

**STAFF ANALYSIS
FSA15-02/03/05/07/08**

ISSUES

Five separate Fishery Special Action Requests FSA15-02, 03, 05, 07, and 08 were submitted by the Akiak Native Community, Native Village of Napakiak, Native Village of Akiachak, Native Village of Chuathbaluk, and the Native Village of Lower Kalskag, respectively. All request that the Federal Subsistence Board (Board) close Federal public waters of the Kuskokwim River drainage to the harvest of salmon except by Federally qualified subsistence users, further reduce the pool of eligible harvesters based on the Alaska National Interest Lands Conservation Act (ANILCA) Section 804 analysis that was implemented in 2014, and implement an allocation strategy among eligible users.

DISCUSSION

All five Tribes request that the Board implement a strategy for Chinook Salmon subsistence management and allocation that will ensure the ability of subsistence users, consistent with necessary conservation, to engage in their customary and traditional uses of Chinook Salmon. The Tribes state that without Federal management of Kuskokwim River Chinook Salmon fisheries, local communities will not be ensured a priority and opportunity for customary and traditional uses of Chinook Salmon that are required by Title VIII of ANILCA. The Tribes said that without Federal management, their social and cultural reliance on Chinook Salmon will be impacted. The State manager anticipates low Kuskokwim River Chinook Salmon returns again in 2015. The proponents state that without Federal management, the Tribes' abilities to harvest Chinook Salmon for customary and traditional subsistence uses will be compromised by other regulatory requirements that do not prioritize rural subsistence uses. Therefore, the Tribes request the Board use the 2014 ANILCA Section 804 determination to provide for equitable opportunity for subsistence uses of Chinook Salmon by communities within the Kuskokwim River drainage. The Tribes said Chinook Salmon harvest management for the Kuskokwim River drainage is usually approached by limiting the area, time, and gear for fishery openings. The Tribes said that these blunt strategies have proven insufficient for precise management of Chinook Salmon and failed to equitably allocate Chinook Salmon among communities. Additionally, the Tribes request the Board assume management of all Kuskokwim salmon stocks as necessary to ensure conservation and subsistence uses of Chinook Salmon stocks.

Special Action Requests from Napakiak (FSA15-03), Akiachak (FSA15-05), Chuathbaluk (FSA15-07), and Lower Kalskag (FSA15-08) said

It is essential that the Board work closely with our Tribe and the other tribal governments on the Kuskokwim River drainage in managing salmon and subsistence uses for the river. The Tribe fully supports the demonstration project announced by the Secretary for establishing of a co-management structure for the Kuskokwim that incorporates the Kuskokwim River Inter-Tribal Fish Commission into the federal management system. This co-management structure should be fully implemented for the 2016 season. For the

2015 season, the Board should implement an interim co-management system through temporary rules and the tribal consultation requirement that meaningfully incorporates tribal governments and the inter-tribal commission into all pre-season and in-season management actions and in the development and implementation of a Chinook allocation plan for the members and residents of tribal communities.

Last year, in April 2014, the Board supported Fishery Special Action Request FSA14-03 from the Napaskiak Tribal Council and closed Federal public waters in the Kuskokwim River drainage to the harvest of Chinook Salmon except by residents of the drainage and four coastal communities Kwigillingok, Kongiganek, Kipnuk, and Chefornak.

In 2015, Special Action Request FSA15-02/03/05/07/08 additionally ask the Board to assume management of all Kuskokwim salmon as necessary to ensure conservation and subsistence uses of salmon and to implement an allocation strategy for salmon among eligible users.

In 2014, Special Action Requests FSA14-09/10/11/12/13/14 were submitted by the Village of Lower Kalskag, Kuskokwim Native Association, Native Village of Napaimute, Native Village of Crooked Creek, Native Village of Aniak, and Native Village of Kalskag, respectively, in late July 2014. They requested the Board ensure reasonable opportunity and priority use of subsistence resources and exert Federal jurisdiction for fisheries management on the Kuskokwim River for the remainder of the 2014 fishing season. The Tribes said that their subsistence needs had not been met, which required them to harvest more Coho Salmon than they had in past years. Further, Chinook Salmon conservation actions enacted by Federal and State Managers in part assured subsistence users that opportunity would be provided to harvest other species of salmon to compensate for the lack of opportunity to harvest Chinook Salmon. In 2014, the Board deferred action on the six Special Action Requests based on State action that suspended commercial fishing in the Kuskokwim River.

In Special Action Request FSA15-02/03/05/07/08, the Tribes request that staff include Chinook, Chum, Sockeye, and Coho Salmon in the analysis. Management of Chinook Salmon runs affect management of other species of salmon because run timing overlaps considerably (**Figure 1**). In recent years, people were restricted from salmon fishing or using effective gear types such as large-mesh gillnets even when the majority of salmon in the river was Chum and Sockeye salmon. For example in 2014, the drainage was closed to the harvest of salmon May 20–June 13, and fishing for nonsalmon species with gillnets was restricted to 4-inch or less mesh size. Starting June 14, the State allowed people to harvest Chum and Sockeye salmon while live releasing Chinook salmon, but with dip nets and not 6-inch or larger mesh gillnets that are typically used. Requiring people to use dip nets that allowed live release of Chinook Salmon, State managers prevented people from harvesting Chum and Sockeye Salmon in large enough numbers to fill smokehouses, for example, and prevented people from retaining the few Chinook Salmon they could have caught and killed in their large-mesh gillnets. Further, commercial fisheries for Chum, Sockeye, and Coho Salmon occur only in the lower river, and they limit the opportunity for middle and upper river communities to harvest Chum, Sockeye, or Coho Salmon for subsistence. Additionally, the end of the directed fishery for Chinook Salmon and the beginning of the directed fishery for Chum or Sockeye Salmon are not defined in regulation leaving unclear when Federal management of the salmon runs end. Allowing the Special Action to continue into the Chum, Sockeye, and Coho Salmon runs allows

the Federal manager to maintain authority on Federal public waters until it is clear that Federal management of salmon harvests is no longer necessary in order to either protect Chinook Salmon or provide opportunity for subsistence users to harvest Chinook, Chum, Sockeye, or Coho Salmon.

Existing Federal Regulation

Kuskokwim Area—Fish

§100.27(e)(4)(ii) For the Kuskokwim area, Federal subsistence fishing schedules, openings, closings, and fishing methods are the same as those issued for the subsistence taking of fish under Alaska Statutes (AS 16.05.060), unless superseded by a Federal Special Action.

Proposed Federal Regulation

Kuskokwim Area—Fish

§100.27(e)(4)(ii) For the Kuskokwim area, Federal subsistence fishing schedules, openings, closings, and fishing methods are the same as those issued for the subsistence taking of fish under Alaska Statutes (AS 16.05.060), unless superseded by a Federal Special Action.

Unless re-opened by the Yukon Delta National Refuge Manager, Federal public waters in that portion of the Kuskokwim River drainage that are within and adjacent to the exterior boundaries of the Yukon Delta National Wildlife Refuge are closed to the harvest of Chinook, Chum, Sockeye, and Coho Salmon except by Federally qualified residents of the Kuskokwim River drainage and the villages of Chefornek, Kipnuk, Kwigillingok and Kongiganek.

State of Alaska Regulations

Kuskokwim Area—Subsistence Fishing

5 AAC 01.260. Fishing seasons and periods

(a) Unless otherwise specified in this section, 5 AAC 01.275, or 5 AAC 07.365, finfish, except rainbow trout, may be taken in the Kuskokwim Area at any time. Rainbow trout taken incidentally in other subsistence finfish net fisheries and through the ice are legally taken and may be retained for subsistence purposes.

(b) In the waters of Districts 1 and 2 and those waters of the Kuskokwim River between Districts 1 and 2, salmon may be taken at any time, except that the commissioner may, by emergency order, close the subsistence fishing periods in the waters of Districts 1 and 2 and those waters of the Kuskokwim River between District 1 and 2 and reopen those waters to commercial fishing. In Subdistricts 1-A and 1-B, the commissioner may, by emergency order, reopen fishing periods where subsistence fishing will be allowed in portions of waters adjacent to the waters of Subdistricts 1-A or 1-B open to commercial fishing under this subsection.

Extent of Federal Public Lands

For purposes of this discussion, the phrase “Federal public waters” is defined as those waters described under 50 CFR 100.3. The affected area consists of those waters of the Kuskokwim River drainage that are

within and adjacent to the exterior boundaries of the Yukon Delta National Wildlife Refuge, including portions of Districts 1 and 2 of the Kuskokwim Fishery Management Area (Kuskokwim Area). The waters are generally described as the lower Kuskokwim River drainage from the mouth upriver to and including about 30 miles of the Aniak River (see **Map**).

Customary and Traditional Use Determination

Most residents of the Kuskokwim Fishery Management Area (except those persons residing on the United States military installations located on Cape Newenham, Sparrevohn USAFB, and Tatalina USAFB) have a customary and traditional use determination for all salmon in Kuskokwim River drainage. The area includes 40 villages. Presented from south to north, the villages are: Newtok, Tununak, Toksook Bay, Nightmute, Mekoryuk, Chefornak, Kipnuk, Kwigillingok, Kongiganek, Platinum, Goodnews Bay, Quinhagak, Tuntutuliak, Eek, Napakiak, Napaskiak, Kasigluk, Nunapitchuk, Atmauthluak, Oscarville, Bethel, Kwethluk, Akiachak, Akiak, Tuluksak, Lower Kalskag, Kalskag, Aniak, Chuathbaluk, Napaimute, Crooked Creek, Georgetown, Red Devil, Sleetmute, Stony River, Lime Village, Takotna, McGrath, Telida, and Nikolai.

Cultural Background

People who are members of 40 tribes and about 7 regional groups live in the Kuskokwim Fishery Management Area. The majority of people in the area are *Yup'ik* Eskimos. *Yup'ik* people self-recognize as belonging to a number of confederations of villages: *Qaluyaarmiut* on Nelson Island, *Nunivavaarmiut* on Nunivak Island are two commonly recognized groups; also, *Canineqmiut* along the coastal area from the mouth of the Kuskokwim River to Nelson Island and *Kusquqvagmiut* in the lower and middle Kuskokwim River drainage. *Deg Hit'an* (or Ingalik), Upper Kuskokwim, and *Dena'ina* Athabascan peoples live in the villages along the middle and upper Kuskokwim River drainage (Fienup-Riordan 1984, Oswalt 1980).

Many forces of change have influenced people's subsistence uses of salmon. One is the increased use of motorized boats, snowmachines, and airplanes that replaced dog sleds as the primary mode of transportation. People no longer find it necessary to harvest wild resources in order to feed the dogs that were once owned by almost every family. People fed their dogs mainly Chum and Sockeye Salmon that were harvested later than Chinook Salmon. People harvested Chinook Salmon mainly for human consumption. Today, only some families own dogs, and subsistence harvests of Chum and Sockeye Salmon have decreased greatly since the 1960s (Ikuta et al. 2013).

Most non-Natives living in the Kuskokwim Fishery Management Area reside in the regional hubs of Federal and State governments, transportation, trade, and services: Bethel, Aniak, and McGrath. Historically, people entered the area to mine, trade, missionize, homestead, and recreate. Some of the villages were staging areas for these activities (Fienup-Riordan 1983, 1984; Kilbuck 1988; Oswalt 1990; Oswalt and VanStone 1967).

In 2010, an estimated 17,454 people living in 4,894 households were described as permanent residents of the villages in the Kuskokwim Area by the U.S. Bureau of the Census. In 1960, the U.S. Bureau of the

Census estimated that 6,776 people lived in the area (**Table 1**). The population of the Kuskokwim Area almost tripled in the 50 years between 1960 and 2010 (ADCCED 2014).

Harvest History

From the mid-1990s through 2014, harvest of Chinook Salmon for subsistence has averaged 81,000 fish annually from the Kuskokwim River drainage (**Table 2**). However, since 2010, the amount of harvest has trended downward, due to both record low runs and corresponding increased fishing restrictions in some years. The estimated 2010 subsistence harvest was 66,000 fish, and the 2011 estimated subsistence harvest was 59,000 fish (Brazil et al. 2013). The estimated 2012 subsistence Chinook Salmon harvest of 24,000 fish was the lowest on record at that time. This occurred as a result of the lowest run size to date at the time, in conjunction with significant restrictions on Chinook Salmon fishing throughout the 2012 fishing season. In 2013, subsistence users harvested an estimated 46,500 fish; almost twice as much as the previous year, but still well below the 25-year average of 81,000 fish (Elison 2014, pers. comm.). The preliminary 2014 subsistence harvest was an estimated 11,234 Chinook Salmon (Hamazaki and Liller 2015). In 2014, preliminary drainage-wide harvest estimates for other salmon species were 68,398 Chum, 48,372 Sockeye, and 49,736 Coho Salmon. Compare these to the recent 10-year averages, 62,671 Chum, 43,792 Sockeye, and 34,800 Coho Salmon (ADF&G 2015c).

Biological Background

Run Size

Since 2007, the Kuskokwim River Chinook Salmon stocks have been in a multi-year period of low productivity insufficient to meet necessary escapement levels and provide subsistence users with sufficient opportunity to harvest (Schindler et al. 2013). The average Kuskokwim River Chinook Salmon run size from 1990–2014 was 244,000 fish, with the last 5 years, 2010–2014, averaging only 116,000 fish. Since 2010, the Chinook Salmon runs have been some of the lowest runs on record, with the estimated 2013 run of about 94,000 fish. This was the lowest run ever documented (**Table 2**; Brazil et al. 2013; Elison 2014, pers. comm.; Hamazaki and Liller 2015; see **Appendix A**).

Escapement

Escapement objectives for Chinook Salmon were not met on the Kuskokwim River 2009–2013. Prior to the 2012 Chinook Salmon fishing season, the Federal and State inseason fisheries managers, with concurrence from the Kuskokwim River Salmon Management Working Group (Working Group), agreed on managing the subsistence fishery with an escapement goal of 127,000 fish, based on the Bethel Test Fishery abundance index. The estimated 2012 total run of 101,000 Chinook Salmon in the Kuskokwim River was not only lower than the escapement goal, but turned out to be the lowest run on record at the time, dating back to 1976 (**Table 2**; Brazil et al. 2013; Elison 2014, pers. comm.; Hamazaki and Liller 2015).

In January 2013, the Alaska Board of Fisheries adopted a new Kuskokwim River Salmon Management Plan (5 AAC 07.365), and a new, drainage-wide Sustainable Escapement Goal (SEG) of 65,000–120,000

Chinook Salmon. For the 2013 Chinook Salmon fishing season, with this new SEG in place, the inseason fisheries managers, with concurrence from the Working Group, agreed on managing the subsistence fishery with an escapement goal of 85,000 fish. Due to run timing and compression, few restrictions were placed on Chinook Salmon subsistence harvest throughout the 2013 fishing season, which resulted in the lowest escapement on record (**Table 2**; Elison 2014, pers. comm.).

In 2014, the Kuskokwim River Chinook Salmon forecast was for a return of 71,000–116,000. Inseason fishery managers, with concurrence from the Working Group, agreed to enter the fishing season closed to the harvest of salmon, which resulted in the lowest Chinook Salmon subsistence harvest on record, a preliminary estimated harvest of 11,000 Chinook Salmon that were harvested incidentally. The estimated drainage-wide return was 135,000 Chinook Salmon, resulting in an escapement of 123,987 fish, slightly above the SEG of 65,000–120,000 fish. However, two important weir projects in the Kwethluk and Kogukluk rivers failed to reach their tributary-specific escapement goals. Preliminary estimates indicate that the 2014 Chum Salmon was below average, the Sockeye Salmon run was average, and the Coho Salmon run was above average (ADF&G 2015a, Hamazaki and Liller 2015).

The 2015 Chinook Salmon forecast for the Kuskokwim River is 96,000–163,000 fish. If the run returns near the low end of the forecast range, then there will not be enough Chinook Salmon to provide for escapement and subsistence opportunity. Due to several consecutive years of well-below average Chinook Salmon runs, and the fact that two important weir projects failed to reach their tributary-specific escapement goals in 2014, conservation measures will again be warranted drainage-wide in 2015. It is likely that no directed Chinook Salmon fishing will be allowed during part, if not all, of the 2015 salmon fishing season (ADF&G 2015a). The State sport fishery targeting Chinook Salmon closed on April 1, 2015 through July 25, 2015 (ADF&G 2015b).

Management in 2014

In 2014, the Board received Fishery Special Action Request FSA14-03 from the Napaskiak Tribal Council that asked the Board to close the Kuskokwim River drainage to the harvest of Chinook Salmon except by Federally qualified subsistence users, and to conduct an analysis under Section 804 of ANILCA. The Board supported FSA14-03 that resulted in two actions. First, the Yukon Delta Refuge Manager closed most Refuge waters to the harvest of Chinook Salmon except by Federally qualified subsistence users. Second, the pool of Federally qualified subsistence users was reduced to only residents of the Kuskokwim River drainage and the coastal villages of Chefornak, Kipnuk, Kwigillingok, and Kongiganek (SA 3-KS-01-14). Federal management actions are presented in chronological order below (**Tables 3–4**, ADF&G 2015b, FWS 2015).

Federal Special Actions

On May 20, 2014, the Federal manager closed Refuge waters from the Kuskokwim River mouth upriver to Tuluksak to the harvest of Chinook Salmon by all users, and Refuge waters from Tuluksak to the Aniak River closed on May 27 (SA 3-KS-02-14 and SA 3-KS-03-14). The effect of the closures was to restrict subsistence nets to 4-inch or less mesh size not to exceed 60-feet long (FWS 2015).

Federal Subsistence Board

On June 11, the Federal manager opened Refuge waters to the harvest of Chinook Salmon by only residents of villages issued Social and Cultural Permits and using gillnets 6-inch or less mesh size not exceeding 50-fathoms long and 45-meshes deep (SA 3-KS-04-14).

On June 20, the Federal manager opened Refuge waters from the Kuskokwim River mouth to Tuluksak to the harvest of Chinook Salmon by only Federally qualified subsistence users with gillnets 6-inches or less mesh size not exceeding 50-fathoms long and 45-meshes deep, for 4 hours (SA 3-KS-05-14).

Also on June 20, the Federal manager opened Refuge waters below the southern tip of Eek Island to the harvest of Chinook Salmon by Federally qualified subsistence users with gillnets 6-inch or less mesh size not exceeding 50-fathoms long and 45-meshes deep (SA 3-KS-06-14).

On June 24, as Chum and Sockeye Salmon abundance started to exceed Chinook Salmon abundance, as indicated by the Bethel Test Fishery, the Federal manager announced that Federal subsistence fishing schedules, openings, closings, and fishing methods in the Kuskokwim Area were the same as those issued for the subsistence taking of fish under Alaska Statutes (AS 16.05.060) (SA 3-KS-07-14). Two Special Actions remained in effect, 3-KS-01-14 (until July 18) and 3-KS-04-14 (until June 30).

State Emergency Orders

The 2014 fishing season was the first that dip nets could be used as a legal salmon subsistence fishing gear in the Kuskokwim River drainage. The Board of Fisheries approved dip nets as a method to allow subsistence opportunity during times of Chinook Salmon conservation. Subsistence fishing with dip nets was allowed beginning June 14, with additional opportunity provided sequentially upstream as run timing dictated. All Chinook Salmon caught in a dip net were required to be immediately released unharmed (**Table 4**, ADF&G 2015b).

On May 1, the State closed the sport fishery to the harvest of Chinook Salmon in the Kuskokwim River drainage. Only one unbaited, single-hook, artificial lure might be used. All Chinook Salmon caught unintentionally while fishing for other species would not be removed from the water and were to be released immediately.

On June 1, the State closed the Kuskokwim River drainage from the Aniak River upriver to the Holitna River to the harvest of Chinook Salmon, and from the Holitna River upriver to the headwaters on June 4. The effect of the closures was to restrict subsistence nets to 4-inch or less mesh size not to exceed 60-feet long.

As Chum and Sockeye Salmon abundance started to exceed Chinook Salmon abundance, as indicated by the Bethel Test Fishery, limited subsistence fishing opportunity with 6-inch mesh gillnet gear was provided. The first 6-inch mesh fishing period was on June 20, with additional opportunity provided sequentially upstream as run timing dictated. Fish wheels were required to have a live box from June 19–August 4 to facilitate the live release of Chinook Salmon. The Kwethluk, Kasigluk, Kisaralik, Tuluksak, and Aniak river drainages remained restricted to the use of 4-inch mesh gillnets through August 4.

Section 804 Analysis

Section 804 of ANILCA requires the Secretary of the Department of the Interior and the Secretary of the Department of Agriculture to respond when the population of a fish or wildlife species in a particular area becomes depressed to the point that the Secretaries are forced by circumstances to choose between otherwise qualified rural residents who wish to fish, hunt, or trap from that depressed population. Section 804 of ANILCA requires the Secretaries to make a determination based on three criteria: (1) customary and direct dependence upon the populations as the mainstay of livelihood, (2) local residency, and (3) the availability of alternative subsistence resources.

ANILCA Section 804

Except as otherwise provided in this Act and other Federal laws, the taking on public lands of fish and wildlife for nonwasteful subsistence uses shall be accorded priority over the taking on such lands of fish and wildlife for other purposes. Whenever it is necessary to restrict the taking of populations of fish and wildlife on such lands for subsistence uses in order to protect the continued viability of such populations, or to continue such uses, such priority shall be implemented through appropriate limitations based on the application of the following criteria:

- (1) customary and direct dependence upon the populations as the mainstay of livelihood;*
- (2) local residency; and*
- (3) the availability of alternative resources.*

Codified Federal Regulations 50 CFR §__100.17 Determining priorities for subsistence uses among rural Alaska residents

(a) Whenever it is necessary to restrict the subsistence taking of fish and wildlife on public lands in order to protect the continued viability of such populations, or to continue subsistence uses, the Board shall establish a priority among the rural Alaska residents after considering any recommendation submitted by an appropriate Regional Council.

(b) The priority shall be implemented through appropriate limitations based on the application of the following criteria to each area, community, or individual determined to have customary and traditional use, as necessary:

- (1) Customary and direct dependence upon the populations as the mainstay of livelihood;*
- (2) Local residency; and*
- (3) The availability of alternative resources.*

(c) If allocation on an area or community basis is not achievable, then the Board shall allocate subsistence opportunity on an individual basis through application of the criteria in paragraphs (b)(1) through (3) of this section.

(d) In addressing a situation where prioritized allocation becomes necessary, the Board shall solicit recommendations from the Regional Council in the area affected.

Once a limited pool of qualified users is identified based on an analysis of the above three criteria and informed by recommendations from the relevant Regional Advisory Councils when possible, other management actions are taken to ensure subsistence opportunities are available within the confines of specific conservation concerns. In other words, an analysis based on Section 804 of ANILCA and 50 CFR §__100.17 does not allocate resources among those within the limited pool of users; it simply identifies that pool of users.

In this case, such an analysis is required because the proponent requested it and because of the projected small harvestable surplus of Chinook Salmon in the Kuskokwim River drainage relative to the large number of subsistence users with a customary and traditional use determination to harvest Chinook Salmon. There is a high potential for harvest to exceed the harvestable surplus. The following section addresses these criteria as they relate to rural residents with a customary and traditional use determination for salmon in the Kuskokwim River drainage.

Sources of Information

Published ethnographic studies of the communities that have a customary and traditional use determination for Chinook, Chum, Sockeye, and Coho Salmon in the Kuskokwim River drainage include: Fienup-Riordan (1983, 1984), Ikuta et al. (2013), Oswalt (1959, 1990), Wolfe and Ellanna (1983), Wolfe and Spaeder (2009), and Wolfe et al. (1983). Historical and contemporary subsistence patterns are described in the technical paper series of the Division of Subsistence, ADF&G. Harvest statistics are housed in three places. The results of household harvest surveys are reported in the *Community Subsistence Information System*, an online database, Division of Subsistence, ADF&G (2014a, **Table 5**). The FWS/ADF&G permit reporting system is another source, but it is not widely used in most rural areas of the state. Finally, drainage residents report their harvests of salmon during annual household harvest surveys that are described in Shelden, Hamazaki, Horne-Brine, Roczicka, Thalhauser, and Carroll (*in pub.*) (**Tables 6–9**). The primary purpose of household harvest surveys is to document subsistence uses of wild resources. These quantitative studies focus on a one-year time period; however, they may not be the “typical” year. In fact, annual variation in subsistence patterns can be significant as subsistence harvesters respond, for example, to the availability of resources or employment opportunities that may vary considerably from year to year. Thus, harvest estimates for some communities may be imprecise and large data sets are required to detect trends. Household harvest survey data are collected, processed, and reported by major resource categories (salmon, nonsalmon fishes, etc.). Harvest levels are converted to pounds (lbs) edible weight and presented as per capita harvest levels. Per capita harvest levels allow comparisons between resources and communities and take into account human population differences (**Table 10**).

Criterion 1: Customary and Direct Dependence upon the Population as the Mainstay of Livelihood

The information below is based on the detailed descriptions in **Appendix B** of where people harvest, process, and preserve salmon.

1. Residents of South Kuskokwim Bay

Goodnews Bay, Quinhagak, and Platinum—Salmon are a mainstay of the subsistence economy for the villages. Higher numbers of Coho, Sockeye, and Chinook Salmon are harvested than Chum Salmon (**Tables 6–9, Figure 2**); however, salmon are harvested from drainages nearby the villages including the Kanektok, Goodnews, and Arolik rivers and not from the Kuskokwim River drainage (LaVine et al. 2007).

2. Residents of Nelson Island, Newtok, and Chefornak (Qaluyaarmiut)

Newtok, Nightmute, Tununak, and Toksook Bay—These villages rely more heavily on herring, other nonsalmon fishes, and marine mammals than they do on salmon as a mainstay of the subsistence economy. Salmon is harvested, but from the marine waters closer to the villages and not from the Kuskokwim River drainage (**Table 5, Figure 2**) (Fienup-Riordan 1983, Wolfe et al. 2012).

Chefornak—People at Chefornak, while culturally and linguistically related to the people of Nelson Island, do not have opportunities to harvest herring at the high levels seen on Nelson Island. Other nonsalmon fishes, marine mammals, and salmon are likely harvested at high levels. Historically, people maintained fish camps at the mouth of the Kuskokwim River all summer to harvest, process, and preserve salmon. Before outboards, the trip took 4 days by boat. Currently, a few Chefornak families still travel to the Kuskokwim River fish camps. People also harvest a mixed variety of salmon from near-shore waters of Etolin Strait and Cape Vancouver and Coho Salmon during August in the Kinia River that is adjacent to the village (**Table 5, Figure 2**) (Fienup-Riordan 1983, Wolfe et al. 2012).

3. Residents of Nunivak Island (Nunivavaarmiut)

Mekoryuk—People at Mekoryuk harvest large numbers of nonsalmon fishes and marine mammals. At least one stream on Nunivak supports a Sockeye Salmon run. People occasionally harvest Chinook Salmon when they travel across Etolin Strait to Cape Vancouver and fish with gillnets (**Table 5, Figure 2**) (Drozda 2010, Pete 1984, Wolfe et al. 2012).

4. Residents of the Coast

Kwigillingok and Kongiganek—Salmon are a mainstay of the subsistence economy for the villages. Salmon fishing has long been one of the primary activities of the people living along this area of the coast. Historically people moved to camps on both sides of the Kuskokwim River mouth below Eek Island in order to harvest, process, and preserve salmon all summer. Probably starting in the 1930s, people moved their fish camps to locations near to Napakiak and Napaskiak. By the 1980s, people generally did not move to fish camps in the lower Kuskokwim River area. Today, men generally go by boat to harvest salmon at the mouth of the Kuskokwim River and return to Kwigillingok or Kongiganek the same day. Salmon are processed in the village. Some residents have commercial fishing permits for the Kuskokwim Area and likely return home with some Chinook Salmon retained from their commercial catches. People do not have access to other runs of Chinook Salmon (**Table 5, Figure 2**) (Stickney 1983).

Kipnuk—Kipnuk is situated on the Kuguklik River near the coast, about 60 miles from the mouth of the Kuskokwim River. Historically, some families stayed at fish camps situated at the mouth of the Kuskokwim River to harvest, process, and preserve salmon all summer, a trip taking up to 3 days before outboards. Kipnuk people's fish camps were generally located along the east side of the Kuskokwim River mouth at the north end of Kuskokwim Bay, across and south from Eek Island. In recent years, a few Kipnuk families still travel to the Kuskokwim River fish camps to harvest, process, and preserve salmon. Other people harvest salmon from the local area and from the Kuskokwim River usually returning in a single day or after camping overnight, especially during Chinook Salmon season; however, a few travel to Bethel by airplane to harvest from fish camps near Bethel (**Table 5, Figure 2**). Kipnuk's wild food harvest includes large amounts of nonsalmon fishes including herring, blackfish, halibut, cisco, Pacific cod, and smelt. Marine mammals are probably also a mainstay of the subsistence economy in Kipnuk. (Wolfe et al. 2012).

5. Residents of the Lower and Middle Kuskokwim River Drainage

Tuntutuliak, Eek, Napakiak, Napaskiak, Kasigluk, Nunapitchuk, Atmauthluak, Oscarville, Bethel, Kwethluk, Akiachak, Akiak, Tuluksak, Lower Kalskag, Kalskag, Aniak, and Chuathbaluk—Seventeen villages are situated in the lower and middle Kuskokwim River drainage, and salmon is a mainstay of the subsistence economy (**Tables 6–9, Figure 2**). All 17 villages rely on the harvest of fish, economically, spiritually, and as a matter of survival. They rely most on salmon. The salmon runs are generally consistent, predictable, and large, and people organize their economic, spiritual, and social lives around harvesting, processing, and preserving salmon. People process a lot of the salmon they harvest by carefully tending to it while it is drying and smoking, a process that takes several weeks in dry weather. Chinook Salmon are available for harvest in June during normally dry weather. Historically, people harvested enormous quantities of Chum and Sockeye Salmon to feed their dogs, when all winter travel was by dog sleds. Occasional harvests of Chinook Salmon were preserved for human consumption and not fed to dogs. People preserved Chum and Sockeye Salmon for later use by drying and smoking it. Chum and Sockeye Salmon are available for harvest in July and August when periods of wet weather are typical, and when drying and smoking salmon takes more time. Today, people rely more heavily on Chinook Salmon to feed themselves because it can be processed and preserved during dry weather, and very large quantities can be stored that will remain suitable for human consumption throughout the winter (Andrews 1989, Andrews and Peterson 1983, Brelsford et al. 1987, Brown et al. 2012, Brown et al. 2013, Coffing 1991, Coffing et al. 2001, Ikuta et al. 2013, Oswalt 1959, Ray et al. 2010) .

6. Residents of the Upper Kuskokwim Drainage

Napaimute, Crooked Creek, Georgetown, Red Devil, Sleetmute, Stony River, and Lime Village—The villages in the upper Kuskokwim River drainage rely on salmon as a mainstay of the subsistence economy. People rely on the large quantities of salmon, including Chinook Salmon, that they harvest from the Kuskokwim River drainage. Researchers recently observed Sleetmute families harvest, process, and preserve Chinook and Sockeye Salmon at summer fish camps. People took fewer Coho Salmon because Coho Salmon were available during a normally rainy season when people had a hard time smoking them. People do not prefer to eat frozen Coho Salmon. Large quantities of nonsalmon fishes are

also harvested. For Lime Village, moose and caribou are a mainstay of the subsistence economy also (**Tables 6–10, Figure 2**; Brelsford et al. 1987; Brown et al. 2012; Kari 1983, 1985; Oswalt 1980).

7. Residents of the Kuskokwim River Headwaters

Takotna, Nikolai, and McGrath—People at the villages rely on their harvests of moose, caribou, and salmon, including Chinook Salmon, as the mainstay of the subsistence economy (**Tables 6–10, Figure 2**; Brown et al. 2012, Brown et al. 2013, Ikuta et al. 2013).

Criterion 2. Local residency

People living within the Kuskokwim River drainage have the highest level of local residency. Within the Kuskokwim River drainage, people presently occupy 28 village sites. They are listed in **Table 1**. Two other villages, Kwigillingok and Kongiganek, while not within the drainage are situated within a few miles west of the mouth of the Kuskokwim River. Kipnuk is about 60 miles west of the mouth, further west is Chefornak, and farthest west are the villages of Nelson Island and Nunivak Island. For south Kuskokwim Bay, the village nearest to the mouth is Quinhagak, about 40 miles from the mouth. Goodnews Bay and Platinum are located further south.

Criterion 3. Availability of Alternative Resources

Only residents of the Kuskokwim River drainage and the coastal communities of Kwigillingok, Kongiganek, Kipnuk, and Chefornak are discussed regarding Criterion 3 because it has not been shown that other rural communities rely on salmon that they harvest from the Kuskokwim river drainage. The following description of the availability of wild resources other than salmon relies on ethnographic sources, harvest surveys, and wildlife population assessments in ADF&G management reports.

In research conducted between 2009 and 2011, nonsalmon fishes were harvested at high levels by residents of lower Kuskokwim River drainage communities, 23–46% of the annual harvest of all wild resources, in lbs edible weight (**Table 10**). Harvest levels in other resource categories, such as large land mammals and birds and eggs, were considerably lower. Nonsalmon fishes harvested by residents of lower river communities included pike and whitefishes and smaller amounts of blackfish, burbot, and smelt. One community harvested herring and halibut as well as freshwater fishes (Napakiak), but this was rare. Few char, trout, or grayling were reported in the harvests (ADF&G 2014a, Ray et al. 2010). Typically, communities in the middle and upper Kuskokwim River drainage, from Lower Kalskag to Nikolai, reported harvesting less nonsalmon fishes than lower river communities, 5–17% of annual wild food harvests. The exception was Red Devil where nonsalmon fishes made up 39% of annual wild food harvests. The most common nonsalmon fishes harvested in middle and upper river communities were whitefishes. Other fish included smelt, blackfish, and grayling. Harvests of moose and caribou in only some upper river communities was a large portion of the annual wild resource harvests, 49% in McGrath and 26% in Lime Village (ADF&G 2014a, Krauthoefer et al. 2007, Williams et al. 2004).

The Kuskokwim population of moose in Unit 18 (up to Lower Kalskag) “is small and is still in the process of colonizing the available riparian habitat.” Most of the area “is lowland treeless tundra, which is not suitable as winter habitat for moose Moose densities are low and growing in the lower

Kuskokwim drainage . . . Heavy hunting pressure from communities along the Kuskokwim River has effectively limited moose population growth along that riparian corridor” (Perry 2010:271).

In Unit 19 (above Lower Kalskag), Federal and State moose hunts are closed upstream of Georgetown in Unit 19A. Unit 19A remainder is closed except to residents of local villages with a Federal draw permit, or a Tier II permit on State-managed lands. Moose numbers are high in Unit 19D east including the McGrath area (Seavoy 2010).

From 1994 to 2010, “approximately 10,000 to 40,000 Mulchatna caribou entered Unit 18 from the east” and wintered “throughout the eastern lower Kuskokwim River and Kuskokwim Bay drainages. . . . Occasionally, caribou are reported west of the Kuskokwim River. These reports are sporadic, and no long-term presence of caribou west of the Kuskokwim River has been established” (Perry 2011:111). The hunting season in Units 18, 19A, and 19B is seven and a half months with a 2 caribou harvest limit. Several small herds exist in the McGrath area in Unit 19D. Caribou are rare in Unit 21E (Seavoy 2011).

For the coastal communities of Chefnak, Kipnuk, Kwigillingok and Kongiganek, people at the villages harvest locally available populations of nonsalmon fishes (such as sculpin and sole) and marine mammals. Chum and Sockeye Salmon are available locally, primarily in marine waters. A small and growing population of moose are available for harvest (Fienup-Riordan 1983, Stickney 1983, Wolfe et al. 2012).

Summary

Residents of 32 communities in the Kuskokwim River drainage and Kwigillingok, Kongiganek, Kipnuk, and Chefnak are known to rely on salmon from the Kuskokwim River drainage as a mainstay of livelihood and the subsistence economy. Twenty-eight communities are situated in the Kuskokwim River drainage and therefore have the highest degree of local residency to the salmon runs there. As alternatives to salmon, wild resources available for harvest include nonsalmon fishes, marine mammals, and moose. Coastal communities are better situated regarding their ability to harvest marine fishes and seals, lower Kuskokwim River communities appear to be better situated to harvest nonsalmon fishes, and headwater communities are better situated to harvest moose.

Conclusion of Section 804 Analysis

Residents of 28 communities in the Kuskokwim River drainage and additionally Kwigillingok, Kongiganek, Kipnuk, and Chefnak have the higher level of customary and direct dependence on salmon from the Kuskokwim River drainage than do other communities after consideration of the three criteria in ANILCA Section 804. The 32 villages consist of an estimated 14,739 people living in 4,226 households. Presented from south to north, the area includes the following villages: Chefnak, Kipnuk, Kongiganek, Kwigillingok, Tuntutuliak, Eek, Napakiak, Napaskiak, Kasigluk, Nunapitchuk, Atmauthluak, Oscarville, Bethel, Kwethluk, Akiachak, Akiak, Tuluksak, Lower Kalskag, Kalskag, Aniak, Chuathbaluk, Napaimute, Crooked Creek, Georgetown, Red Devil, Sleetmute, Stoney River, Lime Village, Takotna, Nikolai, Telida, and McGrath.

The villages have similar characteristics. Most are situated within or adjacent to the Kuskokwim River drainage. Most harvest salmon at higher levels than other resources (such as nonsalmon fishes, land

mammals, marine mammals, birds and eggs, and plants); they generally harvest Chinook Salmon in large quantities to dry and smoke during June; they are not situated near alternative Chinook Salmon runs; and they generally are not situated near other alternative resources that can be harvested, processed, and preserved in numbers large enough to replace salmon as a mainstay of livelihood.

Allocation

The Office of Subsistence Management, in cooperation with the U.S. Fish and Wildlife Service and the Yukon Delta National Wildlife Refuge, would be responsible for coordinating the allocation of Chinook Salmon to the residents of the 32 villages if the Yukon Delta Refuge Manager, in consultation with other fishery managers, deems a harvestable surplus of Chinook Salmon has entered the Kuskokwim River. The allocation is based on the 20-year (1990–2009) average harvest of Chinook Salmon by community and will be equitably distributed.

All of the villages are small enough to issue community-based permits for the harvest of an allocation of Chinook Salmon, with the exception of Bethel. Bethel, with a population of over 6,000, comprises almost half (40%) of the eligible users. In such circumstances, regulations specify that “If allocation on an area or community basis is not achievable, then the Board shall allocate subsistence opportunity on an individual basis” through application of three criteria: (1) customary and direct dependence upon the resource as the mainstay of livelihood, (2) local residency, and (3) the availability of alternative resources (§___100.17 *Determining priorities for subsistence uses among rural Alaska residents*). Staff further analyzed the dependence of Bethel residents on Chinook salmon and their eligibility to harvest Chinook salmon as shown in **Appendix C**.

Effects of the Proposal

If the Special Action Request was approved, the Board would close Refuge waters to the harvest of salmon. The Federal closure would affect State sport fisheries that target Chum, Sockeye, and Coho Salmon, and they would not be allowed in Refuge waters during the Federal closure. The State sport fishery targeting Chinook Salmon closed on April 1, 2015, through July 25, 2015, and therefore would unlikely be affected by the Federal closure (ADF&G 2015b). The Federal closure would affect State commercial and subsistence fisheries that target salmon, and they would not be allowed in Refuge waters during the Federal closure. The Refuge Manager, in consultation with other fishery managers, would open a Federal subsistence Chinook Salmon fishery only if levels justify harvest. The Federally qualified residents of only the Kuskokwim River drainage and the coastal villages of Chefornek, Kipnuk, Kongiganek, and Kwigillingok would be allowed to harvest salmon in Refuge waters. Other residents of the Kuskokwim Fishery Management Area would not be allowed to harvest salmon in Refuge waters. The Federal manager could maintain authority into the timing of Chum, Sockeye, and Coho Salmon runs until it was clear that Federal management of salmon harvests was no longer necessary in order to either protect Chinook Salmon or other salmon species, or provide opportunity to harvest Chinook Salmon or other salmon species. If the Special Action was approved, the Federal Subsistence Management Program should build and administer a program to allocate a possible harvestable surplus of Chinook Salmon to the 32 communities in the ANILCA Section 804 determination.

If the Special Action Request was approved, and without assurance of State partnership in the management process, some challenges the Federal management team would face include coordination of stock management, in season stock assessment, the timely finalization of a Chinook Salmon allocation strategy, and implementation of a permitting process. Based on these considerations, if the Federal Subsistence Management Program assumed management of all Kuskokwim salmon stocks the U.S. Fish and Wildlife Service might not have the existing capacity to fulfill all management responsibilities resulting from the approval.

If this Special Action Request was not approved, the Federal and State fishery managers would likely close the Kuskokwim River drainage to the harvest of Chinook Salmon before June 1 and likely would not allow any directed Chinook Salmon harvest during part, if not all, of the 2015 season (ADF&G 2015a). The Refuge Manager should open Refuge waters to the harvest of Chinook salmon to only the 40 communities with a customary and traditional use determination (**Table 1**) if a harvestable surplus of Chinook Salmon entered the Kuskokwim River and he would manage harvest through gear restrictions. Allocation of Chinook Salmon to eligible communities would not be possible unless implemented pre-season.

OSM CONCLUSION

Support Special Action Request FSA15-02/03/05/07/08 with modification to add a permit requirement for residents of Bethel. The regulations should read:

Kuskokwim Area—Fish

§100.27(e)(4)(ii) For the Kuskokwim area, Federal subsistence fishing schedules, openings, closings, and fishing methods are the same as those issued for the subsistence taking of fish under Alaska Statutes (AS 16.05.060), unless superseded by a Federal Special Action.

Unless re-opened by the Yukon Delta National Refuge Manager, Federal public waters in that portion of the Kuskokwim River drainage that are within and adjacent to the exterior boundaries of the Yukon Delta National Wildlife Refuge are closed to the harvest of Chinook, Chum, Sockeye, and Coho Salmon except by Federally qualified residents of the Kuskokwim River drainage and the villages of Chefornak, Kipnuk, Kwigillingok and Kongiganek; residents of Bethel must have a Federal permit to harvest Chinook Salmon.

Justification

It is likely that the 2015 Chinook Salmon run into the Kuskokwim River will not provide a significant harvestable surplus, and the directed Chinook Salmon subsistence fishery will be closed for part, if not all, of the season (ADF&G 2015a). Communities most dependent on Kuskokwim River drainage salmon runs will likely harvest more Chum, Sockeye, or Coho Salmon to compensate, and opening commercial salmon fisheries should be postponed to allow opportunity for middle and upper river communities to harvest Chum, Sockeye, or Coho Salmon. The primary effect of the Special Action is on the distribution of a possible harvestable surplus of Chinook Salmon amongst communities. The Tribes describe their experience with State management as “blunt strategies” that abruptly open short periods of harvest opportunity with little pre-announcement, similar to management of commercial fisheries for example, fostering a derby milieu. They further describe State management as “proven insufficient . . . to equitably

allocate Chinook salmon between communities” because the State lacks the necessary management tools. Federal regulation 50 CFR §__100.17 *Determining priorities for subsistence uses among rural Alaska residents* that springs from ANILCA Section 804 allows the Federal Subsistence Management Program to implement an allocation strategy amongst those rural communities found to be most dependent on the Chinook Salmon. Once communities are identified through the three criteria, the Federal program can further reduce the pool of eligible harvesters by allocating Chinook Salmon to communities, or to individuals if necessary. The Federal program can restrict eligible Bethel residents from fishing for periods to allow Chinook Salmon to move to upriver spawning beds and communities while at the same time allowing an equitable harvest allocation to Bethel residents found to be most dependent on the resource. Subsistence fisheries may be able to harvest and retain Chinook Salmon that are mixing with Chum and Sockeye Salmon, as is their custom, with their Chinook Salmon harvest levels restricted by their community allocations. Finally, allowing the Special Action to close Chum, Sockeye, and Coho Salmon fisheries to all but communities most dependent on them, allows the Federal manager to maintain authority until it is clear that Federal management of salmon harvests is no longer necessary in order to either protect Chinook Salmon or provide opportunity for subsistence users to harvest Chinook, Chum, Sockeye, or Coho Salmon.

LITERATURE CITED

ADCCED (Alaska Dept. of Commerce, Community, and Economic Development). 2014. Community Information. <http://commerce.alaska.gov/cra/DCRAExternal/community/Details/129b1918-7c91-47da-a1f7-202cea468f9a> , retrieved January 28, 2014. Div. of Community and Regional Affairs. Juneau, AK.

ADF&G (Alaska Department of Fish and Game). 2013. Kuskokwim River Salmon Management Working Group. December 17, 2013 Information Packet. <http://www.adfg.alaska.gov/index.cfm?adfg=commercialbyareakuskokwim.kswg#/2013>. Accessed March, 2014. Div. of Commercial Salmon Fisheries. Anchorage, AK.

ADF&G. 2014a. Community Subsistence Information System (CSIS). <http://www.adfg.alaska.gov/sb/CSIS/index.cfm?ADF&G=main.home>, retrieved January 30, 2014. Div. of Subsistence. Anchorage, AK.

ADF&G. 2014b. Kuskokwim River Salmon Management Working Group, Kuskokwim Management Area. <http://www.adfg.alaska.gov/index.cfm?adfg=commercialbyareakuskokwim.kswg>. Div. of Commercial Fisheries. Anchorage, AK.

ADF&G. 2014c. Bethel: Comprehensive subsistence harvests in 2012. Executive Summary of Technical Paper No. 393. Pamphlet. Division of Subsistence, Anchorage, AK.

ADF&G. 2015a. 2014 Kuskokwim River Chinook salmon run reconstruction and 2015 Outlook. News Release, February 24, 2015. ADF&G, Div. of Commercial Fisheries. Anchorage, AK.

ADF&G. 2015b. Regulation announcements, news releases, and updates. <http://www.adfg.alaska.gov/index.cfm?adfg=cfnews.main>, accessed February. Juneau, AK.

ADF&G. 2015c. Kuskokwim River subsistence salmon harvest survey data, 2014. Handout at the Interagency Meeting for the Kuskokwim Area, March 16, 2015. Division of Commercial Fisheries. Anchorage.

Federal Subsistence Board

- Allendorf, F.W., England P.R., Luikart, G., Ritchie, P.A., and N. Ryman. 2008. Genetic effects of harvest on wild animal populations. *Trends Ecol Evol* 23:327–337.
- Andrews, E.F. 1989. The Akulmiut: Territorial dimensions of a Yup'ik Eskimo society. ADF&G, Div. of Subsistence Tech. Paper No. 177. Juneau, AK. 547 pages.
- Andrews, E.F., and R. Peterson. 1983. Wild resource use of the Tuluksak River drainage by residents of Tuluksak, 1980-1983. ADF&G, Div. of Subsistence Tech. Paper No. 87. Juneau, AK. 42 pages.
- Brazil C., D. Bue, and T. Elison 2013. 2011 Kuskokwim Area Management Report. ADF&G, Fishery Management Report No. 13-23, Anchorage, AK.
- Bigler, B.S., D.W. Welch, and J.H. Helle. 1996. A review of size trends among North Pacific salmon (*Oncorhynchus* spp.) *Can. J. Fish. Aquat. Sci.* 53: 455–465.
- Brelsford, T., R. Peterson, and T. Haynes. 1987. An overview of resource use patterns in three central Kuskokwim communities: Aniak, Crooked Creek, and Red Devil. ADF&G, Div. of Subsistence Tech. Paper No. 141. Juneau, AK. 42 pages.
- Bromaghin, J. F. 2005. A versatile net selectivity model, with application to Pacific salmon and freshwater species of the Yukon River, Alaska. *Fisheries Research* 74:157–168.
- Bromaghin J. F., R.M. Nielson, and J. J. Hard 2011. A model of Chinook salmon population dynamics incorporating size selective exploitation and inheritance of polygenic correlated traits. *Natural Resource Modeling* Volume 24, Number 1, February 2011.
- Brown, C. M. 1983. Alaska's Kuskokwim River region: a history. Draft report. Bureau of Land Management, Anchorage, AK.
- Brown, C.L., J.S. Magdanz, and D.S. Koster. 2012. Subsistence harvests in 8 communities in the central Kuskokwim River drainage, 2009. ADF&G, Div. of Subsistence, Tech. Paper No. 365. Anchorage, AK.
- Brown, C.L., H. Ikuta, D.S. Koster, and J.S. Magdanz. 2013. Subsistence harvests in 6 communities in the Lower and Central Kuskokwim River drainage, 2010. ADF&G, Div. of Subsistence Tech. Paper No. 379. Anchorage, AK.
- Chavez, R. 2014. Fisheries biologist. Personal communication: by telephone. *Orutsararmiut* Native Council, Bethel, AK.
- Coffing, M. 1991. Kwethluk subsistence: Contemporary land use patterns, wild resource harvest and use, and the subsistence economy of a lower Kuskokwim River area community. ADF&G, Div. of Subsistence Tech. Paper No. 157. Juneau, AK. 244 pages.
- Coffing, M.W. 2001. Bethel post-season subsistence fisheries harvest surveys, 2000. FSW, OSM, Fisheries Resource Monitoring Program, final report (Study No. 00-009). ADF&G Div. of Subsistence. Juneau. AK.
- Coffing, M.W., L. Brown, G. Jennings, and C.J. Utermohle. 2001. The subsistence harvest and use of wild resources in Akiachak, AK, 1998. ADF&G, Div. of Subsistence Tech. Paper No. 258. Juneau, AK. 197 pages.

Federal Subsistence Board

- Carroll, H. C., and T. Hamazaki. 2012. Subsistence salmon harvests in the Kuskokwim area, 2008 and 2009. Alaska Department of Fish and Game, Fishery Data Series No. 12-35, Anchorage.
- Drozda, R. 2010. Nunivak Island subsistence cod, red salmon and grayling fisheries—Past and present. Final report for Fisheries Resource Monitoring Program Project Number 05-353. Office of Subsistence Management, FWS, Anchorage, AK.
- Dunlop, E.S., M. Baskett, M. Heino, and U. Dieckmann. 2009. Propensity of marine reserves to reduce the evolutionary effects of fishing in a migratory species. *Evolutionary Applications* 2: 245–259.
- Elison, T. B., K.L. Schaberg, and D.J. Bergstrom. 2012. Kuskokwim River Salmon Stock Status and Kuskokwim Area Fisheries, 2012: A Report to the Alaska Board of Fisheries. ADF&G, Special Publication No. 12-27, Anchorage, AK.
- Elison, T. 2014. Kuskokwim Area Fishery Manager, personal communication. ADF&G, Div. of Commercial Fisheries, Anchorage, AK.
- Enberg, K., C. Jørgensen, E.S. Dunlop, M. Heino, and U. Dieckmann. 2009. Implications of fisheries-induced evolution for stock rebuilding and recovery. *Evolutionary Applications* Special Issue 2:394–414.
- Fienup-Riordan, A. 1983. The Nelson Island Eskimo: Social structure and rural distribution. Alaska Pacific University Press, Anchorage, AK.
- Fienup-Riordan, A. 1984. Regional groups on the Yukon-Kuskokwim Delta. Pages 63–93 in *Etudes Inuit Studies*, Vol. 8.
- Fienup-Riordan, A. 1986. When our bad season comes: a cultural account of subsistence harvesting and harvest disruption on the Yukon Delta. Aurora, Alaska Anthropological Association Monograph Series No. 1.
- FWS (U.S. Fish and Wildlife Service). 2014. Unpublished data, on file. Kenai Field Office. Kenai, AK.
- FWS. 2015. Kuskokwim River updates. <http://www.doi.gov/subsistence/topics/kuskokwim.cfm>, accessed in January. Office of Subsistence Management, Anchorage, AK.
- Hamazaki, T. 2011. Reconstruction of subsistence salmon harvests in the Kuskokwim Area, 1990–2009. ADF&G, Fishery Manuscript Series No. 11-09, Anchorage, AK.
- Hamazaki T., M. J. Evenson, S.J. Fleischman, and K. L. Schaberg. 2012. Spawner-Recruit analysis and escapement goal recommendation for Chinook salmon in the Kuskokwim River Drainage, ADF&G, Fishery Manuscript Series No. 12-08, Anchorage, AK.
- Hamazaki, T., and Z. Liller. 2015. 2014 Kuskokwim River Chinook Salmon run reconstruction and model revisions. Memorandum issued March 10, 2015, on file, ADF&G, Div. of Commercial Fisheries, Anchorage. 26 pages.
- Hankin, D.G., and M.C. Healey 1986. Dependence of exploitation rates for maximum yield and stock collapse on age and sex structure of Chinook salmon (*Oncorhynchus tshawytscha*) stocks. *Canadian Journal of Fish and Aquatic Science* 43: 1746-1759.

Federal Subsistence Board

Hard J.J., M. R. Gross, M. Heino, R. Hilborn, R. G. Kope, R. Law, and J. D. Reynolds 2008. Evolutionary consequences of fishing and their implications for salmon. Volume 1, Issue 2 of Evolutionary Applications Blackwell Publishing Ltd.

Hyer K.E., and C.J. Schleusner 2005. Chinook Salmon Age, Sex, and length Analysis from Selected Escapement Projects on the Yukon River. FWS Alaska Fisheries Technical Report 87, Anchorage, AK.

Ikuta, H., A.R. Brenner; A. Godduhn. 2013. Socioeconomic patterns in subsistence salmon fisheries: historical and contemporary trends in five Kuskokwim River communities and overview of the 2012 season. ADF&G, Div. of Subsistence Tech. Paper No. 382. Anchorage, AK.

Jasper, R., and F. Evenson. 2006. Length-girth, length-weight and fecundity of Yukon River Chinook Salmon *Oncorhynchus tshawytscha*. ADF&G. Fishery Data series No. 6-70.

Kari, P.R. 1983. Land use and economy of Lime Village. ADF&G, Div. of Subsistence Tech. Paper No. 80, Juneau, AK.

Kari, P.R. 1985. Wild resource use and economy of Stony River Village. ADF&G, Div. of Subsistence Tech. Paper No. 108. Juneau, AK.

Kenner, P. 2014. Field notes on file. FWS, OSM, Anchorage, AK.

Kilbuck, J. 1988. The Yup'ik Eskimos as described in the travel journals and ethnographic accounts of John and Edith Kilbuck who served with the Alaska mission of the Moravian church, 1985-1900. Edited by A. Fienup-Riordan. The Limestone Press. Kingston, Ontario.

Krauthoefer, T. 2005. Performance report for Project 05-356. Submitted to the FWS, OSM, Fisheries Resource Monitoring Program December 1, 2005. ADFG Division of Subsistence Division, Anchorage.

Krauthoefer, T., J. Simon, M. Coffing, M. Kerlin, and W. Morgan. 2007. The harvest of non-salmon fish by residents of Aniak and Chuathbaluk, Alaska, 2001-2003. ADF&G, Div. of Subsistence, Tech. Paper No. 299. Anchorage.

LaVine, R., M.J. Lisac, and P. Coiley-Kenner. 2007. Traditional ecological knowledge of 20th century ecosystems and fish populations in the Kuskokwim Bay region. Final report for Fisheries Resource Monitoring Program Project Number FIS 04-351. FWS Office of Subsistence Management, Anchorage, AK.

Mather, E. P. 1985. *Cauyarnariuq*. Lower Kuskokwim School District Bilingual/Bicultural Dept. Bethel, AK.

Molyneaux D.B., D.L. Folletti, L. DuBois, G. Roczicka, and W Morgan. 2004. Age, Sex, and length composition of Chinook salmon from the 2002 Kuskokwim River subsistence Fishery. ADF&G, Div. of Commercial Fisheries, Regional Information Report 3A10-05, Anchorage, AK.

Oswalt. W.H. 1959. Napaskiak: an Eskimo village in western Alaska. A dissertation submitted to the Faculty of the Department of Anthropology. University of Arizona, Tucson, AZ.

Oswalt W.H. 1980. Historic settlements along the Kuskokwim River, Alaska. Alaska State Library Historical Monograph No. 7. Alaska Dept. of Education Div. of State Libraries and Museums. Juneau, AK.

Federal Subsistence Board

- Oswalt, W.H. 1990. *Bashful no longer: An Alaskan Eskimo ethnohistory, 1778–1988*. University of Oklahoma Press, Norman, OK, and London.
- Oswalt, W.H and J.W. VanStone. 1967. *The ethnoarcheology of Crow Village, Alaska*. Smithsonian Institution. Bureau of American Ethnology Bulletin 199, Washington, D.C.
- Patton, E. and H.C. Carroll. 2011. *Lower Kuskokwim River in-season subsistence salmon catch monitoring, 2006 to 2009*. ADF&G, Fishery Management Report No.11-76, Anchorage, AK
- Pennoyer, S., K. R. Middleton, and M. E. Morris, Jr. 1965. *Arctic-Yukon-Kuskokwim area salmon fishing history*. Alaska Department of fish and Game, Div. of Commercial Fisheries, Informational Leaflet No. 70, Juneau, AK.
- Perry, P. 2010. Unit 18 moose management report. Pages 71–285 in P. Harper, editor. *Moose management report of survey and inventory activities 1 July 2007–30 June 2009*. ADF&G. Project 1.0. Juneau, AK.
- Perry, P. 2011. Unit 18 caribou management report. Pages 109–115 in P. Harper, editor. *Caribou management report of survey and inventory activities 1 July 2008–30 June 2010*. ADF&G. Project 3.0. Juneau, AK.
- Pete, M.C. 1984. *Subsistence use of herring in the Nelson Island Region of Alaska*. ADF&G, Div. of Subsistence, Tech. Paper No. 113. Juneau, AK.
- Ray, L., C.B. Brown, A. Russell, T. Krauthoefer, C. Wassillie, and J. Hooper. 2010. *Local knowledge and harvest monitoring of nonsalmon fishes in the lower Kuskokwim River region, Alaska, 2005–2009*. ADF&G, Div. of Subsistence, Tech. Paper No. 356. Juneau, AK.
- Roczicka, G. 2014. Natural Resources Director. Personal communication: by telephone. *Orutsararmiut* Native Council, Bethel, AK.
- Schaberg, K. 2014. Fish biologist, personal communication. ADF&G, Div. of Commercial Fisheries, Anchorage, AK.
- Schindler, D., C. Krueger, P. Bisson, M. Bradford, B. Clark, J. Conitz, K. Howard, M. Jones, J. Murphy, K. Myers, M. Scheuerell, E. Volk, and J. Winton. 2013 *Arctic-Yukon-Kuskokwim Chinook Salmon Research Action Plan: Evidence of Decline of Chinook Salmon Populations and Recommendations for Future Research*. Prepared for the AYK Sustainable Salmon Initiative, Anchorage, AK. 70 pages.
- Seavoy, R.J. 2010. Units 19A, 19B, 19C, and 19D moose. Pages 286–319 in P. Harper, editor. *Moose management report of survey and inventory activities 1 July 2007–30 June 2009*. ADF&G. Project 1.0. Juneau, AK.
- Seavoy, R.J. 2011. Units 19A, 19B, 19C, 19D, 21A, and 21E caribou. Pages 116–127 in P. Harper, editor. *Caribou management report of survey and inventory activities 1 July 2008–30 June 2010*. ADF&G. Project 3.0. Juneau, AK.
- Shelden, C. A., T. Hamazaki, M. Horne-Brine, G. Roczicka, M. J. Thalhauser, H. Carroll. 2014. *Subsistence salmon harvests in the Kuskokwim area, 2011 and 2012*. ADF&G, Fishery Data Series No. 14-20 Anchorage, AK.
- Shelden, C. A., T. Hamazaki, M. Horne-Brine, R. Chavez, and R. Frye. *In publication*. *Subsistence salmon harvests in the Kuskokwim area, 2013*. ADF&G, Fishery Data Series. Anchorage.
- Skaugstad, C. and B. McCracken. 1991. *Fecundity of chinook salmon, Tanana River, Alaska*. ADF&G, Fishery Data Series No. 91-8, Anchorage, AK..

Federal Subsistence Board

Stickney, A. 1983. Coastal ecology and wild resource use in the Central Bering Sea Area—Hooper Bay and Kwigillingok. ADF&G, Div. of Subsistence Tech. Paper No. 85. Juneau, AK. 980 pages.

Williams, L., C. Venechuk, D.L. Holen, and W.E. Simeone. 2004. Lake Minchumina, Telida, Nikolai, and Cantwell subsistence community use profiles and traditional fisheries use. ADF&G, Div. of Subsistence Tech. Paper No. 295. Juneau, AK.

Wolfe, R.J. and L.J. Ellanna, compilers. 1983. Resource use and socioeconomic systems: case studies of fishing and hunting in Alaskan communities. ADF&G, Div. of Subsistence Tech. Paper No. 61. Juneau, AK. 316 pages.

Wolfe, R.J., J.J. Gross, S.J. Langdon, J.M. Wright, G.K. Sherrod, L.J. Ellanna, and V. Sumida. 1983. Subsistence-based economies in coastal communities of Southwest Alaska. ADF&G, Div. of Subsistence Tech. Paper No. 89. Juneau, AK. 643 pages.

Wolfe, R. J., and J. Spaeder. 2009. People and salmon of the Yukon and Kuskokwim drainages and Norton Sound in Alaska: fishery harvests, culture change, and local knowledge systems. *American Fishery Society Symposium* 70:349-379.

Wolfe, R.J., C. Stockdale, and C. Scott. 2012. Salmon harvests in coastal communities of the Kuskokwim Area, Southwest Alaska. 2011 Arctic-Yukon-Kuskokwim Sustainable Salmon Initiative Project, Anchorage, AK.

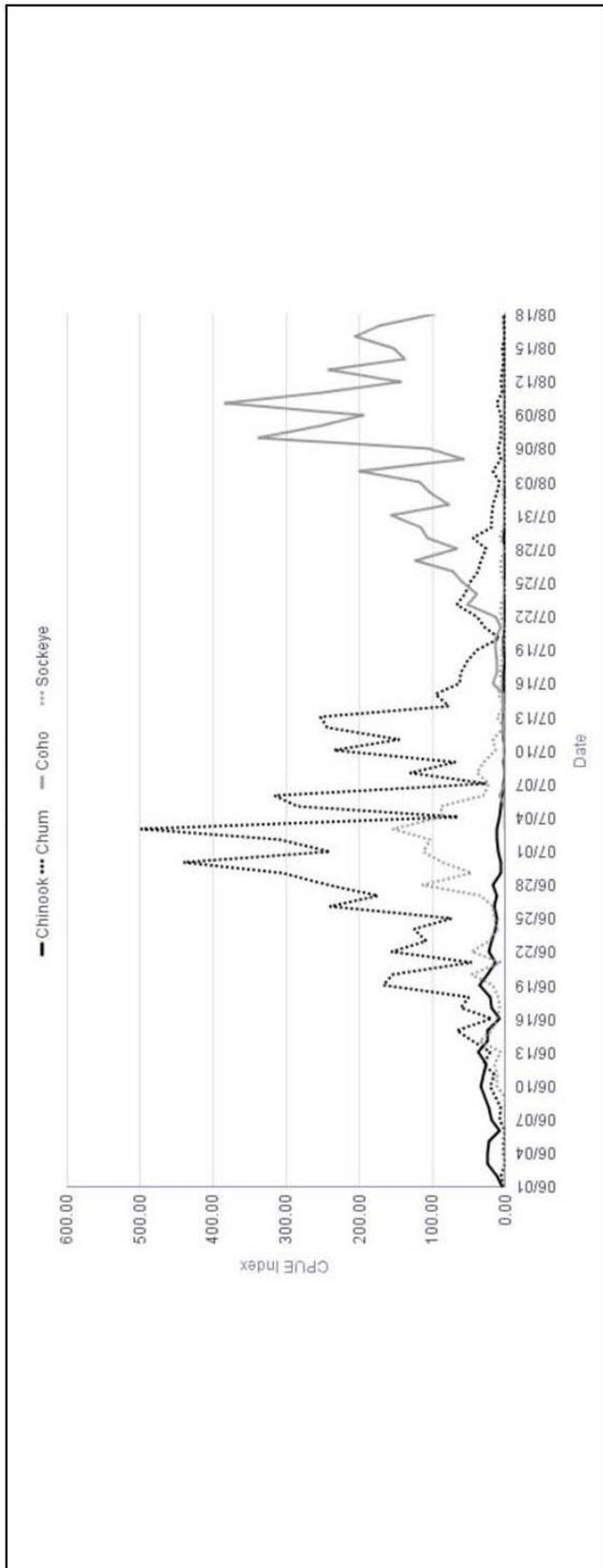


Figure 1. Bethel test fishery daily catch per unit effort, 2014 (Source: ADFG 2014b).

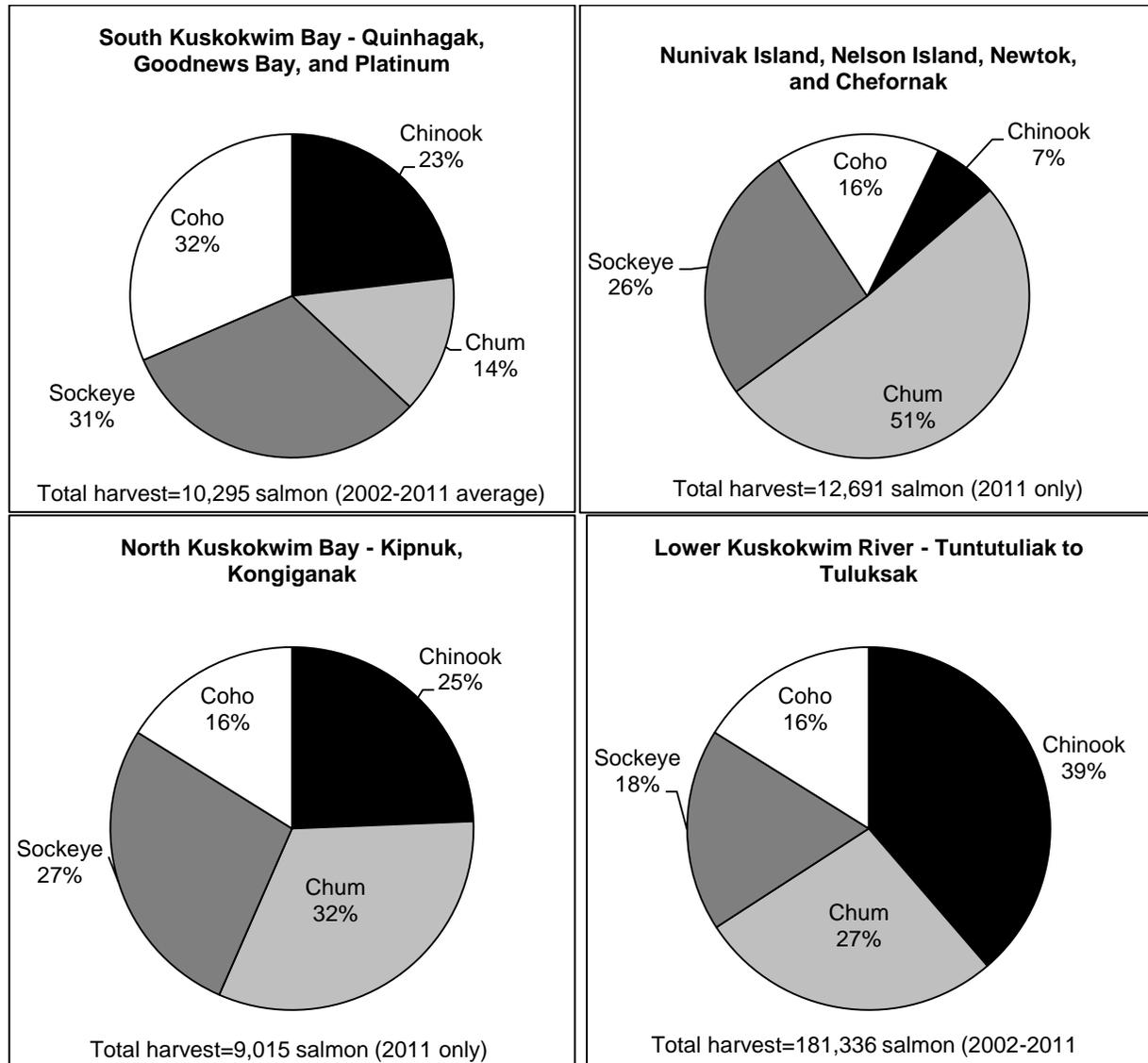


Figure 2. The relative size of the Chinook, chum, sockeye, and coho salmon harvests, in fish, by communities that participated in yearly postseason household harvest surveys (no estimate for Kwigillingok is available) (*continued on next page*).

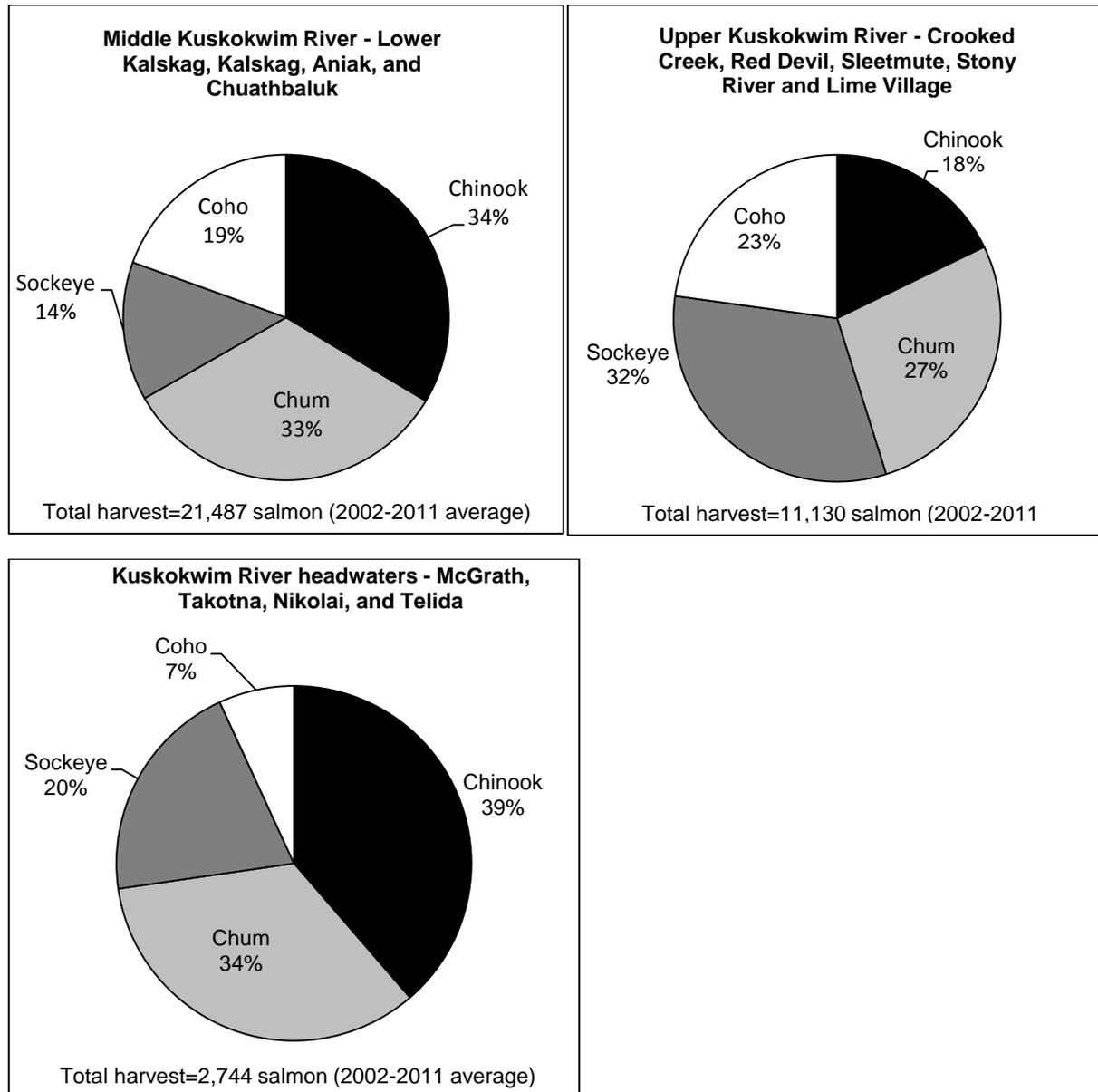


Figure 2. The relative size of the Chinook, chum, sockeye, and coho salmon harvests, in fish, by communities that participated in yearly postseason household harvest surveys (no estimate for Kwigillingok is available). Source: Sheldon, Hamazaki, Horne-Brine, Roczicka, Thalhauser, and Carroll *in pub*; Wolfe et al. 2012. (Continued from previous page.)

Table 1. The number of people living at the 40 communities in the customary and traditional use determination for salmon in the Kuskokwim River drainage, 1960-2010, based on U.S. Bureau of the Census estimates.

Community	1960	1970	1980	1990	2000	2010	2010 number of households
South Kuskokwim Bay and Coast							
Platinum	43	55	55	64	41	61	19
Goodnews Bay	154		168	241	230	243	76
Quinhagak	228	340	412	501	555	669	165
Newtok	129	114	131	207	321	354	70
Tununak	183	274	298	316	325	327	84
Toksook Bay		257	333	420	532	590	125
Nightmute	237	127	119	153	208	280	59
Mekoryuk	242	249	160	177	210	191	70
Chefornak	133	146	230	320	394	418	92
Kipnuk	221	325	371	470	644	639	153
Kwigillingok	344	148	354	278	338	321	82
Kongiganek		190	239	294	359	439	94
Subtotal	1,914	2,225	2,870	3,441	4,157	4,532	1,089
Lower Kuskokwim River Drainage							
Tuntutuliak	144	158	216	300	370	408	96
Eek	200	186	228	254	280	296	91
Napakiak	190		262	318	353	354	96
Napaskiak	154	259	244	328	390	405	94
Oscarville	51	41	56	57	61	70	15
Kasigluk	244		342	425	543	569	113
Nunapitchuk	327	526	299	378	466	496	124
Atmauthluak			219	258	294	277	63
Bethel	1,258	2,416	3,576	4,674	5,471	6,080	1,896
Kwethluk	325	408	454	558	713	721	192
Akiachak	229	312	438	481	585	627	183
Akiak	187	171	198	285	309	346	90
Tuluksak	137	195	236	358	428	373	92
Subtotal	3,446	4,672	6,768	8,674	10,263	11,022	3,145
Central Kuskokwim River Drainage							
Lower Kalskag	122	183	246	291	267	282	75
Kalskag	147	122	129	172	230	210	60
Aniak	308	205	341	540	572	501	166
Chuathbaluk		94	105	97	119	118	36
Subtotal	577	604	821	1,100	1,188	1,111	337
Upper Kuskokwim River Drainage							
Napaimute							
Crooked Creek	92	59	108	106	137	105	38
Georgetown							
Red Devil	32	25	48	42	46	29	11
Sleetmute	152	81	39	53	48	23	12
Stony River	122	109	107	106	100	86	36
Lime Village	40		48	38	50	52	22
Subtotal	438	274	350	345	381	295	119
Headwaters							
Takotna	75	74	62	51	61	54	20
McGrath	241	279	355	528	401	346	147
Telida							
Nikolai	85	112	91	109	100	94	37
Subtotal	401	465	508	688	562	494	204
TOTAL	6,776	8,240	11,317	14,248	16,551	17,454	4,894

Black cell=no information available. Source: ADCCED 2014

Table 2. Kuskokwim River drainage Chinook Salmon estimated run, escapement, and harvest, 1976-2014.

KUSKOKWIM RIVER DRAINAGE							
Year	Total Run	Escapement	Harvest				
			Subsistence ^a	Commercial	Sport	Test Fish	Total
1976	233,967	143,420	58,606	30,735		1,206	90,547
1977	295,559	201,852	56,580	35,830	33	1,264	93,707
1978	264,775	180,853	36,720	45,641	116	1,445	83,922
1979	253,990	157,688	56,283	38,966	74	979	96,302
1980	300,573	203,605	59,892	35,881	162	1,033	96,968
1981	389,791	279,392	61,329	47,663	189	1,218	110,399
1982	187,354	80,353	58,018	48,234	207	542	107,001
1983	166,333	84,188	47,412	33,174	420	1,139	82,145
1984	188,238	99,062	56,930	31,742	273	231	89,176
1985	176,292	94,365	43,874	37,889	85	79	81,927
1986	129,168	58,556	51,019	19,414	49	130	70,612
1987	193,465	89,222	67,325	36,179	355	384	104,243
1988	207,818	80,055	70943 ^b	55,716	528	576	127,763
1989	241,857	115,704	81175 ^b	43,217	1,218	543	126,153
1990	264,802	100,614	109,778	53,504	394	512	164,188
1991	218,705	105,589	74,820	37,778	401	117	113,116
1992	284,840	153,573	82,648	46,872	367	1,380	131,267
1993	270,295	169,816	87,674	9,735	587	2,483	100,479
1994	365,246	242,616	103,343	16,211	1,139	1,937	122,630
1995	360,513	225,595	102,110	30,846	541	1,421	134,918
1996	302,605	197,092	96,415	7,419	1,432	247	105,513
1997	303,190	211,247	79,382	10,441	1,788	332	91,943
1998	213,879	113,627	81,219	17,359	1,464	210	100,252
1999	189,939	112,082	72,775	4,705	279	98	77,857
2000	136,676	65,180	70,883	444	105	64	71,496
2001	223,707	145,232	78,009	90	290	86	78,475
2002	246,297	164,635	80,983	72	319	288	81,662
2003	248,883	180,687	67,228	158	401	409	68,196
2004	388,136	287,178	97,110	2,300	857	691	100,958
2005	366,608	275,598	85,097	4,784	572	557	91,010
2006	307,671	214,004	90,094	2,777	444	352	93,667
2007	273,044	174,943	96,139	179	1,478	305	98,101
2008	237,070	128,978	98,099	8,865	708	420	108,092
2009	204,741	118,478	78,225	6,664	904	470	86,263
2010	118,504	49,073	66,053	2,732	354	292	69,431
2011	132,651	72,097	58,836	748	633	337	60,554
2012 ^c	100,818	76,000	24,000	400	0	418	24,818
2013 ^c	94,018	47,500	46,500	419	0	261	47,180
2014 ^d	135,749	123,987	11,234	31	0	497	11,762
25-year average (1990-2014)	243,868	151,310	80,878	11,063	644	570	92,586
10-year average (2005-2014)	197,087	128,066	65,428	2,760	509	391	69,088

Source: Brazil et al. 2013.

^a Estimated subsistence harvest expanded from villages surveyed and estimates are reconstructed from 1990 to 2009 (Hamazaki 2011).^b Estimates were based on a new formula in 1988 and 1989 and are not comparable with previous years.^c Data preliminary (Elison 2014, pers. comm.).^d Data preliminary (Hamazaki and Liller 2015).

Table 3. Federal special actions, Kuskokwim River drainage, 2014.

KUSKOKWIM RIVER DRAINAGE		
SUBSISTENCE FISHING		
Federal Special Actions	Effective Date	Action
SA 3-KS-01-14	May 20–July 18, 2014	Federal public waters of the Kuskokwim drainage are closed to the harvest of Chinook salmon except by residents of the Kuskokwim drainage and the villages of Chefornak, Kipnuk, Kwigillingok, and Kongiganek.
SA 3-KS-02-14	May 20–July 14, 2014	Mouth upriver to Tuluksak is closed to the harvest of Chinook salmon by all users.
SA 3-KS-03-14	May 27–July 18, 2014	Tuluksak upriver to Refuge boundary at Aniak is closed to the harvest of Chinook salmon by all users
SA 3-KS-04-14	June 11–June 30, 2014	Federal public waters of the Kuskokwim drainage are closed to the harvest of Chinook salmon except by residents of communities issued Social and Cultural Permits fishing with gillnets 6-inch or less mesh size not exceeding 50-fathoms long and 45-meshes deep.
SA 3-KS-05-14 (see EO 3-S-WR-07-14)	June 20, 2014	Mouth upriver to Tuluksak is closed to the harvest of Chinook salmon except by residents of the Kuskokwim drainage and the villages of Chefornak, Kipnuk, Kwigillingok, and Kongiganek fishing with gillnets 6-inches or less mesh size not exceeding 50-fathoms long and 45-meshes deep, for 4 hours.
SA 3-KS-06-14	June 20–July 14, 2014	Below the southern tip of Eek Island is closed to the harvest of Chinook salmon except by residents of the Kuskokwim drainage and the villages of Chefornak, Kipnuk, Kwigillingok, and Kongiganek fishing with gillnets 6-inch or less mesh size not exceeding 50-fathoms long and 45-meshes deep.
SA 3-KS-07-14	June 24–July 14, 2014	For the Kuskokwim area, Federal subsistence fishing schedules, openings, closings, and fishing methods are the same as those issued for the subsistence taking of fish under Alaska Statutes (AS 16.05.060). Two Special Actions remain in effect, 3-KS-01-14 and 3-KS-04-14, unless superseded by a Federal Special Action.

Source: FWS 2015.

Table 4. State emergency orders, Kuskokwim River drainage, 2014.

KUSKOKWIM RIVER DRAINAGE		
SUBSISTENCE FISHING		
State Emergency Orders	Effective Date	Action
Board of Fisheries (3/17/14)	Emergency regulation that has been adopted into permanent regulations	Dip nets are legal gear for harvesting salmon other than Chinook salmon during times of Chinook salmon conservation. A dip net is a bag-shaped net supported on all sides by a rigid frame; the maximum distance between any two points on the net frame may not exceed 5 feet; the bag of the frame must be at least one-half the distance of the maximum frame opening; the webbing of the net may not exceed 4.5-inches stretch mesh.
Board of Fisheries (3/17/14)	Emergency regulation that has been adopted into permanent regulations	Only gillnets less than 25 fathoms are legal gear during times of Chinook salmon conservation. Gillnets may be over 25-fathoms in total length, but must be tied and/or bagged in such a way that only 25-fathoms can be used to fish.
EO 3-KS-01-14 Sport fishing	May 1, 2014	All waters of the Kuskokwim–Goodnews Area are closed to sport fishing for Chinook salmon. Only one unbaited, single-hook, artificial lure may be used. All Chinook salmon caught unintentionally in the Kuskokwim-Goodnews Area while fishing for other species may not be removed from the water and must be released immediately.
EO 3-S-WR-01-14	June 1, 2014	Aniak River upriver to Holitna River, fishing for Chinook salmon is closed. Fishing for non-salmon species with gillnets is restricted to 4-inch or less mesh size not exceeding 60-feet long and 45 meshes deep.
	June 4, 2014	Holitna River upriver to headwaters, fishing for Chinook salmon is closed. Fishing for non-salmon species with gillnets is restricted to 4-inch or less mesh size not exceeding 60-feet long and 45 meshes deep.
EO 3-S-WR-02-14	June 1, 2014	Marine waters near the Kuskokwim River mouth (Ishkowiik River to the northern boundary of District W-4 at Weelung Creek) are closed to salmon fishing.
EO 3-S-WR-03-14	June 3, 2014	Naskonat Peninsula to Ishkowiik River (coastal waters including Nelson Island), fishing for salmon is restricted to gillnets with 6-inch or less mesh size.
	June 10, 2014	<i>Aniak River upriver to Holitna River, fishing for Chinook salmon with a hook and line attached to a rod or pole is closed [already closed].</i>

Continued on next page.

Table 4. State emergency orders, Kuskokwim River drainage, 2014 (continued from previous page).

KUSKOKWIM RIVER DRAINAGE		
SUBSISTENCE FISHING		
State Emergency Orders	Effective Date	Action
EO 3-S-WR-05-14	June 14–30, 2014	Mouth to Tuluksak, fishing with dip nets will be allowed for 12 hours daily, from 9:00 a.m. to 9:00 p.m. Any king salmon caught in a dip net must be returned immediately to the water unharmed.
	June 17–30, 2014	Tuluksak to Refuge boundary at Aniak, fishing with dip nets will be allowed for 12 hours daily, from 9:00 a.m. to 9:00 p.m. Any king salmon caught in a dip net must be returned immediately to the water unharmed. This section does not include the slough (locally known as Utak Slough) on the northwest side of the Kuskokwim River adjacent to the Tuluksak River mouth.
EO 3-S-WR-06-14	June 19, 2014 until further notice	Aniak River to headwaters, fishing with dip nets will be allowed for 12 hours daily, from 9:00 a.m. to 9:00 p.m. Any Chinook salmon caught in a dip net must be returned immediately to the water unharmed.
	June 19, 2014 until further notice	Aniak River to headwaters, fishing with fish wheels will be allowed. Fish wheels are required to have a live box with no less than 45 cubic feet of water, must be checked at least every 6 hours, and all Chinook salmon must be returned to the water alive.
EO 3-S-WR-07-14 (see SA 3KS-05-14 and 3-KS-06-14)	June 20, 2014	Johnson River downriver to southern tip of Eek Island, fishing for chum and sockeye salmon is allowed with gillnets 6-inch or less mesh size not exceeding 50-fathoms long and 45-meshes deep, for 4 hours.
	June 20, 2014	Marine waters near the Kuskokwim River mouth (Ishkowik River to the northern boundary of District W-4 at Weelung Creek), fishing for chum and sockeye salmon is allowed with gillnets 6-inch or less mesh size not exceeding 50-fathoms long and 45-meshes deep, until further notice.
EO 3-S-WR-08-14	June 24, 2014 until further notice	Johnson River downriver to southern tip of Eek Island, fishing for chum and sockeye salmon will be allowed with gillnets with 6-inch or less mesh size not exceeding 50-fathoms long and 45-meshes deep, until further notice from 8:00 a.m. until 4:00 p.m.
	June 24, 2014	Tuluksak downriver to Johnson River, fishing for chum and sockeye salmon will be allowed with gillnets with 6-inch or less mesh size not exceeding 25-fathoms long and 45-meshes deep from 10:00 a.m. until 2:00 p.m. (4 hours). This section includes the slough (locally known as Utak Slough) on the northwest side of the Kuskokwim River adjacent to the Tuluksak River mouth.

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Table 4. State emergency orders, Kuskokwim River drainage, 2014 (continued from previous page).

KUSKOKWIM RIVER DRAINAGE		
SUBSISTENCE FISHING		
State Emergency Orders	Effective Date	Action
EO 3-S-WR-09-14	June 24, 2014 until further notice	Aniak River downriver to southern tip of Eek Island, fishing will remain open to gillnets with 4-inch or less mesh size not exceeding 60-feet long and 45 meshes deep. Fishing for Chinook salmon with a hook and line attached to a rod or pole will remain closed until further notice [already closed].
EO 3-S-WR-10-14	June 27, 2014 until further notice	Johnson River to southern tip of Eek Island, fishing for chum and sockeye salmon will be allowed with gillnets 6-inch or less mesh size not exceeding 50-fathoms long.
	June 27, 2014	Tuluksak downriver to Johnson River, fishing for chum and sockeye salmon will be allowed with gillnets with 6-inch or less mesh not exceeding 50-fathom long from 10:00 a.m. until 6:00 p.m. (8 hours).
	June 27, 2014	Tuluksak upriver to Chuathbaluk, fishing for chum and sockeye salmon will be allowed with gillnets 6-inch or less mesh size not exceeding 50-fathoms long from 10:00 a.m. until 6:00 p.m. (8 hours).
EO 3-S-WR-11-14	June 30, 2014 until further notice.	Tuluksak downriver to Johnson River, fishing for chum and sockeye salmon will be allowed with gillnets with 6-inch or less mesh size not exceeding 50-fathoms long.
	June 30, 2014 until further notice.	Tuluksak upriver to Chuathbaluk, fishing for chum and sockeye salmon will be allowed with gillnets with 6-inch or less mesh size not exceeding 50-fathoms long.
	June 30, 2014	Chuathbaluk upriver to Holitna River, fishing for chum and sockeye salmon will be allowed with gillnets with 6-inch or less mesh size not exceeding 50-fathoms long from 10:00 a.m. to 6:00 p.m.
EO 3-S-WR-12-14	June 30–July 12, 2014	Mouth upriver to Chuathbaluk, fishing with dip nets will be allowed, 24 hours per day, from 9:00 p.m. Monday, until 9:00 p.m. Saturday. Any king salmon caught in a dip net must be returned immediately to the water unharmed.
EO 3-S-WR-13-14	July 1, 2014 until further notice	Naskonat Peninsula to Ishkowiik River (coastal waters including Nelson Island), fishing with gillnets with unrestricted mesh size will be allowed.

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Table 4. State emergency orders, Kuskokwim River drainage, 2014 (continued from previous page).

KUSKOKWIM RIVER DRAINAGE		
SUBSISTENCE FISHING		
State Emergency Orders	Effective Date	Action
EO 3-S-WR-14-14	July 3, 2014 until further notice	Chuathbaluk upriver to Holitna River, fishing for chum and sockeye salmon will be allowed with gillnets with 6-inch or less mesh size not exceeding 50-fathoms long.
	July 3, 2014 until further notice	Holitna River upriver to headwaters, fishing for chum and sockeye salmon will be allowed with gillnets with 6-inch or less mesh size not exceeding 50-fathoms long.
	July 3, 2014 until further notice	Chinook salmon fishing with hook and line gear with a daily bag limit of 3 and no possession, season, or size limits will be allowed.

Source: ADF&G 2015b.

Table 5. The estimated harvest and use of Chinook salmon for subsistence by communities that participated in household harvest surveys of all wild resources.

CHINOOK SALMON HARVEST											
HOUSEHOLD HARVEST SURVEYS											
Community (from south to north)	Study year	Percentage of households:					Chinook salmon harvest				
		Using Chinook salmon	Attempting to harvest Chinook salmon	Harvesting Chinook salmon	Giving Chinook salmon	Receiving Chinook salmon	Estimated Harvest	Lower Estimate	Higher Estimate	Per Person	confidence interval
							(fish)	(fish)	(fish)	(lb)	(+/- lb)
Quinhagak	1982			83%			4,565	1,693	7,437	138	85
Newtok	2011	4%		31%			144	133	165		
Tununak	2011	65%		33%			51	29	73		
	1986	100%	58%	58%	46%	55%	411	233	589	23	10
Toksook Bay	2011	48%		49%			365	332	398		
Nightmute	2011	100%		40%			98	78	125		
Mekoryuk	2011	41%		0%			0	0	0		
Chefornak	2011	27%		16%			161	134	238		
Kipnuk	2011	28%		18%			479	179	937		
Napakiak	2011	77%	59%	59%	30%	36%	2,552	2,546	2,559	76	16
Napaskiak	2011	91%	70%	70%	39%	45%	4,227	4,219	4,236	83	16
Oscarville	2010	100%	75%	75%	42%	25%	1,097	810	1,383	164	43
Nunapitchuk	1983			65%			4,262	1,633	6,891	140	85
Kwethluk	2010	95%	66%	66%	43%	51%	5,459	4,394	6,523	72	14
	1986		70%	70%			5,824			193	0
Akiachak	1998	96%	88%	88%	51%	33%	12,131	10,680	13,581	394	47
Akiak	2010	86%	63%	57%	44%	37%	5,229	4,150	6,308	128	27
Tuluksak	2010	94%	76%	76%	38%	32%	3,798	3,195	4,401	79	13
	1983						1,671	1,671	1,671	62	0
Lower Kalskag	2009	86%	86%	49%	25%	49%	2,034	1,708	2,390	64	12
Kalskag	2009	94%	94%	75%	46%	46%	2,639	2,223	3,055	123	20
Aniak	2009	79%	79%	61%	30%	39%	3,576	3,163	3,990	67	8
Chuathbaluk	2009	90%	90%	60%	23%	47%	875	729	1,163	68	22
	1983	27%					1,503			131	0
Crooked Creek	2009	82%	82%	61%	30%	30%	841	694	994	69	12
Red Devil	2009	73%	73%	45%	18%	45%	148	126	202	44	16
Sleetmute	2009	88%	88%	69%	41%	38%	1,041	900	1,299	109	27
	1983						180			20	0
Stony River	2009	58%	58%	50%	33%	25%	982	589	1,866	147	132
Lime Village	2007	86%	86%	71%	57%	57%	341	217	510	142	71
Takotna	2011	36%	14%	7%	0%	36%	5	4	5	1	1
McGrath	2011	71%	35%	31%	20%	54%	1,157	1,155	1,159	31	7
	1984						830			21	0
Nikolai	2011	73%	65%	42%	35%	58%	1,143	1,131	1,155	92	37
	2002	81%	59%	59%	48%	48%	751	563	939	92	23
	1984		79%				795			103	0

Blank cell=information is not available.

Source: ADF&G 2014a.

Table 6. Estimated number of Chinook salmon harvested for subsistence, Kuskokwim River drainage, based on the annual postseason survey, 2004 to 2013.

CHINOOK SALMON												
KUSKOKWIM RIVER DRAINAGE												
Community	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	5-year average	10-year average
Kongiganak	2,663	1,536	1,729	1,865	2,233	1,243	1,456	1,208	287	641	967	1,486
North Kuskokwim Bay	2,663	1,536	1,729	1,865	2,233	1,243	1,456	1,208	287	641	967	1,486
Tuntutuliak	3,912	4,545	4,469	4,614	4,266	3,067	3,261	3,032	1,123	2,448	2,586	3,474
Eek	2,954	3,133	2,501	2,512	2,966	1,982	1,761	1,378	1,004	1,188	1,463	2,138
Kasigluk	7,859	5,242	4,905	5,167	2,471	2,464	3,014	2,823	552	2,919	2,354	3,742
Nunapitchuk	4,921	4,103	4,121	4,661	4,234	3,468	2,548	3,559	845	2,563	2,597	3,502
Atmautluak	2,153	1,927	1,758	1,890	1,298	1,567	1,088	1,236	234	1,592	1,143	1,474
Napakiak	2,839	3,060	5,125	3,245	1,903	2,387	1,674	1,963	457	1,588	1,614	2,424
Napaskiak	4,058	4,485	5,877	6,392	4,555	5,372	4,333	3,360	1,108	2,939	3,422	4,248
Oscarville	1,325	1,069	1,052	1,360	1,351	754	618	694	51	585	540	886
Bethel	29,443	28,293	27,805	30,422	27,800	26,170	26,157	25,093	7,321	17,246	20,397	24,575
Kwethluk	7,157	6,089	7,258	6,466	8,451	7,130	4,440	2,467	1,709	3,192	3,788	5,436
Akiachak	7,131	5,411	5,561	7,621	9,719	7,361	4,470	3,852	2,862	3,585	4,426	5,757
Akiak	3,775	3,860	4,423	4,297	4,090	3,247	3,625	2,455	1,218	1,449	2,399	3,244
Tuluksak	3,766	2,655	2,372	3,266	2,937	3,212	2,057	1,230	651	732	1,576	2,288
Lower Kuskokwim	81,293	73,872	77,228	81,914	76,040	68,181	59,046	53,142	19,135	42,026	48,306	63,188
Lower Kalskag	1,991	1,417	3,494	1,937	1,748	2,525	1,030	1,260	459	744	1,204	1,661
Upper Kalskag	2,498	2,533	1,569	1,383	2,435	1,696	1,496	1,772	562	1,317	1,369	1,726
Aniak	3,022	1,977	2,412	3,417	3,100	2,130	2,262	2,214	993	1,440	1,808	2,297
Chuathbaluk	1,460	913	887	973	772	877	551	409	103	155	419	710
Middle Kuskokwim	8,971	6,840	8,362	7,710	8,055	7,228	5,339	5,655	2,117	3,656	4,799	6,393
Crooked Creek	946	948	736	647	488	608	240	402	124	145	304	528
Red Devil	156	181	232	301	148	258	33	186	225	77	156	180
Sleetmute	906	522	750	861	933	693	272	242	132	96	287	541
Stony River	688	311	288	530	514	704	189	134	151	51	246	356
Lime Village	69	171	103	95	29	75	47	118	29	43	62	78
McGrath	587	910	689	495	288	600	262	829	68	95	371	482
Takotna	16	8	0	10	0	8	0	0	0	0	2	4
Nikolai	493	564	696	471	184	298	402	450	276	283	342	412
Telida	-	-	-	-	-	-	-	-	-	-	-	-
Upper Kuskokwim	3,861	3,615	3,494	3,409	2,584	3,244	1,445	2,361	1,005	790	1,769	2,581
Kuskokwim River^a	96,788	85,863	90,812	94,898	88,912	79,896	67,286	62,366	22,544	47,113	55,841	73,648
Quinhagak	4,563	3,505	5,163	4,686	3,125	3,312	2,793	2,588	2,396	3,143	2,846	3,527
Goodnews Bay	863	869	713	647	898	569	480	834	389	413	537	667
Platinum	122	74	45	66	42	61	17	62	24	39	41	55
South Kuskokwim Bay	5,548	4,448	5,921	5,399	4,065	3,942	3,290	3,484	2,809	3,595	3,424	4,250
Total Estimated	102,336	90,311	96,733	100,297	92,977	83,838	70,576	65,850	25,353	50,708	59,265	77,898

Source: Sheldon, Hamazaki, Horne-Brine, Roczicka, Thalhauser, and Carroll *in press*.

Note: Dashes indicate harvest was not estimated; bold indicates Bayesian estimates.

^a Kuskokwim River Total includes the Lower, Middle, Upper Kuskokwim areas and North Kuskokwim Bay.

Table 7. Estimated number of chum salmon harvested for subsistence, Kuskokwim River drainage, based on the annual postseason survey, 2004 to 2013.

CHUM SALMON												
KUSKOKWIM RIVER DRAINAGE												
Community	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	5-year average	10-year average
Kongiganak	2,958	1,960	2,420	2,353	1,755	1,420	2,522	2,809	1,638	1,397	1,957	2,123
North Kuskokwim Bay	2,958	1,960	2,420	2,353	1,755	1,420	2,522	2,809	1,638	1,397	1,957	2,123
Tuntutuliak	2,546	3,568	4,024	3,350	3,375	3,330	2,439	1,865	2,614	2,180	2,486	2,929
Eek	688	877	1,075	783	788	782	721	486	1,552	1,232	955	898
Kasigluk	5,064	4,194	5,461	4,309	1,502	1,857	2,338	2,029	3,261	2,197	2,336	3,221
Nunapitchuk	5,053	4,167	5,150	6,619	4,705	3,468	3,223	4,257	5,312	2,977	3,847	4,493
Atmautluak	2,271	1,940	2,337	2,193	2,177	1,665	1,386	1,864	2,701	2,409	2,005	2,094
Napakiak	2,328	3,238	8,143	3,628	1,313	1,638	1,759	1,546	1,711	1,185	1,568	2,649
Napaskiak	2,705	2,205	4,323	3,032	2,400	1,451	3,110	1,783	3,216	2,589	2,430	2,681
Oscarville	828	686	1,151	932	847	534	352	402	599	490	475	682
Bethel	13,448	14,273	20,953	16,540	15,853	10,055	9,575	15,324	26,872	12,506	14,866	15,540
Kwethluk	4,288	4,328	6,328	6,291	5,729	4,111	3,112	3,484	3,849	3,825	3,676	4,535
Akiachak	3,880	2,428	4,333	4,782	6,856	2,872	2,856	3,205	4,150	3,417	3,300	3,878
Akiak	3,499	3,528	3,095	4,141	3,522	1,350	1,163	2,421	2,925	2,212	2,014	2,786
Tuluksak	2,433	2,183	3,094	3,202	2,920	1,570	3,180	2,697	2,585	3,062	2,619	2,693
Lower Kuskokwim	49,031	47,615	69,466	59,803	51,988	34,683	35,214	41,363	61,347	40,281	42,578	49,079
Lower Kalskag	1,316	997	4,703	1,997	1,004	930	691	1,643	3,284	1,214	1,552	1,778
Upper Kalskag	1,656	1,201	2,469	294	2,432	329	391	1,599	1,930	1,534	1,157	1,384
Aniak	2,535	2,952	3,722	4,108	2,830	2,602	2,515	2,391	5,667	2,880	3,211	3,220
Chuathbaluk	2,352	530	1,451	1,541	593	937	535	686	796	935	778	1,036
Middle Kuskokwim River	7,859	5,680	12,345	7,940	6,859	4,798	4,132	6,319	11,677	6,563	6,698	7,417
Crooked Creek	1,583	1,064	1,513	813	352	519	539	862	610	1,803	867	966
Red Devil	135	214	41	186	188	244	122	434	516	981	459	306
Sleetmute	1,054	422	1,475	818	373	367	524	689	1,004	542	625	727
Stony River	754	324	790	540	1,247	771	338	516	491	27	429	580
Lime Village	199	573	316	419	297	405	314	499	419	909	509	435
McGrath	290	470	999	464	676	825	944	476	885	598	746	663
Takotna	0	4	0	0	0	0	0	0	0	12	2	2
Nikolai	277	230	308	223	54	292	440	349	1,044	513	528	373
Telida	-	-	-	-	-	-	-	-	-	-	-	-
Upper Kuskokwim River	4,292	3,301	5,442	3,464	3,187	3,423	3,221	3,825	4,970	5,386	4,165	4,051
Kuskokwim River^a	64,140	58,555	89,674	73,560	63,789	44,324	45,089	54,316	79,631	53,627	55,397	62,671
Quinhagak	1,383	994	2,754	2,249	1,794	1,557	1,347	1,255	2,001	1,958	1,624	1,729
Goodnews Bay	240	192	555	395	586	138	324	349	322	153	257	325
Platinum	42	21	108	77	106	28	37	70	76	90	60	65
South Kuskokwim Bay	1,665	1,207	3,417	2,720	2,486	1,723	1,708	1,674	2,399	2,201	1,941	2,120
Total Estimated Harvest	65,805	59,762	93,091	76,281	66,275	46,047	46,797	55,990	82,030	55,828	57,338	64,791

Source: Shelden, Hamazaki, Horne-Brine, Roczicka, Thalhauser, and Carroll *in press*.

Note: Dashes indicate harvest was not estimated; bold indicates Bayesian estimates.

^a Kuskokwim River Total includes the Lower, Middle, Upper Kuskokwim areas and North Kuskokwim Bay.

Table 8. Estimated number of sockeye salmon harvested for subsistence, Kuskokwim River drainage, based on the annual postseason survey, 2004 to 2013.

SOCKEYE SALMON												
KUSKOKWIM RIVER DRAINAGE												
Community	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	5-year average	10-year average
Kongiganak	1,809	1,103	1,464	960	1,502	1,018	1,869	1,266	1,307	1,031	1,392	1,366
North Kuskokwim Bay	1,809	1,103	1,464	960	1,502	1,018	1,869	1,266	1,307	1,031	1,392	1,366
Tuntutuliak	1,620	2,145	1,834	1,763	2,120	932	2,068	1,274	1,516	1,183	1,582	1,697
Eek	567	1,033	684	558	834	1,019	1,241	664	1,490	1,319	1,050	899
Kasigluk	1,668	1,634	2,248	1,786	1,041	1,215	1,441	1,269	1,451	1,470	1,283	1,528
Nunapitchuk	1,659	1,821	1,871	2,147	2,549	1,538	1,902	2,223	2,396	1,806	2,122	2,012
Atmautluak	1,103	1,444	1,012	1,041	1,250	624	731	827	1,623	1,316	1,011	1,073
Napakiak	1,351	2,122	1,845	1,962	1,244	917	1,183	1,351	1,141	1,105	1,167	1,457
Napaskiak	1,148	1,344	1,784	1,738	2,620	1,579	1,979	1,587	2,065	2,069	1,966	1,760
Oscarville	436	278	778	712	677	332	250	228	323	347	362	446
Bethel	11,679	14,297	12,816	13,902	15,247	11,272	11,103	16,946	18,282	12,616	14,570	13,949
Kwethluk	3,302	2,457	2,770	3,536	4,920	2,432	2,534	2,357	2,884	2,705	3,025	3,021
Akiachak	3,109	2,372	2,661	3,269	4,354	2,407	2,433	2,647	3,443	2,594	3,057	2,966
Akiak	1,258	1,920	2,000	3,695	2,881	1,290	1,161	2,576	1,818	1,731	1,945	2,067
Tuluksak	1,670	987	2,247	1,845	2,133	1,691	2,483	1,699	1,380	1,541	1,877	1,793
Lower Kuskokwim	30,570	33,854	34,550	37,955	41,869	27,248	30,509	35,648	39,812	31,802	35,017	34,668
Lower Kalskag	775	439	1,434	780	1,583	1,044	507	802	891	977	965	917
Upper Kalskag	686	945	563	417	1,000	369	460	938	770	662	707	683
Aniak	996	1,015	692	1,261	1,585	923	1,165	1,168	1,375	1,466	1,243	1,131
Chuathbaluk	526	369	508	484	363	564	403	300	297	480	385	424
Middle Kuskokwim	2,983	2,768	3,197	2,942	4,531	2,900	2,535	3,208	3,333	3,585	3,301	3,155
Crooked Creek	732	693	544	523	220	329	302	243	234	514	266	424
Red Devil	88	272	510	318	359	477	475	502	511	270	465	390
Sleetmute	980	673	1,181	1,303	1,164	684	1,024	693	715	362	856	935
Stony River	896	688	746	1,019	1,476	977	372	303	469	447	719	772
Lime Village	874	1,368	1,216	1,406	659	1,080	932	739	780	831	838	1,006
McGrath	194	454	149	375	417	965	650	630	233	538	579	452
Takotna	0	1	0	1	3	3	2	0	2	2	2	1
Nikolai	1	10	20	14	13	66	65	13	0	0	31	23
Telida	-	-	-	-	-	-	-	-	-	-	-	-
Upper Kuskokwim	3,765	4,160	4,365	4,960	4,310	4,581	3,822	3,123	2,945	2,964	3,756	4,003
Kuskokwim River^a	39,127	41,885	43,577	46,817	52,213	35,747	38,735	43,245	47,396	39,382	43,467	43,193
Quinhagak	1,375	1,745	3,128	1,755	2,097	1,960	1,719	1,582	2,015	2,158	1,875	1,931
Goodnews Bay	873	1,213	995	920	1,739	902	1,093	1,328	1,197	1,113	1,252	1,140
Platinum	183	90	63	121	156	186	175	135	173	181	165	142
South Kuskokwim Bay	2,431	3,048	4,186	2,796	3,992	3,048	2,987	3,045	3,385	3,452	3,291	3,213
Total Estimated	41,558	44,933	47,763	49,613	56,205	38,795	41,722	46,290	50,781	42,834	46,759	46,407

Source: Shelden, Hamazaki, Horne-Brine, Roczicka, Thalhauser, and Carroll *in press*.

Note: Dashes indicate harvest was not estimated; bold indicates Bayesian estimates.

^a Kuskokwim River Total includes the Lower, Middle, Upper Kuskokwim areas and North Kuskokwim Bay.

Table 9. Estimated number of Coho Salmon harvested for subsistence, Kuskokwim River drainage, based on the annual postseason survey, 2004 to 2013.

COHO SALMON												
KUSKOKWIM RIVER DRAINAGE												
Community	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	5-year average	10-year average
Kongiganak	937	740	657	883	557	561	483	613	356	412	485	620
North Kuskokwim Bay	937	740	657	883	557	561	483	613	356	412	485	620
Tuntutuliak	1,189	1,074	948	703	1,620	359	698	250	565	450	464	786
Eek	1,018	378	773	459	661	176	315	280	612	483	373	515
Kasigluk	5,034	1,304	3,070	1,753	867	629	1,043	430	303	418	565	1,485
Nunapitchuk	555	807	692	1,752	508	286	195	407	319	226	287	575
Atmautluak	744	530	254	424	262	67	36	263	383	203	190	317
Napakiak	1,648	742	2,363	1,244	1,006	420	877	927	402	634	652	1,026
Napaskiak	655	602	1,640	639	903	786	1,029	471	269	772	665	777
Oscarville	304	60	175	180	62	67	12	43	38	37	39	98
Bethel	17,040	12,994	18,810	12,972	15,839	12,895	20,426	18,141	13,280	12,662	15,481	15,506
Kwethluk	3,430	3,048	1,245	1,624	7,262	4,333	1,495	1,097	1,013	1,555	1,899	2,610
Akiachak	2,397	1,817	1,714	2,355	4,311	1,790	1,181	1,440	714	1,106	1,246	1,883
Akiak	1,342	1,847	379	1,325	1,358	661	475	505	455	454	510	880
Tuluksak	1,007	484	498	1,131	635	857	330	163	341	473	433	592
Lower Kuskokwim	36,363	25,687	32,561	26,561	35,293	23,326	28,112	24,417	18,694	19,473	22,804	27,049
Lower Kalskag	368	319	1,415	515	76	318	96	684	1,107	529	547	543
Upper Kalskag	1,500	594	1,799	381	2,350	181	92	998	360	636	453	889
Aniak	2,355	2,032	1,018	3,003	2,883	2,223	2,533	2,215	3,365	3,102	2,688	2,473
Chuathbaluk	284	346	727	419	525	96	76	109	179	319	156	308
Middle Kuskokwim	4,507	3,291	4,959	4,318	5,834	2,818	2,797	4,006	5,011	4,586	3,844	4,213
Crooked Creek	713	312	401	289	952	283	87	297	149	255	214	374
Red Devil	65	331	171	193	307	126	88	130	238	318	180	197
Sleetmute	505	581	671	360	228	403	458	426	784	219	458	464
Stony River	679	468	322	336	552	634	201	333	358	120	329	400
Lime Village	231	372	132	443	695	210	146	596	117	384	291	333
McGrath	1,228	799	894	279	247	1,175	1,053	1,331	2,257	523	1,268	979
Takotna	51	8	0	8	6	28	20	3	22	0	14	15
Nikolai	171	166	407	95	53	203	135	20	214	119	138	158
Telida	-	-	-	-	-	-	-	-	-	-	-	-
Upper Kuskokwim River	3,643	3,037	2,998	2,005	3,040	3,062	2,188	3,136	4,139	1,938	2,893	2,919
Kuskokwim River^a	45,450	32,755	41,175	33,766	44,724	29,767	33,580	32,172	28,200	26,409	30,026	34,800
Quinhagak	1,868	1,435	1,558	1,315	1,550	1,869	1,824	1,599	1,369	1,380	1,608	1,577
Goodnews Bay	1,228	1,542	634	605	468	769	261	319	259	382	398	647
Platinum	144	266	223	116	106	114	81	197	143	124	132	151
South Kuskokwim Bay	3,240	3,243	2,415	2,036	2,124	2,752	2,166	2,115	1,771	1,886	2,138	2,375
Total Estimated	48,690	35,998	43,590	35,802	46,848	32,519	35,746	34,287	29,971	28,295	32,164	37,175

Source: Sheldon, Hamazaki, Horne-Brine, Roczicka, Thalhauser, and Carroll *in press*.

Note: Dashes indicate harvest was not estimated; bold indicates Bayesian estimates.

^a Kuskokwim River Total includes the Lower, Middle, Upper Kuskokwim areas and North Kuskokwim Bay.

Table 10. The estimated harvest of wild resources in pounds edible weight per person by residents of communities that have participated in household harvest surveys.

Community (from south to north)	Per person harvest	95% Confidence interval (+/-)	Percentage of total harvest
	Pounds		
Quinhagak 1982			
Salmon	342	78%	45%
Nonsalmon fish	150	51%	20%
Large land mammals	103	117%	13%
Small land mammals	14	107%	2%
Marine mammals	124	68%	16%
Birds and eggs	29	65%	4%
Marine invertebrates	0		0%
Berries and plants	4	115%	1%
Total	766	47%	100%
Tununak 1986			
Salmon	114	23%	10%
Nonsalmon fish	663	19%	61%
Large land mammals	19	47%	2%
Small land mammals	2	42%	0%
Marine mammals	220	25%	20%
Birds and eggs	32	19%	3%
Marine invertebrates	5	21%	0%
Berries and plants	38	20%	3%
Total	1,093	15%	100%
Napakiak 2011			
Salmon	232	30%	47%
Nonsalmon fish	151	22%	31%
Large land mammals	50	27%	10%
Small land mammals	4	44%	1%
Marine mammals	9	62%	2%
Birds and eggs	25	21%	5%
Marine invertebrates	<1	122%	0%
Berries and plants	19	17%	<1%
Total	490	21%	100%

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Table 10. The estimated harvest of wild resources in pounds edible weight per person by residents of communities that have participated in household harvest surveys (*continued from previous page*).

Community (from south to north)	Per person harvest	95% Confidence interval (+/-)	Percentage of total harvest
	Pounds		
Napaskiak 2011			
Salmon	175	17%	43%
Nonsalmon fish	105	52%	26%
Large land mammals	61	23%	15%
Small land mammals	1	75%	<1%
Marine mammals	29	47%	7%
Birds and eggs	24	20%	6%
Marine invertebrates	0		0%
Berries and plants	16	19%	4%
Total	411	21%	100%
Oscarville 2010			
Salmon	256	22%	49%
Nonsalmon fish	169	36%	33%
Large land mammals	42	28%	8%
Small land mammals	0	0%	0%
Marine mammals	14	45%	3%
Birds and eggs	18	24%	3%
Marine invertebrates	0		0%
Berries and plants	21	18%	4%
Total	520	21%	100%
Nunapitchuk 1983			
Salmon	288	58%	36%
Nonsalmon fish	365	37%	46%
Large land mammals	21	61%	3%
Small land mammals	30	14%	4%
Marine mammals	20	78%	2%
Birds and eggs	34	26%	4%
Marine invertebrates	0		0%
Berries and plants	44	15%	5%
Total	802	31%	100%
Kwethluk 2010			
Salmon	170	24%	47%
Nonsalmon fish	84	38%	23%
Large land mammals	48	18%	13%
Small land mammals	8	26%	2%
Marine mammals	25	53%	7%
Birds and eggs	13	21%	4%
Marine invertebrates	<1	109%	<1%
Berries and plants	16	29%	4%
Total	364	17%	100%

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Table 10. The estimated harvest of wild resources in pounds edible weight per person by residents of communities that have participated in household harvest surveys (*continued from previous page*).

Community (from south to north)	Per person harvest	95% Confidence interval (+/-)	Percentage of total harvest
	Pounds		
Kwethluk 1986			
Salmon	446		53%
Nonsalmon fish	269		32%
Large land mammals	51		6%
Small land mammals	17		2%
Marine mammals	8		1%
Birds and eggs	21		3%
Marine invertebrates	0		0%
Berries and plants	26		3%
Total	838		100%
Akiachak 1998			
Salmon	649	12%	49%
Nonsalmon fish	248	12%	19%
Large land mammals	245	10%	18%
Small land mammals	26	16%	2%
Marine mammals	31	47%	2%
Birds and eggs	69	11%	5%
Marine invertebrates	0		0%
Berries and plants	61	12%	5%
Total	1,329	8%	100%
Akiak 2010			
Salmon	292	28%	48%
Nonsalmon fish	209	55%	34%
Large land mammals	57	17%	9%
Small land mammals	10	20%	2%
Marine mammals	6	56%	1%
Birds and eggs	21	18%	3%
Marine invertebrates	<1	80%	<1%
Berries and plants	21	55%	3%
Total	616	30%	100%
Tuluksak 2010			
Salmon	173	13%	48%
Nonsalmon fish	87	26%	24%
Large land mammals	34	21%	9%
Small land mammals	7	17%	2%
Marine mammals	6	66%	2%
Birds and eggs	21	20%	6%
Marine invertebrates	0		0%
Berries and plants	31	15%	9%
Total	359	14%	100%

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Table 10. The estimated harvest of wild resources in pounds edible weight per person by residents of communities that have participated in household harvest surveys (*continued from previous page*).

Community (from south to north)	Per person harvest	95% Confidence interval (+/-)	Percentage of total harvest
	Pounds		
Lower Kalskag 2009			
Salmon	99	16%	53%
Nonsalmon fish	32	17%	17%
Large land mammals	35	17%	19%
Small land mammals	3	33%	2%
Marine mammals	0		0%
Birds and eggs	5	14%	3%
Marine invertebrates	0		0%
Berries and plants	13	26%	7%
Total	187	12%	100%
Kalskag 2009			
Salmon	199	17%	58%
Nonsalmon fish	48	26%	14%
Large land mammals	46	28%	13%
Small land mammals	8	63%	2%
Marine mammals	0		0%
Birds and eggs	8	19%	2%
Marine invertebrates	0		0%
Berries and plants	36	47%	10%
Total	345	25%	100%
Aniak 2009			
Salmon	190	18%	65%
Nonsalmon fish	50	57%	17%
Large land mammals	41	14%	14%
Small land mammals	3	46%	1%
Marine mammals	2	959%	1%
Birds and eggs	2	14%	1%
Marine invertebrates	0		0%
Berries and plants	6	14%	2%
Total	294	27%	100%
Chuathbaluk 2009			
Salmon	159	26%	65%
Nonsalmon fish	20	36%	8%
Large land mammals	41	38%	17%
Small land mammals	8	65%	3%
Marine mammals	0		0%
Birds and eggs	3	36%	1%
Marine invertebrates	0		0%
Berries and plants	14	32%	6%
Total	245	27%	100%

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Table 10. The estimated harvest of wild resources in pounds edible weight per person by residents of communities that have participated in household harvest surveys (*continued from previous page*).

Community (from south to north)	Per person harvest	95% Confidence interval (+/-)	Percentage of total harvest
	Pounds		
Crooked Creek 2009			
Salmon	171	17%	70%
Nonsalmon fish	29	19%	12%
Large land mammals	25	37%	10%
Small land mammals	7	36%	3%
Marine mammals	0		0%
Birds and eggs	2	25%	1%
Marine invertebrates	<1	85%	<1%
Berries and plants	11	11%	4%
Total	245	15%	100%
Red Devil 2009			
Salmon	142	28%	46%
Nonsalmon fish	120	74%	39%
Large land mammals	21	54%	7%
Small land mammals	9	68%	3%
Marine mammals	0		0%
Birds and eggs	6	28%	2%
Marine invertebrates	0		0%
Berries and plants	8	26%	3%
Total	306	52%	100%
Sleetmute 2009			
Salmon	277	17%	68%
Nonsalmon fish	53	14%	13%
Large land mammals	44	20%	11%
Small land mammals	15	31%	4%
Marine mammals	0		0%
Birds and eggs	6	21%	1%
Marine invertebrates	0		0%
Berries and plants	11	12%	3%
Total	406	14%	100%
Stony River 2009			
Salmon	366	56%	69%
Nonsalmon fish	92	87%	17%
Large land mammals	20	70%	4%
Small land mammals	39	78%	7%
Marine mammals	0		0%
Birds and eggs	5	65%	1%
Marine invertebrates	0		0%
Berries and plants	10	41%	2%
Total	532	55%	100%

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Table 10. The estimated harvest of wild resources in pounds edible weight per person by residents of communities that have participated in household harvest surveys (*continued from previous page*).

Community (from south to north)	Per person harvest	95% Confidence interval (+/-)	Percentage of total harvest
	Pounds		
Lime Village 2007			
Salmon	556	57%	59%
Nonsalmon fish	50	68%	5%
Large land mammals	243	71%	26%
Small land mammals	17	51%	2%
Marine mammals	0		0%
Birds and eggs	22	60%	2%
Marine invertebrates	0		0%
Berries and plants	48	33%	5%
Total	935	54%	100%
Takotna 2011			
Salmon	1	127%	1%
Nonsalmon fish	8	52%	5%
Large land mammals	131	35%	82%
Small land mammals	5	103%	3%
Marine mammals	0		0%
Birds and eggs	11	67%	7%
Marine invertebrates	0		0%
Berries and plants	4	70%	3%
Total	160	33%	100%
Nikolai 2011			
Salmon	131	39%	26%
Nonsalmon fish	76	50%	15%
Large land mammals	247	27%	49%
Small land mammals	11	47%	2%
Marine mammals	0		0%
Birds and eggs	24	34%	5%
Marine invertebrates	<1	119%	<1%
Berries and plants	10	26%	2%
Total	499	27%	100%
Nikolai 2002			
Salmon	115	21%	29%
Nonsalmon fish	29	17%	7%
Large land mammals	231	20%	58%
Small land mammals	10	19%	2%
Marine mammals	0		0%
Birds and eggs	10	16%	2%
Marine invertebrates	<1	22%	<1%
Berries and plants	6	15%	1%
Total	401	Not available	100%

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Table 10. The estimated harvest of wild resources in pounds edible weight per person by residents of communities that have participated in household harvest surveys (*continued from previous page*).

Community (from south to north)	Per person harvest	95% Confidence interval (+/-)	Percentage of total harvest
	Pounds		
Nikolai 1984			
Salmon	379		48%
Nonsalmon fish	7		1%
Large land mammals	340		43%
Small land mammals	18		2%
Marine mammals	0		0%
Birds and eggs	18		2%
Marine invertebrates	0		0%
Berries and plants	24		3%
Total	787		100%
McGrath 2011			
Salmon	66	20	28%
Nonsalmon fish	26	15	11%
Large land mammals	115	11	49%
Small land mammals	6	34	3%
Marine mammals	0		0%
Birds and eggs	9	22	4%
Marine invertebrates	<1	97	<1
Berries and plants	14	13	6%
Total	236	10	100%
McGrath 1984			
Salmon	75		41%
Nonsalmon fish	19		11%
Large land mammals	76		42%
Small land mammals	1		1%
Marine mammals	0		0%
Birds and eggs	8		4%
Marine invertebrates	0		0%
Berries and plants	2		1%
Total	182		100%

Source: ADFG 2014a.

APPENDIX A

SUMMARY OF KUSKOKWIM RIVER CHINOOK SALMON HARVEST AND MANAGEMENT

INTRODUCTION

The Kuskokwim River drainage is the second largest in the state of Alaska and has provided Alaska Natives and other residents of the Kuskokwim watershed an abundance of fishery resources, including Chinook Salmon, for subsistence purposes. For thousands of years, Alaska Native movements and settlements were based on these abundant fishery resources. In addition to subsistence uses, salmon have been commercially harvested in the Kuskokwim River drainage for more than 100 years. Federal management of this fishery began in the early 1900s. In 1960, the State of Alaska assumed management responsibility, and the Alaska Department of Fish and Game began regulating commercial and subsistence harvest.

COMMERCIAL FISHERY

In the 1800s, a commercial salmon fishery began in the Kuskokwim River drainage, and most of the catch was sold locally for dog food (Brown 1983, Oswalt 1990). In 1913, salmon commercially harvested in Kuskokwim Bay began to be exported (Pennoyer et al. 1965). During the 1950s, the river was closed or restricted to commercial fishing due to concerns of over-exploitation voiced by subsistence fishers (Pennoyer et al. 1965). During 1954, only Chinook Salmon were allowed to be harvested commercially, possibly to reserve Chum Salmon for the subsistence fishery. The largest commercial harvests of Chinook Salmon occurred in the late 1970s and early 1980s (**Figure A-1**). In 1985, commercial fishing was restricted to gill-net mesh sizes less than or equal to 6 inches. In 1987, the directed commercial fishery for Chinook Salmon was eliminated (Brazil et al. 2013).

SUBSISTENCE FISHERY

The subsistence fishery in the Kuskokwim River drainage was first surveyed in 1924. Between 1933 and 1936, Chinook Salmon comprised 1–5% of the subsistence harvest of salmon (Pennoyer et al. 1965). Since 1936, Chinook Salmon harvest has increased and now surpasses the Chum Salmon harvest (**Figure A-2**).

The subsistence harvest of Chinook Salmon peaked in 1990 (**Figure A-3**). Despite recent declines in the subsistence harvest of Chinook Salmon, the Kuskokwim River still maintains the largest Chinook Salmon subsistence fishery in the state of Alaska with an annual average subsistence harvest of 88,250 Chinook Salmon between 2001 and 2010 (Brazil et al. 2013). Since 2000, the subsistence harvest of Chinook Salmon has accounted for 91–99% of all the Chinook Salmon harvested in the Kuskokwim River (Elison et al. 2012). Currently, permits or harvest limits are not required for subsistence harvest of Chinook Salmon in the Kuskokwim River drainage.

ESCAPEMENT MONITORING AND INSEASON MANAGEMENT

Escapement Monitoring

Monitoring the distribution and estimating total escapement of salmon within the Kuskokwim River drainage is challenging due to the remoteness of escapement projects and the size of the drainage. To monitor escapement, aerial surveys have been flown in the Kwethluk, Kisaralik, Tuluksak, Salmon (Aniak), Kipchuk, Aniak, Holokuk, Oskawalik, Holitna, Cheeneetunuk, Gagaryah, Pitka, Bear, and Salmon (Pitka) rivers since the early 1960s. The Bethel test fishery has been operated above Bethel since 1984 and provides a long term data set on species composition and relative abundances that is comparable to data on run abundance at a small portion of weir escapement projects. The Kogrukuk River weir has been operated since 1969 on a tributary of the Holitna River and is the longest running weir within the Kuskokwim watershed. Additional escapement projects have been added since 1991 through 2000 and include the Aniak River Sonar and the Tuluksak, Kwethluk, George, Tatlawiksuk and Takotna River weirs.

Inseason Management

During times of low abundance management of the Chinook Salmon subsistence fishery can be especially difficult. As the human population has increased within the Kuskokwim watershed, the demand for Chinook Salmon has also grown. The majority of subsistence harvest of Kuskokwim River Chinook Salmon occurs below escapement projects, therefore these projects do not serve as good inseason management tools but are used to evaluate the run postseason. For inseason management and run strength indicators, managers rely on the drift gill-net test fishery that is operated near Bethel, commercial catch statistics, and informal reports from subsistence and recreational anglers. Often 50% or more of the subsistence harvest occurs prior to 10–15% of the run being monitored at the Bethel test fishery (**Figure A-4**). Based upon catch rates in the Bethel test fishery, Chinook Salmon represents approximately 15% of the relative inriver abundance of Chum, Chinook, and Sockeye Salmon between June 1 and July 1, when approximately 90% of the annual harvest of Chinook Salmon occurs below the test fishery. Approximately 40% of the subsistence harvest of Chinook Salmon occurs below the Bethel test fishery (Schaberg 2014, pers. comm.).

These monitoring projects increase knowledge of salmon abundance within some of the tributaries of the Kuskokwim River and have been used to set tributary escapement goals and manage the salmon fisheries. Data from escapement projects, harvest estimates in the subsistence and commercial fisheries, and mark and recapture data sets can be combined with available age information to reconstruct total runs by age and to estimate brood tables. Using these estimates of total run by age, a Bayesian state-space spawner-recruit analysis was conducted encompassing the years from 1976 through 2005. Based on these findings the Alaska Department of Fish and Game developed a drainage wide escapement goal of 65,000 to 120,000 (Elison et al. 2012, Hamazaki et al. 2012).

Since 2010, Chinook Salmon returns to the Kuskokwim River have been some of the lowest on record. In 2012, severe restrictions were put in place to limit the subsistence harvest and conserve Chinook Salmon. As a result of these restrictions, it is estimated that 25,000 Chinook Salmon were harvested in 2012 for

subsistence purposes, which is approximately 25% of the harvest during normal years. The estimated escapement in 2012 was 76,000 Chinook Salmon.

During 2013, conservative management actions were not imposed at the beginning of the season due to an optimistic preseason forecast predicting a return of Chinook Salmon adequate in size to satisfy both the newly established basin wide escapement goal of 65,000–120,000 fish and subsistence harvest needs of approximately 80,000 fish. In addition, weekly fishing reports from subsistence users indicated that the run appeared to be average and no concerns were noted. However, as the season progressed returns of Chinook Salmon abruptly stopped and the lowest escapement on record was observed. The preliminary 2013 escapement is estimated to be 47,500 (Elison 2014, pers. comm.).

In 2014, the directed Chinook Salmon subsistence fishery was closed in the entire drainage and the harvest of Chinook Salmon for subsistence was not allowed. Some Chinook Salmon were reportedly harvested incidentally, an estimated 11,000 fish based on preliminary data (Mamazaki and Liller 2015). This is lowest subsistence harvest on record and far below the 25 year average of 81,000 fish. The estimated run was 136,000 Chinook Salmon, and due to the subsistence closures, an estimated 124,000 fish escaped in the drainage.

Other Considerations

Exploitation Rates

Hankin and Healy (1986) suggest that Maximum Sustained Yield (MSY) exploitation rates are dependent upon rates of ocean survival and age at maturity. Northern stocks of Chinook Salmon, like the late maturing Kuskokwim Chinook Salmon stocks, have an estimated MSY harvest that is approximately one half of the harvest rate for early maturing Chinook Salmon stocks more typically in more southern stocks.

From 1976 through 2007, exploitation (harvest) rates of Kuskokwim River Chinook Salmon have ranged from 25% to 62% (Hamazaki et al. 2012). Restrictions on fishing time in 2012 reduced the Chinook Salmon harvest to approximately 25,000 thereby reducing the harvest exploitation rate below 25% for the first time since 1976. In 2013, subsistence fishing went unrestricted and the exploitation rate of Chinook Salmon was approximately 51%. The Hankin and Healey model suggested that higher exploitation rates lead to loss of older age classes and finally a population crash.

Productivity

Productivity (returns per-spawner) of Kuskokwim River Chinook Salmon from 1976 through 2005 has averaged 2.04 fish (**Figure A-5**). During this time, only three Chinook Salmon brood years had productivity levels greater than 2:1 returns-per-spawner and seven Chinook Salmon brood years had productivity levels less than or equal to 1:1 returns-per-spawner (Schindler et al. 2013).

Quality of Escapement

The quality of escapement may be affected individually or by a combination of factors that influence the weight, length, age, and overall fecundity of fish within the population. Harvest pressure and selectivity can directly influence the quality of escapement. Recent scientific literature has focused on the growing concerns regarding size selective fishing and its effects on the genetic structure of a fish population. Several peer reviewed articles have strongly encouraged managers to address adverse effects of harvest selectivity on animal populations (Allendorf et al. 2008, Dunlop et al. 2009, and Enberg et al. 2009, Hard et al. 2008). Bromaghin et al. (2011) modeled harvests of Yukon River Chinook Salmon and in nearly all fishing scenarios considered, the mean lengths declined by approximately one third in simulations using high productivity stocks and one fourth in low-productivity stocks.

Reports from subsistence users throughout the Kuskokwim watershed have cited a reduction of larger Chinook Salmon from their harvests. In addition, fisheries biologists have also reported a declining trend in size and/or average age of Chinook Salmon stocks in the Kuskokwim River drainage. These patterns have been observed in other Alaskan Chinook Salmon populations or stocks (Bigler et al. 1996, Bromaghin et al. 2011, Hyer and Schleusner 2005). Gill-nets are known to be size-selective (Bromaghin 2005) and the use of large mesh nets may have contributed to the loss of the larger Chinook Salmon within the Kuskokwim River.

Weight

A reduction in the average weight of commercially harvested Chinook Salmon has been noted in the Kuskokwim River (**Figure A-6**; Brazil et al. 2013). This may be an artifact of commercial fishing gill net mesh size restrictions put in place in 1985 leading to the selective harvest of smaller fish; however, since mesh restrictions were implemented the average weight of Chinook Salmon harvested in the commercial fishery appears to be on a continued decline. There are many variables potentially influencing the average weights of Chinook Salmon harvested in the commercial fishery.

Length

The average length of fish in the escapement has also decreased. Subsistence users have noted that large Chinook Salmon in the 39–45 inch (1000 mm+) range, once common in their harvests, have become the exception. The longest running data set for escapements is the Kogruklu River weir (1976–2013). Between 1976 and 2011 the length of female Chinook Salmon in the Kogruklu River has decreased by approximately 3 inches (80 mm; **Figure A-7**; FWS 2014).

Fecundity

Fish size and percent females are important proxies for quality of escapements as both can affect the quantity of eggs deposited on spawning grounds. Samples taken from Yukon River female Chinook Salmon have shown that fecundity (number of eggs per female Chinook Salmon) is directly correlated to fish size (Bromaghin et al. 2011, Jasper and Evenson 2006, Skaugstad and McCracken 1991). The average size of female Chinook Salmon in the Kogruklu River a tributary to the Kuskokwim River has

decreased between 1976 and 2011 (**Figure A-7**). This reduction in size of female Chinook Salmon is directly correlated to fecundity which has decreased by an estimated 16% in the Krogrukluk between 1976 and 2011 (**Figure A-8**). It is suspected that the Krogrukluk is representative of the larger Kuskokwim River drainage and therefore an overall reduction in female size has occurred throughout the Kuskokwim River drainage. Continued selective harvest pressure on larger older age fish may continue the downward trend in Chinook Salmon in the Kuskokwim River drainage.

In addition to a reduction in size being observed in portions of the Kuskokwim River drainage, female Chinook Salmon may also be experiencing disproportional harvest pressure. Approximately 41% of the subsistence harvest has been comprised of female Chinook Salmon. By comparison, escapement monitoring projects have recorded an average of 32% female Chinook Salmon (Molyneaux et al. 2004).

National Wildlife Refuge Mandate

The preservation of wild stocks in their natural unenhanced state is the National Wildlife Refuges' first priority. The Eek, Kwethluk, Kisaralik, Kasigluk, and Tuluksak rivers and a portion of the Aniak River are located on the Yukon Delta National Wildlife Refuge and all support spawning populations of Chinook Salmon for which the Service is responsible. Fish passage projects (weirs) to monitor Chinook Salmon escapements have been established on two of these rivers, the Kwethluk and the Tuluksak. Data from these projects provide a means of monitoring and maintaining these populations as stable and continuing natural populations to provide opportunity for continuance of subsistence uses. Chinook Salmon returning to the Kwethluk River in 2014–2017 will be progeny from 2007–2013. Because of the low escapements during those parent years, estimates of returns using similar returns per-spawner from brood years 2005–2010 suggest that meeting the lower end of the escapement goal in each of the next three years for this system may be challenging. Managing the fishery to ensure escapements are met may require varying levels of subsistence fishing restrictions in the near term to meet Federal mandates and minimize the likelihood of irreversible or long-term adverse effects upon these Chinook Salmon stocks.

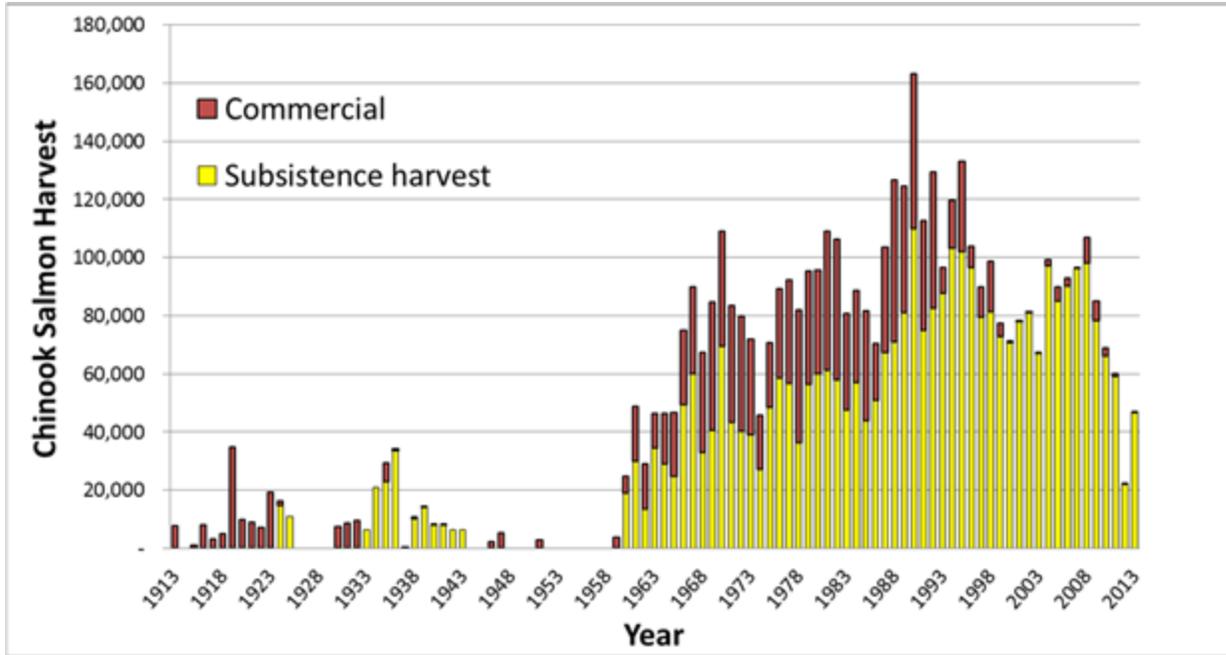


Figure A-1. Commercial and subsistence Chinook Salmon harvests from the Kuskokwim River from 1913 to 2013. Data prior to 1960 are incomplete (Source: Pennoyer et al. 1965, Brazil et al. 2013). Based on preliminary estimates, in 2014 the commercial fishery harvested 31 Chinook Salmon and the subsistence fishery harvested 11,234 (Hamazaki and Liller 2015).

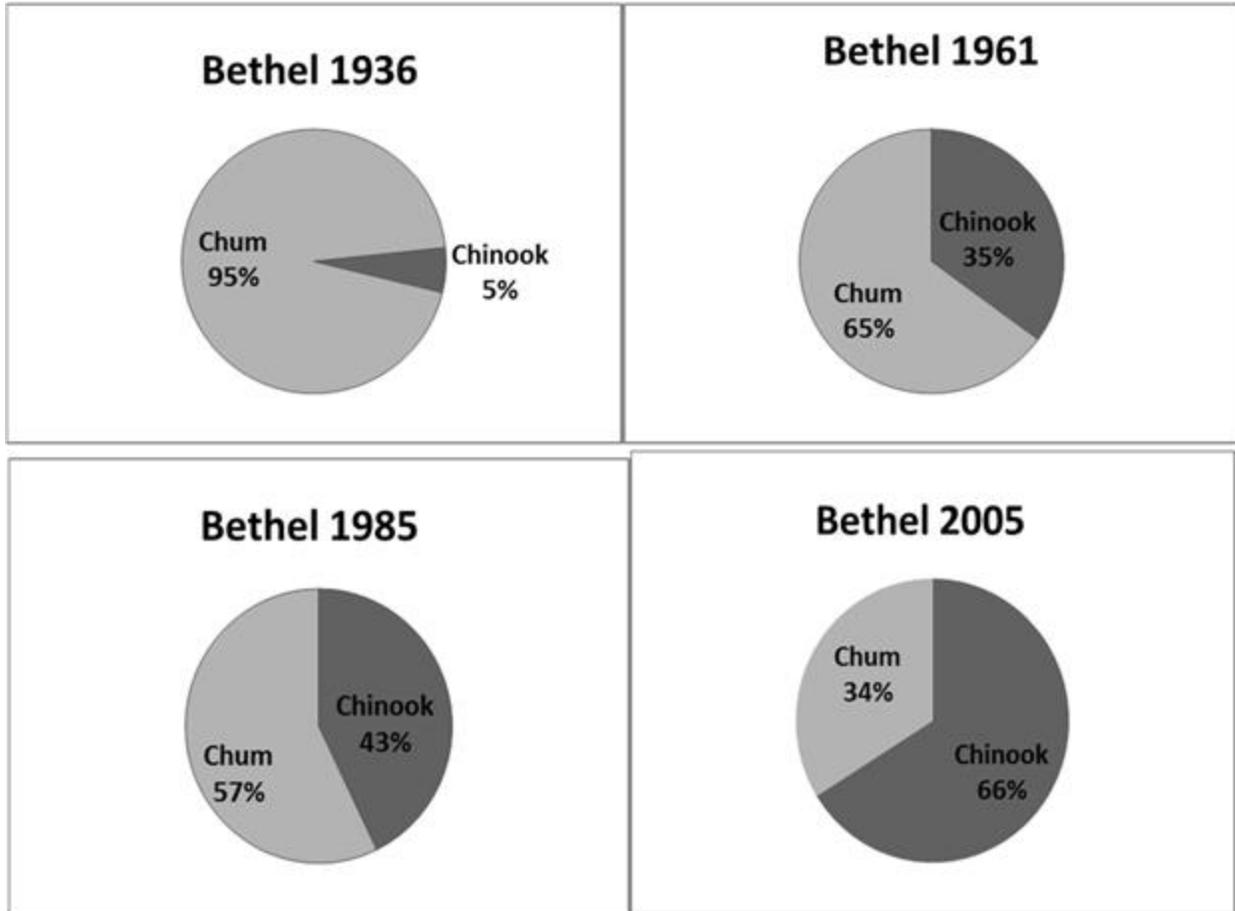


Figure A-2. Changes in harvest preferences between Chinook and Chum Salmon at Bethel. Data from 1936 may have included other species with Chum Salmon. Post 1960 data from ADF&G estimates of subsistence harvest (Brazil et al. 2013, Pennoyer et al. 1965).

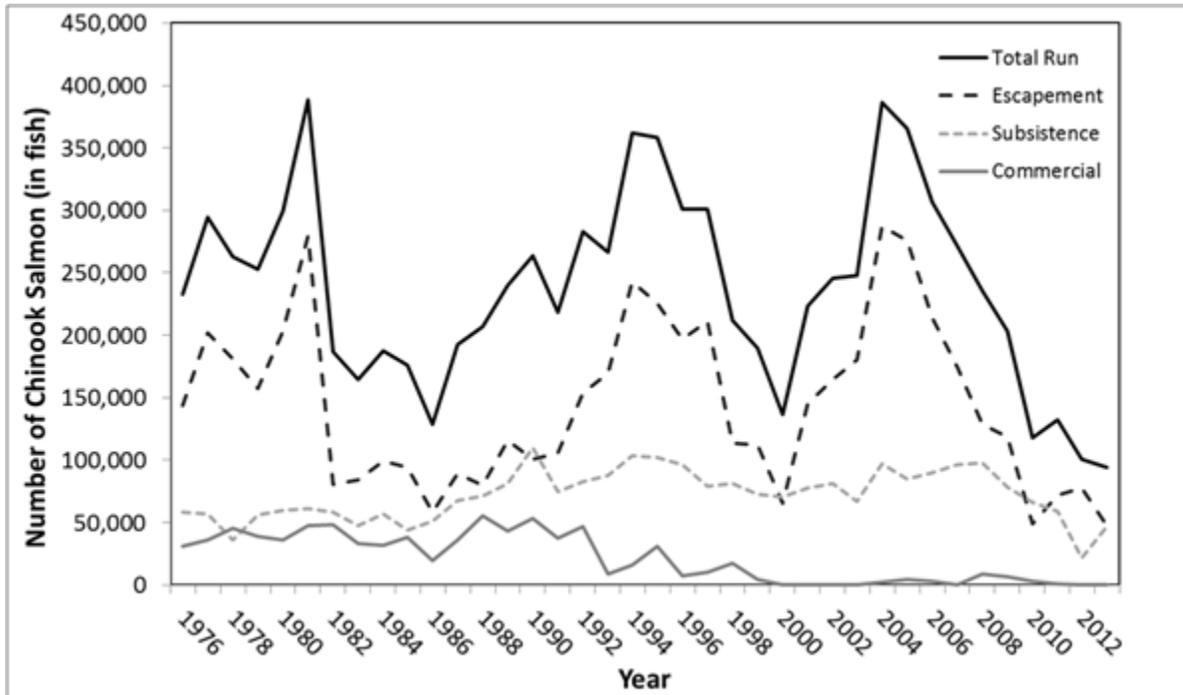


Figure A-3. Estimates of Kuskokwim River escapements and commercial and subsistence harvests (Brazil et al. 2013, Elison 2014, pers. comm.). Based on preliminary 2014 estimates, the total Chinook Salmon run size was 136,000 fish, escapement was 124,000 fish, subsistence harvest was 11,000 fish, and commercial harvest was 31 fish (Hamazaki and Liller 2015).

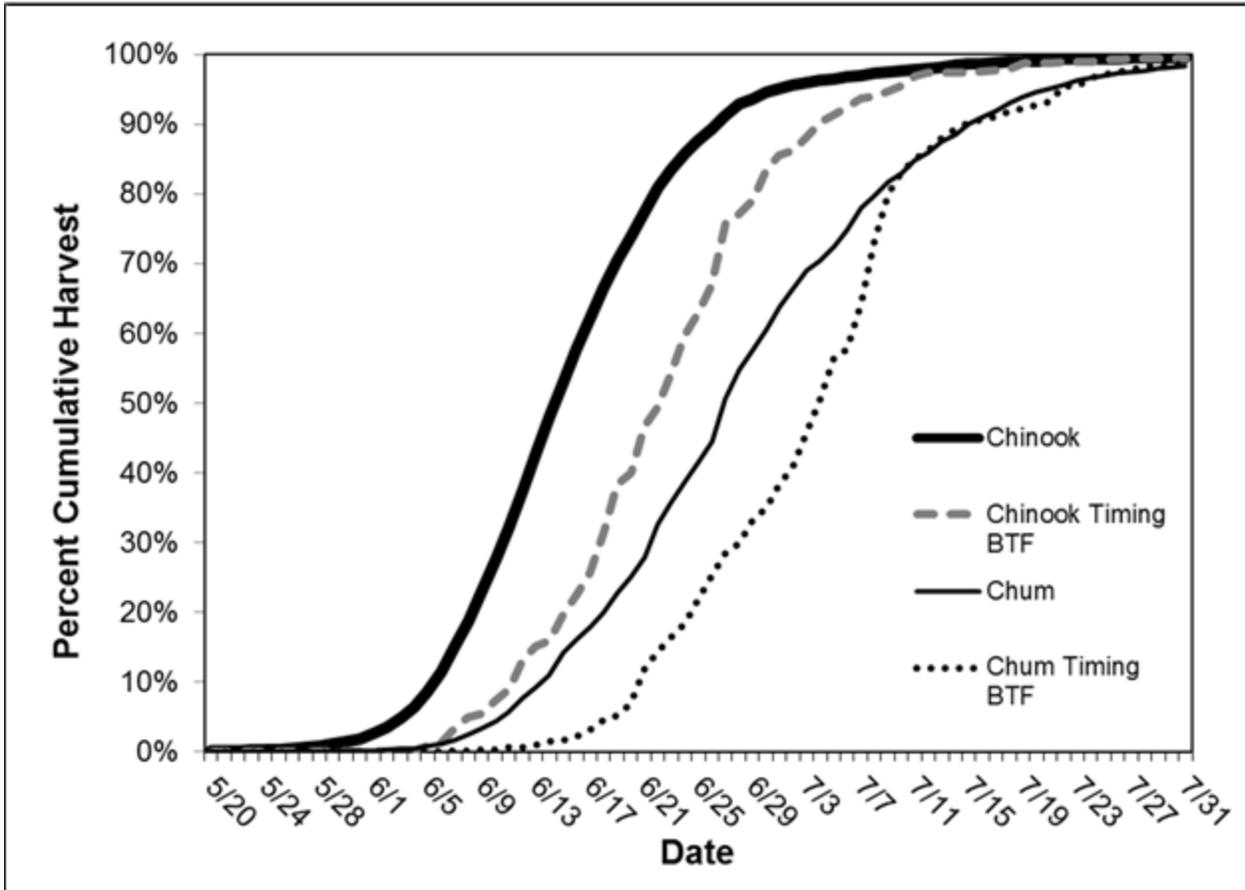


Figure A-4. Chinook and Chum Salmon run timing through the Bethel Test Fishery and harvest near and below Bethel 1989–1999 (ADF&G 2013).

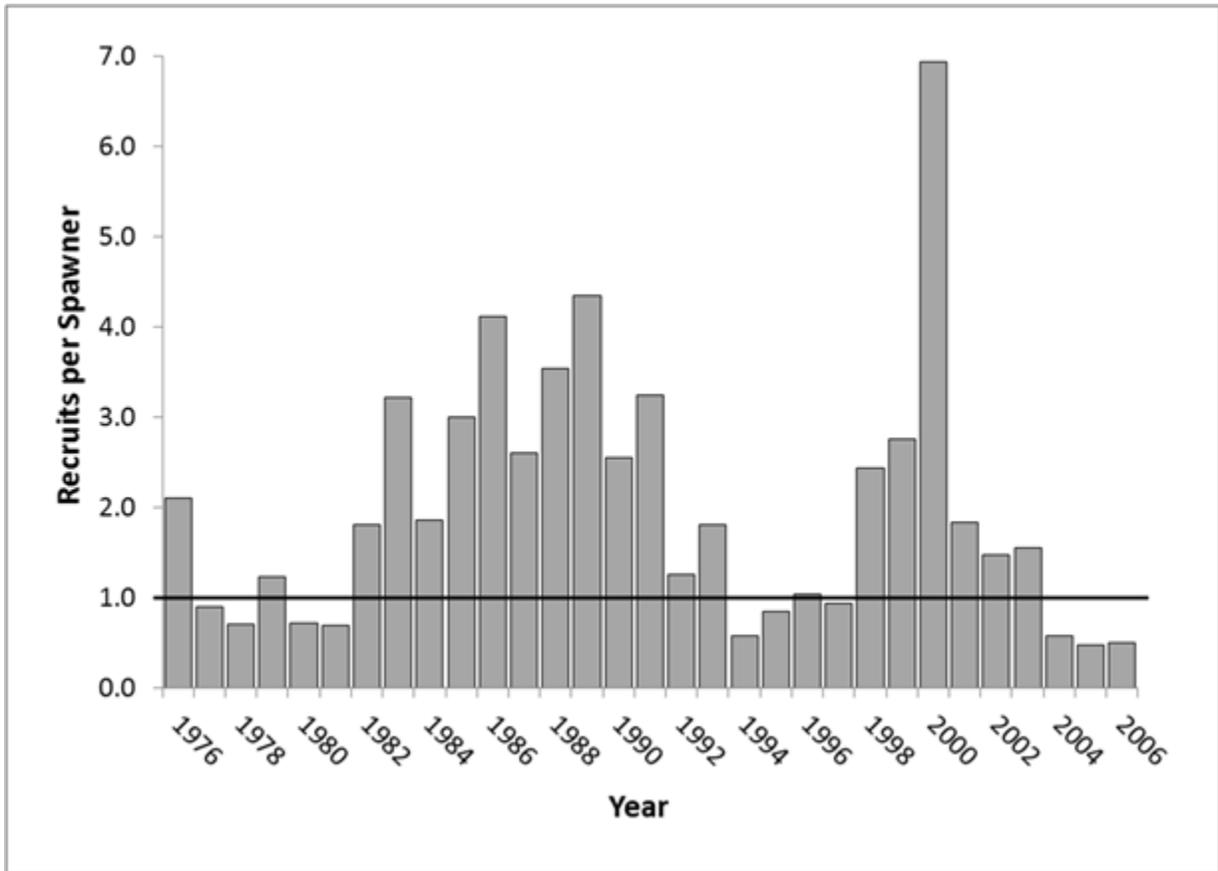


Figure A-5. Chinook Salmon brood-year productivity (returns per spawner, bars) 1976–2006. Productivity as measured as the sum of returns from a given brood year divided by the escapement that produced them. The horizontal line represents the productivity required for the population to replace itself (Schindler et al. 2013).

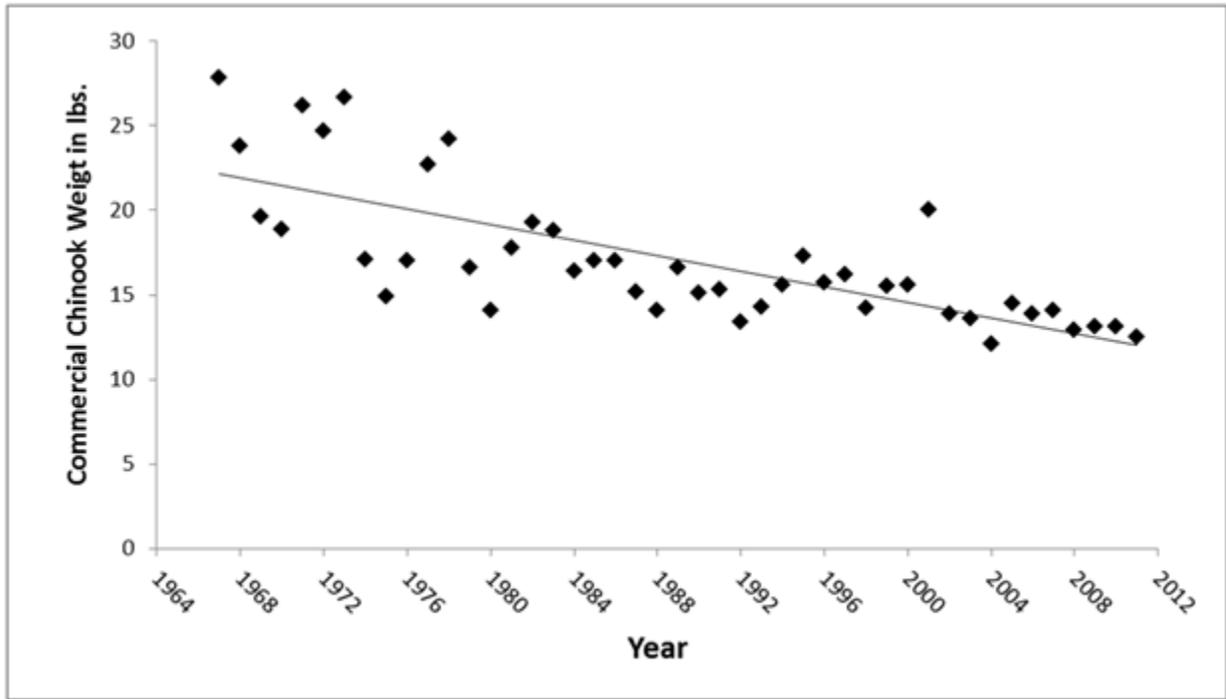


Figure A-6. Average weight of commercially harvested Chinook Salmon from the Kuskokwim River (Brazil et al. 2013).

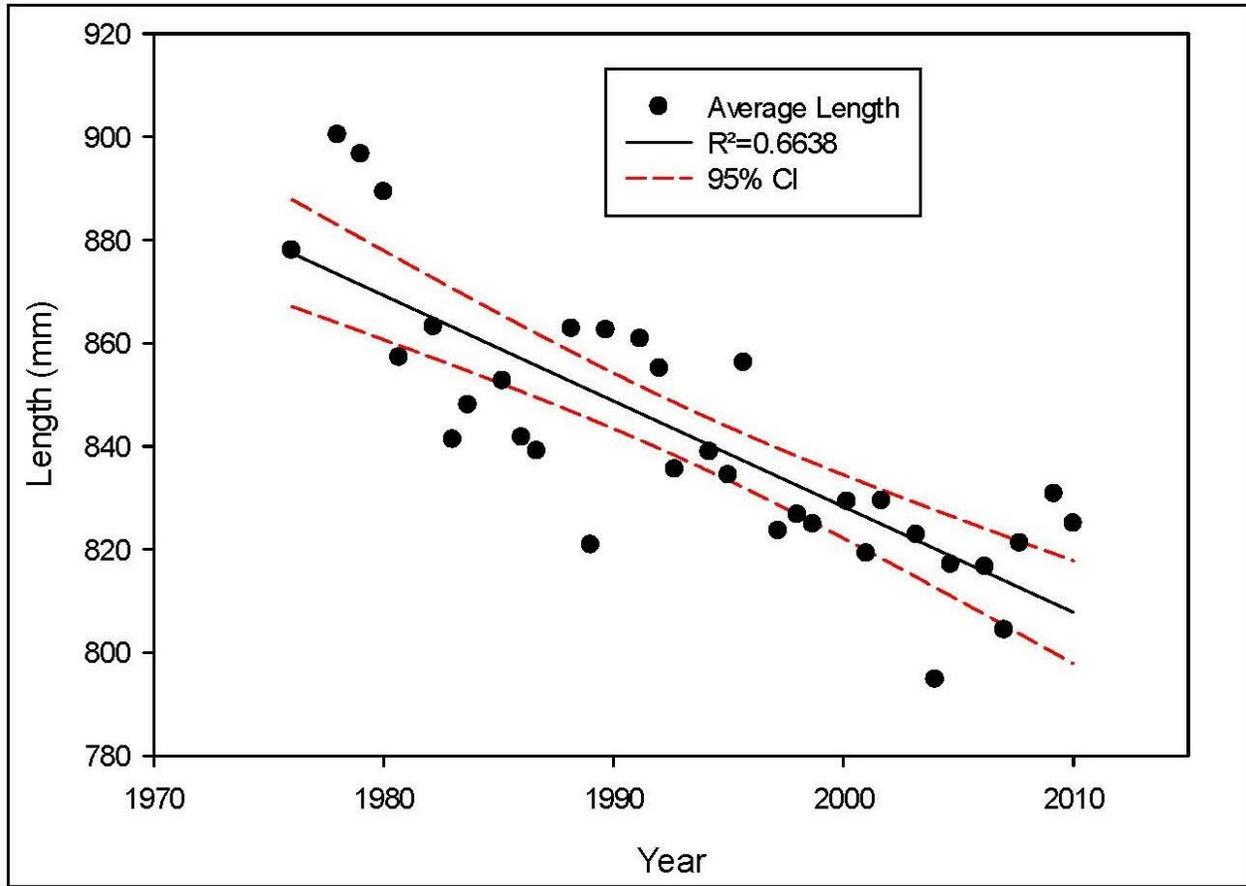


Figure A-7. Decrease in weighted average size of female Chinook Salmon passing the Kogrukluk River weir 1976-2011 (ADF&G 2014b, FWS 2014).

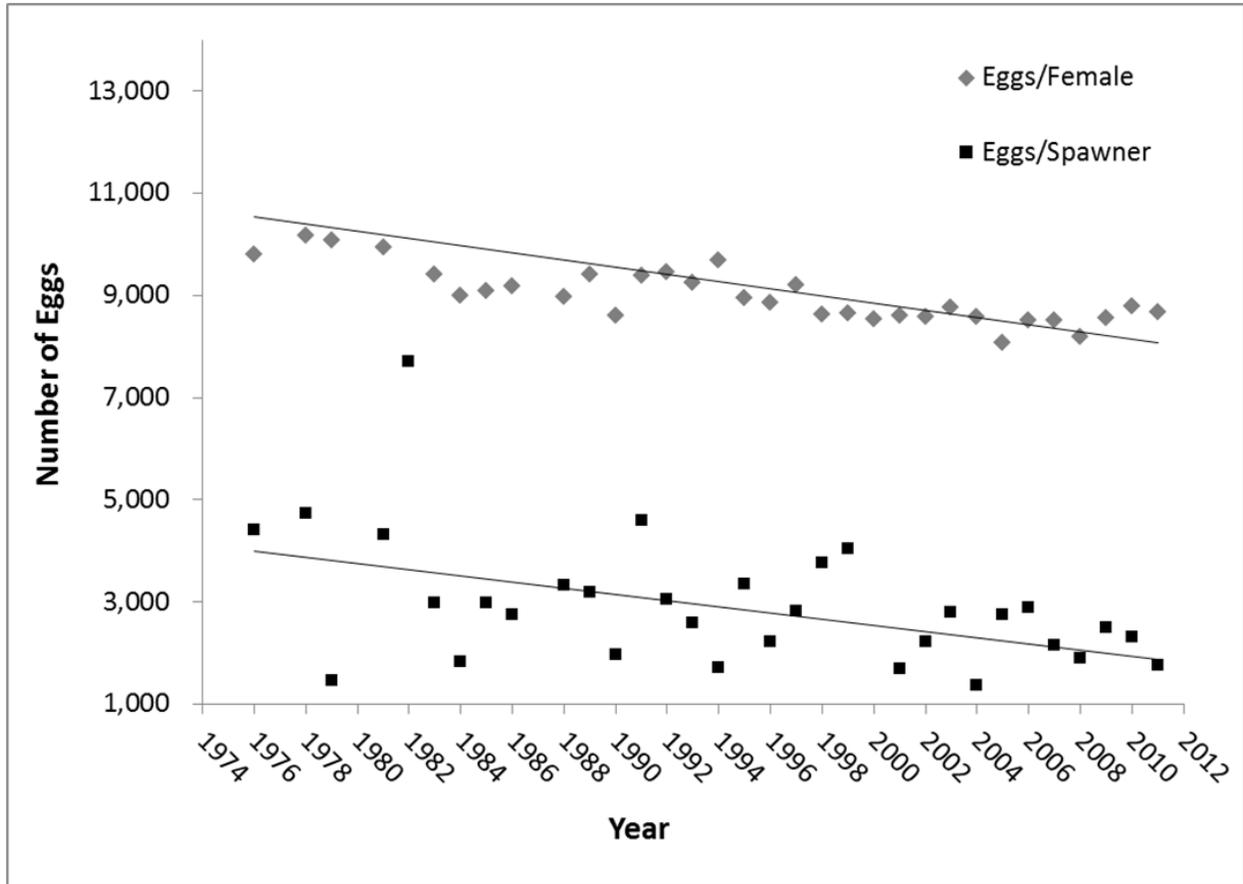


Figure A-8. Estimated average eggs per spawning female and average eggs per spawning fish on the Kogrukluk River. High fluctuations in numbers per spawner (male and female) are influenced by high numbers of returning age 1.2 males (FWS 2014).

APPENDIX B

CUSTOMARY AND TRADITIONAL USES OF SALMON

Below are descriptions of where people living in the Kuskokwim Area harvest, process, and preserve Chinook Salmon.

1. RESIDENTS OF SOUTH KUSKOKWIM BAY

Goodnews Bay, Quinhagak, and Platinum—Chinook Salmon spawn locally in the Kanektok, Goodnews, and Arolik river drainages, arriving in May. Historically, people harvested Chinook Salmon while living at summer fish camps located in the drainages. Currently, people harvest salmon closer to the villages and return to processing sites located nearby their homes. People moved from the historical village of Apokak when the bank eroded into Apokak Slough (around 1935). Apokak Slough is located just inside the Refuge boundary at the mouth of the Kuskokwim River. Some people chose to move to Eek while others moved to Quinhagak (LaVine et al. 2007).

2. RESIDENTS OF NELSON ISLAND, NEWTOK, AND CHEFORNAK (QALUYAARMIUT)

Newtok, Nightmute, Tununak, and Toksook Bay

Herring, other nonsalmon fishes, and marine mammals are harvested at high levels by Nelson Island people. Tununak and Toksook Bay are located near the best herring harvesting areas. Herring are generally abundant near the villages. Some residents of Newtok and Nightmute set up camps near to Tununak or Toksook Bay to harvest, process, and preserve their herring. In 1986, Tununak people participated in a house to house harvest survey. People reported harvesting nonsalmon fishes at the highest levels, 663 lbs edible weight per person (61% of their wild resource harvest) and 220 lbs per person of marine mammals (20% of the wild resource harvest). People reported harvesting 114 lbs per person of salmon (10% of the wild resource harvest) (Table 10, Fienup-Riordan 1983, Wolfe et al. 2012).

Chefornak

The people of Chefornak inhabit the flat coastal region between the mouth of the Kuskokwim River and Nelson Island at the juncture of the Keguk and Kinia rivers, 12 river miles from the Bering Sea. Early in the 1950s people moved from the village of Old Svarnak to the location of Chefornak near the new Bureau of Indian Affairs school. People at Chefornak began harvesting herring from areas near their village fairly recently (before 1984). Other nonsalmon fishes, marine mammals, and salmon are likely harvested at high levels when they are available (Fienup-Riordan 1983, Pete 1984).

Historically, some families traveled to the Kuskokwim River to fish for salmon from June to August based at seasonal fish camps where they harvested, processed and preserved salmon. The trip took up to 4 days by boat. Outboard motors shortened travel time. Currently, a few Chefornak families still travel to the Kuskokwim River fish camps to harvest, process, and preserve salmon. A few people retain salmon from their commercial harvests in Bristol Bay. They harvest a mixed variety of salmon from near-shore

waters of Etolin Strait and Cape Vancouver (Umkumiut to the cape). People catch Coho Salmon during August in the Kinia River that is adjacent to the village (Wolfe et al. 2012).

In 2011, people harvested an estimated 161 Chinook Salmon that was about 31% of their harvest of salmon, in lbs edible weight. They harvested Chum Salmon at the highest level, about 34% of the salmon harvest, in lbs edible weight. Wolfe et al. (2012:7) reported that “salmon was commonly cut as flanks and strips and salted, dried, and smoked, or half-dried (fermented) and cooked, or frozen for later use. Some families salted heads. Some salmon used to be buried and aged underground (taken out before winter), but this was not common anymore.”

3. RESIDENTS OF NUNIVAK ISLAND

Mekoryuk

Most Nunivavaarmiut live at Mekoryuk on Nunivak Island. People at Mekoryuk do not rely on herring as much as the people of Nelson Island, probably because the herring are less predictable and harder to locate in harvestable numbers. Also, the arrival of herring coincided with walrus hunting season. People harvest large numbers of nonsalmon fishes and marine mammals. In 2011, during a house to house harvest survey, people reported harvesting only Chum, Coho, and Pink Salmon. At least one stream on Nunivak supports a Sockeye run. People occasionally harvest Chinook Salmon when they travel across Etolin Strait to Cape Vancouver to fish with gill nets (Drozda 2010, Pete 1984, Wolfe et al. 2012).

4. RESIDENTS OF THE COAST

Kwigillingok and Kongiganek

The people of Kwigillingok and Kongiganek inhabit the flat coastal region between the mouth of the Kuskokwim River and Nelson Island. Salmon fishing has long been one of the primary activities of the people living along this area of the coast (Stickney 1983). In the 1960s, some residents of Kwigillingok, in order to escape flooding, moved their houses and established the village of Kongiganek about 9 miles away. Historically people moved to seasonal fish camps on both sides of the Kuskokwim River mouth below Eek Island in order to harvest, process, and preserve salmon. Probably starting in the 1930s, people moved their fish camps to locations near to Napakiak and Napaskiak. By the 1980s, people generally did not move to fish camps in the lower Kuskokwim River area. Men generally go by boat to harvest salmon at the mouth of the Kuskokwim River and return to Kwigillingok or Kongiganek the same day. Salmon are processed in the village. Some residents have commercial fishing permits for the Kuskokwim Area and likely return home with some Chinook Salmon retained from their commercial catches. People do not have access to other runs of Chinook Salmon. Salmon is dried and smoked in June and July. August is generally rainy, and not favorable for drying. Chinook Salmon is available through June. In 1983, the combined harvest of Chinook and Chum Salmon usually numbered in the several hundred per household (Stickney 1983).

Kipnuk

Kipnuk is situated on the Kuguklik River near the coast, about 60 miles from the mouth of the Kuskokwim River. Kipnuk's wild food harvest includes herring, blackfish, halibut, needlefish, tomcod,

whitefish, cisco, Pacific cod, and smelt. Additionally, in 2011, Kipnuk people harvested an estimated 3,147 salmon, and 25% was Chinook Salmon, in lbs edible weight. Sockeye salmon were harvested at the highest level, 32% in lbs edible weight. Two thirds of Kipnuk's salmon harvest was from the Kuskokwim river, and 95% of Kipnuk's estimated Chinook Salmon harvest of 479 fish was from the Kuskokwim River (**Figure 2**, Wolfe et al. 2012)

Historically, some families traveled to the Kuskokwim River to fish for salmon from June to August based at seasonal fish camps where they harvested, processed and preserved salmon. Kipnuk people's fish camps were generally located along the east side of the Kuskokwim River mouth at the north end of Kuskokwim Bay, across and south from Eek Island. Before outboard motors, the trip took up to 3 days. In recent years, a few Kipnuk families still travel to the Kuskokwim River fish camps to harvest, process, and preserve salmon. Other people harvest salmon from the local area and from the Kuskokwim River usually returning in a single day or after camping overnight, especially during Chinook Salmon season; however, a few travel to Bethel by airplane to harvest from fish camps near Bethel. Wolfe et al. (2012:8) described that in Kipnuk "drying salmon was rare. Because of the high oil content of ocean salmon and the wet weather, key respondents reported that it was difficult to dry salmon taken locally. Some families traded for dried salmon from the Kuskokwim area, offering seal, halibut, and other products." Salmon were half-dried and frozen, or frozen whole, and cooked. Some salmon were salted.

5. RESIDENTS OF THE LOWER AND MIDDLE KUSKOKWIM RIVER DRAINAGE

Tuntutuliak and Eek

Eek is located on the Eek River about 12 miles from the Kuskokwim River. In the 1930s, many people moved to the present site from inland locations that were flooding seasonally and to attend the school. Currently, people maintain summer fish camps on Eek Island, near the entrance of Eenayarak River. Tuntutuliak is located on the north bank of Kinak River (also called the Tunt River). In about 1957, people moved from the Kinak settlement, situated at the mouth of the Kinak River where it enters the Kuskokwim River, and *Qukaqllircaraq* settlement, situated inland, when a school was built at the present site of Tuntutuliak. The site is not located in an area that was much used historically, and people must travel away from the village for many hunting and fishing activities. Many families continue to move seasonally to spring, summer, and fall camps (Ikuta et al. 2013, Ray et al. 2010).

Their earlier fish camps situated at the mouth of the Kinak River eroded out, and before 1950 most families harvested, processed and preserved salmon from seasonally-occupied fish camps situated directly across the Kuskokwim River from the Kinak River. Eventually, people observed fewer near shore fish. Between 1950 and 1965, most families abandoned these fish camps and moved seasonally to Fish Camp Island (*Kuiguyuk*) in the Johnson River area, during a period that coincided with school vacation. People began to fish from Tuntutuliak when improvements in motors made it possible to reach the Kuskokwim River quickly. Currently, few people stay at summer fish camps, instead operating salmon processing and preservation stations nearby their homes in Tuntutuliak. People dry salmon roe, eat the organs, backbones and skin, and clean, braid, and dry the stomachs, esophaguses, and intestines. People make stinkheads or salt the heads. Chinook Salmon is the most popular eating fish. People dry Chinook Salmon when the weather is ideal in order to produce the best possible fish for the winter. "Drying fish in wet weather is

more demanding, takes longer, and produces an inferior product, if it works at all.” Additionally, rainy weather can be rough and dangerous. “Better to let the weather make the windows” (Ikuta et al. 2013:39).

Napakiak, Napaskiak, and Oscarville

The site of Napaskiak was a seasonally-occupied camp. The semi-permanent winter village was a mile upriver, called “Oovingiyuk.” It was partially washed away when people moved the village to its present site (Oswalt 1959). People hunted, fished, and trapped in nearby waters of the Kuskokwim River and the lakes and tundra inland. People from “Eelchuk” located about a mile downriver also relocated to the present site of Napaskiak. More recently, people from nearby, now-abandoned settlements at Loamavik (near the present location of Bethel), “Painuk” (probably *Painguq*, along the lower Johnson River) and “Akuleruk,” moved to Napaskiak. Close ties existed with people at Kwethluk, Napakiak, and Eek. Oscarville was the site of the Oscarville Trading Post and a few families moved nearby (Oswalt 1959).

In 1956, early in June almost every family in Napaskiak had a large-meshed net in an eddy along the Kuskokwim River in order to harvest Chinook Salmon. When Chinook Salmon were harvested at a rate of three or four per night, people began drifting, usually in front of the village. People processed and preserved Chinook Salmon nearby their homes at Napaskiak. Chinook Salmon were dried and smoked for a week or two. Sometime before 1956, more than half the village went to summer fish camps at sites up to 30 miles away. In 1956, only two families were away all summer at fish camp (Oswalt 1959).

Kasigluk, Nunapitchuk, and Atmauthluak, Bethel, Kwethluk, Akiachak, Akiak, Tuluksak, Lower Kalskag, and Kalskag

People rely most on salmon as the mainstay of their livelihood. They harvest salmon from the lower Kuskokwim River drainage almost exclusively (Andrews 1989, Andrews and Peterson 1983, Brown et al. 2012, Brown et al. 2013, Coffing 1991, Coffing et al. 2001, Ikuta et al. 2013).

Aniak

People at Aniak harvest Chinook Salmon from the lower Kuskokwim River drainage from a point midway between Kalskag and Aniak to a point halfway between Chuathbaluk and Kolmakoff. Chinook Salmon are processed and preserved at fish camps that are located nearby their homes at Aniak. Chinook Salmon are dried and smoked. Chinook Salmon are processed into “blanket” fish or cured into “salt fish.” Preservation methods can include drying, freezing, jarring, or vacuum packing of whole, stripped, or sectioned fish. People’s harvest of other salmon species depends on how successful they are harvesting Chinook Salmon, which are preferred and generally harvested early enough to avoid the rainy season and the flies that accompany it (Brelsford 1987, Brown et al. 2012). “Unless cut salmon had dried slightly and formed a ‘crust,’ flies were likely to lay eggs on cut fish. And, they added, it is a laborious process, indeed, to remove fly eggs from cut fish. Even if flies were not the problem, fish tend to sour or mold rather than dry in wet weather” (Brown et al. 2012:25).

Chuathbaluk

Chuathbaluk (also known as Little Russian Mission) is situated at the confluence of Mission Creek and the Kuskokwim River. The Russian trading fort Kolmakovsky Redoubt was about 12 miles from present

day Chuathbaluk when people built the Orthodox Church at the site of Chuathbaluk. For a while, small migrations of Deg Hit'an (or Ingalik) Athabascans and Yup'ik Eskimos moved to the church site. In the 1950s, the Orthodox Church was rebuilt and families again moved to the site at Chuathbaluk. From there, people relocated seasonally to summer fish camps that were located between Aniak and Chuathbaluk. Chinook Salmon arrive in front of the village around the middle of June and continue to run through late July. Salmon are harvested from the middle Kuskokwim River drainage and from the lower Kuskokwim River drainage, such as the Aniak River that supports a large run of Chinook Salmon. People sometimes travel as far as Bethel to harvest salmon (Brown et al. 2012, Oswalt 1980).

6. RESIDENTS OF THE UPPER KUSKOKWIM DRAINAGE

Crooked Creek

Crooked Creek is situated at the confluence of Crooked Creek and the middle Kuskokwim River. Historically, Crooked Creek was at the intersection of Central Yup'ik and Deg Hit'an, and Dena'ina cultures and languages. Historically, people moved to seasonal fish camps at the site of the present-day village. People formed a semi-permanent settlement around a trading post at the site. People from nearby Georgetown, Oskawalik, and Canoe Town moved to nearby the trading post. People from Crooked Creek harvest Chinook Salmon at the mouth of the George River and at the mouth of Oskawalik River. They process and preserve salmon at fish camps that are located nearby their homes at Crooked Creek (Brelsford et al. 1987, Brown et al. 2012, Oswalt 1980).

Red Devil and Sleetmute

Red Devil along the middle Kuskokwim River drainage is not located at the mouth of a tributary. People chose the site to mine mercury from the 1930s to the 1970s. People living in seasonal settlements along the Holitna River moved to Red Devil when the school was built. Currently, the people living at Red Devil are a mix of Yup'ik, Athabascan, and non-Natives who obtained Federal homesteads. The village has close ties with nearby Sleetmute. People from Red Devil harvest, process, and preserve Chinook Salmon at sites nearby their homes at the village. People harvest salmon also from the George River and Holitna River (Brelsford et al. 1987, Brown et al. 2012).

Sleetmute (Sikmiut or *Cellitmiut* in Yup'ik and *Tovishq'vl ghunh* in Deg Hit'an) was likely the site of a seasonal fish camp during historical times. People occupying seasonal camps along the Holitna and Hoholitna river drainages moved to the more permanent settlement of Sleetmute, attracted to a new school and trading post. Non-Natives came to Sleetmute after obtaining Federal homesteads. Families harvest, process, and preserve Chinook and Sockeye Salmon at summer fish camps that are situated up to 3 miles from the village. People take few Coho Salmon because Coho Salmon are available during a normally rainy season when people have a hard time smoking them. People do not prefer to eat frozen Coho Salmon (Brown et al. 2012).

Stony River and Lime Village

Stony River village is located on the middle Kuskokwim River 2 miles from its confluence with Stony River. The settlement has been called Moose Village and Moose Creek. Non-Native people first moved to the site of Stony River village, attracted to the trading post. In the 1960s, Dena'ina families from Lime

Village and Dena'ina and Deg Hit'an families living in the area began staying at Stony River. People harvest salmon and whitefishes, especially Chinook Salmon and humpback whitefish, as the bulk their subsistence diet. Salmon are harvested from the middle Kuskokwim River mainstem and Stony River. Lime Village is located well off the mainstem middle Kuskokwim River along Stony River (Kari 1983, 1985; Oswald 1980; Brown et al. 2012).

7. RESIDENTS OF THE KUSKOKWIM RIVER HEADWATERS

Takotna, Nikolai, and McGrath—People at the villages rely heavily on their harvests of moose, caribou, and salmon, including Chinook Salmon (Brown et al. 2012, Brown et al. 2013, Ikuta et al. 2013).

APPENDIX C

ELIGIBILITY OF BETHEL RESIDENTS

ANILCA SECTION 804 ANALYSIS

DEMOGRAPHY

The community of Bethel is located approximately 60 miles from where the Kuskokwim River meets the Bering Sea, and 390 miles from Anchorage, Alaska. The community can be accessed only by boats and planes and is not connected overland by road to any other community. All cash commodities are delivered either via river barge in summer or by year-round air service.

Bethel is located in the heartland of the traditional territory of Central Yup'ik Eskimos. Moravian missionaries established Bethel at an unoccupied site in 1885 across the river from the village of *Mumtreglak*. The missionaries ran an orphanage, school, church, store, post office, and sawmill. Periodically gold seekers, trappers, and merchants spent time in Bethel awaiting supplies (Hankelman and Vitt 1985). People residing in the region moved to Bethel for the school and church and to trade. By 1960, the population had increased to 1,258 people; it doubled in 1970 to 2,416 people, and continued to increase each census year, numbering 3,576 people in 1980, 4,675 people in 1990, 5,471 people in 2000, and 6,080 in 2010 according to the U.S. Census (ADCCED 2014). In 2010, over two-thirds of Bethel residents were from the region.

HARVEST

Based on the Post-season Salmon Harvest Assessment Survey, the estimated number of Bethel households that harvested salmon 2008–2013 is displayed below (**Table C-1**). In 2013, there were about 2,100 households in Bethel of which about 970 households (46%) fished for salmon. The year 2012 was a year when closed salmon-fishing periods were used in order to prevent the harvest of Chinook Salmon, and only 38% of Bethel households fished for salmon. During other years of Chinook Salmon conservation but with fewer closed salmon-fishing periods, 2010 and 2011, the number of people that reported fishing for salmon actually increased to 66% and 56% of households, respectively. For this study, “fishing household” was defined as a household that participated in subsistence fishing activities, such as harvesting or processing salmon. The five-year average 2003–2007 harvest of Chinook Salmon by residents of Bethel was 28,109 fish. The recent 2008–2012 five-year average harvest was 22,508 fish, a decrease of 20%. In contrast, in 2014 inseason closures resulted in an estimated harvest of only 11,000 Chinook Salmon from the entire Kuskokwim River drainage (Hamazaki and Liller 2015).

Table C-1. The harvest of Chinook Salmon by residents of Bethel, based on household harvest surveys, 2008–2013.

BETHEL						
POST-SEASON SALMON HARVEST ASSESSMENT SURVEY						
Year	Total number of households	Average number of people per household	Estimated number of fishing households	Percentage of households that fished	Estimated total population of Bethel based on survey	Estimated harvest of Chinook Salmon ^a
2013	2,126	3.39	968 (+/-78)	46%	7,216 (+/- 298)	17,246 (+/- 3,450)
2012	2,128	3.44	825 (+/- 86)	38%	7,311 (+/- 324)	7,321 (+/- 1,474)
2011	2,097	3.29	1,175 (+/- 52)	56%	6,893 (+/- 165)	25,093 (+/- 4,052)
2010	2,043	3.41	1,353 (+/- 36)	66%	6,974 (+/- 120)	26,157 (+/-) ^b
2009	2,005	3.34	941 (+/- 50)	47%	6,688 (+/- 206)	26,170 (+/-) ^b
2008	1,981	3.42	886 (+/- 68)	45%	6,770 (+/- 315)	27,800 (+/-) ^b

Source: Carroll and Hamazaki 2012; Sheldon, Hamazaki, Horne-Brine, Roczicka, Thalhauser, and Carroll 2014; Sheldon, Hamazaki, Horne-Brine, Roczicka, and Gillikin *in pub.*

^a In 2014, in-season closures resulted in an estimated harvest of only 11,000 Chinook Salmon from the entire Kuskokwim River drainage (Hamazaki and Liller 2015).

^b Harvest estimates were revised in 2013; confidence intervals were not reported.

SECTION 804 ANALYSIS

Section 804 of ANILCA requires the Secretary of the Department of the Interior and the Secretary of the Department of Agriculture to respond when the population of a fish or wildlife species in a particular area becomes depressed to the point that the Secretaries are forced by circumstances to choose between otherwise qualified rural residents who wish to fish, hunt, or trap from that depressed population. Section 804 of ANILCA requires the Secretaries to make a determination based on three criteria: (1) customary and direct dependence upon the populations as the mainstay of livelihood, (2) local residency, and (3) the availability of alternative subsistence resources.

Criterion 1. Customary and direct dependence upon Chinook Salmon as the mainstay of livelihood

Contemporary Fish Camps at Bethel

There are estimated to be 55 to 60 active fish camps within the Bethel city limits (Roczicka 2014, pers. comm.). They are at home sites that are situated in areas that are away from the dust that pervades the city during dry weather. In addition, there are another 70 to 80 fish camps occupied each summer that are situated along the Kuskokwim River adjacent to Bethel (Chavez 2014, pers. comm.). The total number of fish camps is in a range from 125 to 140.

An In-season Salmon Harvest Monitoring Program is conducted each year in the Bethel area by staff at the *Orutsararmiut* Native Council, which is the tribal organization in Bethel. Participants in the In-season Salmon Harvest Monitoring Program are people occupying the 70 to 80 fish camps situated in the Bethel area between the mouth of the Gweek River and the village of Napaskiak (Patton and Carroll 2011). The use of fish camps along the Kuskokwim River to process and preserve salmon is well documented (cf.

Coffing 1991, Kilbuck 1988). From June through August, the daily activities of many households revolve around harvesting, processing, and preserving salmon for home use, or subsistence. Families process and hang their catches to dry at fish camps making traditional style “dryfish” and smoked strips. Smaller amounts of the salmon catch are preserved for the year by freezing, canning, salting, and fermenting. Households not directly involved in catching salmon assist family and friends with processing and share in the harvest. Fish camps are used by extended families, and often the youngest to the oldest all take part in fish camp activities. This family time together, gathering local food and being out on the land, is considered integral to good health, a sense of well-being, and transmission of local knowledge. The use of family fish camps has been, and remains, an important part of subsistence activities in the area (Patton and Carroll 2011).

Many families either own or have access to sites and have inherited the right to occupy them seasonally. Additionally, families use various strategies to participate at fish camp, for example, by sharing camps with others, or using camps after the owners are done for the season. Fish camps are inherited, for example, in the form of Native allotments or other privately-held land. Some river lots are leased for an annual fee from the Bethel Native Corporation. Fish camps are usually made up of a simple fish rack and smoke house made of tree branches, plywood and other lumber, and plastic tarps. Numerous other structures may include a plywood cabin, outhouse, steam bath, and storage shed. Some long-term fish camps have a larger house that is lived in throughout the summer with a few having solar panels or generators for electricity. Many families spend the majority of the salmon fishing season and other parts of the summer at fish camp. Other families rotate through in shifts with different members helping out at different times. Many Bethel families with full time jobs routinely go back and forth to their fish camps to process and tend their fish while it is drying and smoking. If fishermen are not able to take time off from their day jobs they often harvest, dry, and smoke fish at camp in the evening after work, returning to Bethel late at night to go to work the next day (Patton and Carroll 2011).

People at fish camps near Oscarville and at Napaskiak Slough are of mixed residency, about half from the nearby communities of Oscarville or Napaskiak and half from Bethel. Bethel residents have fish camps wherever they can secure the land and be near a water source. Some fishermen prefer to be “away from civilization, dust, and chemicals,” while others have fish camps “in town” in their own backyards if sufficiently protected from the pervasive windblown road dust in Bethel. Bethel area fish camps are located along the river for ease of transferring the fish catch from the boat, and because of better drying conditions due to the river breeze reducing flies, and close proximity to water needed to clean the fish. Some people from Napaskiak and Oscarville who live in Bethel go to their families’ fish camps near those communities. Bethel residents generally harvest salmon between the villages of Akiachak and Napaskiak as they usually can make good fish catches within this zone without having to travel farther (Patton and Carroll 2011).

Bethel residents use drift gillnets to harvest the majority of their salmon. A variety of mesh sizes are commonly used depending on what each fisherman owns or can borrow. Mesh sizes typically used for salmon range from 8 inches (locally called “king gear”) to 6 inches or less. Some people who possess multiple nets of different sizes rotate between them depending on what species and size of fish they desire to catch and which mesh size is most effective. Setnets are more commonly used to target Chinook

Salmon early in the run. This is a more efficient means of fishing when fish are just beginning the upriver migration and are less abundant. Some families fish using only drift or only set nets depending on their financial resources and what works best for them. Many families employ both methods, tailoring their mesh size, method, and catch to the size and run timing so that they get a specific quantity of each desired species and can process and dry them in a timely manner (Patton and Carroll 2011).

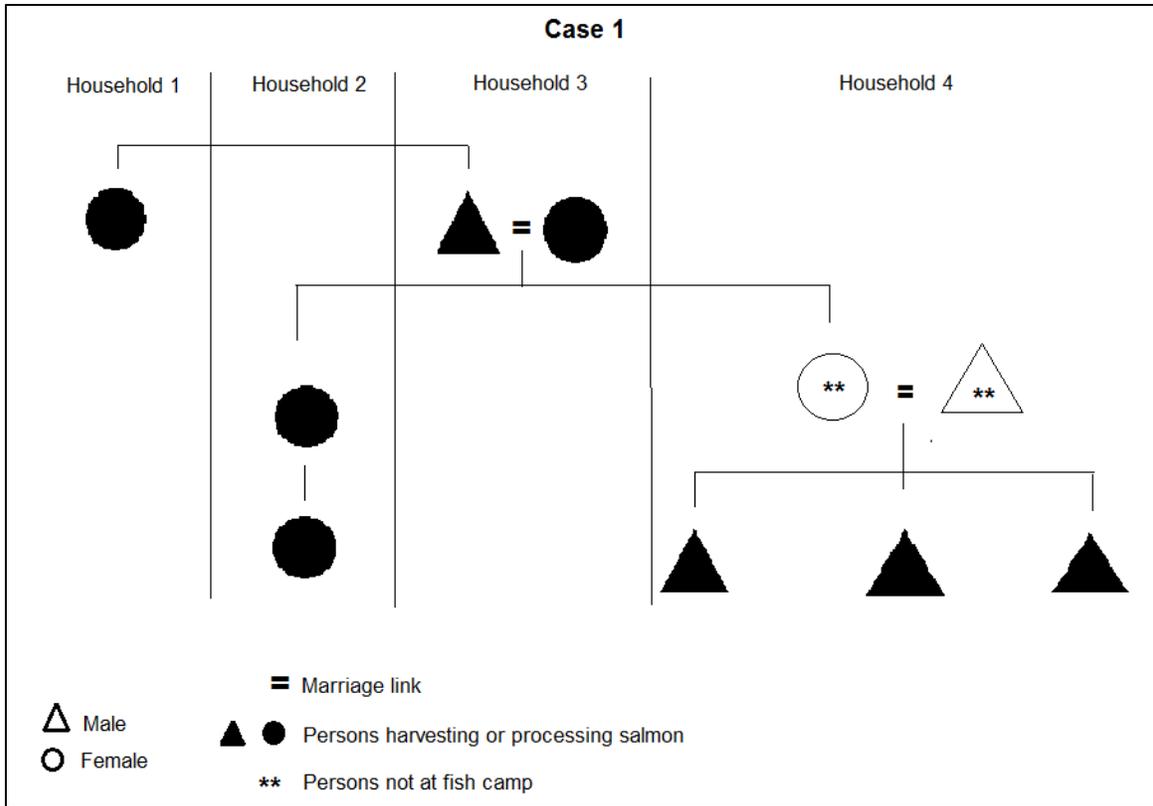
Both drift and setnet fishing requires costly equipment such as a skiff, boat motor, gas, and gillnet; thus, sharing of resources is important for many families, and for some, rod and reel fishing along the river's edge is the only economic option available. Some of the rod and reel fishing occurs at the Bethel sea wall, which is "a popular activity during the summer months and affords people an opportunity to harvest fish for subsistence use without requiring the investment of a boat and motor or a gillnet" (Coffing 2001:5). There is also rod and reel fishing at the mouth of the Kisaralik and Kasiguluk rivers, and parts of Kuskokwak Slough, especially for Coho Salmon. Rod and reel fishing often coincides with summer berry picking and late summer-early fall hunting activities.

How long people fish often depends on the size of their families, their fish harvest goals, and success in meeting those goals. For example, fish camps harvesting for extended families fish throughout the run to meet their needs; or at times when the fish returns are low all fishermen usually take longer to meet their catch goals for the year. Fishing for salmon begins in spring when weather conditions are likely to be at their best for drying and smoking salmon. Sometimes, salmon spoils due to poor weather for drying and due to fly infestations. In these cases families extend their fishing to the very end of the Chinook or Sockeye Salmon run or make up more of their catch with a larger quantity of Coho Salmon arriving later in the summer. How much families harvest and preserve is based on their obligations throughout the winter. Salmon are preserved as a main food source to feed the family all year, shared at festivals, holiday gatherings, memorial feasts, and sometimes traded for other subsistence goods, such as seal oil from the coast, or moose and caribou meat (Mather 1985, Patton and Carroll 2011).

The information below describing the social organization of salmon production work groups are based on interviews with participants (Kenner 2014). A work group is a group of people that together participated in subsistence fishing activities, such as harvesting or processing salmon.

Case 1

The first case is the extended family of a married, middle-aged couple. Both are employed fulltime year round. They are both originally from other villages situated in the region, but they have used their fish camp alongside the Kuskokwim River adjacent to Bethel for many years. They lease the site from the Bethel Native Corporation and were grandfathered in when the Bethel Native Corporation began leasing to only shareholders. The work group is comprised of family members from four separate households.



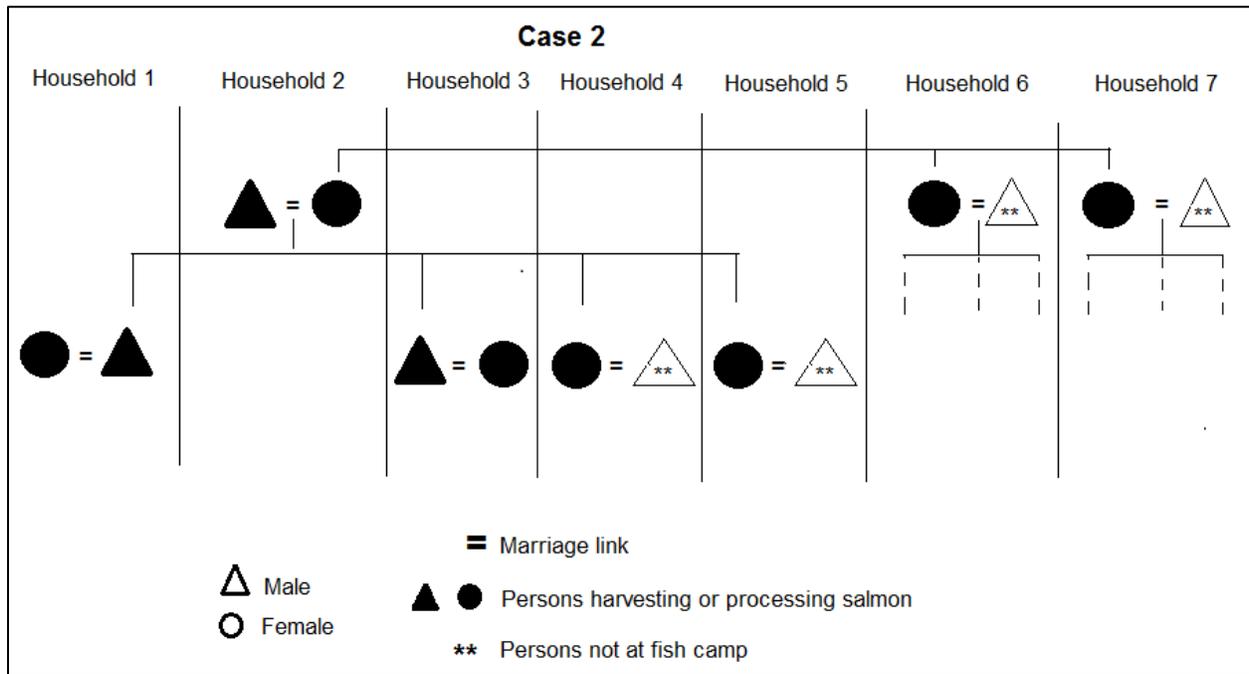
The husband's sister lives in a nearby village. The wife, her sister-in-law, and one daughter do most of the processing. The husband and his three grandsons do most of the harvesting.

The work group puts up 30 to 40 salmon in total. They have built a small cabin at the site. They return to their homes in Bethel most nights. They harvest salmon in a setnet in front of the processing station. The net is picked from a small skiff by the husband with help from his three grandsons, or the husband pulls the net and they pick the salmon from shore. They harvest whatever hits their net, a combination of Chinook, Chum, and Sockeye Salmon. They also put a setnet in the adjacent slough to harvest whitefish, checking it often to retrieve broad and humpback whitefish and the occasional jack Chinook Salmon or Dolly Varden.

Whitefish are processed along with salmon. Some salmon and whitefish are fermented in a hole in the ground several feet deep by layering the fish with guts and grass. Plants are picked at the fish camp such as wild celery. Occasionally, other family members are present. The river bank at the fish camp is constantly eroding and they have moved their cabin, racks, and smokehouse further from the bank. One of the daughters and her husband are employed fulltime and cannot go to fish camp; however, their three sons go and help their grandparents. They put salmon that has been preserved blanket style into cardboard boxes and strips into plastic baggies when bringing them to their home in Bethel. They do not have facilities for canning at their fish camp.

Case 2

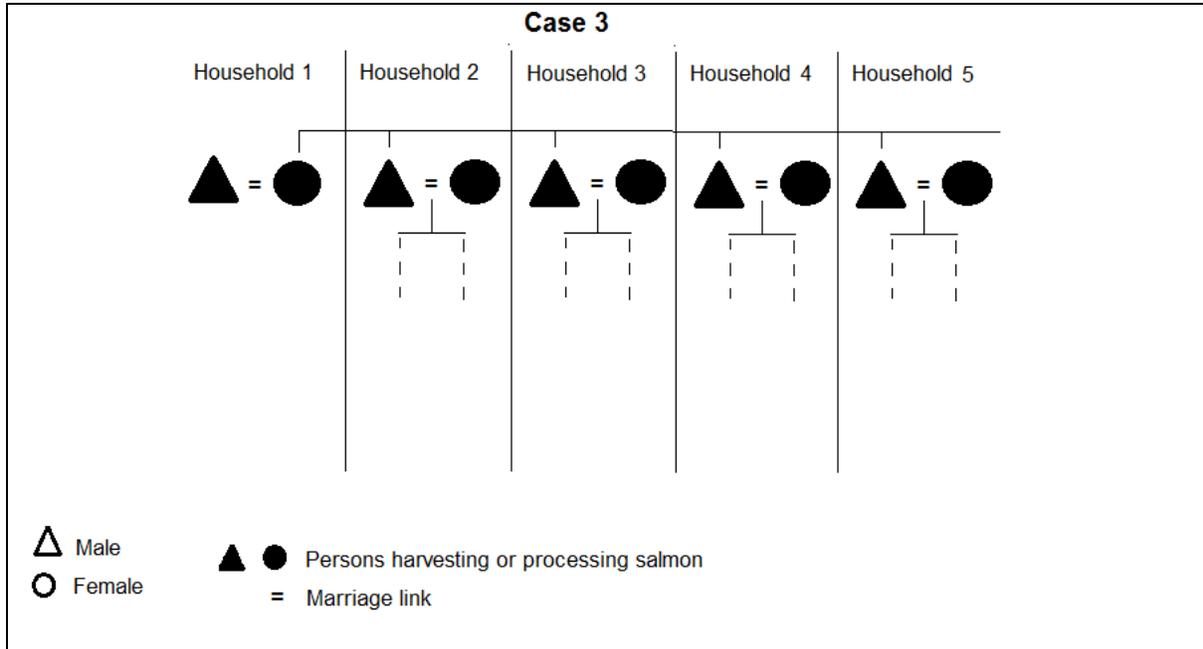
The second case is the extended family of a married, middle-aged couple. Both are members of Orutsararmiut, the Bethel tribe. Their fish camp is situated at a site that they own alongside the Kuskokwim River adjacent to Bethel. They have built a house at the site and family members stay at the house for most of the summer. A generator furnishes the home with electricity and there are cooking facilities in the home. The family has the typical racks and smokehouse. The workgroup is comprised of seven separate households. The wife's two sisters and their children use the fish camp. The couple's two sons and their sons' wives and the couple's two daughters use the fish camp. Their two sons harvest the salmon. They harvest about 400 salmon; about 200 Chinook Salmon and a combination of Chum and Sockeye Salmon. The Chinook and Sockeye Salmon are dried and smoked. Chum Salmon are dried and smoked and sometimes canned; Chum Salmon are canned because dried they cannot be preserved for long periods of time to consume later in the year. Coho Salmon might be harvested later in the season for freezing. Work group members take turns tending to a garden patch of potatoes and other vegetables.



Case 3

The third case concerns a middle-aged married couple living in Bethel who operate their fish camp within the Bethel city limits. One of them has a fulltime year round job. One is a member of Orutsararmiut, the Bethel tribe, and the other is originally from outside Alaska. They have grown children. They are situated in a location that is protected from the pervasive dust created by cars traveling on the dirt roads in Bethel. They have racks and a smokehouse. Her brothers and their wives are part of the work group; although, some have begun putting up fish at their own homes. Children of all ages arrive with their parents and help with the harvesting, cutting, hanging, and smoking. Both men and women perform all duties. The stove is fueled for two to three weeks by locally-collected cottonwood. In the past, the family put up more

Chinook Salmon but in recent years almost all of the salmon that they dry and smoke is Chum and Sockeye Salmon. Sheefish caught in their net are frozen, as is Chum Salmon that is beginning to turn that is used to feed their dogsled team. They preserve about 60 salmon and divide them between the households. The strips are generally frozen to consume later.



Criterion 2. Local residency

For salmon, all residents of Bethel exhibit similar attributes concerning local residency. The community is located alongside the Kuskokwim River with all residents living within one and a half miles of the river edge. Multiple public access areas exist where people can fish from the riverbank or park their boats. The majority of people do not live along the river bank because modern home sites were purposively established away from the river bank to protect them from flood waters and from being undercut by bank erosion.

Criterion 3. The availability of alternative resources

All residents of Bethel are similarly situated concerning the availability of alternative wild resources to Chinook Salmon. Bethel residents are similarly situated regarding harvest limits, seasons, and allowable gear types for most wild resources available to them. One difference is in the Marine Mammal Protection Act that allows only Alaska Natives to harvest seals and some other marine mammals. Bethel residents participated in a harvest survey of all wild resource use for the year 2012, and marine mammal harvests represented only 2% of the total harvest by weight (ADF&G 2014c). This is because Bethel is situated approximately 65 river miles from Kuskokwim Bay, the closest marine mammal habitat. The availability of marine mammals to Alaska Native residents of Bethel as an alternative to Chinook Salmon is low.

Summary

It appears that the vast majority of usable fish camp sites that are situated alongside the Kuskokwim River adjacent to Bethel are already taken by longtime residents of Bethel. Some have fish camps at their home sites in Bethel that are situated at favorable locations away from the pervasive dust. Others who enter the community generally participate in salmon fishing when invited by friends or co-workers at established fish camps, or by harvesting smaller amounts of salmon from shore or skiff with net or rod and reel. If dependence on Chinook Salmon is measured by harvest levels, it is clear that the large harvesters are people who own or lease fish camp sites alongside the Kuskokwim River adjacent to Bethel or within the Bethel city limits. A fish camp is often used by extended families comprising as many as seven separate households whose members are mostly processing and preserving salmon and not harvesting them. Several harvesters may supply salmon directly to multiple households. It is for this reason that both the In-season Salmon Harvest Monitoring Program and the Post-season Salmon Harvest Assessment Program, described above, recognize that work groups are the basis of the salmon subsistence economy in Bethel, and both programs structure their surveys to identify work groups in order to collect accurate information about salmon use patterns and harvest levels.

JUSTIFICATION

Work groups at Bethel area fish camps have the greater customary and direct dependence on Chinook Salmon from the Kuskokwim River drainage than do most other residents of Bethel after consideration of the three criteria in Section 804. It was not possible to identify *individuals* who have the greater customary and traditional dependence on Chinook Salmon based on the available information. Instead, harvesting is often one task in a multi-task, multi-household production effort. The entire work group is considered to consist of “fishing” households that contribute the most to the Chinook Salmon harvest estimates for Bethel (Shelden et al. 2014). Therefore, recognizing work groups at fish camps optimizes the pattern of use exemplified by the domestic mode of production that characterizes much of the salmon subsistence economy in Bethel. Further, the domestic mode of production observed in Bethel area fish camps should be the basis for any allocation system. It is recommended that salmon harvesters should primarily be identified not as individuals or through their household affiliations but by identification of their work groups. However, while identification of individuals who have the greater dependence on Chinook Salmon was not possible, it can be assumed that some Bethel residents without access to work groups or fish camps are highly dependent on Chinook Salmon and consider Chinook Salmon to be irreplaceable. Therefore, the Federal Subsistence Management Program should provide another form of opportunity for residents of Bethel to harvest Chinook Salmon, such as a drawing permit.

INTERAGENCY STAFF COMMITTEE RECOMMENDATION

FSA15-02/03/05 and FSA14-07/08

Oppose Fisheries Special Action Requests FSA15-02/03/05 and FSA14-07/08

The special action requests submitted to the Federal Subsistence Board (Board) regarding Kuskokwim River salmon fisheries have the same requests to 1) close Federal public waters of the Kuskokwim River drainage to the harvest salmon, except by Federally qualified subsistence users; and 2) implement an allocation strategy, consistent with Section 804 of ANILCA, that provides for equitable opportunity for customary and traditional uses of salmon for Federally qualified subsistence users within the Kuskokwim River drainage. While the special actions request that the Board assume management of Kuskokwim River salmon stocks, it should be clarified that these requested actions are limited to the take of salmon on Federal public waters of the Kuskokwim River drainage. The Board's action on these special action requests will not affect non-Federal public waters of the drainage.

The closure aspects of these special actions are unnecessary, as the Yukon Delta National Refuge Manager can exercise the Board's delegated authority, in close coordination with the Alaska Department of Fish and Game, to enact appropriate conservation measures to conserve Chinook salmon as necessary to meet biological escapement goals and provide equitable opportunity for subsistence harvests when possible. Both the Federal Subsistence Board and the Alaska Board of Fisheries have granted local managers additional regulatory options for 2015 to better accomplish this mandate.

Chum, Sockeye and Coho salmon returns to the Kuskokwim have been reasonably healthy and appear capable of supporting ongoing subsistence uses. The anticipated weak Chinook salmon return in 2015 justifies federal managers using delegated authority to preemptively close Federal waters of the Kuskokwim River to the harvest of Chinook salmon, and if allowable harvests are available, these can be opened to qualified rural residents. The ISC is fully supportive of the local manager exercising this delegated authority for Chinook salmon and endorses the

state and federal managers' efforts to provide involvement of local users through the Kuskokwim River Salmon Management Working Group. Based on their recommendations, the joint Federal and State in-season management may also close fishing periods for other species to protect pulses of Chinook salmon. However, the requested closure to salmon, other than Chinook salmon, for the entire fishing season does not meet the requirements of ANILCA Sections 804, 815(3), and 816. The ISC recommends the Special Action Requests be rejected for these reasons.

Akiak Native Community

Akiak IRA Council

P.O. Box 52127

Akiak, Alaska 99552

Phone: (907) 765-7112 Fax: (907) 765-7512

February 20, 2015

Tim Towarak, Chairman – Federal Subsistence Board
c/o Gene Peltola, U.S. Fish & Wildlife Service
Office of Subsistence Management
1011 East Tudor Road
Anchorage, AK 99503

Re: Akiak Native Community Special Action Request to the Federal Subsistence Board to Assume Management of Kuskokwim Salmon Stocks, Limit 2015 Kuskokwim Chinook Salmon Fisheries to Federally Qualified Subsistence Users, and Implement an Allocation Strategy Consistent with Section 804 of ANILCA Among the Native Villages, Communities and Federally Qualified Subsistence Users in the Kuskokwim Drainage

Mr. Towarak:

The Akiak Native Community, a federally recognized Tribe, submits this Special Action Request asking the Federal Subsistence Board to limit the 2015 Kuskokwim River drainage Chinook subsistence salmon fisheries to federally qualified subsistence users. The Tribe also requests that the Board implement a strategy for Chinook salmon subsistence management and allocation among the Native Villages, communities and federally qualified subsistence users throughout the Kuskokwim River drainage that ensures the ability, consistent with necessary conservation, to engage in social, customary, and traditional uses of Chinook. Without federal management of Kuskokwim River Chinook fisheries, our local tribal members and tribal communities will not be ensured the priority and opportunity for important customary and traditional uses of the Kuskokwim Chinook salmon that is required by Title VIII

of ANILCA. Without federal management, our social and cultural reliance on this resource will also be implicated. Finally, the Tribe requests the Board take over management of the Kuskokwim salmon fisheries other than Chinook in order to ensure that the management of these fisheries is consistent with the management of the Kuskokwim drainage Chinook stocks for conservation and opportunity for subsistence uses.

The Kuskokwim River has the largest Chinook salmon subsistence fishery in the state. But, since 2007, the Kuskokwim River Chinook salmon stocks have been in a multi-year period of low productivity insufficient to meet necessary escapement levels and provide subsistence users with sufficient harvest opportunities. Escapement objectives for Chinook salmon were not met on the Kuskokwim River in 2013 or 2014. Total run estimates for Kuskokwim River Chinook salmon in 2010, 2012, and 2013 are the three lowest on record. Estimated 2014 subsistence harvest numbers and escapement estimates for 2015 are expected to fall well below established goals.

In April 2014, the Board accepted the 804 analysis completed by the Office of Subsistence Management regarding customary and traditional subsistence use determinations under ANILCA Section 804 for the following villages: Chefornak, Kipnuk, Kwigillingok, Kongiganek, Tuntutuliak, Eek, Napakiak, Napaskiak, Kasigluk, Nunapitchuk, Atmauthluk, Oscarville, Bethel, Kwethluk, Akiakchak, Akiak, Tuluksak, Lower Kalsag, Upper Kalsag, Aniak, Chuathbaluk, Napaimute, Crooked Creek, Georgetown, Red Devil, Sleetmute, Stoney River, Lime Village, Takotna, Nikolai, Telida, and McGrath.¹ It then limited the 2014 Kuskokwim Chinook salmon fisheries to these federally qualified subsistence users, and delegated all management and allocation authority to the federal in-season manager.

As in 2014, federal management of Chinook salmon, restricting this fishery to federally qualified subsistence users during the 2015 Kuskokwim River fishing season, is necessary to provide for the priority and opportunity for customary and traditional subsistence uses of Chinook salmon, to ensure ability to engage in social and cultural uses of Chinook salmon, and to ensure the healthy conservation of Chinook salmon stocks in light of anticipated low Chinook salmon run forecasts in 2015. Chinook salmon play a crucial role in our Tribe's social and cultural practices. Without federal management, the Tribe's ability to harvest Chinook for customary and traditional subsistence uses, and our social and cultural reliance on and use of this resource, will be compromised by other regulatory requirements that do not prioritize subsistence uses or our cultural and social needs.

The Tribe requests that the Board implement an allocation strategy, consistent with section 804 of ANILCA, which provides for equitable opportunity for customary and traditional subsistence uses of Chinook for the Native Villages, communities and federally qualified subsistence users within Kuskokwim River drainage. Chinook harvest management for the

¹ As the Board identified [Native Village] as a Federally qualified subsistence user in 2014, another ANILCA 804 analysis is unnecessary at this time.

Kuskokwim is usually approached by limiting the area, time and gear for fishery openings. These blunt strategies have proven insufficient as methods for precise management of Chinook and fail to equitably allocate the Chinook resource between communities and subsistence users when harvestable surpluses are low. This management strategy also falls short of what is required for the conservation and rebuilding of the Kuskokwim Chinook stocks. It is also essential that there is a management strategy for Kuskokwim chum, red and silver salmon stocks that is consistent with ensuring conservation, rebuilding and the opportunity for subsistence uses of Kuskokwim Chinook salmon. The Tribe requests federal management of all Kuskokwim salmon stocks as necessary to ensure conservation, important cultural practices, and subsistence uses of the Chinook stocks.

Respectfully,



Ivan M. Ivan, Chief
Akiak IRA Council

Tim Towarak, Chairman – Federal Subsistence Board
c/o Gene Peltola, U.S. Fish & Wildlife Service
Office of Subsistence Management
1011 East Tudor Road
Anchorage, AK 99503

Re: [Native Village] Special Action Request to the Federal Subsistence Board to Assume Management of Kuskokwim Salmon Stocks, Limit 2015 Kuskokwim Chinook Salmon Fisheries to Federally Qualified Subsistence Users, and Implement an Allocation Strategy Consistent with Section 804 of ANILCA Among the Native Villages, Communities and Federally Qualified Subsistence Users in the Kuskokwim Drainage

Mr. Towarak:

The Native Village of Napakia federally recognized Tribe, submits this Special Action Request asking the Federal Subsistence Board to limit the 2015 Kuskokwim River drainage Chinook subsistence salmon fisheries to federally qualified subsistence users. The Tribe also requests that the Board implement a strategy for Chinook salmon subsistence management and allocation among the Native Villages, communities and federally qualified subsistence users throughout the Kuskokwim River drainage that ensures the ability, consistent with necessary conservation, to engage in social, customary, and traditional uses of Chinook. Without federal management of Kuskokwim River Chinook fisheries, our local tribal members and tribal communities will not be ensured the priority and opportunity for important customary and traditional uses of the Kuskokwim Chinook salmon that is required by Title VIII of ANILCA. Without federal management, our social and cultural reliance on this resource will also be implicated. Finally, the Tribe requests the Board take over management of the Kuskokwim salmon fisheries other than Chinook in order to ensure that the management of these fisheries is consistent with the management of the Kuskokwim drainage Chinook stocks for conservation and opportunity for subsistence uses.

The Kuskokwim River has the largest Chinook salmon subsistence fishery in the state. But, since 2007, the Kuskokwim River Chinook salmon stocks have been in a multi-year period of low productivity insufficient to meet necessary escapement levels and provide subsistence users with sufficient harvest opportunities. Escapement objectives for Chinook salmon were not met on the Kuskokwim River in 2013 or 2014. Total run estimates for Kuskokwim River Chinook salmon in 2010, 2012, and 2013 are the three lowest on record. Estimated 2014 subsistence harvest numbers and escapement estimates for 2015 are expected to fall well below established goals.

In April 2014, the Board accepted the 804 analysis completed by the Office of Subsistence Management regarding customary and traditional subsistence use determinations under ANILCA Section 804 for the following villages: Cheforak, Kipnuk, Kwigillingok, Kongiganek, Tuntutuliak, Eek, Napakiak, Napaskiak, Kasigluk, Nunapitchuk, Atmauthluak, Oscarville, Bethel, Kwethluk, Akiakohak, Akiak, Tuluksak, Lower Kalsag, Kalsak, Aniak, Chuathbaluk, Napaimute, Crooked Creek, Georgetown,

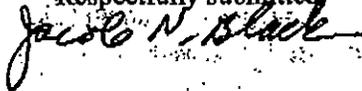
Red Devil, Sleetmute, Stoney River, Lime Village, Takotna, Nikolai, Telida, and McGrath.¹ It then limited the 2014 Kuskokwim Chinook salmon fisheries to these federally qualified subsistence users, and delegated all management and allocation authority to the federal in-season manager.

As in 2014, federal management of Chinook salmon, restricting this fishery to federally qualified subsistence users during the 2015 Kuskokwim River fishing season, is necessary to provide for the priority and opportunity for customary and traditional subsistence uses of Chinook salmon, to ensure ability to engage in social and cultural uses of Chinook salmon, and to ensure the healthy conservation of Chinook salmon stocks in light of anticipated low Chinook salmon run forecasts in 2015. Chinook salmon play a crucial role in our Tribe's social and cultural practices. Without federal management, the Tribe's ability to harvest Chinook for customary and traditional subsistence uses, and our social and cultural reliance on and use of this resource, will be compromised by other regulatory requirements that do not prioritize subsistence uses or our cultural and social needs.

The Tribe requests that the Board implement an allocation strategy, consistent with section 804 of ANILCA, which provides for equitable opportunity for customary and traditional subsistence uses of Chinook for the Native Villages, communities and federally qualified subsistence users within Kuskokwim River drainage. Chinook harvest management for the Kuskokwim is usually approached by limiting the area, time and gear for fishery openings. These blunt strategies have proven insufficient as methods for precise management of Chinook and fail to equitably allocate the Chinook resource between communities and subsistence users when harvestable surpluses are low. This management strategy also falls short of what is required for the conservation and rebuilding of the Kuskokwim Chinook stocks. It is also essential that there is a management strategy for Kuskokwim chum, red and silver salmon stocks that is consistent with ensuring conservation, rebuilding and the opportunity for subsistence uses of Kuskokwim Chinook salmon. The Tribe requests federal management of all Kuskokwim salmon stocks as necessary to ensure conservation, important cultural practices, and subsistence uses of the Chinook stocks.

It is essential that the Board work closely with our Tribe and the other tribal governments on the Kuskokwim River drainage in managing salmon and subsistence uses for the River. The tribe fully supports the demonstration project announced by the Secretary for establishment of a co-management structure for the Kuskokwim that incorporates the Kuskokwim River Inter-Tribal Fish Commission into the federal management system. This co-management structure should be fully implemented for the 2016 season. For the 2015 season, the Board should implement an interim co-management system through temporary rules and the tribal consultation requirement that meaningfully incorporates tribal governments and the inter-tribal commission into all pre-season and in-season management actions and in the development and implementation of a Chinook allocation plan for the members and residents of tribal communities.

Respectfully submitted,



[Native Village]

¹ As the Board identified [Native Village] as a Federally qualified subsistence user in 2014, another ANILCA 804 analysis is unnecessary at this time.

Native Village of [Napakiak]

A Resolution Supporting a Special Action Request to the Federal Subsistence Board to Implement the Subsistence Priority in Title VIII of ANILCA and Assume Management of Kuskokwim River Salmon Stocks

WHEREAS, the Native Village of [Napakiak] is a federally recognized Tribe located in the Kuskokwim River Drainage whose Tribal members have engaged in customary and traditional use of Chinook salmon since time before memory to sustain our nutritional, economic and cultural way of life; and

WHEREAS, Over the past several years, Kuskokwim River Chinook salmon runs have been in steep decline and returned in numbers insufficient to meet escapement goals and provide for Tribal and rural customary and traditional subsistence uses and needs; and

WHEREAS, in 2014, the Federal Subsistence Board adopted the analysis completed by the Office of Subsistence Management under section 804 of ANILCA, finding that our Tribe engaged in customary and traditional subsistence uses of Chinook salmon, limited Kuskokwim Chinook salmon fisheries to federally qualified rural subsistence users, and delegated management of and allocation authority over Kuskokwim River Chinook salmon stocks to the federal in-season manager; and

WHEREAS, the 2015 Chinook salmon run is projected to be another year of declining returns which will be insufficient to meet Kuskokwim subsistence uses and escapement goals; and

WHEREAS, federal management that restricts Kuskokwim River Chinook salmon fisheries during the 2015 season to federally qualified subsistence users, implements an allocation strategy that provides an equitable opportunity for customary and traditional subsistence uses of Chinook, and institutes federal in-season management of all salmon stocks for the Kuskokwim is necessary to provide for our Tribal fishing way of life and to ensure the conservation and rebuilding of Kuskokwim Chinook salmon stocks; and

WHEREAS, In implementing federal salmon management regulations, policies and programs for the Kuskokwim, it is essential that federal salmon management agencies institute a tribal co-management structure as soon as possible.

NOW THEREFORE BE IT RESOLVED, that the Native Village of [Napakiak] submits the attached Special Action Request to the Office of Subsistence Management seeking federal management of Kuskokwim salmon fisheries in 2015, limiting Chinook salmon fisheries to qualified federal subsistence users, and implementing a strategy to equitably allocate Chinook salmon among Kuskokwim Native Villages, Communities, and federally qualified subsistence users..

Signature

Jacobs N. Black

Tim Towarak, Chairman – Federal Subsistence Board
c/o Gene Peltola, U.S. Fish & Wildlife Service
Office of Subsistence Management
1011 East Tudor Road
Anchorage, AK 99503



Re: Akiachak Special Action Request to the Federal Subsistence Board to Assume Management of Kuskokwim Salmon Stocks, Limit 2015 Kuskokwim Chinook Salmon Fisheries to Federally Qualified Subsistence Users, and Implement an Allocation Strategy Consistent with Section 804 of ANILCA Among the Native Villages, Communities and Federally Qualified Subsistence Users in the Kuskokwim Drainage

Mr. Towarak:

The Native Village of Akiachak, a federally recognized Tribe, submits this Special Action Request asking the Federal Subsistence Board to limit the 2015 Kuskokwim River drainage Chinook subsistence salmon fisheries to federally qualified subsistence users. The Tribe also requests that the Board implement a strategy for Chinook salmon subsistence management and allocation among the Native Villages, communities and federally qualified subsistence users throughout the Kuskokwim River drainage that ensures the ability, consistent with necessary conservation, to engage in social, customary, and traditional uses of Chinook. Without federal management of Kuskokwim River Chinook fisheries, our local tribal members and tribal communities will not be ensured the priority and opportunity for important customary and traditional uses of the Kuskokwim Chinook salmon that is required by Title VIII of ANILCA. Without federal management, our social and cultural reliance on this resource will also be implicated. Finally, the Tribe requests the Board take over management of the Kuskokwim salmon fisheries other than Chinook in order to ensure that the management of these fisheries is consistent with the management of the Kuskokwim drainage Chinook stocks for conservation and opportunity for subsistence uses.

The Kuskokwim River has the largest Chinook salmon subsistence fishery in the state. But, since 2007, the Kuskokwim River Chinook salmon stocks have been in a multi-year period of low productivity insufficient to meet necessary escapement levels and provide subsistence users with sufficient harvest opportunities. Escapement objectives for Chinook salmon were not met on the Kuskokwim River in 2013 or 2014. Total run estimates for Kuskokwim River Chinook salmon in 2010, 2012, and 2013 are the three lowest on record. Estimated 2014 subsistence harvest numbers and escapement estimates for 2015 are expected to fall well below established goals.

In April 2014, the Board accepted the 804 analysis completed by the Office of Subsistence Management regarding customary and traditional subsistence use determinations under ANILCA Section 804 for the following villages: Chefornak, Kipnuk, Kwigillingok, Kongiganek, Tuntutuliak, Eek, Napakiak, Napaskiak, Kasigluk, Nunapitchuk, Atmauthluak, Oscarville, Bethel, Kwethluk, Akiachak, Akiak, Tuluksak, Lower Kalsag, Kalsak, Aniak, Chuathbaluk, Napaimute, Crooked Creek, Georgetown,

Red Devil, Sleetmute, Stoney River, Lime Village, Takotna, Nikolai, Telida, and McGrath.¹ It then limited the 2014 Kuskokwim Chinook salmon fisheries to these federally qualified subsistence users, and delegated all management and allocation authority to the federal in-season manager.

As in 2014, federal management of Chinook salmon, restricting this fishery to federally qualified subsistence users during the 2015 Kuskokwim River fishing season, is necessary to provide for the priority and opportunity for customary and traditional subsistence uses of Chinook salmon, to ensure ability to engage in social and cultural uses of Chinook salmon, and to ensure the healthy conservation of Chinook salmon stocks in light of anticipated low Chinook salmon run forecasts in 2015. Chinook salmon play a crucial role in our Tribe's social and cultural practices. Without federal management, the Tribe's ability to harvest Chinook for customary and traditional subsistence uses, and our social and cultural reliance on and use of this resource, will be compromised by other regulatory requirements that do not prioritize subsistence uses or our cultural and social needs.

The Tribe requests that the Board implement an allocation strategy, consistent with section 804 of ANILCA, which provides for equitable opportunity for customary and traditional subsistence uses of Chinook for the Native Villages, communities and federally qualified subsistence users within Kuskokwim River drainage. Chinook harvest management for the Kuskokwim is usually approached by limiting the area, time and gear for fishery openings. These blunt strategies have proven insufficient as methods for precise management of Chinook and fail to equitably allocate the Chinook resource between communities and subsistence users when harvestable surpluses are low. This management strategy also falls short of what is required for the conservation and rebuilding of the Kuskokwim Chinook stocks. It is also essential that there is a management strategy for Kuskokwim chum, red and silver salmon stocks that is consistent with ensuring conservation, rebuilding and the opportunity for subsistence uses of Kuskokwim Chinook salmon. The Tribe requests federal management of all Kuskokwim salmon stocks as necessary to ensure conservation, important cultural practices, and subsistence uses of the Chinook stocks.

It is essential that the Board work closely with our Tribe and the other tribal governments on the Kuskokwim River drainage in managing salmon and subsistence uses for the River. The tribe fully supports the demonstration project announced by the Secretary for establishment of a co-management structure for the Kuskokwim that incorporates the Kuskokwim River Inter-Tribal Fish Commission into the federal management system. This co-management structure should be fully implemented for the 2016 season. For the 2015 season, the Board should implement an interim co-management system through temporary rules and the tribal consultation requirement that meaningfully incorporates tribal governments and the inter-tribal commission into all pre-season and in-season management actions and in the development and implementation of a Chinook allocation plan for the members and residents of tribal communities.

Respectfully submitted,

Akwachak Native Community
IRA Council

¹ As the Board identified [Native Village] as a Federally qualified subsistence user in 2014, another ANILCA 804 analysis is unnecessary at this time.

Tim Towarak, Chairman – Federal Subsistence Board
C/O Gene Peltola, U.S. Fish & Wildlife Service
Office of Subsistence Management
1011 East Tudor Road
Anchorage, AK 99503



RE: The Native Village of Chuathbaluk Special Action Request to the Federal Subsistence Board to Assume Management of Kuskokwim Salmon Stocks, Limit 2015 Kuskokwim Chinook Salmon Fisheries to Federally Qualified Subsistence Users, and Implement an Allocation Strategy Consistent with Section 804 of ANILCA Among the Native Villages, Communities and Federally Qualified Subsistence users in the Kuskokwim Drainage.

Mr. Towarak:

The Native Village of Chuathbaluk, a federally recognized Tribe, submits this Special Action Request asking the Federal Subsistence Board to limit the 2015 Kuskokwim River drainage Chinook subsistence salmon fisheries to federally qualified subsistence users. The Tribe also requests that the Board implement a strategy for Chinook salmon subsistence management and allocation among the Native Villages, communities and federally qualified subsistence users throughout the Kuskokwim River drainage that ensures the ability, consistent with necessary conservation, to engage in social, customary, and traditional uses of Chinook. Without federal management of Kuskokwim River Chinook fisheries, our local tribal members and tribal communities will not be ensured the priority and opportunity for important customary and traditional uses of the Kuskokwim Chinook salmon the is required by Title VIII of ANILCA. Without federal management, our social and cultural reliance on this resource will also be implicated. Finally, the Tribe requests the Board take over management of these fisheries is consistent with the management of the Kuskokwim drainage Chinook stocks for conservation and opportunity for subsistence uses.

The Kuskokwim River has the largest Chinook salmon subsistence fishery in the state. But, since 2007, the Kuskokwim River Chinook salmon stocks have been in a multi-year period of low productivity insufficient to meet necessary escapement levels and provide subsistence users with sufficient harvest opportunities. Escapement objectives for Chinook salmon were not met on the Kuskokwim River in 2013 or 2014. Total run estimates for Kuskokwim River Chinook salmon in 2010, 2012, and 2013 are the three lowest on record. Estimated 2014 subsistence harvest numbers and escapement estimates for 2015 are expected to fall well below established goals.

In April 2014, the Board accepted the 804 analysis completed by the Office of Subsistence Management regarding customary and traditional subsistence use determinations under ANILCA Section 804 for the following villages: Chefornak, Kipnuk, Kwigillingok, Kogiganek, Tuntutuliak, Eek, Napakiak, Napaskiak, Kasigluk, Nunapitchuk, Atmauthluak, Oscarville, Bethel, Kwethluk, Akiakchak, Akiak, Tuluksak, Lower Kalskag, Kalskag, Aniak, Chuathbaluk, Napaimute, Crooked Creek, Georgetown, Red Devil, Sleetmute, Stony River, Lime Village, Takotna Nikolai, Telida, and McGrath. It then limited the

2014 Kuskokwim Chinook salmon fisheries to these federally qualified subsistence users, and delegated all management and allocation authority to the federal in-season manager.

As in 2014, federal management of Chinook salmon, restricting this fishery to federally qualified subsistence users during the 2015 Kuskokwim River fishing season, is necessary to provide for the priority and opportunity for customary and traditional subsistence uses of Chinook salmon, to ensure ability to engage in social and cultural uses of Chinook salmon, and to ensure the healthy conservation of Chinook salmon stocks in light of anticipated low Chinook salmon run forecasts in 2015. Chinook salmon play a crucial role in our Tribe's social and cultural practices. Without federal management, the Tribe's ability to harvest Chinook for customary and traditional subsistence uses, and our social and cultural reliance on and use of this resource, will be compromised by other regulatory requirements that do not prioritize subsistence uses or our cultural and social needs.

The Tribe requests that the Board implement an allocation strategy, consistent with section 804 of ANILCA, which provides for equitable opportunity for customary and traditional subsistence uses of Chinook for the Native Villages, communities and federally qualified subsistence users within Kuskokwim River drainage. Chinook harvest management for the Kuskokwim is usually approached by limiting the area, time and gear for fishery openings. These blunt strategies have proven insufficient as methods for precise management of Chinook and fail to equitably allocate the Chinook resource between communities and subsistence users when harvestable surpluses are low. This management strategy also falls short of what is required for the conservation and rebuilding of the Kuskokwim Chinook stocks. It is also essential that there is a management strategy for Kuskokwim chum, red and silver salmon stocks that is consistent with ensuring conservation, rebuilding and the opportunity for subsistence uses of Kuskokwim Chinook salmon. The Tribe requests federal management of all Kuskokwim salmon stocks as necessary to ensure conservation, important cultural practices, and subsistence uses of the Chinook stocks.

It is essential that the Board work closely with our Tribe and the other tribal governments on the Kuskokwim River drainage in managing salmon and subsistence uses for the River. The tribe fully supports the demonstration project announced by the Secretary for establishing of a co-management structure for the Kuskokwim that incorporates the Kuskokwim River Inter-Tribal Fish Commission into the federal management system. This co-management structure should be fully implemented for the 2016 season. For the 2015 season, the Board should implement an interim co-management system through temporary rules and the tribal consultation requirement that meaningfully incorporates tribal governments and the inter-tribal commission into all pre-season and in-season management actions and in the development and implementation of a Chinook allocation plan for the members and residents of tribal communities.

Respectfully submitted,

Native Village of Chuathbaluk

Jaey Simeon
Tribal Administrator



Village of Lower Kalskag
PO Box 27
Lower Kalskag, AK 99626
Phone #: (907) 471-2300 Fax #: (907) 471-2378
Email: village_of_lower_ta@yahoo.com

To: Tim Towarak, Chairman – Federal Subsistence Board
c/o Gene Peltola, U.S. Fish & Wildlife Service
Office of Subsistence Management
1011 East Tutor Road
Anchorage, AK 99503

Date: March 13, 2015

Re: Village of Lower Kalskag Special Action Request to the Federal Subsistence Board to Assume Management of the Kuskokwim Salmon Stocks, Limit 2015 Kuskokwim Chinook Salmon Fisheries to Federal Qualified Users, Implement an Allocation Strategy Consistent with Section 804 of ANILCA Among the Native Villages, Communities and Federally Qualified Subsistence Users in the Kuskokwim Drainage, and Request the Federal Subsistence Board to Direct the Federal Agency to Determine the Status of the Other Important Fish Species.

Mr. Towarak,

The Village of Lower Kalskag, a federally recognized Tribe, submits this Special Action Request asking the Federal Subsistence Board to limit the 2015 Kuskokwim River drainage Chinook subsistence salmon fisheries to federally qualified subsistence users. The Tribe also requests that the Board implement a strategy for Chinook salmon subsistence management and allocation among the Native Villages, communities and federally qualified subsistence throughout the Kuskokwim River drainage that ensures the ability, consistent with necessary conservations, to engage in social, customary, and traditional uses of Chinook. Without federal management of Kuskokwim River Chinook fisheries, our local tribal members and tribal communities will not be ensured the priority and opportunity for important customary and traditional uses of the Kuskokwim Chinook salmon that is required by Title VIII of ANILCA. Without federal management, our social and cultural reliance on this resource will also be implicated. Finally, the Tribe requests the Board to take over management of the Kuskokwim salmon fisheries other than Chinook in order to ensure that the management of these fisheries is consistent with the management of the Kuskokwim drainage Chinook stocks for conservation and opportunity for subsistence uses.

The Kuskokwim River has the largest Chinook salmon subsistence fishery in the state. But, since 2007, the Kuskokwim River Chinook salmon stocks have been in a multi-year period of low productivity insufficient to meet necessary escapement levels and provide subsistence users with sufficient harvest opportunities. Escapement objectives for Chinook salmon were not met on the Kuskokwim River in 2013. Total run estimates

for the Kuskokwim River Chinook salmon in 2010, 2012, and 2013 are the three lowest on record. Estimated 2014 subsistence harvest numbers and escapement estimates for 2015 are expected to fall well below established goals.

In April 2014, the Board accepted the 804 analysis completed by the Office of Subsistence Management regarding customary and traditional subsistence use determinations under ANILCA Section 804 for the following villages: Chefornak, Kipnuk, Kwigillingok, Kongiganak, Tuntutuliak, Eek, Napakiak, Napaskiak, Kasigluk, Nunapitchuk, Atmautluak, Oscarville, Bethel, Kwethluk, Akiachak, Akiak, Tuluksak, Lower Kalskag, Upper Kalskag, Aniak, Chuathbaluk, Napaimute, Crooked Creek, Georgetown, Red Devil, Sleetmute, Stony River, Lime Village, Takotna, Nikolai, Telida, and McGrath. It then limited the 2014 Kuskokwim Chinook salmon fisheries to these federally qualified subsistence users, and delegated all management and allocation authority to the federal in-season manager.

As in 2014, federal management of Chinook salmon, restricting this fishery to federally qualified subsistence users during the 2015 Kuskokwim River fishing season, is necessary to provide for the priority and opportunity for customary and traditional subsistence uses of Chinook salmon, to ensure ability to engage in social and cultural uses of Chinook salmon, and to ensure the healthy conservation of Chinook salmon stocks in light of anticipated low Chinook salmon run forecasts in 2015. Chinook salmon play a crucial role in our Tribe's social and cultural practices. Without federal management, the Tribe's ability to harvest Chinook for customary and traditional subsistence uses, and our social and cultural reliance on and use of this resource, will be compromised by other regulatory requirements that do not prioritize subsistence uses or our cultural and social needs.

The Tribe requests that the Board implement an allocation strategy, consistent with section 804 of ANILCA, which provides for equitable opportunity for customary and traditional subsistence uses of Chinook for the Native Villages, communities and federally qualified subsistence users within Kuskokwim River drainage. Chinook harvest management for the Kuskokwim is usually approached by limiting the area, time and gear for fishery openings. These blunt strategies have proven insufficient as methods for precise management of Chinook and fail to equitably allocate the Chinook resource between communities and subsistence users when harvestable surpluses are low. This management strategy also falls short of what is required for the conservation and rebuilding of the Kuskokwim Chinook stocks. It is also essential that there is a management strategy for Kuskokwim chum, red and silver salmon stocks that is consistent with ensuring conservation, rebuilding and the opportunity for subsistence uses of Kuskokwim Chinook salmon. The Tribe requests federal management of all Kuskokwim salmon stocks as necessary to ensure conservation, important cultural practices, and subsistence uses of the Chinook stocks.

Due to the restrictions on the Chinook, our people have been depending more heavily on other species of fish for subsistence which includes non-salmon species. The Tribe therefore asks the Board to direct the federal agency to determine the status of the other important fish species, i.e. all species of whitefish, burbot, sheefish,

pike, grayling, blackfish, trout, smelt, eels, etc. The Tribe believes it is very important that these species are also protected and remain a healthy sustainable resource.

It is essential that the Board work closely with our Tribe and the other tribal governments on the Kuskokwim River drainage in managing salmon and subsistence uses for the River. The Tribe fully supports the demonstration project announced by the Secretary for establishment of a co-management structure for the Kuskokwim that incorporates the Kuskokwim River Inter-Tribal Fish Commission into federal management system. This co-management structure should be fully implemented for the 2016 season. For the 2015 season, the Board should implement an interim co-management system through temporary rules and the tribal consultation requirement that meaningfully incorporates tribal governments and the inter-tribal commission into all pre-season and in-season management actions and in the development and implementation of a Chinook allocation plan for the members and residents of the tribal communities.

Respectfully submitted,

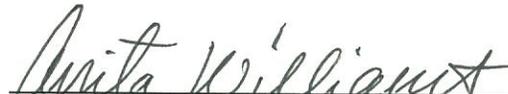
Phyllis Evan, President



Nastasia Levi, Vice President



Mike A. Savage Sr., Sec/Treas.



Anita Williams, Council Member



Darlene J. Heckman, Council Member

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