

## STAFF ANALYSIS

### FSA19-02

#### ISSUES

Temporary Fishery Special Action Request FSA19-02 was submitted by the Akiak Native Community, representing the Akiak IRA Council, on March 1, 2019, and requests that the Federal Subsistence Board take the following actions:

- Close Federal public waters of the Kuskokwim River drainage to the harvest of Chinook Salmon except by Federally qualified subsistence users possessing a community harvest permit between June 1, 2019 and July 1, 2019
- Reduce the pool of eligible harvesters within the Kuskokwim River drainage based on the Alaska National Interest Lands Conservation Act (ANILCA) Section 804 Subsistence User Prioritization that was implemented in 2017
- Conduct tribal consultation about developing an appropriate Chinook Salmon harvest allocation strategy with the Federally recognized tribes named in the 2014 Office of Subsistence Management (OSM) Section 804 analysis
- Allow fishing under a community allocation system with harvest reported to community harvest monitors.

#### DISCUSSION

The applicable Federal regulations are found in 50 CFR 100.19(b) and 36 CFR 242.19 (Temporary Special Actions) and state that:

*... After adequate notice and public hearing, the Board may temporarily close or open public lands for the taking of fish and wildlife for subsistence uses, or modify the requirements for subsistence take, or close public lands for the taking of fish and wildlife for nonsubsistence uses, or restrict take for nonsubsistence uses.*

The proponent states Kuskokwim Chinook Salmon subsistence harvests have declined precipitously over the recent decade, and a poor run size and harvest are projected for Chinook Salmon in 2019. Therefore, to ensure the continued opportunity for subsistence uses and to ensure the continued viability of Kuskokwim Chinook Salmon stocks, the Board should close Federal public waters to the harvest of Chinook Salmon by non-Federally qualified users and further reduce eligibility in the fishery by closing to all but a prioritized pool of Federally qualified subsistence users. The proponent states “Failure to *first* restrict Chinook salmon harvest to federally qualified subsistence users forgoes the Board’s additional responsibility to restrict within subsistence users” (emphasis included in original) in order to fulfill its duties and responsibilities as set forth in ANILCA Title VIII.

The proponent states that Chinook Salmon community allocations in 2015 strengthened relationships and trust between tribal communities, the Yukon Delta National Wildlife Refuge, and the Kuskokwim River Inter-tribal Fisheries Commission due to frequent communication and consultation.

The proponent clarified the timing of the closure in its request, from June 1, 2019 to July 1, 2019. The proponent also clarified details of the requested allocation system. In 2015, only designated fishermen could use gillnets to harvest a community's allocation of Chinook Salmon. This year, the harvestable surplus is much higher, and any harvest of Chinook Salmon should be reported to community harvest monitors instead.

The Federal in-season manager is hereafter referred to as the the Yukon Delta National Wildlife Manager or Refuge Manager.

### **Closing Federal Public Lands and Waters**

Sections 804, 815, and 816 of ANILCA describe three types of closures to the harvest of a fish stock or wildlife population on Federal public lands and waters. If the population of Kuskokwim Chinook Salmon was sufficient to support the harvest demands of all user groups without endangering the health of the resource, then all uses authorized by the State (such as sport and commercial fishing) would be allowed on Federal public lands and waters.

If necessary for the conservation of a healthy populations or to continue subsistence uses of Kuskokwim Chinook Salmon, Section 815(3) of ANILCA and 50 CFR 100.14(b) of Federal regulations authorize closures on the taking of Kuskokwim Chinook Salmon for nonsubsistence uses (such as sport and commercial fishing) on Federal public lands and waters. When implemented, all harvesting authorized by the State would be closed. Special Action Request FSA19-02 asks the Board to implement this type of closure.

If nonsubsistence uses were eliminated on Federal public lands and waters, but it remained necessary to restrict the taking of Kuskokwim Chinook Salmon on Federal public lands and waters by subsistence users in order to protect the continued viability or to continue subsistence uses of Kuskokwim Chinook Salmon, the Board would take the next step and establish a priority among subsistence users, authorized in Section 804 of ANILCA and 50 CFR 100.17. Special Action Request FSA19-02 asks the Board to implement this type of closure.

### **Existing Federal Regulation**

#### **§ \_\_.27(e)(4) Kuskokwim Area—Fish**

*(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

### § \_\_.27(e)(4) Kuskokwim Area—Fish

*(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.*

***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 Salmon, except by Federally qualified subsistence users that are residents of the Kuskokwim River drainage and the villages of Chefornak, Kipnuk, Kwigillingok and Kongiganek, effective on June 1, 2019 through July 1, 2019. Federal subsistence fishing schedules, openings, closures, and fishing methods will be determined by the Yukon Delta National Wildlife Refuge Manager. Additionally, a community-based allocation system will be implemented amongst the limited pool of Federally qualified subsistence users.***

## Relevant Federal Regulations

For other relevant Federal regulations see **Appendix A**.

## Existing State Regulations

### Kuskokwim Area—Subsistence Fishing

#### **5 AAC 01.255. Description of districts, subdistricts, and sections**

*(a) Districts and subdistricts are as described in 5 AAC 07.200.*

*(b) During times of king salmon conservation, the Kuskokwim River may be divided into the following sections by emergency order:*

*(1) Section 1: from a line at the Yukon Delta National Wildlife Refuge boundary at the mouth of the Kuskokwim River at 59° 59.96' N. lat., 162° 30.46' W. long. to 59° 59.95' N. lat., 162° 11.15' W. long. to the confluence of the Johnson River and Kuskokwim River;*

*(2) Section 2: from the confluence of the Johnson River and Kuskokwim River to a line between ADF&G regulatory markers located approximately one-half mile upstream of the Tuluksak River mouth;*

*(3) Section 3: from a line between ADF&G regulatory markers located approximately one-half mile upstream of the Tuluksak River mouth to a line between ADF&G regulatory markers at the Yukon Delta National Wildlife Refuge boundary near Aniak;*

*(4) Section 4: from a line between ADF&G regulatory markers at the Yukon Delta National Wildlife Refuge boundary near Aniak to a line between ADF&G regulatory markers located downstream of the Holitna River mouth;*

*(5) Section 5: from a line between ADF&G regulatory markers located downstream of the Holitna River mouth to the headwaters of the Kuskokwim River.*

## **5 AAC 07.365. Kuskokwim River Salmon Management Plan**

...

*(c) In the king salmon fishery,*

*(1) when the projected escapement of king salmon is below the drainagewide escapement goal range, the commissioner shall close, by emergency order, the commercial, sport, and subsistence king salmon fisheries;*

*(2) when the projected escapement of king salmon is within the drainagewide escapement goal range, the commissioner shall open and close fishing periods, by emergency order, as follows:*

*(A) the commissioner shall close, by emergency order, the commercial, sport, and subsistence king salmon fisheries, and after June 11, to the extent practicable, the commissioner shall open, by emergency order, at least one fishing period per week for a directed subsistence king salmon fishery to provide harvest opportunity on surplus king salmon in excess of escapement needs,*

*(B) after June 11, fishing may be opened for commercial and sport fisheries to provide harvest opportunity on surplus king salmon in excess of escapement and subsistence needs;*

*(C) notwithstanding (c)(2)(A) of this section, before June 12 the commissioner shall open, by emergency order, at least one subsistence fishing period per week with four-inch or smaller mesh gillnets; the gillnet may only be operated as a set gillnet and no part of the set gillnet may be more than 100 feet from the ordinary high water mark;*

*(3) when the projected escapement of king salmon exceeds the drainagewide escapement goal range,*

*(A) the commissioner shall close, by emergency order, the commercial, sport, and subsistence king salmon fisheries, and after June 11, the directed subsistence king salmon fishery will be open seven days per week; and*

*(B) after June 11, the commercial and sport fisheries will be managed to provide harvest opportunity on surplus king salmon in excess of escapement and subsistence needs.*

*(C) notwithstanding (c)(3)(A) of this section, before June 12 the commissioner shall open, by emergency order, at least one subsistence fishing period per week with four-*



*inch or smaller mesh gillnets; the gillnet may only be operated as a set gillnet and no part of the set gillnet may be more than 100 feet from the ordinary high water mark;*

*(4) notwithstanding the provisions of (2) and (3) of this subsection, if the department determines there is a harvestable surplus of king salmon, the commissioner may open, by emergency order, a subsistence king salmon fishery during which*

*(A) king salmon may be taken only by a person 60 years of age or older; and*

*(B) a person authorized to take king salmon under this paragraph may not authorize a proxy to take or attempt to take king salmon under AS 16.05.405 or 5 AAC 01.011, but the participant may be assisted by family members within the second degree of kindred; in this subparagraph, "within the second degree of kindred" has the meaning given in 5 AAC 92.990(a).*

*(d) In the subsistence fishery, in the Kuskokwim River drainage, in the waters of the mainstem of the river and other salmon spawning tributaries, unless otherwise specified by the department,*

*(1) the subsistence salmon net and fish wheel fisheries will be open seven days per week, except that if the commissioner determines that it is necessary in order to achieve escapement goals, the commissioner may alter fishing periods, by emergency order, based on run abundance;*

*(2) the commissioner may implement one or more of the gear limitations as described in 5 AAC 01.270(n) during times the commissioner determines that it is necessary for the conservation of king salmon;*

*(A) the gillnet mesh size may not exceed four inches until sockeye and chum salmon abundance exceeds the king salmon abundance;*

*(B) a gillnet may not exceed 25 fathoms in length, except that a longer gillnet may be used if no more than 25 fathoms of the gillnet is in a fishing condition and the remainder of the gillnet is tied up or secured so that it is not in the water in a fishing condition;*

*(C) a person may fish for salmon with a dip net, as defined in 5 AAC 39.105, and all king salmon caught by a dip net must be returned immediately to the water unharmed;*

*(3) actions to conserve king salmon may be applied to the entire Kuskokwim River, its sections, or tributaries, consistent with harvest trends and variability in abundance of king salmon available for harvest as the run progresses upstream;*

*(4) the commissioner may alter the subsistence hook and line bag and possession limits specified in 5 AAC 01.295, by emergency order, if the commissioner determines that inseason information indicates it is necessary for conservation purposes.*

## **Relevant State Regulations**

For other relevant State regulations see **Appendix B**.

## **Extent of Federal Public Waters**

For purposes of this analysis, the phrase “Federal public waters” is defined as those waters described under 36 CFR 242.3 and 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 (Refuge), including District 1 and portions of District 2 of the Kuskokwim Fishery Management 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 1**). These waters are hereafter referred to as Refuge waters.

## **Customary and Traditional Use Determinations**

Residents of the Kuskokwim Area, except those persons residing on United States military installations located on Cape Newnham, Sparrevohn USAFB, and Tatalina USAFB, have a customary and traditional use determination for salmon (36 CFR 242.24 and 50 CFR 100.24). The area includes 40 villages. Presented from south to north, the villages are: Newtok, Tununak, Toksook Bay, Nightmute, Mekoryuk, Chefornek, Kipnuk, Kwigillingok, Kongiganek, Platinum, Goodnews Bay, Quinhagak, Tuntutuliak, Eek, Napakiak, Napaskiak, Kasigluk, Nunapitchuk, Atmautluak, 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.

## **Regulatory History**

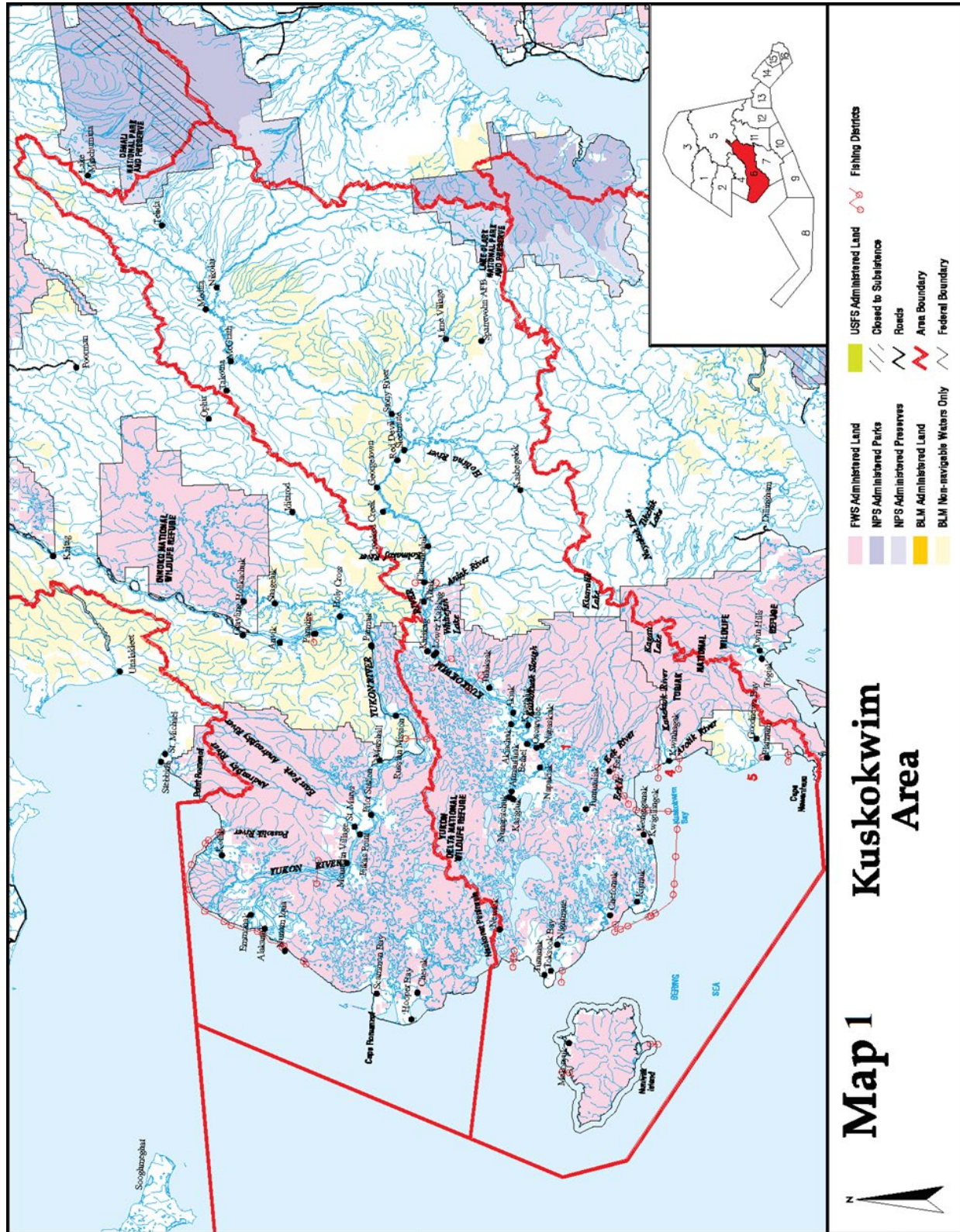
The Kuskokwim River drainage salmon subsistence fishery was open continuously until 1977 when State managers began closing it for periods before, during, and after commercial fishing openings. Currently, the subsistence fishery is closed for six hours before, during, and three hours after each commercial fishing period (Tiernan and Poetter 2015). Legal gear in the Federal salmon subsistence fishery are gillnets, beach seines, fish wheels, dip nets, and rod and reel. Within the Holitna drainage, spears are also allowed.

The following is a summary of the management of salmon subsistence fisheries in the Kuskokwim River drainage since 1993. The summary is of State management actions unless otherwise noted.

In 1993, the subsistence fishery in the Kuskokwim River was closed for the first time because of low Chum Salmon returns. From 1997 through 2001 Kuskokwim River returns of Chinook and Chum Salmon were low (Tiernan and Poetter 2015).

In 1999, Federal salmon subsistence fishery management was authorized by the Board. Openings, closures, and methods have been the same as those issued under State emergency orders, unless superseded by Federal regulations (§\_\_\_\_.27(e)(4)(ii)).

In 2000, the Alaska Board of Fisheries expanded to the lower Kuskokwim River drainage the legal use of rod and reel in the salmon subsistence fishery (Burkey et al. 2001).



In 2000, due to low runs of Chinook and Chum Salmon, the salmon subsistence fishery was restricted to the use of 6-inch or less mesh gillnets on July 8, and hook and line fishers were limited to one Chinook Salmon per day. The Federal in-season manager issued an emergency special action with similar effect (Burkey et al. 2001).

In 2001, the Alaska Board of Fisheries passed the Kuskokwim River Rebuilding Plan (5 AAC 07.365, Tiernan and Poetter 2015). Additionally, the salmon subsistence fishery was limited by “windowed,” or rolling, closures implemented sequentially up the river in a step-wise progression consistent with salmon run timing. Throughout the Chinook and Chum Salmon runs, the drainage was closed to the harvest of salmon, except by hook and line, from three days per week (upper river) to five days per week (lower and middle river), during which gillnets were restricted to 4-inch or less mesh size (Whitmore et al. 2004).

From 2002 through 2003, during the Chinook Salmon run, the Kuskokwim River drainage was closed to the harvest of Chinook Salmon, except by hook and line, three days a week in rolling closures, during which gillnets were restricted to 4-inch or less mesh size (Whitmore et al. 2004).

From 2004 through 2006, three day per week rolling closures to the harvest of Chinook Salmon were implemented until June 16 (in 2005 and 2006) and June 20 (in 2004), during which gillnets were restricted to 4-inch or less mesh size. There were no closures to the harvest of salmon in the upriver areas during these years (Martz and Whitmore 2005, Martz and Dull 2006, Dull and Sheldon 2007).

From 2007 through 2009, the salmon subsistence fishery in the Kuskokwim River was not restricted, and closed only around commercial fishing periods (Tiernan and Poetter 2015).

Federal management was first initiated in 2010. During that year, from June 10 through July 31, the Federal in-season manager closed the Tuluksak and Kwethluk rivers to the harvest of Chinook Salmon with gillnets due to conservation concerns. During this time gillnets were restricted to 4-inch or less mesh size in the Tuluksak and Kwethluk rivers (Brazil et al. 2011).

In 2011, from June 1 through July 25, the harvest of Chinook Salmon using hook and line gear or gillnets (restricted at the time to 4-inch or less mesh size) was closed in the following important salmon rearing tributaries: Kuskokuak Slough, including all waters of the Kisaralik, Kasigluk, and Kwethluk river drainages; and the Tuluksak River drainage. District 1 of the Kuskokwim River main stem closed to the harvest of salmon from June 16 through June 19 and June 23 through June 29. The Federal in-season manager closed Refuge waters to the harvest of salmon for three days from June 30 through July 2 because of continuing concerns for the conservation of Chinook Salmon (Brazil et al. 2013).

In 2012, from June 1 through July 25 the harvest of Chinook Salmon using hook and line gear was closed, while gillnets were restricted to 4-inch or less mesh size. Areas were closed in Kuskokuak Slough, including all waters of the Kisaralik, Kasigluk, and Kwethluk river drainages, and the Tuluksak, Aniak, and George river drainages. In the mainstem, during the Chinook Salmon run, the harvest of salmon was restricted for 12 consecutive days by the use of rolling closures from the Kuskokwim River mouth to the headwaters followed by six days of rolling open fishing periods when 6-inch or less mesh size gillnets were allowed. After six-day periods when there were no closures, harvest of salmon was again prohibited

in rolling closures until a date between June 30 (in the lower river) and July 14 (at the headwaters); however, the harvest of salmon with hook and line gear remained closed until later in the summer (Ellison et al. 2015).

In 2013, the Alaska Board of Fisheries adopted the Kuskokwim River Salmon Management Plan (5 AAC 07.365). Additionally, the harvest of Chinook Salmon using hook and line gear or gillnets, during which gillnets were restricted to 4-inch or less mesh size, was closed in Kuskokuak Slough, including all waters of the Kisaralik, Kasigluk, and Kwethluk river drainages, and the Tuluksak, Aniak, and George river drainages. Gillnets were limited to 6-inch or less mesh size in the lower river beginning June 28 and in the middle river beginning July 3 in order to conserve Chinook Salmon. All restrictions were lifted by July 15 (Tiernan and Poetter 2015).

#### Salmon Management in 2014

See **Appendix C** for Federal special actions and State emergency orders issued in 2014.

On April 17, the Board approved Temporary Special Action Request FSA14-03, submitted by the Napaskiak Tribal Council, which closed Refuge waters to the harvest of Chinook Salmon and further reduced the pool of eligible harvesters based on an ANILCA Section 804 Subsistence User Prioritization analysis. The analysis identified residents of the Kuskokwim River drainage and four coastal communities, Kwigillingok, Kongiganek, Kipnuk, and Chefornek (32 of 40 communities in the customary and traditional use determination), as having the highest customary dependence on Chinook Salmon in the Kuskokwim River drainage and therefore the only subsistence users eligible to harvest Chinook Salmon in 2014 (FWS 2014).

On May 20, the Federal in-season manager closed Refuge waters from the mouth of the Kuskokwim River upriver to Tuluksak River to the harvest of Chinook Salmon by all users, and on May 27 continued the closure from the Tuluksak River to the Aniak River. Gillnets were restricted to 4-inch or less mesh size. Limited harvests of Chinook Salmon were allowed, primarily through Federal Social and Cultural Permits that allowed harvests of up to 100 Chinook Salmon per community using most gear types.

From June 24 through July 18, the State managed subsistence fisheries for salmon other than Chinook Salmon. Chum and Sockeye Salmon subsistence fishing opportunity (with 6-inch or less mesh gillnets) continued during periods opened sequentially upriver. By July 3, all State restrictions to the use of 6-inch or less mesh gillnets to the harvest of Chum or Sockeye Salmon were rescinded. All subsistence salmon fishing restrictions were lifted by August 4.

The 2014 fishing season was the first that dip nets could be used as a legal salmon subsistence fishing gear type under State regulations in the Kuskokwim River drainage to provide an alternative method for subsistence opportunity during times of Chinook Salmon conservation. The State allowed subsistence fishing with dip nets beginning June 14, with additional opportunity provided sequentially upriver as run timing dictated. All Chinook Salmon caught in dip nets were required to be immediately released unharmed.

In late July, Special Action Requests FSA14-09, 10, 11, 12, 13, and 14 were submitted by the Lower Kalskag Tribe, Kuskokwim Native Association, and Napaimute, Crooked Creek, Aniak, and Kalskag Tribal councils, respectively. They requested the Board ensure reasonable opportunity and priority use of subsistence resources and exert Federal jurisdiction for fisheries management on the Kuskokwim River within the Refuge boundaries for the remainder of the 2014 fishing season. The Board deferred action on the six special action requests based on State action that temporarily suspended commercial fishing in the Kuskokwim River after July 21 until a run assessment indicated there would be a harvestable surplus of Coho Salmon available for harvest (ADF&G 2014a).

In 2014, commercial fishery openings occurred in the Kuskokwim River on July 14, 18, and 21, and August 11, 14, 18, 20, and 26 (ADF&G 2017).

### Salmon Management in 2015

See **Appendix C** for a Federal special actions and State emergency orders issued in 2015.

In February and March, five separate Temporary Special Action Requests, FSA15-02, 03, 05, 07, and 08, were submitted by Akiak, Napakiak, Akiachak, Chuathbaluk, and Lower Kalskag Tribal councils, respectively. All requested that the Board close Refuge waters to the harvest of all salmon by nonsubsistence users, further reduce the pool of eligible harvesters based on the ANILCA Section 804 Subsistence User Prioritization analysis that was implemented in 2014, and implement an allocation strategy among eligible users. Several requested implementation of an interim tribal co-management system for the 2015 season. At its work session on April 16, the Board deferred action on all the special action requests until such time, during the season, the Chair determined it necessary for Federal involvement (FWS 2015a).

On May 6, the Board approved the ANILCA Section 804 Subsistence User Prioritization for the harvest of Chinook Salmon only, including a Bethel allocation strategy based on Section 804 (see **Appendix F**), and left the final decision concerning whether or not to close Refuge waters to the harvest of Chinook Salmon to the Federal in-season manager (FWS 2015b).

On May 16, the Federal in-season manager issued a special action to close Refuge waters from the Kuskokwim River mouth to its confluence with the Tuluksak River and salmon tributaries (Eek, Kwethluk, Kasigluk, Kisaralik, and Tuluksak rivers) to the harvest of Chinook Salmon from May 21 through July 20. The closure restricted everyone from harvesting Chinook Salmon except for Federally qualified subsistence users identified in the ANILCA Section 804 Subsistence User Prioritization analysis including the Bethel allocation strategy based on Section 804 (see **Appendix F**). Gillnets were restricted to 4-inch mesh size and could be used only three days a week.

From June 5 through July 20, the Federal in-season manager closed Refuge waters to the harvest of all fish except by Federally qualified subsistence users. Refuge waters were closed to the harvest of Chinook Salmon by all users. Gillnets were restricted to 4-inch mesh size and could be used only three days a week. On June 7, the Kwethluk, Kasigluk, Kisaralik, Tuluksak, and Aniak Rivers and their salmon tributaries within Refuge waters were closed to the use of gillnets.



From June 10 through June 30, the Federal in-season manager opened the Kuskokwim River, the Eek River, and salmon tributaries of the Eek River to the harvest of Chinook Salmon using most legal methods by only subsistence users in possession of a Federal Community Harvest Permit. The drainage-wide harvest quota was 7,000 Chinook Salmon. Specific community allocations were based on each community's share of the average total subsistence harvest of Kuskokwim River Chinook Salmon over 20 years (1990–2009). Designated fishermen were assigned to harvest salmon for each participating community and salmon were distributed to subsistence users.

The Federal in-season manager realized that village allocations were not going to meet subsistence needs, but hoped they would provide an opportunity to harvest a small number of Chinook Salmon and allow for some customary and traditional cultural practices associated with the Chinook Salmon fishery. The Community Harvest Permit Program was voluntary and communities did not have to participate. If a community wished to participate, the tribal council was tasked with ensuring that all Federally qualified users within each community had fair access to Chinook Salmon that were harvested under the permit. The permit was issued to a community representative, identified by the tribe, who was responsible for overseeing the community fishery. A limited number of fishermen were designated to catch a community's allocation of Chinook Salmon. Only those who were identified as designated fishermen in possession of a designated fishing permit could harvest Chinook Salmon under the program. This opportunity was permitted June 10–30, with no other time or gear restrictions. The Community Harvest Permit expired and became invalid once the community harvest quota was achieved or on July 1, whichever came first (FWS 2015c).

In Bethel, the Natural Resource Department of Orutsararmiut Native Council, the Federally recognized Tribe in Bethel, organized allocations of Chinook Salmon to over 100 summer fish camps used by Bethel residents who were identified in the Section 804 Subsistence User Prioritization analysis (see **Figure F**). Designated fishermen harvested salmon that were then distributed to subsistence users without access to fish camps who requested an allocation. Additionally, Orutsararmiut Native Council organized the distribution of Chinook Salmon to subsistence users in upriver communities beyond the Refuge boundary who were unable to legally harvest Chinook Salmon except from Refuge waters.

From June 18 through June 21, Refuge waters from the Kuskokwim River mouth to its confluence with the Tuluksak River and salmon tributaries were closed to the use of gillnets except by subsistence users using 4-inch or less mesh gillnets to harvest nonsalmon fishes or in possession of a Community Harvest Permit.

From July 2 through July 20, the harvest of Chinook Salmon in Refuge waters remained closed except by subsistence users. Salmon fishing opportunity continued during periods that opened sequentially upriver. All Chinook Salmon subsistence fishing restrictions were lifted by August 4.

On August 20, Lisa Feyereison, of Crow Village, and David G. Diehl, of Aniak, submitted Special Action Request FSA15-17. They requested that the Board “take action necessary to assume management of Coho Salmon to provide reasonable certainty that (1) the established Coho Salmon escapement goal within the Federal management unit will be achieved, and (2) that reasonable opportunity and priority use of

subsistence salmon resources necessary to meet customary subsistence needs throughout the watershed per ANILCA Section 804 occurs.” The proponents stated that it was important that subsistence users be given opportunity to harvest Coho Salmon to make up for the low numbers of Chinook Salmon they were allowed to harvest earlier in the season due to restrictions by State and Federal in-season managers. Additionally, the proponents stated that it was likely that the Coho Salmon escapement goal would not be achieved in the Kwethluk River. Action on FSA15-17 was deferred based on State action that temporarily suspended commercial fishing in the Kuskokwim River after August 10 because Coho Salmon escapements at weir projects were below average (ADF&G 2015, FSB 2016).

In 2015, due to a below average Chum Salmon return, a commercial fishery period was not authorized in the Kuskokwim River until August 10. Commercial periods also occurred on August 17 and August 21, for a total of three commercial fishing periods for the season (ADF&G 2017).

### Salmon Management in 2016

**See Appendix C** for a Federal special actions and State emergency orders issued in 2016.

On March 31, the Akiak Native Community submitted Temporary Special Action Request FSA16-01. It requested the Board to 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 ANILCA Section 804 Subsistence User Prioritization analysis implemented in 2015, and employ an allocation strategy among eligible users, similar to the one implemented in 2015, for Chinook, Chum, Sockeye, and Coho salmon.

The Alaska Department of Fish and Game (ADF&G) closed subsistence fishing with gillnets starting on May 20.

On June 1, the Board approved the special action with modification, closing Federal public waters of the Kuskokwim River drainage to the harvest of Chinook and Chum salmon by non-subsistence users identified in a Section 804 Subsistence User Prioritization analysis. The Board determined there was a need to restrict the harvest of Chinook and Chum Salmon for the conservation of healthy populations and to continue subsistence uses. Those eligible to harvest Chinook and Chum salmon under Federal regulations were the following: Federally qualified subsistence users residing in the Kuskokwim River drainage and the coastal communities of Chefornak, Kongiganek, Kipnuk, and Kwigillingok.

Additionally, the Board determined the Federal in-season manager would provide harvest opportunity for Chinook and Chum Salmon subsistence fisheries with a combination of management tools including area, timing, and gear restrictions developed in consultation with the Kuskokwim River Inter-Tribal Fisheries Commission pursuant to the Memorandum of Understanding between the U.S. Fish and Wildlife Service and the Commission (**Appendix D**) (FWS 2016).

On June 3, the Federal in-season manager closed Refuge waters to the harvest of Chinook and Chum Salmon by subsistence users. The Federal in-season manager opened Refuge waters for 12 hours on June 12, 24 hours on June 16, 72 hours on June 21, and another 72 hours on June 29 for the harvest of Chinook



and Chum Salmon by those subsistence users identified in the Section 804 Subsistence User Prioritization analysis.

On June 12, the Federal in-season manager closed the Eek, Kwethluk, Kasigluk, Kisaralik, Tuluksak, and Aniak Rivers as well as their salmon tributaries within the Refuge boundary to the use of gillnets. On June 21, the Federal in-season manager rescinded the closure to the subsistence harvest of Chinook and Chum Salmon in the Kalskag and Lower Kalskag areas. On July 7, the Federal in-season manager rescinded previously issued special actions.

In 2016, salmon commercial fishing was allowed on July 29 and August 12; however, no commercial salmon processors were available in the area and the opportunity was for catcher/sellers only (ADF&G 2016a and 2016b).

### Salmon Management in 2017

See **Appendix C** for Federal special actions and State emergency orders issued in 2017.

On March 1, Lamont Albertson, the Executive Director of the Kuskokwim River Inter-Tribal Fisheries Commission, submitted Temporary Special Action Request FSA17-03. It requested that the Board approve a pre-season management strategy that would close Federal public waters in the Kuskokwim River drainage to the harvest of Chinook Salmon except by Federally qualified subsistence users if the forecast run size was less than a target identified by the Kuskokwim River Inter-Tribal Fisheries Commission.

On March 14, the Akiak Native Community submitted Temporary Special Action Request FSA17-04. It requested that the Board close Federal public waters of the Kuskokwim River drainage to the harvest of salmon except by Federal qualified subsistence users, further reduce the pool of eligible harvesters based on the ANILCA Section 804 Subsistence User Prioritization analysis that was implemented in 2016, and implement an allocation strategy among eligible users. The Akiak Native Community clarified at a later date that an allocation strategy was not requested and that the harvestable surplus of Chinook Salmon did not seem to require a permit system, but could rather be managed through timing and gear restrictions, as was done in 2016.

On May 3, the Federal in-season manager closed Federal public waters in the Kuskokwim River drainage to the use of all gillnets by all users, effective June 12 to August 10, to provide for escapement of Chinook Salmon.

On May 19, the Board met via teleconference (and in a subsequent email poll on May 22 to clarify the intent of the Board action) and approved Temporary Special Action Requests FSA17-03 and FSA17-04 with modification. The actions closed Federal public waters of the Kuskokwim River drainage on June 12 to the harvest of Chinook Salmon except by Federally qualified subsistence users identified in a Section 804 Subsistence User Prioritization analysis. The Board determined there was a need to restrict the harvest of Chinook Salmon for the conservation of healthy populations and to protect the continuation of subsistence uses as mandated under ANILCA Section 815. Those eligible to harvest Chinook and Chum

Salmon under Federal regulations were the following: Federally qualified subsistence users residing in the Kuskokwim River drainage and the coastal communities of Chefornak, Kongiganek, Kipnuk, and Kwigillingok. Additionally, the Board determined the Federal in-season manager would provide harvest opportunity for Chinook and Chum Salmon subsistence fisheries with a combination of management tools including area, timing, and gear restrictions developed in consultation with the Kuskokwim River Inter-Tribal Fisheries Commission, pursuant to the Memorandum of Understanding between the U.S. Fish and Wildlife Service and the Commission (**Appendix D**). These Temporary Special Actions were to expire when the Federal in-season manager re-opened Federal public waters of the Kuskokwim River drainage to the harvest of Chinook Salmon by non-Federally qualified users, or when they were superseded by subsequent special actions, or at the end of the regulatory year on March 31, 2018, whichever came first. This Board action superseded the previous special action issued by the Federal in-season manager on May 19 (FWS 2017a).

The Federal in-season manager issued another special action on May 24, following the Board actions taken on the previous temporary special action requests, to close Federal public waters of the Kuskokwim River mainstem and salmon bearing tributaries (including Eek, Kwethluk, Kasigluk, Kisaralik, Tuluksak, and Aniak Rivers) to the harvest of Chinook Salmon by all Federally qualified subsistence users. The special action was effective from June 12 until August 10.

Refuge waters were closed to subsistence gillnet fishing starting on May 25. Two days after this closure, ADF&G provided a 12 hour subsistence fishing opportunity with 4-inch or less set gillnets to harvest nonsalmon species and incidentally retain any Chinook Salmon harvested. On June 1, the closure extended to the Holitna River mouth, which was then followed up by a second 12 hour subsistence fishing opportunity on June 3. On June 4, the entire Kuskokwim River was closed to subsistence fishing with gillnets. On June 10, ADF&G provided the last 12-hour subsistence opportunity with 4-inch or less set gillnets. In total, three four-inch set gillnet opportunities, totaling 36 hours, were allowed during the early season Chinook Salmon fishery closure in 2017.

On June 12, the Federal in-season manager opened Refuge waters for 12 hours for the harvest of Chinook Salmon by those Federally qualified subsistence users identified in the Section 804 subsistence User Prioritization analysis. Drift or set gillnets were limited to six inch or less mesh and could not exceed 45 meshes in depth. Nets from the Refuge boundary at the Kuskokwim River mouth to the Johnson River could not exceed 50 fathoms (300 feet), while nets upriver from the Johnson River to the Refuge boundary at Aniak could not exceed 25 fathoms (150 feet) in length.

On June 24, the Federal in-season manager opened Refuge waters for 12 hours for the harvest of fish other than Chinook Salmon. Additionally, Federally qualified subsistence users identified in the Section 804 Subsistence User Prioritization analysis could retain any Chinook Salmon incidentally harvested in gillnets. These same restricted openings were repeated for 6 hours on July 1, and for 12 hours on July 3. Drift or set gillnets were limited to six inch or less mesh and could not exceed 45 meshes in depth. Nets could not exceed 25 fathoms (150 feet) in length.

On July 7, the Federal in-season manager rescinded previously issued special actions, opening Federal public waters of the Kuskokwim River drainage to the harvest of Chinook Salmon by nonsubsistence users.

In 2017, a very limited Coho Salmon commercial fishery was allowed on July 30, August 14, and August 17 resulting in well below average harvests. Participants included those commercial fishermen who had registered with the department as catcher/sellers and had secured their own markets (ADF&G 2018).

### Salmon Management in 2018

See **Appendix C** for Federal special actions and State emergency orders issued in 2018.

On February 5, the Yukon Delta National Wildlife Refuge submitted Temporary Special Action Request FSA18-01. It requested the Board to close Federal public waters of the Kuskokwim River Drainage to the harvest of Chinook Salmon except by Federally qualified subsistence users, and further reduce the pool of eligible harvesters based on the ANILCA section 804 user prioritization analysis that was implemented in 2017. The requested actions would have an effective starting date of June 12, 2018 and last until August 30, 2018, unless the Federal in-season manager reopens Federal public waters of the Kuskokwim River drainage to the harvest of Chinook Salmon by non-federally qualified users or when they are superseded by subsequent special actions.

On March 28, the Akiak Native Community (a Federally recognized tribe) submitted Temporary Fishery Special Action Request FSA18-03. The request asked the Board to close Federal public waters of the Kuskokwim River drainage to the harvest of Chinook Salmon except by subsistence users, and further reduce the pool of eligible harvesters based on ANILCA 804 Subsistence User Prioritization analysis that was implemented in 2015. They requested this action to be in place from May 20 through June 30. Additionally, they requested a community-based allocation system similar to the one used in 2015 to be implemented amongst the limited pool of Federally qualified subsistence users. The board took no action on FSA18-03.

On June 7, the Federal in-season manager issued an emergency special action that closed the harvest of Chinook Salmon in Federal public waters of the Kuskokwim River main stem and the following salmon spawning tributaries: Eek River, Kwethluk River drainage including its confluence with Kuskokuak Slough and downstream to ADF&G regulatory markers located at the downstream mouth of the slough; Kasigluk and Kisaralik river drainages including Old Kuskokuak Slough to ADF&G regulatory markers at the confluence of Old Kuskokuak Slough with Kuskokuak Slough; Tuluksak River Drainage including its confluence with the Kuskokwim River and downstream approximately 1-mile to ADF&G regulatory markers; and the Aniak River drainage to ADF&G regulatory markers at its confluence with the Kuskokwim River. The Federal in-season manager also closed non-salmon spawning tributaries within 100 yards of their confluence with the main stem Kuskokwim River. The effective dates were June 12 to July 15, and the justification was to provide for escapement of Chinook Salmon.

In addition, on June 7, the Federal in-season manager issued a second emergency special action opening Refuge waters of the Kuskokwim River main stem except the waters of the Kuskokwim River main stem

from the Yukon Delta National Wildlife Refuge (Refuge) boundary at Aniak downstream to a line formed from the northwest corner of the runway, due north to a point on the southwest corner of a sandbar for 12 hours allowing the harvest of Chinook Salmon by those Federally qualified subsistence users identified in the Section 804 subsistence User Prioritization analysis for June 12 and June 16. Drift or set gillnets were limited to six inch or less mesh and could not exceed 45 meshes in depth. Nets from the Refuge boundary at the Kuskokwim River mouth to the Johnson River could not exceed 50 fathoms (300 feet) in length, while nets upriver from the Johnson River to the Refuge boundary at Aniak could not exceed 25 fathoms (150 feet) in length. Salmon bearing tributaries remained closed to the harvest of Chinook Salmon. The first 100 feet of the non-salmon bearing tributaries, which had been closed by earlier action, were also opened to Chinook Salmon harvest during the 12 hour opportunities.

On June 22, the Federal in-season manager issued a third emergency special action opening Refuge waters of the Kuskokwim River main stem except the waters of the Kuskokwim River main stem from the Refuge boundary at Aniak downstream to a line formed from the northwest corner of the runway, due north to a point on the southwest corner of a sandbar for 12 hours allowing the harvest of Chinook Salmon by those Federally qualified subsistence users identified in the Section 804 subsistence User Prioritization analysis for June 24, 2018. Drift or set gillnets were limited to six inch or less mesh and could not exceed 45 meshes in depth. Nets from the Refuge boundary at the Kuskokwim River mouth to the Johnson River could not exceed 50 fathoms (300 feet), while nets upriver from the Johnson River to the Refuge boundary at Aniak could not exceed 25 fathoms (150 feet) in length. Salmon bearing tributaries remained closed to the harvest of Chinook Salmon. Again, the first 100 feet of the non-salmon bearing tributaries were open to Chinook Salmon harvest during the 12 hour opportunity.

Also on June 22, the Federal in-season manager reopened opportunity for Federally qualified subsistence users identified in the section 804 Subsistence User Prioritization analysis to harvest Chinook Salmon on Federal public waters of the Kuskokwim River Main Stem from a line downstream of Kalskag at the south edge of Uknarik Slough, due east to the edge of the bluff line to the Refuge boundary at Aniak beginning on June 24, until superseded by subsequent emergency special action in that portion of the Federal public waters of the Kuskokwim River main stem, excluding the previously mentioned closures around Aniak. All drift or set nets were limited to 6-inch or less mesh, and could not exceed 45 meshes in depth or 25 fathoms (150 feet) in length.

On June 27, the Federal in-season manager issued an emergency special action opening Refuge waters of the Kuskokwim River main stem from the mouth to a line downstream of Kalskag at the south edge of Uknarik Slough and then due east to the edge of the bluff line for 6 hours on June 29, allowing the harvest of Chinook Salmon by those Federally qualified subsistence users identified in the Section 804 subsistence User Prioritization analysis. Drift or set gillnets were limited to six inch or less mesh and could not exceed 45 meshes in depth. Nets from the Refuge boundary at the Kuskokwim River mouth to the Johnson River could not exceed 50 fathoms (300 feet) in length, while nets upriver from the Johnson River to the Refuge boundary at Aniak could not exceed 25 fathoms (150 feet) in length. Salmon bearing tributaries remained closed to the harvest of Chinook Salmon. Again, the first 100 feet of the non-salmon bearing tributaries were open to Chinook Salmon harvest during the 6 hour opportunity.

On July 3, the Federal in-season manager issued an emergency special action opening Refuge waters of the Kuskokwim River main stem to a line downstream of Kalskag at the south edge of Uknavik Slough and then due east to the edge of the bluff line for 12 hours on July 5, allowing the harvest of Chinook Salmon by those Federally qualified subsistence users identified in the Section 804 Subsistence User Prioritization analysis. Drift or set gillnets were limited to six inch or less mesh and could not exceed 45 meshes in depth. Nets from the Refuge boundary at the Kuskokwim River mouth to the Johnson River could not exceed 50 fathoms (300 feet) in length, while nets upriver from the Johnson River to the Refuge boundary at Aniak could not exceed 25 fathoms (150 feet) in length. Salmon bearing tributaries remained closed to the harvest of Chinook Salmon.

On July 6, the Federal in-season manager issued an emergency special action rescinding all previously issued special actions regarding the management of Chinook Salmon in the Kuskokwim River drainage, and Refuge waters opened to the harvest of Chinook Salmon by non-Federally qualified subsistence users

In 2018, a very limited commercial fishery was allowed for Coho Salmon on August 5, August 8, August 15, August 21, and August 31. Participants included those commercial fishermen who had registered with ADF&G as catcher/sellers and had secured their own markets (ADF&G 2018).

### **Current Events**

The Alaska Board of Fisheries met in Anchorage from January 15–19, 2019, discussing the current Arctic-Yukon-Kuskokwim area proposals. Major outcomes of the meeting include the addition of dip nets as legal gear used to subsistence fish under State of Alaska subsistence fishing gear types in the Kuskokwim River. This addition allows fishers the opportunity to use a dip net to catch salmon at any time, not just during times of Chinook Salmon conservation. The department still retains the ability to require the live release of Chinook Salmon if needed (ADF&G 2019).

The Alaska Board of Fisheries also passed regulations reducing the distance that gillnets must be separated from 150 feet to 75 feet. The locations affected are located within tributaries of the Kuskokwim River located from the north end of Eek Island upstream to the mouth of the Kolmakoff River. Operations within the main stem of the Kuskokwim River do not change (ADF&G 2019).

### **Public Hearing FSA19-02**

A public hearing was held on March 28, 2019, at the AVCP Housing Authority building in Bethel, Alaska. Sixteen people identified themselves at the start of the teleconferenced meeting, and seven people and/or organizations testified. Individual testifiers were all residents of lower Kuskokwim drainage communities.

All testifiers generally supported FSA19-02, except there was disagreement on the part of the request to allow fishing under a community allocation system with harvest reported to community harvest monitors. One person supporting allocation said the alternative, windowed subsistence opportunities, create combat fishing where everyone goes to the same fishing sites and harvests as many Chinook Salmon as possible, preventing fish from reaching spawning grounds. He said people want to fish from the early part of June

to early July “without any interference” and without being “regulated with windows,” and that “People like to harvest in the sunshine and dry fish from early to mid-June so that fish do not spoil.” However, one person said that using allocations to Bethel fish camp members was problematic when used in 2015. She said it was unfair that a fish camp supporting six families received an allocation for only one family. She said community allocations are difficult to monitor, the logistics of using an allocation system have not been adequately worked out, and Tribe members will be fined for illegally harvesting, and people are just getting used to the system that has been used. She does not support allocating Chinook Salmon.

The Executive Director of the Kuskokwim River Inter-Tribal Fisheries Commission said the Commission supports the first three parts of the request. Concerning the fourth part of the request, allocating Chinook Salmon, she said the Commission did not have a consensus among member tribes and will continue the discussion. She said many tribes would be more comfortable with community allocation than with the open windows that have been implemented, but at this point the Commission is neutral.

The representative of Orutsararmiut Native Council stated the Council’s support for all parts of the request. Concerning allocation, the Council does not support windowed subsistence opportunity, which has been used since 2015. She said families have missed out due to illness or because they are not aware of fishing opportunities. She said the Council supports a community harvest allocation system and is willing to assist in harvest data collection. Some fish camp users complained about the 2015 designated fishermen permit that was used in Bethel, and the Council is open to suggestions for improvements.

Other comments from the lower river were that subsistence fishermen did not decimate Kuskokwim Chinook Salmon, and back in the day people fished in the morning and cut fish the rest of the day, allowing fish to pass by on their migration upriver. He said when people caught enough they would stop fishing even though more salmon were available. Commercial fishing was different. The whole river was swept of fish, and this coincided with the start of the salmon population decline. He said with windowed subsistence opportunity, the same thing is happening. He also reminded salmon is necessary for the survival of other animals as well as humans.

Another person said salmon are declining. He said back in the day people were playing a game, as if salmon were not important. They were told not to throw anything into the river, like stones or guts, but at the time people were not doing what they were told not to do. They were told if they did not follow our folk ways that salmon would decline, but a lot of people would still leave fish on drying racks for too long. He said if we do not care about our resources, then they will be taken away. This is the law if the land, and all need to adhere to it. He said we should not be keeping these ways to ourselves. We should be telling everyone and respecting everyone. He said it was impressed on him that we help people when they are in need.

#### Tribal Consultation FSA19-02

Tribal consultation with a members of the Federal Subsistence Board occurred on Thursday March 28, 2019 at the AVCP Housing Authority building in Bethel, Alaska. Board Chair Tony Christianson and Member Rhonda Pitka attended, Carol Damberg attended for Member Greg Siekaniec, Clarence Summers attended for Member Bert Frost, Pat Petrivelli attended for Member Gene Peltola, and Tom Whitford

attended for Member David Schmid. Tribal representatives of Orutsararmiut Native Council representing Bethel Tribe members attended the teleconferenced meeting.

Orutsararmiut Native Council representatives support allocating Chinook Salmon to communities in the ANILCA Section 804 Subsistence User Prioritization that was implemented in 2017.

Orutsararmiut Native Council does not support short openings otherwise provided because some families have not been able to fish due to short notices of fishing opportunities. Whole communities have missed out, and young people have not learned how to harvest and process fish. Additionally, harvest information has been inadequately addressed in the past and using harvest monitors will improve harvest reporting. Another reason the Council supports allocation is because people have become more combative when fishing because of few opportunities. In contrast allocation reduced stress because families could choose to fish when it was best for them. The Council has been involved in fisheries monitoring and played a role in administrating Bethel fish camp allocations in 2015. The Council supports and would implement a Bethel fish camp allocation system as it did in 2015.

Orutsararmiut Native Council believes fishing opportunity should be decided in consultation with the Kuskokwim River Inter-Tribal Fisheries Commission and not during this consultation.

During the ANSCA corporation consultation, an Akiak Native tribal member stated his support for this Special Action request. There is still a conservation concern for Chinook Salmon on the Kuskokwim River. Last year everyone worked to meet the escapement goals and overall it succeeded in allowing some needs to be met and allowed fish to get up river to spawn. Short fishing opportunities produce crowded fishing opportunities, locally referred to as combat fishing. Going to community allocations would produce more relaxed fishing opportunities, more closely matching traditional fishing techniques while conserving Chinook Salmon on the Kuskokwim River. The allocations will allow for more accurate counts from each community. This Akiak Tribal member did not see an issue with fishing starting on June 1 if the fishing is relaxed, and having an allocation system in place would likely mean relaxed fishing early in the season when there are few Chinook Salmon in the river.

During ANSCA corporation consultation, an Aniak tribal member stated that he supports Federal management of the Chinook Salmon subsistence fisheries in Federal water and the proposed June 1 to July 1 dates. He also noted that recent conservation efforts have been to rebuild the Chinook Salmon stocks for the future and wants the children to know what Chinook Salmon tastes like. Escapement has been made the last 5 years, and the Kuskokwim River Intertribal Fish Commission is firm on an 110,000 Chinook Salmon escapement, allowing for a potential 30,000 Chinook Salmon to be harvested. This tribal member does not want the escapement to be lower than 110,000 and wants to try to evenly distribute the harvest efforts between all users on the river. He also stated that management is like a three legged stool between tribal, State of Alaska, and the Federal in-season manager, and they need to come to an agreement on fishing times and to make sure the communities above Federal waters will have an opportunity to fish.

During the ANSCA corporation consultation, a second tribal member from Aniak stated that subsistence needs were not entirely met last year, but at least people were able to put fish away for the winter, and have a taste of fish. He also commented that with in-season data from the Bethel test Fish, the sonar, and

the Aniak weir there is enough information to allow people to harvest some fish and still conserve Chinook Salmon.

#### ANCSA Corporation Consultation FSA19-02

Consultation between ANCSA corporations and members of the Board occurred on Thursday March 28, 2019, from 1:30 p.m. to 3:30 p.m. The teleconferenced meeting was held at the AVCP Housing Authority building in Bethel, Alaska. Board Chair Tony Christianson and Member Rhonda Pitka attended, Carol Damberg attended for Member Greg Siekaniec, Clarence Summers attended for Member Bert Frost, and Pat Petrivelli attended for Member Gene Peltola. Several tribal representatives called in to listen in and discuss FSA19-02; however, no ANCSA corporations called in for this consultation period. Tribal comments that occurred during the ANCSA consultation are documented in the Tribal consultation section.

During tribal consultation, a Kwethluk Incorporated representative said he does not support allocating Chinook Salmon because his community tried allocation in 2015 and it did not work well.

#### Alaska Department of Fish and Game Comments on FSA19-02

See **Appendix F**

### **Cultural Knowledge and Traditional Practices**

Members of 40 Federally-recognized tribes 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, *Canineqmiut* along the coastal area from the mouth of the Kuskokwim River to Nelson Island, and *Kusquvagmiut* 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 (Oswalt 1980, Fienup-Riordan 1984).

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. Many families no longer find it necessary to harvest wild resources in order to feed the dogs that were once owned by almost every family. In the Kuskokwim River drainage, Kuskokwim Bay, and adjacent coastal area, people fed their dogs with mainly Chum and Sockeye Salmon that were harvested later than Chinook Salmon. Dogs ate massive amounts of fish. These circumstances have changed and fewer families now own dogs, thereby greatly reducing subsistence harvests of Chum and Sockeye Salmon from 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, non-Natives entered the area to mine, trade, missionize, homestead, and recreate. Some contemporary village sites were staging areas for these activities (Oswalt and VanStone 1967; Fienup-Riordan 1983, 1984; Kilbuck 1988; Oswalt 1990).



The population of the Kuskokwim Fishery Management Area almost tripled in the 50 years between 1960 and 2010, from 6,776 to 17,454 people, based on the U.S. Census (**Table 1**).

Historically, in the lower and middle Kuskokwim River drainage subsistence activities centered around fish, furbearers, and migratory birds. Moose and caribou were rare sights until recently. The fact that salmon are overwhelmingly the most important food item also influences the nature of the subsistence activities in this area (Oswalt 1959, 1990).

When salmon began their ascent of the Kuskokwim River, there was no way to foretell whether the run would be strong or weak, and so from the time the run began, men fished from their boats with long gill nets much of the afternoon and night. The yearly salmon run assured people of a predictable source of food. Usually about a week before Chinook Salmon arrived, Sheefish were caught in these nets. No fish was unutilized; in fact, the entire fish was used as food for humans or dogs. Store-bought necessities included sugar, salt, flour, milk, coffee, tea, tobacco, and cooking fats. Other foods frequently purchased included various canned meats and fish, crackers, candy, carbonated beverages, canned fruits, potatoes, onions, and rice. The frequency with which these were consumed depended upon the cash or fur income of the family involved (Oswalt 1959).

In 2012, Ikuta and others (2013) observed that elders in particular expressed concern about the consequences of not taking proper care of fish. Traditionally, if people keep fishing in the correct manner, there will be more fish every year. It was widely agreed upon among the people she talked to that if fish were wasted or disrespected, there would not be as many fish returning in the future. Fish remains were treated with great respect, so that the fish would not tell others to avoid these people. “A traditional Yup’ik belief is that fish go away if they are not used, and taken care of” (Ikuta et al. 2013:15).

Traditionally and historically, in the Kuskokwim Area, people organized much of their lives in pursuit of wild resources in order to redistribute their surpluses during winter ceremonial seasons and during more informal sharing, such as funeral and birthday gatherings or hosting family and friends. “Status and authority accrued to the one who could afford to give” (Fienup-Riordan 1984:69). People continue to organize traditional winter ceremonies. Some are organized concurrently with American holiday celebrations or have merged with gatherings to celebrate Independence Day, Thanksgiving, Christmas, and Easter. High harvesters are also high givers, and giving to other households may be a primary motivation for high production by some households (Wolfe et al. 2007).

### Commercial Fishery

Kuskokwim Chinook Salmon have been exported from the area and sold on commercial markets since 1913 (Pennoyer et al. 1965). During the 1950s, commercial fishing was closed or restricted due to concerns of over-exploitation voiced by subsistence fishers (Pennoyer et al. 1965). After 1959 and statehood, commercial harvests of Chinook Salmon grew steadily. The largest commercial harvests occurred in the late 1970s and early 1980s, and took place as far up the drainage as the community of Chuathbaluk in the middle river (**Figure 1**). However, subsistence fishery harvests grew as well, and in 1987 the directed commercial fishery for Chinook Salmon was eliminated. Currently, by regulation, up to 50,000 Chinook Salmon may be incidentally harvested in the Chum Salmon-directed commercial fishery

and sold; however, since 2000 these incidental harvests have been much smaller (Brazil et al. 2013). In 2014, the first commercial fishing opportunity was pushed back into July so that little incidental harvest of Chinook Salmon would occur, and the first commercial fishing opportunity in 2015 did not occur until August 10 to protect Chum Salmon due to a below average return (ADF&G 2017). Since 2016, commercial fishing has targeted only Coho Salmon beginning in late July, but no commercial salmon processors have been available in the area and the opportunity has been for catcher/sellers only (ADF&G 2016a, 2016b; ADF&G 2018). A commercial salmon processor is not expected to be in the region in 2019. Kuskokwim commercial fishing is not limited entry. Most Alaska residents can apply for and receive a commercial fishing permit; however, the majority of permits have consistently gone to residents of the region. At its peak there were over 600 Kuskokwim salmon permits (Ikuta et al. 2013).

### Subsistence Fishery

In the 1950s, during the months of spring, families were often at camps harvesting fish for food and muskrats for fur and for food. The fresh food was welcome after relying on primarily dried and preserved salmon for months in late winter and early spring. People returned to settlements oriented on the Kuskokwim River to prepare for salmon season. Nylon nets were available and used, but it was still common to see people drifting nets while rowing locally-made plank boats, which might float up to two miles during one set. Fishing equipment was not very efficient (Oswalt 1959, 1990). It was the growing commercial fishery in the 1970s and early 1980s that brought more efficient gear into the subsistence fishery. People would harvest Chinook Salmon to fill drying racks and smoke houses and then turn back to commercial fishing. Aluminum boats, 40 horse power engines, and deeper and longer nets that were more efficient at harvesting salmon became more common (Ikuta et al. 2013).

During this time, middle and upper river residents were voicing concerns that their subsistence harvests and upper river runs were being impacted by the growing commercial and subsistence fisheries in the lower river. These concerns grew in the 1980s when salmon returns decreased. To ease these concerns, in 1988 ADF&G formed the Kuskokwim River Salmon Management Working Group (Working Group) to meet weekly with the ADF&G manager to evaluate run strength and the progress of commercial and subsistence fisheries (Hamazaki 2008). In 2001, the Alaska Board of Fisheries implemented subsistence fishing closure schedule “windows” throughout the Kuskokwim River drainage. The primary objective was to reduce harvest early in the season by reducing the subsistence fishery from seven to four days a week, from Wednesday to Saturday (Hamazaki 2008).

Chinook Salmon escapement increased across the drainage, and as a result the schedule was eased. From 2007 through 2011, ADF&G did not impose the schedule. Research findings suggested the increase in escapement was not due to windows but to an increase in the Chinook Salmon run size. Additionally, subsistence fishermen increased their fishing efforts during the open period and harvested the same number of fish per week as without the scheduling. One researcher said “while the windows did not reduce the subsistence fisher’s fishing opportunities, it synchronized their fishing dates, removing their ability to determine fishing dates based on their needs and availability of fish,” which was a negative effect on subsistence users (Hamazaki 2008).

Upriver concerns continued to be heard. On several occasions the Working Group asked the fishery manager to delay opening the commercial fishery to allow more time for salmon to move upriver when the manager vetoed the recommendation, adhering to regulation and policy concerning sustained yield, which compelled him to allow commercial fishing opportunity soon after indications that Bethel subsistence fishermen had met their Chinook Salmon harvest goals (Carroll and Bradley 2010, Brodersen and Carroll 2011, Bailey and Shelden 2014).

In 2012 due to the shrinking run size, on March 6–8, the Association of Village Council Presidents (AVCP, the regional Native non-profit corporation comprised of lower river tribes) held a special convention (AVCP 2012). The purpose was to identify ways to help conserve Chinook Salmon. One of the major focuses was developing ideas on how to incorporate tribes into the management of Kuskokwim salmon. During the convention, some suggested a permit or Tier II system during low returns years.

On June 5, 2012, the Working Group received a letter from AVCP and Kuskokwim Native Association (KNA, the Native non-profit corporation comprised of mid-drainage tribes) expressing concerns about ADF&G's management strategy (AVCP and KNA 2012). Their concerns included ADF&G lowering the in-season management escapement objective to 87,000 Chinook Salmon, which was lower than historical escapements, and which would decrease Chinook Salmon densities and opportunities for middle and upper river subsistence users. They were also concerned that ADF&G had not consulted with others about the management strategy.

On June 10, 2012, ADF&G implemented a schedule of rolling closures. The first closure to the subsistence fishery began June 10 in the lower river and lasted seven days. The Working Group did not support a five-day extension that was requested by Federal and State fishery managers, “objecting on the basis that a 12-day closure for subsistence salmon fishing would result in an extraordinary hardship for the Kuskokwim River families that rely upon harvesting king salmon in early June” (Ikuta et al. 2013: 125); however, the closure was extended for five days.

This was the most extensive restriction on subsistence fishing ever implemented on the Kuskokwim River, and on June 20 people from Tuntutuliak to Tuluksak began fishing for salmon with 6-inch mesh gillnets despite the closure. Sixty-one people received citations and had their nets confiscated or cut (Ikuta et al. 2013). Some of these fishers were allowed to keep one Chinook Salmon, but the rest of their illegally caught Chinook Salmon were donated to charity. Some of the violators pleaded guilty and paid a fine; others went to trial at various points between the fall of 2012 and spring of 2013, and were convicted and fined. Thirteen fishermen appealed the Bethel District Court decision to the Alaska Court of Appeals (*Phillip II v. State of Alaska ap-2446*). These thirteen defendants waived any individual defenses they might have had, and instead they filed a collective brief asserting that their fishing in violation of the emergency orders was religiously based conduct that was protected under the free exercise clause of the Alaska Constitution. They were represented by John M. Starkey and Thomas Stenson of the American Civil Liberties Union of Alaska Foundation.

According to the Alaska Court of Appeals opinion, the defendants presented expert testimony on the central role that fishing for Chinook Salmon plays in Yup'ik culture and spiritual beliefs. The defense

experts testified that according to traditional Yup'ik belief, *Ellam Yua* is the spirit of the universe, consisting of all things in a state of interconnectedness. *Ellam Yua* provides the Yup'ik with the resources they need to survive, and the Yup'ik are expected to work hard to harvest those resources. If the Yup'ik stop fishing for salmon, *Ellam Yua* will take offense, and the salmon will cease to make themselves available (*Phillip II v. State of Alaska ap-2446*).

The experts also testified that along the Kuskokwim River, where all of the defendants lived, Chinook Salmon is regarded as “the most important food.” It is the “apex” fish, and it is irreplaceable. Other fish and other species of salmon are acceptable for eating, but they are not viewed as an adequate substitute for Chinook Salmon, in part because Chinook is the first salmon to return to the Kuskokwim River in the spring, and it arrives during the prime drying season. The testimony also established that Chinook Salmon play a central role in traditional Yup'ik fish camps, which is where Yup'ik spiritual values are taught to the next generation. Based on this expert testimony, the district court judge found that the defendants were sincere in their religious beliefs. But the judge ruled that even assuming the sincerity of each individual defendant’s religious belief, the State’s compelling interest in preserving the Kuskokwim River Chinook Salmon run outweighed that religious interest. In their opinion, the Appeals Court judges said, “Once the district court found the defendants’ fishing in violation of the emergency orders was religiously based conduct, the burden shifted to the State to establish that its compelling interest in preserving the viability of the Kuskokwim king salmon population ‘will suffer if an exemption is granted to accommodate the religious practice at issue’.” In March 2015, the Appeals Court affirmed the decision of the Bethel District Court judge (*Phillip II v. State of Alaska ap-2446*).

In 2013, ADF&G management began by only closing subsistence fishing in lower river Chinook Salmon-bearing tributaries. On June 22, when the run was deemed weak and not just late, ADF&G and FWS managers implemented several drainage-wide closures. The escapement estimate, however, was the lowest on record.

On June 12 and 13, 2014, Yupiit Nations (a consortium of Federally recognized tribes with the core group of Akiak, Akiachak, Tuluksak, and Kwethluk Tribes) met and considered a presentation by the Northwest Indian Fisheries Commission and convened a panel to discuss two Inter-Tribal Fisheries Commission proposals, one for the Kuskokwim River drainage and the other for the Yukon River drainage. One of the products of the meeting was Yupiit Nation Tribal Forum Strategic Plan. In the summary, they stated “there is a real possibility of civil disobedience throughout the main stem of the Kuskokwim River. It is the desire and the goal of Yupiit Nation to obviate this possibility before it happens” (Yupiit Nations 2014). One change in management strategy they requested was a village allocation of salmon implemented jointly by the Office of Subsistence Management and tribes.

In February 2016, The U.S. Fish and Wildlife Service Director in Alaska and the Yukon Delta Wildlife Refuge Manager signed a Memorandum of Understanding with the Kuskokwim River Inter-tribal Fisheries Commission (see **Appendix E**). The agreement was the first formalization of co-management between the Alaska tribes along the Kuskokwim River and the Federal government. The Refuge Manager consults with the Commission before making management decisions in Federal public waters.

Each year since 2013, the Board or the Federal in-season manager has closed the Kuskokwim River drainage to the harvest of Chinook Salmon by nonsubsistence users, and subsistence users have had very little fishing opportunity. Chinook Salmon fishing opportunities, including schedules, openings, closures, and methods in Refuge waters have been implemented by special actions issued by the Federal in-season manager (**Appendix C**). Harvests of fish other than Chinook Salmon have been allowed only with methods allowing live release of Chinook Salmon. In 2014, limited harvests of Chinook Salmon were allowed and fishing opportunity that was allowed occurred primarily through Federal Social and Cultural Permits that allowed harvests of up to 100 Chinook Salmon per community using most gear types. In 2015, it was necessary to close Refuge waters to the harvest of all fish by nonsubsistence users to prevent the incidental harvest of Chinook Salmon in State fisheries targeting other fish species. Subsistence users were allowed to continue using up to 4-inch mesh gillnets targeting other fish species, but nets had to be set and could be used only during three-day opportunities that were announced through special actions. This was to discourage the targeting of Chinook Salmon in small mesh nets intended for the harvest of nonsalmon fish species. Nonsalmon-bearing tributaries were remained open to the use of any size gillnets by subsistence users.

In 2015, each community received a harvest allocation. The drainage-wide harvest quota was 7,000 Chinook Salmon. Specific community allocations were based on each community's share of the average total subsistence harvest of Kuskokwim River Chinook Salmon over 20 years (1990–2009). Designated fishermen were assigned to harvest salmon for each participating community and salmon were distributed to Federally qualified subsistence users. This opportunity was permitted from June 10–30, with no other time or gear restrictions. The Federal in-season manager realized that community allocations were not going to meet subsistence needs, but hoped they would provide an opportunity to harvest a small number of Chinook Salmon and allow for some customary and traditional cultural practices associated with the Chinook Salmon fishery.

In 2015, the Natural Resource Department of Orutsararmiut Native Council, the Federally recognized Tribe in Bethel, organized allocations of Chinook Salmon to over 100 summer fish camps used by Bethel residents who were identified in the Section 804 Subsistence User Prioritization analysis (**see Appendix D**). Designated fishermen harvested salmon that were then distributed to Federally qualified subsistence users without access to fish camps who requested an allocation. Additionally, Orutsararmiut Native Council organized the distribution of Chinook Salmon to Federally qualified subsistence users in upriver communities beyond the Refuge boundary who were unable to legally harvest Chinook Salmon except from Refuge waters.

In 2016, both Chinook and Chum Salmon harvesting from Refuge waters were closed to nonsubsistence users so that the Federal in-season manager could continue implementing schedules, openings, closures, and methods through the timing of the Chum Salmon run, which overlaps the Chinook Salmon run. The Federal in-season manager regulated subsistence fishing by closing and opening Refuge waters to the use of gillnets. Harvests of fish other than Chinook and Chum Salmon were allowed only with methods that allowed live release of Chinook Salmon. The State closed the directed Chinook and Chum Salmon sport fisheries and the State closed the Refuge waters to the use of gillnets.

In 2017 and 2018, Chinook Salmon harvesting in Refuge waters was closed to nonsubsistence users. The Federal in-season manager regulated subsistence fishing by closing and opening Refuge waters to the use of gillnets. Harvests of fish other than Chinook Salmon were allowed only with methods that allowed live release of Chinook Salmon. Gillnet use in non-salmon bearing tributaries remained open to subsistence users. The State closed the directed Chinook sport fisheries in the drainage, and the State closed Refuge waters to the use of gillnets.

### The Impact of Overlapping Salmon-Run Management on Subsistence Users

Management of Chinook Salmon affects management of other species of salmon because run timing overlaps considerably. People have been restricted from salmon fishing or using effective gear types such as large-mesh gillnets in recent years, even when the majority of salmon in the river were Chum and Sockeye salmon. For example in 2017, the drainage was closed to the harvest of Chinook Salmon from May 20 through June 11. From June 12 through July 3, only four opportunities to harvest salmon with gillnets with up to 6-inch mesh were provided: three 12-hour opportunities and one 6-hour opportunity. The opportunity to harvest Chum and Sockeye salmon while live releasing Chinook Salmon was allowed, but users were restricted to dip nets and not 6-inch or larger mesh gillnets that are typically used. Requiring the use dip nets and live release of Chinook Salmon prevented people from harvesting Chum and Sockeye salmon in large enough numbers to fill smokehouses, and prevented people from retaining the few Chinook Salmon they could have caught and killed in their large-mesh gillnets.

### Drying and Smoking Salmon

Hiroko Ikuta and others conducted research on subsistence salmon fisheries in 2012 (see Ikuta et al. 2013). In their report, they describe how people dry and smoke salmon because it is necessary for understanding some of the impacts of early salmon fishing season closures on subsistence users that dry and smoke salmon. The closures occur early in the season, when weather is more likely to be warm and dry. The author discusses why warm and dry weather are necessary to successfully dry and smoke salmon.

Salmon are cut into fillets and various parts of the fish (i.e., fillets, heads, bones, and roe) are processed into different final products. A portion of deboned king [Chinook] salmon fillets are often processed into a popular product known locally as strips. These are made by slicing deboned king salmon fillets in lengthwise strips. The strips are brined, hung to dry in covered, outdoor racks for a few days to a week, then hung in the smokehouse where wood smoke saturates the flesh with preserving compounds and they dry more completely. This method is also referred to as a cold-smoke process, so-called because drying occurs at temperatures sufficiently low to prevent cooking of the fish. Cold-smoking is a process wherein brining, drying, and smoking each contributes to the fish's preservation. Proper drying of fish for preservation in a cold-smoke process cannot occur at high relative humidity. Cold-smoking of strips is one of the preferred processing methods for king salmon in many parts of the Kuskokwim River because individuals of the species tend to be very large. Large, thick fillets will often not dry thoroughly before

spoiling, unless the ambient relative humidity of the fish rack is sufficiently low and the ratio of surface area to mass of the flesh is greatly increased as it is in these strips (Ikuta et al. 2013:124).

Smaller species of salmon such as chum, sockeye, and coho salmon, are often processed into a product known locally as dry fish. In this process, salmon are headed, gutted, and filleted. The fillets are cross-cut through the flesh down to the internal surface of the skin. These fillets are hung on a covered fish rack for several days until dry. The cross-cutting of the fillets increases the ratio of surface to mass of the flesh, allowing quicker and more complete air-drying. It is usually unnecessary for the processors to cut smaller fish into strips, because cross-cutting the thinner fillets sufficiently increases the surface area to mass ratio and allow for drying. Large king salmon fillets are also processed in this fashion by some fishers when weather conditions permit it. Some fishers refer to these as slabs or blankets (Ikuta et al. 2013:124).

## Biological Background

### Run-Size

Estimates of drainage-wide run size are produced by the Chinook Salmon run-reconstruction model. This model uses multiple sources of data such as weir and aerial escapement indices, commercial catch and effort, mark-recapture estimates, and harvest to estimate annual returns (Liller and Hamazaki 2016).

Chinook Salmon abundance in the Kuskokwim River system has been highly variable with cyclical (~10 years) peaks around 400,000 and valleys around 80,000-100,000. The last peak run-size occurred in 2004 with an estimated size of 366,725 Chinook Salmon. Run-sizes have dropped steadily from that peak until reaching an all-time low of 79,238 salmon in 2012. Since 2012, the population appeared to be on a slightly increasing trend with the 2015 estimated run-size at 125,058, the estimated 2016 run-size at 128,855, and the estimated 2017 run-size at 133,267 Chinook Salmon. The preliminary estimated run-size for Chinook Salmon in 2018 was approximately 141,000 (ADF&G 2018). The Chinook Salmon run-size has slowly increased from 2015 to 2018 (**Table 2, Figure 2**).

Direct estimates of total run-size for Kuskokwim River Chinook Salmon are available from 2003–2007 and 2014–2017 through extensive mark-recapture surveys performed by ADF&G. The mark-recapture projects from 2003 to 2007 and in 2014 were performed above Kalskag during above average run abundances (with the exception of 2014), while the 2015 to 2017 projects were performed in the lower Kuskokwim River just above Eek during below average run abundances. Methods for estimating escapement to unmonitored tributaries downriver of the tag site also were changed in 2015 to 2017 (Liller 2017). From 2003 to 2007, direct estimates ranged from 242,000 to 423,000 Chinook Salmon, while 2014–2017 estimates ranged from 78,600 to 133,200 Chinook Salmon (**Table 4**). The mark-recapture estimate for Chinook Salmon in 2017 is 133,200 (CI: 101,500 – 160,274 fish). A direct comparison illustrates that drainage-wide estimates derived from mark-recapture data are, on average, 27% smaller (approximately 42,000 fish) compared to the estimates of total run based on the current published model (Liller and Smith 2018).

The inclusion of the 2014-2017 mark-recapture information into the Chinook Salmon run-reconstruction makes end-of-season management evaluation complicated. The drainage-wide escapement goal for Chinook Salmon in the Kuskokwim River was set in 2013 with only 2003-2007 mark-recapture information to scale the run-size estimates. As stated before, the 2003-2007 mark-recapture projects were done during average to above average run-size years for Chinook Salmon. This means that the scale of the drainage-wide escapement goal would be different (i.e., higher) than that of the run-size estimates produced from the run-reconstruction model with the inclusion of the mark-recapture information from 2014-2017. The only way to produce an updated drainage-wide escapement goal that is on the same scale as the run-reconstruction estimates with 2014-2017 mark-recapture information included, a new spawn-recruit analysis would need to be performed with run-size estimates that include the 2014-2017 mark-recapture information.

An updated run reconstruction model was created and a summary of changes published during 2018 (Liller et al. 2018). The new model uses data collected from a 2014-2017 Chinook Salmon mark recapture project initiated in the lower river, almost doubling the amount of information used for model scaling. The information used in scaling now covers periods of record high and record low run sizes (Liller et al. 2018). The updates resulted in revising the historical estimates down in 34 of the 42 years (81%) and increased in eight years (19%). The estimated annual abundance and drainage wide escapement estimates decreased an average of approximately 11% (14,800) each (**Table 2**: Liller et al. 2018)

In addition to the mark-recapture abundance estimates, ADF&G in 2017 began operating a sonar and drift gillnet apportionment project near Church Slough above Bethel in order to estimate daily and total abundance of adult salmon species returning to the Kuskokwim River. Given that the sonar is located above Bethel, the total abundance reported is in terms of numbers of Chinook Salmon escaping past the Bethel fishery. In order to calculate a total abundance number, estimated Chinook Salmon harvest below Bethel would need to be added to the sonar abundance estimate. The preliminary abundance estimate for Chinook Salmon at the sonar site in 2018 was 103,300 (88,800-117,700 fish) (FWS 2018). As 2017 was the first year the sonar was in full operation, the initial results should be taken into consideration carefully until the project has accumulated enough years' worth of data. The data collected for this project is not currently used in the run-reconstruction for Kuskokwim River Chinook Salmon; however, once enough data is accumulated and any kinks are identified and fixed, the sonar data will be pursued and analyzed as an additional data source to be used in the run-reconstruction.

### Escapement

Chinook Salmon escapement is monitored throughout the Kuskokwim River drainage with a variety of weir and aerial surveys. Six weirs are utilized as data sources in the run-reconstruction model: two in the lower river (Kwethluk, Tuluksak) and four in the upper river (George, Kogruklu, Tatlawiksuk, and Takotna). The ADF&G discontinued the Takotna weir in 2014, but has since restarted the weir again in 2017. Two other weirs in the drainage are not used as data inputs in the run-reconstruction model (Salmon River of the Aniak drainage, Salmon River of the Pitka Fork drainage). In addition to the weir projects, 14 aerial index surveys are utilized as inputs into the run-reconstruction model: three in the lower river



(Kwethluk, Tuluksak, and Kisaralik) and 11 in the upper river (Salmon-Aniak, Kipchuk, Aniak, Holokuk, Oskawalik, Holitna, Cheeneetnuk, Gagaryah, Pitka, Bear, and Salmon-Pitka).

Total escapement estimates follow the same general trend as total run estimates with cyclical peaks and valleys. Average high escapement years were around 250,000 Chinook Salmon, while average low escapements were around 85,000 Chinook Salmon. The last peak was in 2004, with an escapement of around 266,000 fish. After the last peak, the Chinook Salmon escapement dropped to a record low of around 37,000 fish in 2013. Since the record low, escapement has steadily increased although it appears as though the rate of increased escapement is slower than escapement cycles in the past despite heavy restrictions to harvest. Since 2015, conservative fisheries management has led to escapement being in the upper end of the SEG of 65,000–120,000. (**Table 2, Figure 2**) (Smith and Liller 2018).

Tributary Chinook Salmon escapement is monitored through various aerial and ground-based weir surveys throughout the Kuskokwim River drainage. Currently, there are 7 tributaries with escapement goals that are monitored by aerial surveys (Aniak, Cheeneetnuk, Gagaryah, Holitna, Kisaralik, Salmon River of the Pitka Fork, and Salmon River of the Aniak) and three tributaries with escapement goals that are monitored by weir projects (George, Kogruklu, and Kwethluk). For 2018, aerial surveys were flown in all of these systems. Each of the tributaries monitored by aerial surveys had escapements within their established escapement goal range; however, with exception to the Salmon River of the Pitka Fork, the escapements observed for each tributary were on the lower end of their established escapement goals. For 2018, weir surveys were conducted in all the tributaries that have established escapement goals, however the counts from the Kwethluk River were incomplete. The George and Kogruklu River escapements exceeded the lower bound of their goals (ADF&G 2018).

In 2012, Federal and State in-season fisheries managers, with concurrence from the Kuskokwim River Salmon Management Working Group (Working Group), agreed on a drainage-wide escapement goal of 127,000 fish (OSM 2015).

For the 2013 Chinook Salmon fishing season, with a new SEG in place (65,000–120,000 fish), in-season fisheries managers, with concurrence from the Working Group, agreed on managing the fishery with an escapement goal of 85,000 fish. Due to run timing and the return being compressed, few restrictions were placed on Chinook Salmon subsistence harvesting throughout the 2013 fishing season. The resulting overharvest from lack of management actions in-season resulted in the lowest escapement on record (an estimated 37,000 fish) (**Table 2, Figure 2**) (OSM 2015).

In 2014, the Kuskokwim River Chinook Salmon forecast was for a return of 71,000–116,000 fish. In-season fishery managers, with concurrence from the Working Group, agreed to start the fishing season closed to the harvest of Chinook Salmon. At the time, an estimated drainage-wide run size was predicted to be 135,000 Chinook Salmon, resulting in an escapement of 123,987 fish, which was slightly above the upper limit of the SEG (120,000 fish). However, two weir projects in the Kwethluk and Kogruklu rivers failed to reach their tributary-specific escapement goals (OSM 2015). The new run reconstruction model as revised these estimates lower, with a run size near 84,000 and an escapement near 73,000 Chinook Salmon.

In 2015, the Kuskokwim River Chinook Salmon forecast was 96,000–163,000 fish. At the time, the estimated drainage-wide run size was 172,000 Chinook Salmon, which resulted in an escapement estimate of approximately 155,000 Chinook Salmon. This estimate was near average and larger than the SEG of 65,000–120,000 Chinook Salmon (OSM 2015). However, the new run reconstruction model has revised these estimates lower, with a run size near 125,000 and an escapement near 108,000 Chinook Salmon.

In 2016, the Kuskokwim River Chinook Salmon forecast was 125,000–219,000 fish. The Federal in-season manager and the Kuskokwim River Inter-Tribal Fisheries Commission compromised to set a fundamental escapement objective of at least 100,000 Chinook Salmon. Coinciding with that decision, Working Group set an escapement objective of 85% of the upper bound of the SEG (65,000–120,000 fish), which was approximately 102,000 Chinook Salmon. The estimated total Chinook Salmon run size in 2016 for the Kuskokwim River was around 129,000 fish, which resulted in an estimated escapement of around 98,000 fish.

The 2017 Kuskokwim River Chinook Salmon forecast was 132,000–222,000 fish. The Federal in-season manager, compromised with the Kuskokwim River Inter-Tribal Fisheries Commission, to set a fundamental escapement objective of 110,000 Chinook Salmon. The preliminary estimated total run size in 2017 for Chinook Salmon in the Kuskokwim River was around 167,000 fish, which resulted in an estimated escapement of around 150,000 fish. The level of escapement would have been above the upper bound of the SEG of 120,000 Chinook Salmon. However, the new run reconstruction model has revised these estimates lower, with a run size near 133,000 with an escapement near 117,000 Chinook Salmon.

The initial 2018 Kuskokwim River Chinook Salmon forecast was 140,000–193,000 fish (Smith and Liller 2018). However, this forecast was revised following updates to the original run-reconstruction model to 115,000–150,000 fish (Liller et al. 2018). The Federal in-season manager, working with the Kuskokwim River Inter-Tribal Fisheries Commission, set a fundamental escapement objective of 110,000 Chinook Salmon. The preliminary estimated total run size in 2018 for Chinook Salmon in the Kuskokwim River was around 141,000 fish, which resulted in an estimated escapement of around 110,000 fish, although a final estimate has not been published by ADF&G at this time.

#### In-Season Run Timing and Composition

In-season management relies heavily on in-river abundance estimates via test fisheries, creel surveys, effort counts, and pre-season forecasts in order to inform harvest decisions that control subsistence opportunities. The main in-river abundance indicator used during the season is the Bethel Test Fishery. The test fishery has been operated upstream of Bethel since 1984, and provides a long term data set on species composition, relative abundances, and run-timing. There are complications with using data from the test fishery to help in-season management because the test fishery is located upstream of where much of the Chinook Salmon harvest takes place, as well as the fact that in-river abundance during the season is confounded with run-timing. There is also a large amount of variation in historical run-timing, which complicates in-season predictions of run abundance. All of these factors highlight the importance of the pre-season forecast during the early stages of in-season management.

Chinook Salmon enter the Kuskokwim River beginning in late May and continue through early August; with about 85% of Chinook Salmon passing through the Bethel Test Fishery by July 1 (**Figure 3**). The Bethel Test Fishery starts operating around the end of May and continues until late August. The cumulative catch of Chinook Salmon at the test fishery can best be described by a sigmoidal shaped curve (i.e., logistic), and can be utilized to generalize run-strength, run-timing, and species composition (**Figure 3**). From 1984 to 2018, the estimated dates at which 50% of the Chinook Salmon run has passed the Bethel Test Fishery (D50) ranges from June 14 to July 2, with an average of June 22  $\pm$  4 days (**Table 5, Figure 3**). Past research has shown that Chinook Salmon migrating to the upriver portions of the drainage tend to migrate earlier in this range than Chinook Salmon migrating to the middle or lower portions of the drainage (Stuby 2007). This pattern is supported by recent telemetry research on Chinook Salmon in the Kuskokwim River (Liller 2017, pers. comm.). Based on 2018, the run-timing of Kuskokwim River Chinook Salmon was near average (FWS 2018).

Chinook Salmon are the main salmon species moving in the Kuskokwim River in the beginning of the season; however, the composition of the run transitions to Chum and Sockeye Salmon by mid-June (**Figure 4**). From 1984 to 2017, the average date at which the proportions of Chinook Salmon is equal to that of Chum Salmon plus Sockeye Salmon at the Bethel test fishery (1:1 ratio) is June 13 (**Figure 4**). The overall composition of catch by species at the Bethel test fishery is dominated by Chum and Sockeye Salmon, which on average account for 93% of the catch, while Chinook Salmon account for only 7% of the total catch (**Figure 4**).

#### *Early-Season (Pre-June 12) Chinook Run-Timing and Abundance*

Determining the necessity of a closure for Chinook Salmon before June 12 is dependent on biological quantities such as abundance, composition, and run-timing. In order to measure these quantities, projects need to exist during the time frame being considered. The time frames considered range from as early as April to as late as June 12. The only projects collecting data during this period is the Bethel Test Fishery, which has been in continuous operation since 1984 and generally starts collecting data by June 1 every year. As stated in the previous section, the Bethel Test Fishery provides a long-term dataset that collects species composition, relative abundances, and run-timing. However, the relative abundance data is confounded with other factors such as run-timing and harvest that occurs downstream of the Bethel Test Fishery. Changes in harvest patterns downstream of the Test Fishery during restricted periods also make year-to-year comparisons difficult. In addition to these issues, the Bethel Test Fishery has documented large amounts of variation in Chinook Salmon run-timing, making it difficult to use this tool to determine in-season estimates of run-strength in this early period. These various issues require cautious utilization of the information, especially in the early portion of the season. With this in mind, the following is an overview of the variability in the cumulative proportion of Chinook Salmon that have passed the Bethel Test Fishery from June 1 to June 12 across the time series and under various run-timing scenarios. For the following sections please refer to **Figure 5** and **Table 6**.

From 1984 to 2017, the median cumulative proportion of Chinook Salmon passing the Bethel Test Fishery by June 12 was approximately 13%, with most values falling between 6 – 19%. Over this same time period, the minimum cumulative proportion of Chinook Salmon was 0%, while the maximum was

39%. The large variation in the overall cumulative proportions can likely be contributed to run-timing; therefore, to simplify the run-timing issues the information can be stratified into three categories based on run-timing: early, average, and late.

During the five earliest run-timing years (1996, 2014, 1993, 2003, 1994; average D50: June 17), the median cumulative proportion of Chinook Salmon passing the Bethel Test Fishery by June 12 was approximately 23%, with most values falling between 17 – 35%. During these earliest run-timing scenarios, the minimum cumulative proportion of Chinook Salmon was 16%, while the maximum was 39%.

During the five latest run-timing years (2012, 2007, 2017, 1999, 1989; average D50: June 29), the median cumulative proportion of Chinook Salmon passing the Bethel Test Fishery by June 12 was approximately 3%, with most values falling between 1 – 6%. During these latest run-timing scenarios, the minimum cumulative proportion of Chinook Salmon was 0%, while the maximum was 6%.

During the average run-timing years (1987, 2004, 2009, 2016, 2010, 1986; average D50: June 22), the median cumulative proportion of Chinook Salmon passing the Bethel Test Fishery by June 12 was approximately 11%, with most values falling between 5 – 19%. During these average run-timing scenarios, the minimum cumulative proportion of Chinook Salmon was 5%, while the maximum was 24%.

In all of the scenarios above, the cumulative proportion of Chinook Salmon increases in an exponential fashion from June 1 to June 12, with the earliest run-timing scenario having the largest rate of increase, the late run-timing scenarios having the smallest rate of increase, and the average falling somewhere in-between. Additionally, the variability in the cumulative proportion of Chinook Salmon increases daily under each scenario; however, the early run-timing scenario variability is by far the largest, while the late run-timing scenario is the smallest. Across all scenarios, the cumulative proportion of Chinook Salmon by June 1 is less than or equal to 1%. In average or late run-timing years, the cumulative proportion of Chinook Salmon passing the Bethel Test Fishery by June 6 increased to around 1 – 4%, while in early run-timing scenarios the cumulative proportion is much higher, around 4 – 13%.

When viewed in this manner, it becomes readily apparent that run-timing is the most influential factor in determining the proportion of Chinook Salmon that passes the Bethel Test Fishery at any given day between June 1 and June 12. The earlier the run-timing, the more Chinook Salmon are available in the system, while the later the run-timing the less Chinook Salmon are available in the system. However, even within run-timing scenarios, the uncertainty in the cumulative proportion of Chinook Salmon is large; this is especially true under early run-timing scenarios. It is problematic to management that run-timing is so influential in determining the amount of Chinook Salmon passing by the Bethel Test Fishery. This quality poses serious problems because predicting run-timing for Chinook Salmon in the Kuskokwim River drainage is notoriously difficult, both pre-season and in-season.

Advances in forecasting run-timing pre-season for Chinook Salmon in the Kuskokwim River were recently attempted by Staton et al. (2017), using a host of environmental variables to aid in predicting run-timing. Their model predicted an early to average run-timing for the 2017 Chinook Salmon season;

however, the run wound up being about 4 days later than average. During in-season operations, run-timing becomes more informed as the season progresses with more data being collected from the Bethel Test Fishery, but is not well known or approximated until the end of June/beginning of July, by which time most of the run has progressed through the Bethel Test Fishery.

Past research has shown that Chinook Salmon migrating to the upriver portions of the drainage tend to migrate earlier in this range than Chinook Salmon migrating to the middle or lower portions of the drainage (Stuby 2007, Smith and Liller 2017a, 2017b). Tagging studies performed by ADF&G in 2015 and 2016 performed near the confluence of the Johnson and Kuskokwim rivers, showed headwater Chinook Salmon comprised between 50 - 67% of the studies' catches during the end of May/beginning of June, while toward the middle/end of June the same sub-stock only comprised 5% or less of the catch. Additional evidence from the Salmon Pitka Fork weir located in the headwaters of the Kuskokwim River drainage also support this pattern. The absence of a lower river Chinook Salmon subsistence fishery before June 12 for the last three years has resulted in some of the largest Chinook Salmon escapements at the Salmon Pitka Fork weir (6,000 – 8,000 fish from 2015 – 2017). During the traditional timing of the Chinook Salmon subsistence fishery, these headwater stocks likely were harvested at a higher rate than the lower and middle river stocks given that the lower river subsistence fishery prefers harvesting in the early part of June when the headwater stocks are moving through the lower river to their final destination.

The tagging studies in 2015 and 2016 showed that all sub-stocks display similar migration rates. Between the tagging site near the confluence of the Johnson and Kuskokwim rivers to the area near Bethel (rkm 112), tagged Chinook Salmon migrated at a rate between 9 – 16 rkm/day. Chinook Salmon passing between these locations took 3 – 5 days to pass rkm 112 near Bethel. Chinook Salmon migrating pass this point proceed at a faster rate between 31 – 45 rkm/day (Smith and Liller 2017a, 2017b).

### Age Composition

Chinook Salmon returning to the Kuskokwim River drainage usually complete their spawning migration between the ages of 4 and 7, with a majority returning at ages 5 and 6 (Hamazaki et al. 2012). Median brood year recruit age percentages as estimated by the Bayesian state-space spawn-recruit model are around 20% for age 4 fish, 38% for age 5, 39% for age 6, and 3% for age 7 (Hamazaki et al 2012). The sources of age structure for the Bayesian model are a combination of harvest and escapement age data collected by ADF&G through the past commercial fishery, the subsistence fishery, and weir surveys throughout the drainage.

The 2017 Chinook Salmon return saw the arrival of the initial cohort from the 2013 return (4 year olds), which experienced the lowest escapements on record. In 2017, four-year olds composed approximately 30% of the Chinook Salmon run, which is about a 10% increase from historical composition. Five-year olds from the 2012 cohort composed approximately 45% of the 2017 run, which is an increase of about 9% from historical composition; however, six-year olds from the 2011 cohort experienced a decrease in composition to approximately 24%, which is a 15% decrease from historical composition. Seven-year olds from the 2010 cohort composed <1% of the 2017 run, which is a decrease from the historical composition. This lower magnitude trend in seven-year olds has been consistent since 2014 (Smith 2018, pers. comm.). Data for 2018 is not available at this time.

## Population Assessment

The output from the run-reconstruction, along with estimates of harvest and age composition from harvest and escapement is then fed into a Bayesian State Space spawn-recruit analysis (Hamazaki et al 2012). The spawn-recruit analysis produces drainage-wide estimates of productivity, carrying capacity, and age, and recruitment variation. These estimates and the uncertainty around them are then used to derive biological reference points that are used to develop drainage-wide escapement goals for the Kuskokwim River (SEG: 65,000 – 120,000), as well as goals for selected tributaries (Kwethluk, George and Kogrukluk).

### *Management Reference Points*

Biological reference points are representative of a standard by which the stock abundance or exploitation rate can be compared to determine stock statuses. The reference points are calculated using estimated productivity and carrying capacity parameters from the spawn-recruit relationship and are used by ADF&G to help assist in establishing escapement goals for Chinook Salmon in the Kuskokwim River.

The reference points used by State management are: equilibrium escapement producing recruitment equal to escapement ( $S_{eq}$ ), escapement providing maximum sustainable yield ( $S_{msy}$ ), and escapement providing maximum recruitment ( $S_{max}$ ).

Two of these reference points ( $S_{msy}$  and  $S_{max}$ ) are used to calculate approximate yield, which are then used to produce two versions of escapement goals: (1) a range achieving at least 90% of MSY more than 90% of the time and (2) a range achieving at least 90% of maximum recruitment ( $R_{max}$ ) more than 90% of the time.

The decision to use the  $S_{msy}$  or  $S_{max}$  version of the escapement goals depends on the nature of the fisheries that exist. A  $S_{msy}$  based escapement goal is more appropriate where the fishery is dominated by commercial fisheries that have excess fishing power sufficient to harvest all available yields. A  $S_{max}$  based escapement goal is deemed more appropriate where the fishery is dominated by subsistence or sport fisheries that harvest a fixed amount of fish regardless of run size and are attempting to minimize the effort needed to harvest (Hamazaki et al. 2012).

For Kuskokwim River Chinook Salmon, two escapement goal ranges were determined to be 48,400–84,400 Chinook Salmon for  $S_{msy}$  and 68,000–113,600 Chinook Salmon for  $S_{max}$ . The expected yield has less than a 2.5% chance of being less than 100,000 Chinook Salmon for both of these ranges (Hamazaki et al. 2012).

### *Establishing Targets and Limits*

Setting the drainage-wide escapement goal for Chinook Salmon in the Kuskokwim River at 65,000–120,000 was a combination of the two escapement goals mentioned in the above section, which considered the subsistence nature of the fishery and the limited commercial fishery, with an additional consideration for not setting the lower bound of the escapement goal below the lowest historical estimated escapement that has provided recruits sufficient for meeting subsistence harvest needs. This additional

consideration was needed because the lower bound suggested by the escapement goal range based on  $S_{msy}$  was 48,400 Chinook Salmon, which was lower than any escapement ever recorded for this system at the time of the analysis. (Hamazaki et al. 2012). However, the estimated escapement in 2013 has been revised below this point to 36,823 through the updated run reconstruction analysis (Liller et al. 2018).

The escapement goal was reviewed by ADF&G in 2018, but was not recommended for change (Liller and Savereide 2019). The review was deemed necessary due to the recent change in statistical model used by ADF&G to estimate historical run sizes. The revisions to the statistical model resulted in smaller estimates in of drainage wide abundance and escapement, and therefore smaller estimates of total recruits from individual brood years. The same Bayesian state-space spawner recruit analysis was conducted for this review that resulted in the initial 2012 SEG (Hamazaki et al. 2012), with the only difference being updated input data. Changes to the goal were considered not justified as the results were consistent with the past analysis.

The lowest (and deemed most accurate and reliable by ADF&G) estimated escapement that provided enough recruits sufficient for meeting subsistence harvest needs, at the time of the escapement goal review, was approximately 65,000 Chinook Salmon in 2000, which was chosen as the lower bound of the SEG. The upper bound of the SEG was set at 120,000 which was approximately 6,000 more fish than recommended by the  $S_{max}$  based escapement goal. Further analysis shows that the selected SEG with buffers on the lower and upper end provides escapements that have a 95% chance of producing yields greater than 100,000 Chinook Salmon, except when escapements are consistently at 120,000 fish at which yield decreases substantially. The SEG does not have the greatest potential to produce MSY, but it achieves a balance of achieving high recruitments that would have the highest chance of meeting subsistence harvest needs, minimizing subsistence restrictions, and providing harvestable surplus for other fisheries (Hamazaki et al. 2012).

It is important to note that the current assessment of stock-recruitment dynamics for Chinook Salmon in the Kuskokwim River are done on the aggregate stock. In reality, the aggregate stock is composed of a mixture of stocks that spawn in tributaries throughout the drainage. Tributary escapement goals are in place to help monitor sub-stock populations; however, these are not based on separate stock-recruitment analyses, but are calculated by the relative size of escapement in comparison to the drainage-wide escapement (Hamazaki et al. 2012). These sub-stocks have their own productivities and carrying capacities associated with them; however, lack of stock identification techniques for harvest make separate stock-recruitment analyses difficult. At this point, assessments on sub-stock populations have not been completed and research is ongoing (Connors et al. 2016). The protection of weak-stocks is important for Chinook Salmon stocks in the Kuskokwim River because biodiversity in Chinook Salmon biology acts to buffer population production at aggregate scales of complexity by spreading the risk of poor production across a diverse set of populations and life histories (Schindler et al. 2010).

Another important consideration is that the current escapement goal has only been in place for four years and the escapement that resulted from the years in which the escapement goal was established are just now beginning to return to the Kuskokwim River (5 year olds in 2018 from the 2013 brood year, 5 year olds in 2019 from 2014 brood year). The first year in which a majority of the ages (4–7 year olds) of a

return will be from time periods in which the current escapement goal (2013-present) was managed will be 2020, while the first year in which a majority of ages (4–7 year olds) of a return will be from time periods of conservative management (2014-present) will be 2021.

### Pre-Season Forecast

Prior to 2012, ADF&G did not produce a formal forecast for Chinook Salmon or any other salmon species. Instead, the State produced broad expectations of salmon abundance based on parent-year escapements and recent year trends. The ADF&G would then typically provide an approximation of available surplus for commercial harvest (Liller 2017, pers. comm.).

In 2012 and 2013, a formal forecast was made for Chinook Salmon using a multi-model approach that relied on sibling and spawner-recruit relationships. A variety of competing models were evaluated for each age class and the model with the best fit was used. Age-class estimates were summed (Liller 2017, pers. comm.).

The current pre-season forecast run-size ranges for Chinook Salmon in the Kuskokwim River are produced by a method in which the range is equal to the prior year run-size plus or minus the recent seven-year average percent deviation of subsequent year runs. The average percent deviation is not a fixed value; rather it varies as a function of similarity in run-sizes observed, which recently has been around 25% (Liller 2017, pers. comm.). Since 2014, the average percent deviation has fluctuated between 24 – 27%; however, in 2018 the average percent deviation dropped to approximately 15%. The reason for this sudden decrease is that the recent seven-year average has shifted to a time periods that includes times in which the Chinook Salmon run sizes have been smaller and more consistent in magnitude. This trend will continue if variability in run sizes remains low for the foreseeable future.

The pre-season forecast is usually produced in March because of the time it takes to summarize data coming from the post-season subsistence harvest surveys that occur from September through early November. A total run estimate is produced by late February following summarization of harvest data, pre-season forecast methodology is used to predict the next year's run-size range in March, and pre-season management strategies for that year are formulated based on that prediction (FSB 2017). Additional information is used to develop pre-season management strategies such as recent year's abundance trends, stock productivity, age-class relationships, and other abundance information (Liller 2017).

As of 2018, the current methodology is surprisingly accurate as total run abundances have fallen in or near the pre-season forecast range in every year since 2014 (**Table 7**). This result is a product of an era of low run size returns and extremely low variability in run sizes that the Kuskokwim River Chinook Salmon have resided in since 2010. The 2019 Kuskokwim River Chinook Salmon forecast is 115,000–150,000 fish (**Appendix F**).



### *2019 Pre-Season Forecast Compared to SEG*

To date, the only information available to help inform management about the 2019 Chinook Salmon return is the pre-season forecast, which for 2019 is 115,000 to 150,000 fish. It is widely known that Chinook Salmon begin their migration into the Kuskokwim River around the end of May/beginning of June. In-season data collection at the Bethel Test Fishery does not typically begin until the end of May/June 1 and even with that, the Bethel Test Fishery does not become a useful management tool until run-timing is approximated at the end of June or in early July). It is important to note that there are no current projects that can help inform management when and where Chinook Salmon are located until salmon begin migrating past the Bethel Test Fishery. These issues amplify the importance of the pre-season forecast in the early season management of Chinook Salmon in the Kuskokwim River. With the forecast being the only tool available for the 2019 Chinook Salmon season, it is possible to look at the potential allowable harvest for Chinook Salmon. Potential allowable harvest can simply be calculated by subtracting escapement targets from the lower, middle, and upper bounds of the SEG from the lower and upper bounds of the pre-season forecast. This allows for the comparison of potential allowable harvest to the historical range of Chinook Salmon subsistence harvest during unrestricted times between 1990 and 2009 (67,596 – 109,778 fish, **Table 2** and **Table 3**).

To begin this comparison, we created three scenarios. First, if managing for escapement near the lower quartile of the SEG (65,000 – 79,000 fish), potential allowable harvest ranges from 36,000 to 85,000 Chinook Salmon for any of the run-sizes found within the pre-season forecast. This potential allowable harvest range for the Chinook Salmon subsistence fishery in 2019 is partially within the historical range of Chinook Salmon subsistence harvest during unrestricted times (from 67,596 fish to 109,778 fish). Next is the second scenario. If managing for escapement near the middle of the SEG (92,500 fish), potential allowable harvest ranges from 22,500 to 57,500 Chinook Salmon for any of the run-sizes found within the pre-season forecast. This potential allowable harvest range for the Chinook Salmon subsistence fishery falls below the historical range of Chinook Salmon subsistence harvest during unrestricted times. And finally, if managing for escapement near the upper quartile of the SEG (106,000 – 120,000 fish), potential allowable harvest ranges from 0 to 30,000 Chinook Salmon for any of the run-sizes found within the pre-season forecast for the 2019 season. The majority of the potential allowable harvest range for the Chinook Salmon subsistence fishery in 2019 is below the historical range of Chinook Salmon subsistence harvest during unrestricted times.

These three scenarios demonstrate the impact of the subsistence fishery on whether the SEG is achieved, thereby conserving healthy populations of Chinook Salmon. Given the pre-season forecast methodology, the likelihood of any of these scenarios is impossible to calculate; however, it is clear that if management targets escapement near the upper quartile of the SEG (106,000 – 120,000 fish), then there are many scenarios in which the Chinook Salmon run in the Kuskokwim River may not be large enough to provide for an unrestricted subsistence fishery in 2019. The Chinook Salmon subsistence fishery has been managed for escapement near the upper quartile of the SEG since 2014, and both Federal and State managers have noted that a conservative management approach is warranted in 2019.

## Harvest History

### Commercial

The beginnings of the commercial salmon fishery on the Kuskokwim started in the 1800s (Brown 1983, Oswalt 1990). The exportation of salmon commercially harvested from the Kuskokwim area has occurred since about 1935 (Pennoyer et al. 1965); however, the fishery did not mature until statehood. During the 1960s and 70s, commercial salmon fisheries in the Kuskokwim area were considered experimental and were managed using adaptive fisheries management. The directed Chinook Salmon commercial fishery was formally closed in 1987 to insure subsistence needs were met, but incidental catch in the Chum and Sockeye Salmon fisheries was still allowed (Schindler et al. 2013). Incidental harvest of Chinook Salmon in the Chum and Sockeye fisheries are limited to 50,000 fish (Hamazaki et al. 2012).

Commercial Chinook Salmon harvest in the Kuskokwim River averaged 23,000 per year during the 1960s and peaked in the 1980s with an average annual harvest of around 39,000 fish. From the 1990s to present commercial harvest of Chinook Salmon has dropped drastically from a peak of around 53,000 fish in 1990 to 0 fish in 2018. The average harvest during this period was around 9,800 Chinook Salmon (**Table 2, Figure 1**; Liller and Smith 2018).

### Subsistence

The Kuskokwim River Chinook Salmon subsistence fishery is the largest in Alaska. Before 1990, annual harvest surveys employed various non-standard, ad hoc methods that were not always comparable between years. In 1990, a formal statistical survey protocol was established (Walker and Coffing 1993, Simon et al. 2007). Since 2009, the harvest of Chinook Salmon has been restricted during most years. From 1990 to 2016, annual subsistence harvest averaged 73,303 fish, with a range of 67,596 fish in 2000 to 109,778 fish in 1990. Since 2009, the annual subsistence harvest has gone down, including the lowest annual harvest on record in 2014 of 11,234 fish (**Table 2, Figure 1**). The most recent five-year (2013–2017), ten-year (2008–2017), and 20-year (1998–2017) average annual subsistence harvest estimates for Chinook Salmon are: 24,305 fish, 44,883 fish, and 63,234 fish, respectively (**Table 3**, Liller and Smith 2018). The Chinook Salmon subsistence harvest for 2017 was 16,380 fish (Liller and Smith 2018). Annual harvest estimates by village for the time period 2006–2016 are reported in **Table 1**. The 2018 estimates of harvest by village are not yet available. The majority of harvest has occurred in the lower river, where the majority of the human population of the drainage resides (**Table 8**).

## Section 804 Subsistence User Prioritization Analysis

The following sections address the closure under ANILCA Section 804, which the proponent requested the Board to implement. For Chinook Salmon in the Kuskokwim River drainage, the Board has delegated the Federal in-season manager the authority to close Refuge waters to nonsubsistence uses and to close Refuge waters to all uses, but not to implement a closure under Section 804 establishing a priority among subsistence users.

Section 804 of ANILCA, 36 CFR 242.17, and 50 CFR 100.17 of Federal regulations mandate that the taking on Federal 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. Section 804 of ANILCA and Federal regulation at 36 CFR 242.17 and 50 CFR 100.17 further require that 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 subsistence uses, such a priority shall be implemented through appropriate limitations based on the application of the following three criteria: (1) customary and direct dependence upon the populations as the mainstay of livelihood, (2) local residency, and (3) the availability of alternative resources. The following sections address these criteria as they relate to each of the communities included in the customary and traditional use determination for Chinook Salmon in the Kuskokwim River drainage.

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 Chinook Salmon in the Kuskokwim River drainage. The area includes 40 villages (**Table 1**).

#### Sources of Information

Published ethnographic studies of the communities that have a customary and traditional use determination for Chinook 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 comprehensive (includes the use of all wild resources) household harvest surveys are reported in the Community Subsistence Information System, an online database, Division of Subsistence, ADF&G (2014b). The FWS/ADF&G permit reporting system is another source, but it is not widely used by residents of the Kuskokwim River drainage. Finally, drainage residents report their harvests of salmon during annual household harvest surveys that are described in Lipka and Tiernan (2018) (**Table 8, Figure 6**). The primary purpose of comprehensive household harvest surveys is to document subsistence uses of wild resources. These quantitative studies focus on one-year time periods; 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 (for example, salmon and nonsalmon fishes). 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 by community and through time (**Table 9**).

The sections below describe the customary and traditional harvest and use of Kuskokwim River drainage populations of Chinook Salmon, the degree of local residency of subsistence users, and the availability of subsistence resources as an alternative to Kuskokwim River drainage Chinook Salmon.

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

### *1. Residents of South Kuskokwim Bay*

*Goodnews Bay, Quinhagak, and Platinum*—Chinook Salmon are a mainstay of the subsistence economy for the villages; however, Chinook Salmon are harvested from drainages nearby the villages including the Kanektok, Goodnews, and Arolik rivers and not from the Kuskokwim River drainage (**Tables 8 and 9, Figure 6**, La Vine et al. 2007). Salmon spawn locally in the Kanektok, Goodnews, and Arolik river drainages, first arriving in May. Historically, people harvested 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 at the mouth of the Kuskokwim River. Some people chose to move to Eek while others moved to Quinhagak (La Vine et al. 2007).

### *2. Residents of Nelson Island, Newtok, and Chefnak*

*Newtok, Nightmute, Tununak, and Toksook Bay*—Chinook Salmon are not a mainstay of the subsistence economy. These villages rely more on herring, nonsalmon fishes, and marine mammals than they do on salmon. Salmon are harvested, but from marine waters closer to the villages and not from the Kuskokwim River drainage (**Tables 8 and 9, Figure 6**, Fienup-Riordan 1983, Wolfe et al. 2012)

Herring, other nonsalmon fishes, and marine mammals are harvested at high levels by Nelson Island people. Tununak and Toksook Bay are located near 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 level, 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 9**, Fienup-Riordan 1983, Wolfe et al. 2012).

*Chefnak*—Chinook Salmon are a mainstay of the subsistence economy. People at Chefnak, 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 and marine mammals are likely harvested at high levels also (Fienup-Riordan 1983, Pete 1984). The people of Chefnak 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 Chefnak near the new Bureau of Indian Affairs school. People at Chefnak began harvesting herring from areas near their village fairly recently (before 1984) (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 four days by boat. Outboard motors shortened travel time. Currently, a few Chefnak families still travel to their Kuskokwim River fish camps to harvest, process, and preserve Chinook Salmon. A few people

retain salmon from their commercial harvests in Bristol Bay. They harvest a mixed variety of Chinook, Chum, Sockeye, and Coho Salmon from near-shore waters of Etolin Strait and Cape Vancouver. 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 840 salmon, 141 harvested from the Kuskokwim River, the majority Chum or Sockeye Salmon. More than half the Chinook Salmon was harvested in the Kuskokwim River (95 fish). 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*—People at Mekoryuk do not rely on Chinook Salmon as a mainstay of the subsistence economy (Pete 1984, Drozda 2010, Wolfe et al. 2012). They harvest large numbers of nonsalmon fishes and marine mammals also. 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 (Pete 1984, Drozda 2010, Wolfe et al. 2012). 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 herring are less predictable and harder to locate in harvestable numbers. Historically, the arrival of herring coincided with walrus hunting season. In 2011, during a house to house harvest survey, people reported harvesting only Chum, Coho, and Pink Salmon. 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*—Chinook Salmon are a mainstay of the subsistence economy for the villages and are harvested from the Kuskokwim River drainage (**Table 8, Figure 6**, Stickney 1983). 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 nine 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. Since the 1980s, people generally have not moved to fish camps in the lower Kuskokwim River. 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 salmon retained from their commercial catches. People do not have access to other runs of Chinook Salmon. Salmon are dried and smoked in June and July. August is generally rainy, and not favorable for drying. In 1983, the combined harvest of Chinook and Chum Salmon usually numbered in the several hundred per household (Stickney 1983).

*Kipnuk*—Chinook Salmon are a mainstay of the subsistence economy (**Figure 6**, Wolfe et al. 2012). 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 also 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 estimated salmon harvest was from the Kuskokwim River, and 95% of Kipnuk's Chinook Salmon harvest of 479 fish was from the Kuskokwim River (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 three days. In recent years, a few Kipnuk families still travel to their 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 (Wolfe et al. 2012).

##### *5. Residents of the Lower and Middle Kuskokwim River Drainage*

*Tuntutuliak and Eek*—Chinook Salmon harvested from the Kuskokwim River drainage are a mainstay of the subsistence economy in these villages (**Tables 8 and 9, Figure 6**, Ray et al. 2010, Ikuta et al. 2013). Eek is located on the Eek River about 12 miles from the Kuskokwim River. In the 1930s, many people moved to the present site seeking refuge 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 *Qukaqlircaraq* settlement, situated inland, when a school was built at the present site of Tuntutuliak. The site is not located in an area that was heavily 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 (Ray et al. 2010, Ikuta et al. 2013).

When their historically-used fish camps situated at the mouth of the Kinak River eroded out, most families began harvesting, processing and preserving salmon from seasonally occupied fish camps situated directly across the Kuskokwim River from the Kinak River until the 1950s. 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 are the most popular eating fish. People dry Chinook Salmon when the weather is ideal in order to produce the best possible fish for winter. A resident of Tuntutuliak said in 2012, “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*—Chinook Salmon harvested from the Kuskokwim River drainage are a mainstay of the subsistence economy in these villages (**Tables 8 and 9, Figure 6**, Oswalt 1959). The site of Napaskiak was a seasonally occupied camp. The semi-permanent winter village, called “Oovingiyuk,” was a mile upriver. It was partially washed away before 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), *Painguiq* (along the lower Johnson River) and “Akuleruk,” moved to Napaskiak. Close ties exist 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, according to an observer (Oswalt 1959). 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 Atmautluak, Bethel, Kwethluk, Akiachak, Akiak, Tuluksak, Lower Kalskag, and Kalskag*—People rely most on Chinook Salmon as the mainstay of the subsistence economy in these villages. They harvest salmon from the lower Kuskokwim River drainage almost exclusively (**Tables 8 and 9, Figure 6**, Andrews and Peterson 1983, Andrews 1989, Coffing 1991, Coffing et al. 2001, Brown et al. 2012, Brown et al. 2013, Ikuta et al. 2013). These communities rely on the harvest of fish, economically, spiritually, and as a matter of survival. They rely the most on salmon. The salmon runs have generally been consistent, predictable, and large, and people organize their economic, spiritual, and social lives around harvesting, processing, and preserving salmon. People process much 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, during the period when all winter travel was by dog sleds. Occasional harvests of Chinook Salmon were preserved for human consumption and not as feed for dogs. People preserved Chum, Sockeye, and Coho Salmon for later use by drying and smoking it. Chum, Sockeye and Coho Salmon were available for harvest in July and August when periods of wet weather were typical, and when drying and smoking salmon took 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 (Oswalt 1959, Andrews and Peterson 1983, Brelsford et al. 1987, Andrews 1989, Coffing 1991, Coffing et al. 2001, Ray et al. 2010, Brown et al. 2012, Brown et al. 2013, Ikuta et al. 2013).

*Aniak*—People rely on Chinook Salmon as the mainstay of the subsistence economy (**Tables 8 and 9, Figure 6**, Brelsford 1987, Brown et al. 2012). People at Aniak harvest Chinook Salmon from the middle and upper 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*—People rely on Chinook Salmon from the Kuskokwim River drainage as the mainstay of the subsistence economy (**Tables 8 and 9, Figure 6**, Oswalt 1980, Brown et al. 2012). 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 people 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. People sometimes travel as far as Bethel to harvest salmon (Oswalt 1980, Brown et al. 2012).

#### *6. Residents of the Upper Kuskokwim Drainage*

*Crooked Creek*—People rely on Chinook Salmon from the Kuskokwim River drainage as a mainstay of the subsistence economy (**Table 8, Figure 6**, Oswalt 1980, Brelsford et al. 1987, Brown et al. 2012). Crooked Creek is situated at the confluence of Crooked Creek and the upper Kuskokwim River. Historically, Crooked Creek was at the intersection of Central Yup’ik, Deg Hit’an, and Dena’ina cultures and languages. Historically, people moved to seasonal fish camps near 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 salmon at the mouths of the George and Oskawalik rivers. They process and preserve salmon at fish camps that are located nearby their homes at Crooked Creek (Oswalt 1980, Brelsford et al. 1987, Brown et al. 2012).



*Red Devil and Sleetmute*—People rely on Chinook Salmon from the Kuskokwim River drainage as a mainstay of the subsistence economy (**Table 8, Figure 6**, Brelsford et al. 1987, Brown et al. 2012). Red Devil along the upper 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 salmon at sites nearby their homes. People harvest salmon also from the George and Holitna rivers (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 three 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*—People rely on Chinook Salmon from the Kuskokwim River drainage as a mainstay of the subsistence economy (**Table 8, Figure 6**, Oswalt 1980; Kari 1983, 1985; Brown et al. 2012). Stony River village is located on the upper Kuskokwim River two 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 of their subsistence diet. Salmon are harvested from the upper Kuskokwim River mainstem and Stony River. Lime Village is located well off the mainstem middle Kuskokwim River along Stony River. For Lime Village, moose and caribou are a mainstay of the subsistence economy also (Oswalt 1980; Kari 1983, 1985; Brown et al. 2012).

## 7. Residents of the Kuskokwim River Headwaters

*Nikolai, Takotna and Telida*—Chinook Salmon from the Kuskokwim River drainage are a mainstay of the subsistence economy. People are also highly dependent on their harvests of moose (**Tables 8 and 9, Figure 6**).

Nikolai, Takotna, and Telida are primarily Upper Kuskokwim Athabascan villages. Many people moved to Nikolai after 1948 when the first school was built. In the 1990s, the school at Telida closed and most residents moved to Nikolai.

Prior to the adoption of snowmachines, many residents of Nikolai and Telida spent a large part of each summer using fish wheels to harvest chum salmon to be used as dog food (Stokes 1985:61). At Alaska Statehood, subsistence salmon fishing regulations changed and fish fences that had been used before this

to harvest king salmon became illegal (Holen et al. 2006:93). This regulatory change led to the replacement of fish fences with a rod and reel subsistence king salmon fishery that, along with the harvest of king salmon with set gillnets, currently yields a large portion of Nikolai's total wild food harvest.

The seasonal pattern of salmon fishing in Nikolai has changed from harvesting multiple salmon species over the entire summer to emphasizing mainly king salmon from late June until mid-July. Fishing other salmon species continues for some residents into August or September (Ikuta et al. 2013:106).

Some people continue to harvest, process, and preserve salmon at fish camps. Others stay in the villages. People travel to Chinook Salmon harvesting locations along the Little Tonzona River, Big River, Blackwater Creek, and Salmon River. Some also harvest Chum and Coho Salmon (Collins 2004, Williams et al. 2004, Ikuta et al. 2013).

*McGrath*—Chinook Salmon are a mainstay of the subsistence economy in the community. People are also highly dependent on their harvest of moose (**Tables 8 and 9, Figure 6**, Ikuta et al. 2014). McGrath is situated in the headwaters area of the Kuskokwim drainage at the mouth of Takotna River, and the site was used seasonally by Upper Kuskokwim Athabascans. Non-Native people moved to the area primarily to mine. A large airstrip was built in 1940 during World War II. McGrath has developed into the region's hub of government, trade, and transportation. The Federal Aviation Communication offices closed sometime after 1990, and personnel moved from the community, lowering the community population somewhat (**Table 1**). Salmon harvesting locations include downriver areas where salmon are fresher and higher in oil content, such as the Swift and Takluitsik rivers. More Chinook and Coho Salmon are harvested than Chum and Sockeye Salmon (Ikuta et al. 2014).

## 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 Chefnak, and farthest west are the villages of Nelson Island and Nunivak Island. For south Kuskokwim Bay, the village nearest to the mouth of the Kuskokwim River 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 Chefnak are discussed regarding Criterion 3 because it has not been shown that other rural communities rely on Chinook Salmon that they harvest from the Kuskokwim River drainage as a mainstay of livelihood. The following description of the availability of wild resources other than Chinook Salmon relies on ethnographic sources, harvest surveys, and wildlife population assessments in ADF&G management reports.

In research conducted between 2009 and 2011, residents of lower Kuskokwim River drainage communities harvested high levels of nonsalmon fishes, 23–46% of their annual harvest of all wild resources in lbs. edible weight (**Table 9**). Harvest levels in other resource categories, such as large land mammals and birds and eggs, were considerably lower. Nonsalmon fishes harvested by residents of communities in the lower river 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 2014b, Ray et al. 2010). Typically, communities in the middle and upper Kuskokwim River drainage, from Lower Kalskag to Nikolai, reported harvesting nonsalmon fishes at a lower rate 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 2014b, 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. Some Chum, Sockeye, and Coho Salmon are available locally, primarily in marine waters. A small and growing population of moose is 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 Chinook 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 Chinook Salmon runs there. As alternatives to Kuskokwim Chinook Salmon, wild resources available for harvest include other salmon, 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 the Kuskokwim River drainage, including 28 communities, and additionally Kwigillingok, Kongiganek, Kipnuk, and Chefornak have the highest customary dependence on Chinook 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: Chefornak, Kipnuk, Kongiganek, Kwigillingok, Tuntutuliak, Eek, Napakiak, Napaskiak, Kasigluk, Nunapitchuk, Atmautluak, 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 Chinook Salmon at higher levels than other resources (such as other salmon, 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 alternative resources that can be harvested, processed, and preserved in numbers large enough to replace Chinook Salmon as a mainstay of livelihood.

All of the 32 villages included in the Section 804 Subsistence User Prioritization analysis are small enough to organize for the harvest of an allocation of Chinook Salmon at the community level, with the exception of Bethel. Bethel, with a population of over 6,000, based on the 2010 U.S. Census (**Table 1**, ADCCED 2014), comprises almost half (40%) of the eligible subsistence users. In such circumstances, Federal subsistence 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 (50 CFR 100.17 Determining priorities for subsistence uses among rural Alaska residents). In order to address the unique characteristics of Bethel, staff further analyzed the dependence of Bethel residents on Chinook Salmon and their eligibility to harvest Chinook Salmon in **Appendix D**.

#### **Allocation**

In 2015, 2016, 2018 and this year 2019, proponents of special action requests to the Board to close Refuge waters to the harvest of Chinook Salmon by non-subsistence users have also requested the implementation of an allocation system. In these cases before the Board, the allocation system has been

viewed as an alternative to the race to harvest fish, also called derby fishing that results when short opportunities for harvest are provided, and a tool for management in which local communities play vital role. Community harvest limit and reporting systems, whereby allocations are made in the form of community harvest limits, are described in Federal regulations (36 CFR 242.6 and 50 CFR 100.6: Licenses, permits, harvest tickets, tags, and reports). Best practices advise careful consideration be given to operational planning describing, for example, if a permit will be used and if so how will it be distributed, who will be key personnel, how will data be stored, and how will it be reported to the public (Fall and Shanks 2000).

If the Board approved the implementation of an allocation strategy, 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 32 communities eligible to harvest Chinook Salmon. It would be recommended that such an allocation be based on each community's 20-year (1990–2009) average harvest of Chinook Salmon (totaling 87,056 drainage-wide). The period 1990–2009 is considered the best representation of historical salmon harvests and was used to determine community allocations of Chinook Salmon in 2015. Before 1990, annual harvest surveys employed various non-standard, ad hoc methods that were not always comparable between years. In 1990, a formal statistical survey protocol was established (Walker and Coffing 1993, Simon et al. 2007). Since 2009, the harvest of Chinook Salmon has been restricted during most years. Since 2010, the Chinook Salmon subsistence fishery has had some of its lowest runs on record and harvest restrictions have been implemented most years. Therefore, these years were excluded from the calculation of community Chinook Salmon allocations in 2015, and it is recommended that calculations of average harvest continue to be based on the 20-year period between 1990 and 2009.

In 2015, a combination of Community Harvest Permits and the use of designated fishers were employed to allocate up to 7,000 Chinook Salmon to Federally qualified subsistence users in the 32 communities. In Bethel, harvested Chinook Salmon were distributed to registered fish camps and Bethel residents without access to fish camps who requested an allocation. This process resulted in an updated list of 238 registered fish camps by May 18, 2016 (Joseph 2016, pers. comm.). Approximately 1,677 Chinook Salmon were harvested out of 2,086 Chinook Salmon (80%) allocated to Bethel residents in 2015. Within the other 31 communities, a Community Harvest Permit was issued to a community representative identified by the local tribe and was responsible for assigning designated fishers to harvest Chinook Salmon and distribute them in the community. For the 31 communities, a total of 2,948 out of 4,012 Chinook Salmon allocated (73%) were harvested (FWS 2015d).

For the 2019 season, if the Board approved the implementation of an allocation strategy, it would be recommended that the use of designated fishers to target Chinook Salmon during harvest opportunities would not be required.

### **Effects of the Request**

If this special action request is approved, the Board would close Refuge waters to the harvest of Chinook Salmon from June 1, 2019, through July 1, 2019, except by subsistence users identified in the Section 804

Subsistence User Prioritization and fishing under the terms and authority of a community harvest permit, unless superseded by subsequent special actions. Community harvest limits would be based on each community's share, or allocation, of the average subsistence harvest of Chinook Salmon over a 20 year period (1990–2009), as was done in 2015. Allocation may provide more opportunities to harvest Chinook Salmon than would otherwise be provided.

In 2015, the Federal in-season manager opened the Kuskokwim River main stem and the Eek River to the harvest of Chinook Salmon using most legal methods by subsistence users in possession of a Federal Community Harvest Permit. The Community Harvest Permit Program was voluntary and communities did not have to participate. The permit was issued to a community representative, identified by the tribe, who was responsible for overseeing the community fishery. There were no other time or gear restrictions. The Community Harvest Permit expired and became invalid once the community harvest quota was achieved or on July 1, whichever came first (FWS 2015c).

In 2015, in Bethel the Natural Resource Department of Orutsararmiut Native Council, the Federally recognized Tribe in Bethel, organized allocations of Chinook Salmon to over 100 summer fish camps used by Bethel residents who were identified in the Section 804 Subsistence User Prioritization analysis (see **Appendix D**). Additionally, Orutsararmiut Native Council organized the distribution of Chinook Salmon to subsistence users in upriver communities beyond the Refuge boundary who were unable to legally harvest Chinook Salmon except from Refuge waters.

If this special action request was not approved by the Board, then State subsistence and sport fisheries targeting Chinook Salmon and the directed Chum Salmon commercial fishery would be closed prior to June 11. State regulations now mandate that Chinook Salmon fisheries be closed through June 11 every year. The Kuskokwim Salmon Management Working Group, who for the past several years recommended the start date of this front end closure, will not meet prior to the April 15-18 dates set for the Board to take action on this request. As such, the specific dates for that closure will not likely be determined before Board action on this request.

Before June 12, ADF&G would issue an emergency order for at least one fishing period per week with 4-inch or less mesh set gillnets for the purpose of allowing subsistence harvest of non-salmon fish species. All Alaska residents would be eligible to participate in State subsistence fisheries.

If the Board did not approve this special action request, the Federal in-season manager could close Refuge waters to the harvest of Chinook Salmon except by subsistence users through their delegated authority from the Board. This would mean Chinook Salmon fishing opportunities including schedules, openings, closures, and methods would be determined by the Federal in-season manager in consultation with the Kuskokwim River Inter-Tribal Fisheries Commission and other fishery managers including State and tribal interests, and decisions would be coordinated with the Office of Subsistence Management to ensure proposed actions were aligned with Federal subsistence regulations and policy. The Federal in-season manager could issue special actions providing more subsistence opportunity than would otherwise be provided under State management.

## OSM Conclusion

**Approve** Temporary Special Action FSA 19-02 **with modification** to include language “the in-season manager will collaborate with Federally qualified subsistence users, as identified in the Section 804 Subsistence User Prioritization Analysis, to provide Chinook Salmon harvest opportunities through a mutually agreed upon allocation system.”

The modified regulation should read:

§\_\_\_\_.27(e)(4) Kuskokwim Area—Fish

*(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.*

***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 Salmon, except by Federally qualified subsistence users who are residents of the Kuskokwim River drainage and the villages of Chefornek, Kipnuk, Kwigillingok and Kongiganek, effective on June 1, 2019 through July 1, 2019. The in-season manager will collaborate with Federally qualified subsistence users identified in the Section 804 prioritization to provide Chinook Salmon harvest opportunities through a mutually agreed upon allocation system.***

## Justification

The preseason forecast is for an estimated 115,000 to 150,000 Chinook Salmon for the 2019 season. As the escapement goal range is 65,000 to 120,000 Chinook Salmon, there is a possible harvest range of 0 to 85,000 fish depending on the target escapement set by the Federal in-season manager. Harvest opportunity for Federally qualified subsistence users will likely need to be restricted during the 2019 season to conserve healthy populations of Chinook Salmon in the Kuskokwim River drainage. Managers have addressed similar Chinook Salmon conservation concerns over the past five years by providing limited harvest opportunities that have negatively impacted Federally qualified subsistence users and the continuation of subsistence uses. Historically, in a typical season, subsistence users would participate in an unrestricted fishery. The average annual harvest of Chinook Salmon from 1990-2009 was 86,418 fish. From 2010 on, returns have fallen below historical run sizes and more rigorous restrictions on harvest have been implemented. While the 2018 harvest estimates have not yet been finalized, the 2013-2017 average has been limited to 24,305 Chinook Salmon.

The negative impacts that low Chinook Salmon run sizes and limited harvests have had on Federally qualified subsistence users, combined with the current Chinook salmon preseason run-size forecast, call for an immediate closure to the harvest of Chinook Salmon by non-Federally qualified users. Chinook Salmon fishing opportunities in Refuge waters should be directed by the Federal in-season manager throughout the season to provide a Federal subsistence priority.

Approving this temporary special action request as modified by OSM will reduce the pool of eligible users of Chinook Salmon to only Federally qualified subsistence users identified in a Section 804 Subsistence User Prioritization, which includes residents of the Kuskokwim drainage and four coastal communities of Chefornak, Kipnuk, Kongiganek, and Kwigillingok. These are the communities that have been shown to have the highest customary direct dependence on Chinook Salmon in the Kuskokwim River drainage. The approval of this portion of the request complies with ANILCA Section 804, which provides a step down approach to closing and opening Federal subsistence fisheries.

Approving this request as modified would provide flexibility to the Federal in-season manager to manage the run during the season while also providing a limited harvest opportunity for Chinook Salmon. Harvest opportunity would be based on a harvest allocation system that focuses on the accepted harvestable surplus of Chinook Salmon and reflects a mutually agreed upon allocation approach developed through consultation with Federally qualified subsistence users, the Kuskokwim River Inter-tribal Fisheries Commission, and other managers.

### **Comparison of Fisheries Special Action Requests FSA19-02 and FSA19-03**

There have been two temporary Federal special action requests submitted to the Federal Subsistence Board regarding fisheries in the Kuskokwim River drainage (FSA19-02 and FSA19-03) for the 2019 season. Temporary special action request FSA19-02 was submitted by the Akiak Native Community on March 4, 2019. Temporary special action request FSA19-03 was submitted by the Organized Village of Kwethluk and was received by the Office of Subsistence Management on March 29, 2019. This document outlines the similarities and differences between the two requests.

#### Similarities

- Temporary special action requests FSA19-02 and FSA19-03 both request the harvest of Chinook Salmon to be restricted to Federally qualified subsistence users during the 2019 season.
- Both request a closure date of June 1, 2019
- Both request the Board to further reduce the pool of eligible harvesters of Chinook Salmon based on an Alaska National Interest Lands Conservation Act (ANILCA) Section 804 Subsistence User Prioritization.
- Both requests call for tribal consultation on the implementation of an appropriate allocation system for Chinook Salmon on the Kuskokwim River.
- Both request that these be temporary special actions.

#### Differences

- FSA19-02 requests the Chinook Salmon closure to be from June 1, 2019 to July 1, 2019 (31 days), while FSA19-03 requests the closure to begin June 1, 2019 and end on July 31, 2019 (61 days).
- FSA19-02 requests that the ANILCA Section 804 subsistence user prioritization be based on the one implemented in 2017, while FSA19-03 does not specify who should be included in the ANILCA Section 804 Subsistence User Prioritization.



- FSA19-02 requests to limit harvest of *Chinook Salmon* to Federally qualified subsistence users listed in the ANILCA Section 804 subsistence user prioritization, while FSA19-03 is requesting to limit harvest of *all fish* to Federally qualified subsistence users, with the harvest of Chinook Salmon further reduced to a pool of eligible harvesters based on an ANILCA Section 804 Subsistence User Prioritization.
  - All fish generally includes salmon, whitefish, Burbot, Rainbow Trout, Arctic Grayling, Dolly Varden, smelt, Alaska blackfish, Longnose Sucker, and Northern Pike.
- FSA19-02 requests a community allocation system, while FSA19-03 requests an unspecified allocation system, as well as scheduled fishing opportunities with at least one 12-hour opportunity per week in June (four total) and three 24-hour opportunities in July, using any mesh size gillnet.

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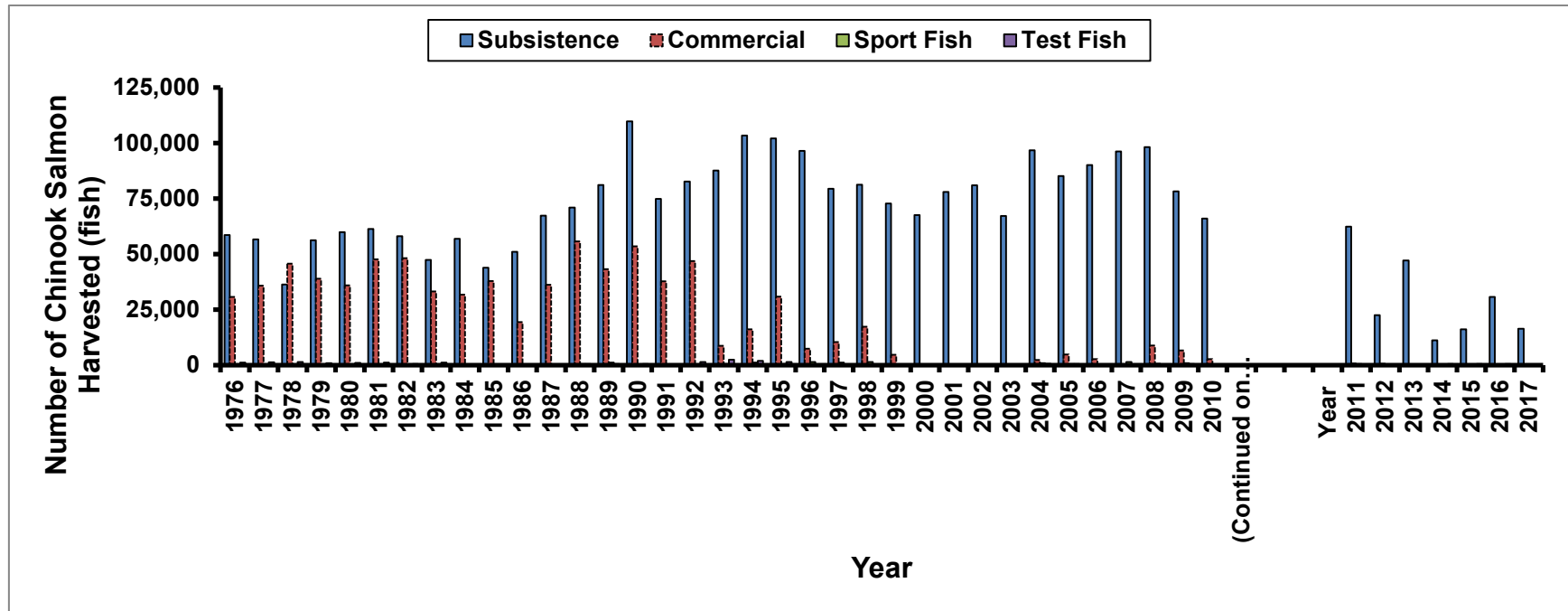
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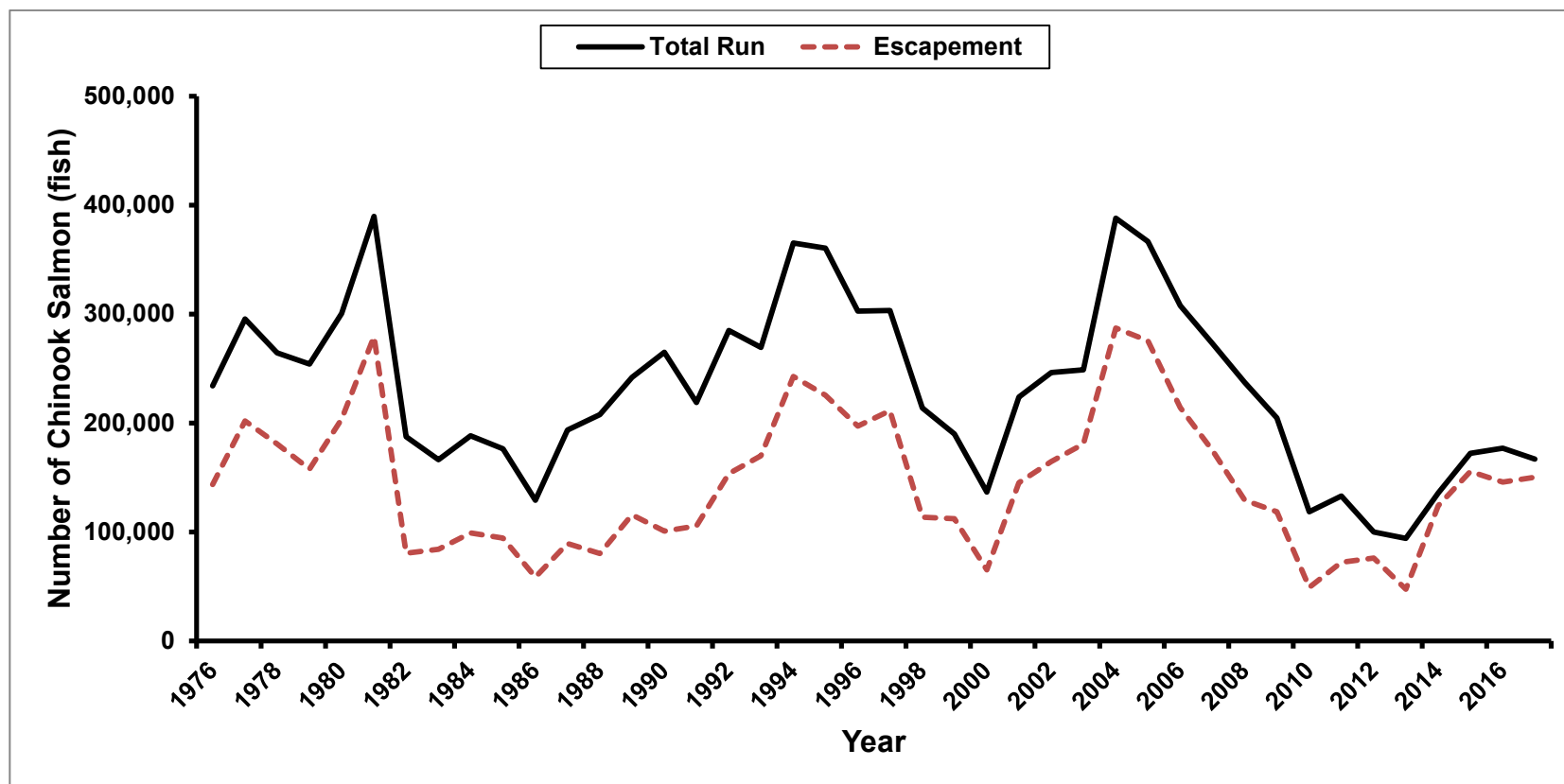
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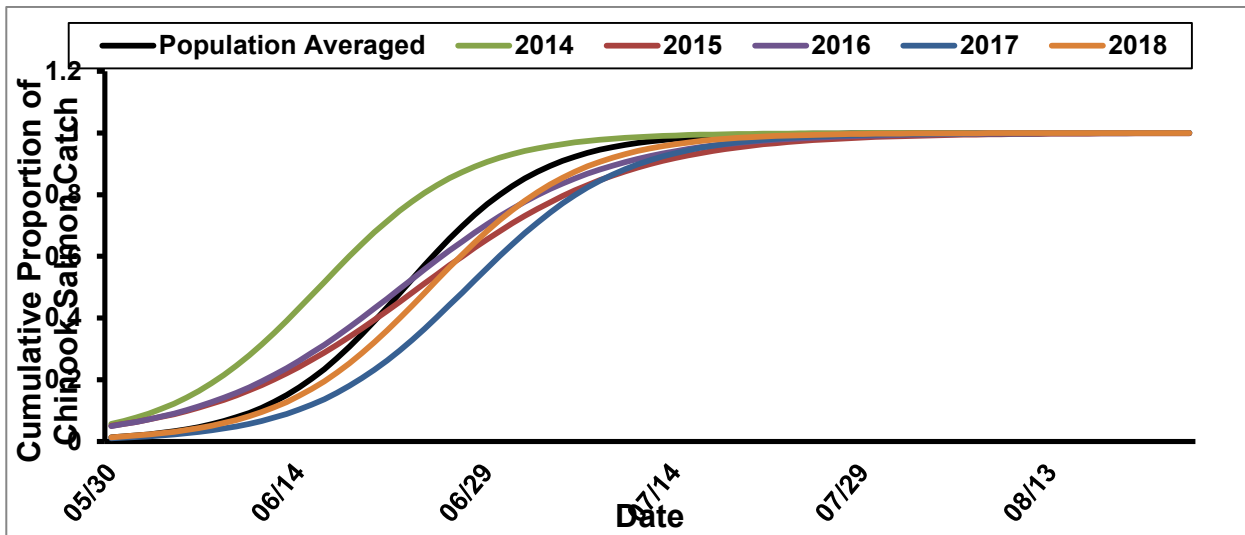


**Figure 1.** Number of Chinook Salmon harvested in the Kuskokwim River from 1976 to 2017 for Subsistence, Commercial, Sport Fish, and the Bethel Test Fishery (Liller and Smith 2018).

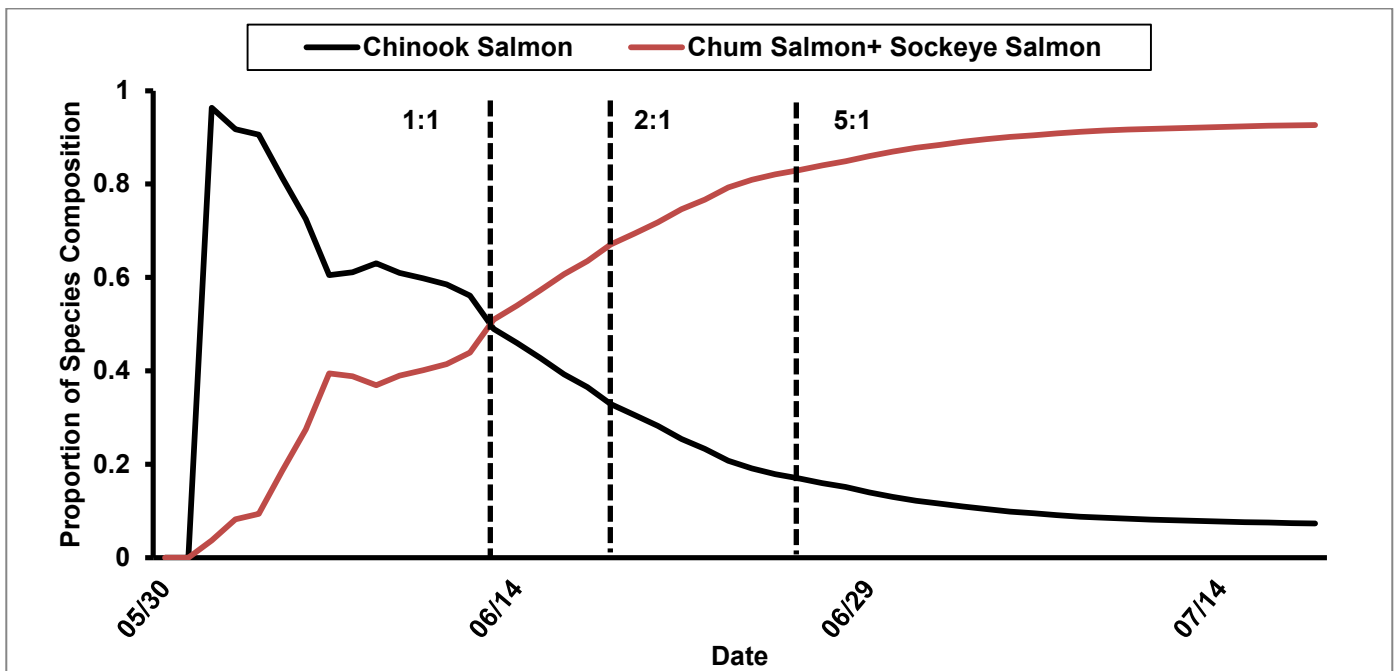




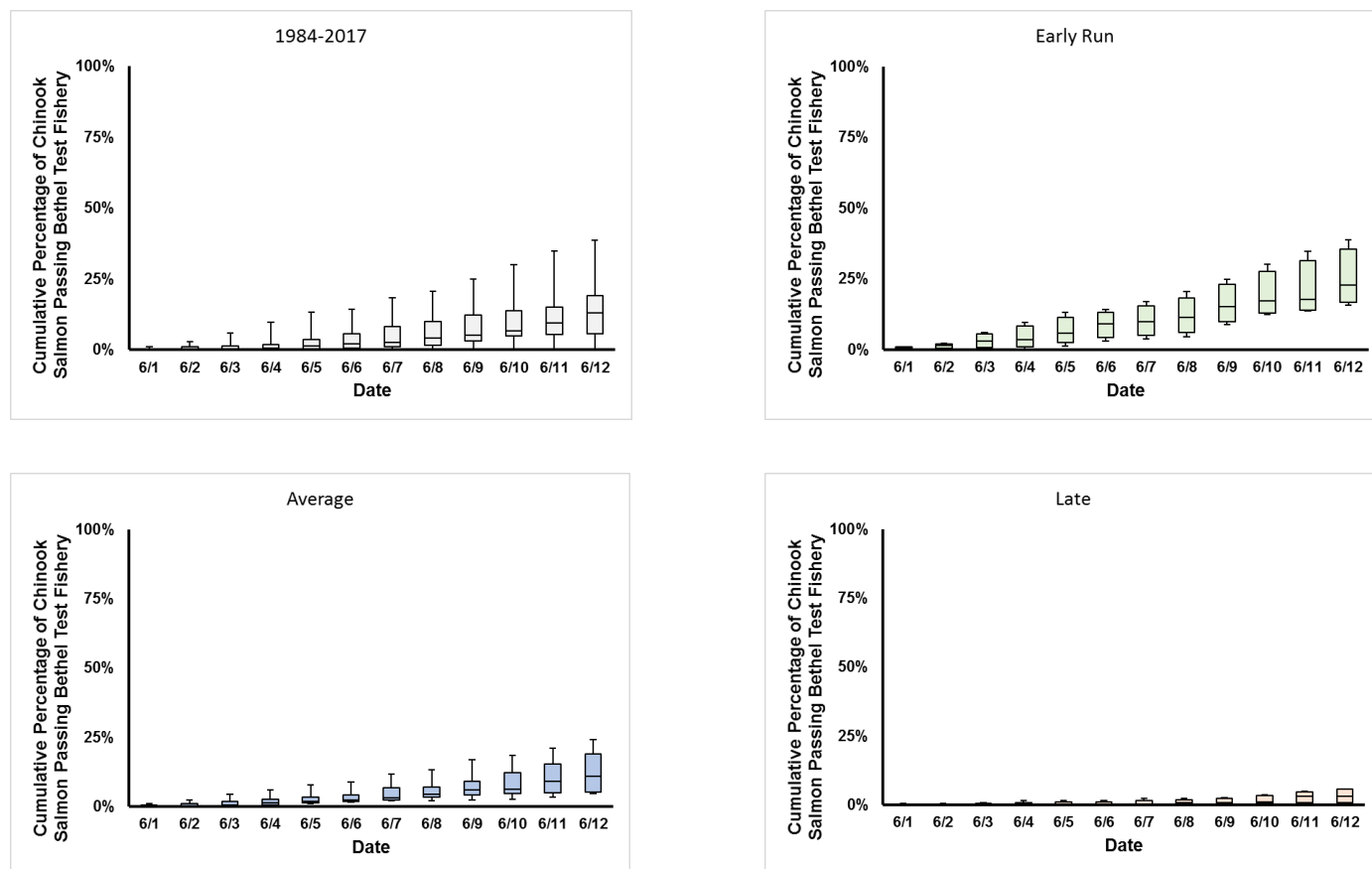
**Figure 2.** Estimates of Kuskokwim River Chinook Salmon total run-sizes and escapements from 1976 to 2017. Estimates are produced from the Kuskokwim River Chinook Salmon Run-Reconstruction Model (Liller and Hamazaki 2016), and preliminary run-size and escapement estimate for 2017.



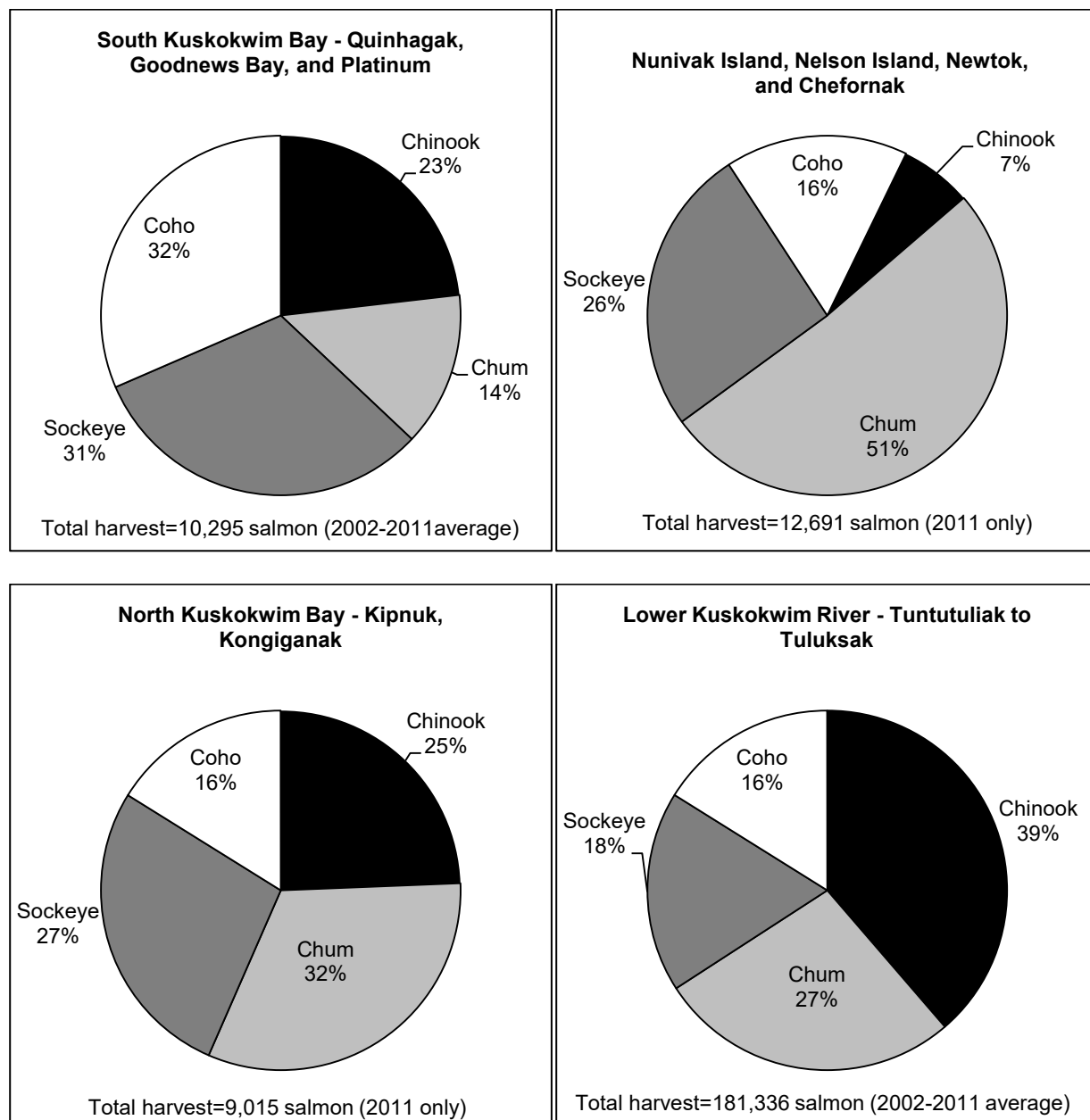
**Figure 3.** Estimated average of the cumulative proportion of Chinook Salmon catch collected by date at the Bethel test fishery from 1984 to 2018. The most recent three years of the cumulative proportion of catch at the Bethel test fishery is also plotted for comparison purposes. Dates were estimated using non-linear version of the logistic equation.



**Figure 4.** Average proportion of species composition by date caught at the Bethel test fishery from 1984 to 2018. Three vertical dashed lines represent three increasing ratios of Chum and Sockeye to Chinook Salmon, which occur approximately on June 13 (1:1), June 18 (2:1), and June 26 (3:1).

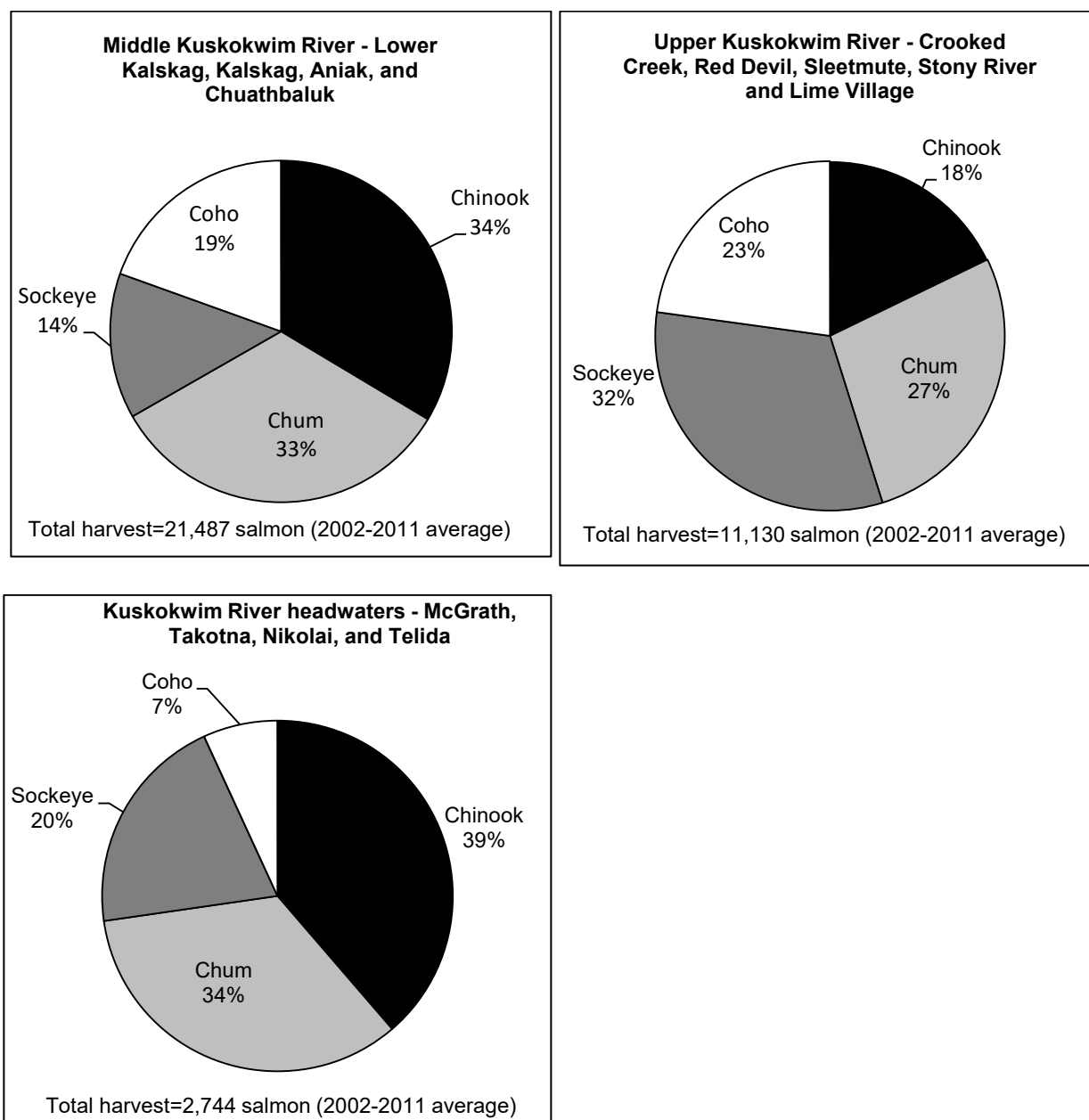


**Figure 5.** Box and Whisker plot for the cumulative percentage of Chinook Salmon passing through the Bethel Test Fishery from June 1 to June 12 under various run-timing scenarios.



**Figure 6.** 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 (Sources: Sheldon et al. 2014, Wolfe et al. 2012).

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**Figure 6.** The relative size of the Chinook, Chum, Sockeye, and Coho Salmon harvests, in fish, by communities that participated in yearly postseason household harvest surveys.

(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 (ADCCED 2014).

Community	1960	1970	1980	1990	2000	2010	2010 number of households
<b>South Kuskokwim Bay and Coast</b>							
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
<b>Subtotal</b>	<b>1,914</b>	<b>2,225</b>	<b>2,870</b>	<b>3,441</b>	<b>4,157</b>	<b>4,532</b>	<b>1,089</b>
<b>Lower Kuskokwim River Drainage</b>							
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
<b>Subtotal</b>	<b>3,446</b>	<b>4,672</b>	<b>6,768</b>	<b>8,674</b>	<b>10,263</b>	<b>11,022</b>	<b>3,145</b>
<b>Central Kuskokwim River Drainage</b>							
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
<b>Subtotal</b>	<b>577</b>	<b>604</b>	<b>821</b>	<b>1,100</b>	<b>1,188</b>	<b>1,111</b>	<b>337</b>
<b>Upper Kuskokwim River Drainage</b>							
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
<b>Subtotal</b>	<b>438</b>	<b>274</b>	<b>350</b>	<b>345</b>	<b>381</b>	<b>295</b>	<b>119</b>
<b>Headwaters</b>							
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
<b>Subtotal</b>	<b>401</b>	<b>465</b>	<b>508</b>	<b>688</b>	<b>562</b>	<b>494</b>	<b>204</b>
<b>TOTAL</b>	<b>6,776</b>	<b>8,240</b>	<b>11,317</b>	<b>14,248</b>	<b>16,551</b>	<b>17,454</b>	<b>4,894</b>

Black cell=no information available.

**Table 2.** Published estimates of Kuskokwim River Chinook Salmon run-size, escapement, and harvest from 1976 to 2017. Total Run and Escapement are estimated from the Kuskokwim River Chinook Salmon Run-Reconstruction Model (Liller and Smith 2018).

Year	Total Run	Revised	Escapement	Revised	Harvest				
		Total Run		Escapement	Subsistence	Commercial	Sport	Test Fish	Total
1976	233,967	187,584	143,420	97,037	58,606	30,735		1,206	90,547
1977	295,559	348,824	201,852	255,117	56,580	35,830	33	1,264	93,707
1978	264,325	241,781	180,853	158,309	36,270	45,641	116	1,445	83,472
1979	253,970	233,787	157,668	137,485	56,283	38,966	74	979	96,302
1980	300,573	357,950	203,605	260,982	59,892	35,881	162	1,033	96,968
1981	389,791	308,660	279,392	198,261	61,329	47,663	189	1,218	110,399
1982	187,354	173,072	80,353	66,071	58,018	48,234	207	542	107,001
1983	166,333	148,278	84,188	66,133	47,412	33,174	420	1,139	82,145
1984	188,238	171,853	99,062	82,677	56,930	31,742	273	231	89,176
1985	176,292	143,568	94,365	61,641	43,874	37,889	85	79	81,927
1986	129,168	123,452	58,556	52,840	51,019	19,414	49	130	70,612
1987	193,465	186,184	89,222	81,941	67,325	36,179	355	384	104,243
1988	207,818	204,824	80,055	77,061	70,943	55,716	528	576	127,763
1989	241,857	214,081	115,704	87,928	81,175	43,217	1,218	543	126,153
1990	264,802	266,353	100,614	102,167	109,778	53,502	394	512	164,186
1991	218,705	210,525	105,589	97,377	74,820	37,778	401	149	113,148
1992	284,846	259,154	153,573	127,881	82,654	46,872	367	1,380	131,273
1993	269,305	274,830	169,816	175,319	87,674	8,735	587	2,515	99,511
1994	365,246	411,724	242,616	289,094	103,343	16,211	1,139	1,937	122,630
1995	360,513	371,079	225,595	236,161	102,110	30,846	541	1,421	134,918
1996	302,603	307,072	197,092	201,561	96,413	7,419	1,432	247	105,511
1997	303,189	295,259	211,247	203,878	79,381	10,441	1,227	332	91,381
1998	213,873	184,356	113,627	84,140	81,213	17,359	1,434	210	100,216
1999	189,939	158,770	112,082	80,940	72,775	4,705	252	98	77,830
2000	136,618	129,138	65,180	60,905	67,620	444	105	64	68,233
2001	223,707	205,152	145,232	126,677	78,009	90	290	86	78,475
2002	246,296	226,106	164,635	144,445	80,982	72	319	288	81,661
2003	248,789	232,282	180,687	164,180	67,134	158	401	409	68,102
2004	388,136	366,725	287,178	266,084	96,788	2,305	857	691	100,641
2005	366,601	326,904	275,598	235,901	85,090	4,784	572	557	91,003
2006	307,662	326,067	214,004	232,409	90,085	2,777	444	352	93,658
2007	273,060	244,754	174,943	146,637	96,155	179	1,478	305	98,117
2008	237,074	219,709	128,978	111,613	98,103	8,865	708	420	108,096
2009	204,747	189,370	118,478	103,101	78,231	6,664	904	470	86,269
2010	118,507	112,975	49,073	43,541	66,056	2,732	354	292	69,434

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**Table 2.** *Continued from previous page.*

Year	Total Run	Revised Total Run	Escapement	Revised Escapement	Harvest				
					Subsistence	Commercial	Sport	Test Fish	Total
2011	133,059	113,749	72,097	49,718	62,368	747	579	337	64,031
2012	99,807	79,238	76,074	55,746	22,544	627	0	321	23,492
2013	94,166	84,311	47,315	36,823	47,113	174	0	201	47,488
2014	135,749	84,326	123,987	72,560	11,234	35	0	497	11,766
2015	172,055	125,058	155,464	108,454	16,124	8	0	472	16,604
2016	176,916	128,855	145,718	97,640	30,676	0	0	522	31,198
2017	165,863	133,267	150,193	116,597	16,380	0	0	290	16,670
2018		*140,981							

\*Preliminary estimate from 2018 Preliminary Kuskokwim Area Salmon Season Summary



**Table 3.** Summary statistics (average, standard deviation, minimum, first quartile, median, third quartile, and maximum) of Chinook Salmon subsistence harvest on the Kuskokwim River by time periods (overall, five year, ten years, twenty years) in comparison to ANS range set by the Alaska Board of Fisheries in 2013.

<b>Chinook Salmon Harvest in Kuskokwim River Subsistence Fishery</b>							
<b>Time Period</b>	<b>Average</b>	<b>SD</b>	<b>Minimum</b>	<b>1st Quartile (25%)</b>	<b>Median (50%)</b>	<b>3rd Quartile (75%)</b>	<b>Maximum</b>
Overall (1976-2017)	68,052	23,319	11,234	56,432	67,620	83,872	109,778
Five Year (2013-2017)	24,305	14,675	11,234	13,679	16,380	38,895	47,113
10 Year (2008-2017)	44,883	30,141	11,234	16,316	38,895	69,100	98,103
20 Year Average (1998-2017)	63,234	28,959	11,234	34,785	70,198	84,121	98,103
ANS (set in 2013)	88,500	-	67,228	-	-	-	109,778

**Table 4.** Comparison of mark-recapture estimates and run-reconstruction output for Kuskokwim River Chinook Salmon for years 2003-2007 and 2014-2017. Numbers inside parentheses represent lower and upper 95% confidence intervals. Run-reconstruction estimate does not include 2014-2017 mark-recapture estimates as data input.

<b>Year</b>	<b>Mark-Recapture Estimate</b>	<b>Run-Reconstruction Estimate</b>
<b>2003</b>	241,617 (169,871-313,363)	275,834 (233,604 - 325,698)
<b>2004</b>	422,657 (283,025 - 562,289)	412,965 (346,503 - 492,176)
<b>2005</b>	345,814 (254,337 - 437,291)	391,193 (333,637 - 458,678)
<b>2006</b>	396,248 (273,062 - 519,434)	336,298 (280,117 - 403,746)
<b>2007</b>	266,219 (201,637 - 330,801)	281,487 (243,325 - 325,633)
<b>2014</b>	78,600 (67,300 – 98,100)	131,674 (99,377 - 174,466)
<b>2015</b>	122,400 (112,000 - 132,600)	164,906 (123,895 - 219,491)
<b>2016</b>	127,500 (110,100 - 155,300)	176,916 (134,407 - 232,871)
<b>2017</b>	133,200 (101,500 – 160,274)	166,863 (130,668 – 213,085)

**Table 5.** Estimates of the date at which 50% of the Chinook Salmon run has passed the Bethel Test Fishery. Julian day represents the number of days passed starting at January 1. Dates were estimated using non-linear version of the logistic equation, with Year modeled as a random effect.

<b>Year</b>	<b>Date of 50% Catch in the Bethel Test Fishery</b>
1984	06/23
1985	07/02
1986	06/22
1987	06/22
1988	06/20
1989	06/23
1990	06/25
1991	06/25
1992	06/21
1993	06/17
1994	06/19
1995	06/21
1996	06/14
1997	06/20
1998	06/24
1999	06/30
2000	06/20
2001	06/23
2002	06/19
2003	06/18
2004	06/22
2005	06/23
2006	06/24
2007	06/27
2008	06/24
2009	06/22
2010	06/22
2011	06/23
2012	06/27
2013	06/23
2014	06/16
2015	06/24
2016	06/22
2017	06/27
<b>Average (1984-2017)</b>	06/22

**Table 6.** Summary statistics for the cumulative percentage of Chinook Salmon passing through the Bethel Test Fishery from June 1 to June 12 under various run-timing scenarios.

Run-Timing	Summary Statistic	6/1	6/2	6/3	6/4	6/5	6/6	6/7	6/8	6/9	6/10	6/11	6/12
Overall	Min	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Overall	25%	0%	0%	0%	0%	0%	1%	1%	2%	3%	5%	5%	6%
Overall	Median	0%	0%	0%	1%	1%	2%	3%	4%	5%	7%	10%	13%
Overall	75%	0%	1%	1%	2%	4%	6%	8%	10%	12%	14%	15%	19%
Overall	Max	1%	3%	6%	10%	13%	14%	18%	20%	25%	30%	35%	39%
Early	Min	0%	0%	0%	0%	1%	3%	4%	4%	9%	12%	14%	16%
Early	25%	0%	1%	1%	1%	2%	4%	5%	6%	10%	13%	14%	17%
Early	Median	1%	1%	3%	3%	6%	9%	10%	11%	15%	17%	18%	23%
Early	75%	1%	2%	5%	8%	11%	13%	15%	18%	23%	28%	31%	35%
Early	Max	1%	2%	6%	10%	13%	14%	17%	20%	25%	30%	35%	39%
Average	Min	0%	0%	0%	0%	1%	1%	2%	2%	2%	2%	3%	5%
Average	25%	0%	0%	0%	0%	1%	2%	2%	3%	4%	5%	5%	5%
Average	Median	0%	0%	0%	1%	2%	2%	3%	4%	6%	6%	9%	11%
Average	75%	0%	1%	2%	3%	3%	4%	7%	7%	9%	12%	15%	19%
Average	Max	1%	2%	4%	6%	8%	9%	12%	13%	17%	18%	21%	24%
Late	Min	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Late	25%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%
Late	Median	0%	0%	0%	0%	0%	0%	0%	1%	1%	1%	3%	3%
Late	75%	0%	0%	0%	1%	1%	1%	1%	2%	2%	3%	5%	6%
Late	Max	0%	0%	1%	1%	1%	1%	2%	2%	3%	4%	5%	6%

**Table 7.** Pre-season forecast for Chinook Salmon in the Kuskokwim River as provided by ADF&G from 2012 to 2019.

Forecast Year	Lower Range	Upper Range	Actual Run-Size
2012	158,000	236,000	99,807
2013	160,000	240,000	94,166
2014	71,000	116,000	135,749
2015	96,000	163,000	172,055
2016	125,000	219,000	176,916
2017	132,000	222,000	166,863
2018	115,000	150,000	N/A
2019			

**Table 8.** Estimated number of Chinook Salmon harvested for subsistence, Kuskokwim River drainage, based on the annual postseason survey, 2007 - 2017

Community	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2012- 2016 5-year average	2007- 2016 10-year average
Kongiganak <sup>a</sup>	1,865	2,233	1,243	1,456	1,208	287	641	964	-	-	-	631	1,237
Kuskokwim Bay	1,865	2,233	1,243	1,456	1,208	287	641	964	-	-	-	631	1,237
Tuntutuliak	4,614	4,266	3,067	3,261	3,032	1,123	2,448	574	1,668	1,963	1,459	1,555	2,602
Eek	2,512	2,966	1,982	1,761	1,378	1,004	1,188	665	850	1,460	825	1,033	1,577
Kasigluk <sup>b</sup>	5,167	2,471	2,464	3,014	2,823	552	2,919	205	438	951	791	1,013	2,100
Nunapitchuk <sup>b</sup>	4,661	4,234	3,468	2,548	3,559	845	2,563	287	1,051	1,695	761	1,288	2,491
Atmautluak <sup>b</sup>	1,890	1,298	1,567	1,088	1,236	234	1,592	108	514	763	195	642	1,029
Napakiak <sup>b</sup>	3,245	1,903	2,387	1,674	1,963	457	1,588	311	917	1,151	505	885	1,560
Napaskiak <sup>b</sup>	6,392	4,555	5,372	4,333	3,360	1,108	2,939	422	816	1,535	858	1,364	3,083
Oscarville <sup>b</sup>	1,360	1,351	754	618	694	51	585	68	120	208	122	206	581
Bethel <sup>b</sup>	30,422	27,800	26,170	26,157	25,093	7,321	17,246	3,089	4,918	9,462	5,336	8,407	17,768
Kwethluk <sup>b</sup>	6,466	8,451	7,130	4,440	2,467	1,709	3,192	959	900	1,731	1,019	1,698	3,745
Akiachak <sup>b</sup>	7,621	9,719	7,361	4,470	3,852	2,862	3,585	1,033	1,103	3,438	1,415	2,404	4,504
Akiak <sup>b</sup>	4,297	4,090	3,247	3,625	2,455	1,218	1,449	530	610	1,274	694	1,016	2,280
Tuluksak	3,266	2,937	3,212	2,057	1,230	651	732	404	231	709	511	545	1,543
Lower Kuskokwim	81,913	76,041	68,181	59,046	53,142	19,135	42,026	8,655	14,136	26,340	14,491	22,058	44,862
Lower Kalskag	1,937	1,748	2,525	1,030	1,260	459	744	283	351	578	260	483	1,092
Upper Kalskag	1,383	2,435	1,696	1,496	1,772	562	1,317	258	334	838	190	662	1,209
Aniak <sup>b</sup>	3,417	3,100	2,130	2,262	2,214	993	1,440	344	542	1,293	718	922	1,774
Chuathbaluk	973	772	877	551	409	103	155	90	90	203	100	128	422
Middle Kuskokwim	7,710	8,055	7,228	5,339	5,655	2,117	3,656	975	1,317	2,912	1,268	2,195	4,496
Crooked Creek	647	488	608	240	402	124	145	35	78	384	110	153	315
Red Devil	301	148	258	33	186	225	77	83	52	69	38	101	143
Sleetmute	861	933	693	272	242	132	96	58	137	169	36	118	359
Stony River	530	514	704	189	134	151	51	24	25	33	109	57	236
Lime Village <sup>a</sup>	95	29	75	47	118	29	43	32	-	35	33	35	56
McGrath <sup>b</sup>	495	288	600	262	829	68	95	173	75	384	118	159	327
Takotna	10	0	8	0	0	0	0	0	3	0	0	1	2
Nikolai	471	184	298	402	450	276	283	235	301	367	177	292	327
Telida <sup>a</sup>	-	-	-	-	-	-	-	-	-	-	-	-	-
Upper Kuskokwim River <sup>d</sup>	3,410	2,584	3,244	1,445	2,361	1,005	790	640	671	1,441	621	916	1,765
Quinhagak	4,686	3,125	3,312	2,793	2,588	2,396	3,143	3,723	3,082	4,822	5,217	3,433	3,367
Goodnews Bay	647	898	569	480	834	389	413	431	220	654	457	421	553
Platinum	66	42	61	17	62	24	39	46	11	99	96	44	47
Kuskokwim Bay	5,399	4,065	3,942	3,290	3,484	2,809	3,595	4,200	3,313	5,575	5,770	3,898	3,967
<b>Estimated Harvest</b>	100,297	92,978	83,838	70,576	65,850	25,353	50,708	15,434	19,437	36,268	22,150	29,699	56,327

Source: Lipka and Tiernan 2018.

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

<sup>a</sup> Villages not surveyed in 2017. Harvest was not estimated due to lack of recent data.

<sup>b</sup> 2015 estimate includes a tally of Chinook salmon harvested under the USFWS issued permits.

<sup>c</sup> The 2015 Bethel estimate contains both the permit numbers from Bethel and the seasonal village of Napaimute.

<sup>d</sup> Kuskokwim River Total includes the Lower, Middle, Upper Kuskokwim areas and North Kuskokwim Bay.

**Table 9.** The estimated harvest of wild resources in pounds edible weight per person by communities that have participated in household harvest surveys, from south to north (Source: ADFG 2014b).

Community (from south to north)	Per person harvest	95% Confidence interval (+/-)	Percentage of total harvest
	Pounds		
<b>Quinhagak 1982</b>			
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%
<b>Tununak 1986</b>			
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%
<b>Napakiak 2011</b>			
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 9.** (Continued from previous page).

Community (from south to north)	Per person harvest	95% Confidence interval (+/-)	Percentage of total harvest
	Pounds		
<b>Napaskiak 2011</b>			
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%
<b>Oscarville 2010</b>			
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%
<b>Nunapitchuk 1983</b>			
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%
<b>Kwethluk 2010</b>			
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 9.** (Continued from previous page).

Community (from south to north)	Per person harvest	95% Confidence interval (+/-)	Percentage of total harvest
	Pounds		
<b>Kwethluk 1986</b>			
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%
<b>Akiachak 1998</b>			
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%
<b>Akiak 2010</b>			
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%
<b>Tuluksak 2010</b>			
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 9.** (Continued from previous page).

Community (from south to north)	Per person harvest	95% Confidence interval (+/-)	Percentage of total harvest
	Pounds		
<b>Lower Kalskag 2009</b>			
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%
<b>Kalskag 2009</b>			
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%
<b>Aniak 2009</b>			
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%
<b>Chuathbaluk 2009</b>			
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 9.** (Continued from previous page).

Community (from south to north)	Per person harvest	95% Confidence interval (+/-)	Percentage of total harvest
	Pounds		
<b>Crooked Creek 2009</b>			
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%
<b>Red Devil 2009</b>			
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%
<b>Sleetmute 2009</b>			
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%
<b>Stony River 2009</b>			
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 9.** (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 9.** (Continued from previous page).

Community (from south to north)	Per person harvest	95% Confidence interval (+/-)	Percentage of total harvest
	Pounds		
<b>Nikolai 1984</b>			
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%
<b>McGrath 2011</b>			
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%
<b>McGrath 1984</b>			
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%

## APPENDIX A

### RELEVANT FEDERAL REGULATIONS

#### **Kuskokwim Area—Fish**

*(i) Unless otherwise restricted in this section, you may take fish in the Kuskokwim Area at any time without a subsistence fishing permit.*

*(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.*

*. . .*

*(ix) You may only take salmon by gillnet, beach seine, fish wheel, dipnet, or rod and reel subject to the restrictions set out in this section, except that you may also take salmon by spear in the Kanektok, and Arolik River drainages, and in the drainage of Goodnews Bay.*

*(x) You may not use an aggregate length of set gillnets or drift gillnets in excess of 50 fathoms for taking salmon.*

*(xi) You may take fish other than salmon by set gillnet, drift gillnet, beach seine, fish wheel, pot, long line, fyke net, dip net, jigging gear, spear, lead, handline, or rod and reel.*

*(xii) You must attach to the bank each subsistence gillnet operated in tributaries of the Kuskokwim River and fish it substantially perpendicular to the bank and in a substantially straight line.*

*(xiii) Within a tributary to the Kuskokwim River in that portion of the Kuskokwim River drainage from the north end of Eek Island upstream to the mouth of the Kolmakoff River, you may not set or operate any part of a set gillnet within 150 feet of any part of another set gillnet.*

*(xiv) The maximum depth of gillnets is as follows:*

*(A) Gillnets with 6-inch or smaller stretched-mesh may not be more than 45 meshes in depth;*

*(B) Gillnets with greater than 6-inch stretched-mesh may not be more than 35 meshes in depth.*

*(xv) You may not use subsistence set and drift gillnets exceeding 15 fathoms in length in Whitefish Lake in the Ophir Creek drainage. You may not operate more than one subsistence set or drift gillnet at a time in Whitefish Lake in the Ophir Creek drainage. You must check the net at least once every 24 hours.*



## APPENDIX B

### RELEVANT STATE REGULATIONS

#### **AS 16.05.060. Emergency orders.**

- (a) This chapter does not limit the power of the commissioner or an authorized designee, when circumstances require, to summarily open or close seasons or areas or to change weekly closed periods on fish or game by means of emergency orders.*

#### **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.*
- (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.*

#### **(a) 5 AAC 01.270. Lawful gear and gear specifications and operation**

- (a) Salmon may be taken only by gillnet, beach seine, a hook and line attached to a rod or pole, handline, or fish wheel subject to the restrictions set out in this section and 5 AAC 01.275, except that salmon may also be taken by spear in the Holitna River drainage, Kanektok River drainage, Arolik River drainage, and the drainage of Goodnews Bay.*
- (b) The aggregate length of set gillnets or drift gillnets in use by any individual for taking salmon may not exceed 50 fathoms.*
- (c) Fish other than salmon may be taken only by set gillnet, drift gillnet, beach seine, fish wheel, pot, longline, fyke net, dip net, jigging gear, spear, a hook and line attached to a rod or pole, handline, or lead.*
- (d) Each subsistence gillnet operated in tributaries of the Kuskokwim River must be attached to the bank, fished substantially perpendicular to the bank and in a substantially straight line.*
- (e) In that portion of the Kuskokwim River drainage from the north end of Eek Island upstream to the mouth of the Kolmakoff River, no part of a set gillnet located within a tributary to the Kuskokwim River may be set or operated within 150 feet of any part of another set gillnet.*





*(f) A gillnet may not obstruct more than one-half the width of any fish stream and any channel or side channel of a fish stream. A stationary fishing device may not obstruct more than one-half the width of any salmon stream and any channel or side channel of a salmon stream.*

*(g) Repealed 5/19/2004.*

*(h) The maximum depth of gillnets is as follows:*

*(1) gillnets with six-inch or smaller mesh may not be more than 45 meshes in depth;*

*(2) gillnets with greater than six-inch mesh may not be more than 35 meshes in depth. (i) Halibut may be taken only by a single hand-held line with no more than three hooks attached to it.*

*(j) Subsistence set and drift gillnets operated in Whitefish Lake in the Ophir Creek drainage may not exceed 15 fathoms in length.*

*(k) A person may not operate more than one subsistence set or drift gillnet at a time in Whitefish Lake in the Ophir Creek drainage. A person operating a subsistence set or drift gillnet shall check the net at least once every 24 hours.*

*(l) Repealed 5/29/2001.*

...

*(n) Notwithstanding (b) and (j) of this section, during times when the commissioner determines that it is necessary for the conservation of king salmon, the commissioner, by emergency order, may close the fishing season in any portion of the Kuskokwim Area and immediately reopen the season in that portion during which one or more of the following gear limitations may be implemented:*

*(1) for gillnets;*

*(A) a gillnet mesh size may not exceed six inches;*

*(B) a gillnet mesh size may not exceed four inches and the gillnet may only be operated as a set gillnet; no part of a set gillnet may be more than 100 feet from the ordinary high water mark;*

*(C) a gillnet may not exceed the length specified by the commissioner in the emergency order, except that a longer gillnet may be used if no more than the specified length of the gillnet is in a fishing condition and the remainder of the gillnet is tied up or secured so that it is not in the water in a fishing condition;*

*(2) for fish wheels;*

*(A) except as provided in (B) of this paragraph, a fish wheel used to take fish must be equipped with a livebox that is constructed so that it contains no less than 45 cubic feet of water volume while it is in operation; the livebox of a fish wheel must be checked at least once every six hours while the fish wheel is in operation, and all king salmon in the livebox must be returned alive to the water;*

*(B) a person may operate a fish wheel without a livebox only if (i) the fish wheel is equipped with a chute that returns fish captured by the fish wheel to the water alive; (ii) the person closely attends the fish wheel while it is in operation; and (iii) the person returns all king salmon caught to the water alive;*

*(3) for beach seine gear: any king salmon taken in beach seine gear must be released immediately and returned alive to the water;*

*(4) for dip nets: a person may fish for salmon with a dip net, as defined in 5 AAC 39.105, and all king salmon caught in a dip net must be released immediately and returned alive to the water.*

*(o) For the purposes of this section, a "livebox" is a submerged container, that is attached to a fish wheel and that will keep fish caught by the fish wheel alive.*

*(p) A beach seine may not exceed (1) 50 fathoms in length; (2) 100 meshes in depth; (3) a mesh size of three and one-half inches stretched measure.*

#### **5 AAC 01.271. Identification of gear**

*In addition to the requirements of 5 AAC 01.010(h), (1) each fish wheel must have the first initial, last name and address of the operator plainly and legibly inscribed on the side of the fish wheel facing midstream of the river; (2) for all gillnets and unattended gear that are fished under the ice, the first initial, last name and address of the operator must be plainly and legibly inscribed on a stake inserted in the ice and attached to the gear.*

#### **5 AAC 01.280. Subsistence fishing permits**

*Fish may be taken for subsistence purposes without a subsistence fishing permit, except as otherwise provided in this section.*

*(1) Starting in the 2018 fishing season, during times when the commissioner determines it is necessary for the conservation of king salmon, the commissioner may, by emergency order, require that in the Kuskokwim River drainage, upstream of a line between ADF&G regulatory markers at the Yukon Delta National Wildlife Refuge Boundary near Aniak, king salmon may be taken only under the authority of a subsistence fishing permit with the following conditions:*

*(A) annual limit of 10 king salmon;*

*(B) fishing under the permit may not commence until the subsistence king salmon fishery opens after June 11 as described in 5 AAC 07.365;*

*(C) the commissioner may, by emergency order, implement one or more of the gear limitations specified in 5 AAC 01.270(n) (1) for fishing under the permit;*

*(D) permit holders must complete and return permits, including daily records of king salmon harvested, each year by October 31;*

*(E) once the annual limit is reached, additional king salmon may not be taken except in compliance with all applicable regulations and emergency orders;*

*(F) only one permit may be issued to a household each year;*

*(2) the provisions of (1) of this section do not apply after December 31, 2021.*

#### **5 AAC 01.284. Limitations on subsistence fishing with hook and line gear**

*During times when the commissioner determines it to be necessary for the conservation of salmon, the commissioner may, by emergency order, close the fishing season for salmon, and immediately reopen the season during which restrictions apply to the waters, seasons, bag, possession, and size limits, and method and means for subsistence fishing for salmon with a hook and line attached to a rod or pole. The provisions of this section do not apply to fishing through the ice.*

#### **5 AAC 01.295. Aniak River bag and possession limits**

*From June 1 through August 31, when subsistence fishing with a hook and line attached to a rod or pole, in that portion of the Aniak River drainage upstream of Doestock Creek, (1) the bag and possession limit is as specified by species in 5 AAC 71.010, except that the bag and possession limit for king salmon is two fish, with no size and annual limits; and (2) rainbow trout may not be retained.*

#### **5 AAC 07.200. Fishing districts, subdistricts, and sections**

*(a) District 1 consists of that portion of the Kuskokwim River upstream from a line from Apokak Slough at 60° 08.50' N. lat., 162° 12' W. long. to the southernmost tip of Eek Island to Popokamiut at 60° 04' N. lat., 162° 28' W. long., to a line between ADF&G regulatory markers located at the mouth of Bogus Creek.*

*(1) Subdistrict 1-A consists of that portion of District 1 upstream from a line between ADF&G regulatory markers located at the downstream end of Steamboat Slough to a line between ADF&G regulatory markers located at the mouth of Bogus Creek;*

*(2) Subdistrict 1-B consists of that portion of District 1 upstream from a line from Apokak Slough at 60° 08.50' N. lat., 162° 12' W. long. to the southernmost tip of Eek Island to*

*the Popokamiut at 60° 04' N. lat., 162° 28' W. long. to a line between ADF&G regulatory markers located at the downstream end of Steamboat Slough.*

*(A) Lower Section consists of that portion of Subdistrict 1-B upstream from a line from Apokak Slough at 60° 08.50' N. lat., 162° 12' W. long. to the southernmost tip of Eek Island to Popokamiut at 60° 04' N. lat., 162° 28' W. long. to a line between ADF&G regulatory markers located at approximately 60° 28' N. lat., 162° 18' W. long. and 60° 28' N. lat., 162° 21' W. long.;*

*(B) Upper Section consists of that portion of Subdistrict 1-B not included in Lower Section.*

*(b) District 2 consists of that portion of the Kuskokwim River from the ADF&G regulatory markers located just below the upstream entrance to the second slough on the west bank of the Kuskokwim River downstream of Lower Kalskag, approximately seven and one-half miles downstream of Lower Kalskag, to ADF&G regulatory markers at the downstream edge of Chuathbaluk.*

**APPENDIX C**

**FEDERAL SPECIAL ACTIONS AND STATE EMERGENCY ORDERS 2014–2018**



## SALMON MANAGEMENT IN 2014

Appendix Table C-1. Federal special actions, Kuskokwim River drainage, 2014.

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 Chefnak, 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 Chefnak, 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 Chefnak, 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.

**Appendix Table C-2.** State emergency orders, Kuskokwim River drainage, 2014.

2014 KUSKOKWIM RIVER DRAINAGE SUBSISTENCE FISHING		
State Emergency Orders	Effective Date	Action
Board of Fisheries (3/17/14)	Emergency regulation that was 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 was 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 (Ishkowik 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 Ishkowik River (coastal waters including Nelson Island), fishing for salmon is restricted to gillnets with 6-inch or less mesh size.
	June 10, 2014	Aniak River upriver to Holitna River, fishing for Chinook salmon with a hook and line attached to a rod or pole is closed.

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**Appendix Table C-2.** State emergency orders, Kuskokwim River drainage, 2014 (*continued from previous page*).

2014 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.

*Continued on next page.*

**Appedix Table C-2.** State emergency orders, Kuskokwim River drainage, 2014 (*continued from previous page*).

<b>2014 KUSKOKWIM RIVER DRAINAGE SUBSISTENCE FISHING</b>		
<b>State Emergency Orders</b>	<b>Effective Date</b>	<b>Action</b>
EO 3-S-WR-09-14	June 24, 2014 until further notice	<i>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].</i>
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 Ishkowi River (coastal waters including Nelson Island), fishing with gillnets with unrestricted mesh size will be allowed.

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**Appendix Table C-2.** State emergency orders, Kuskokwim River drainage, 2014 (*continued from previous page*).

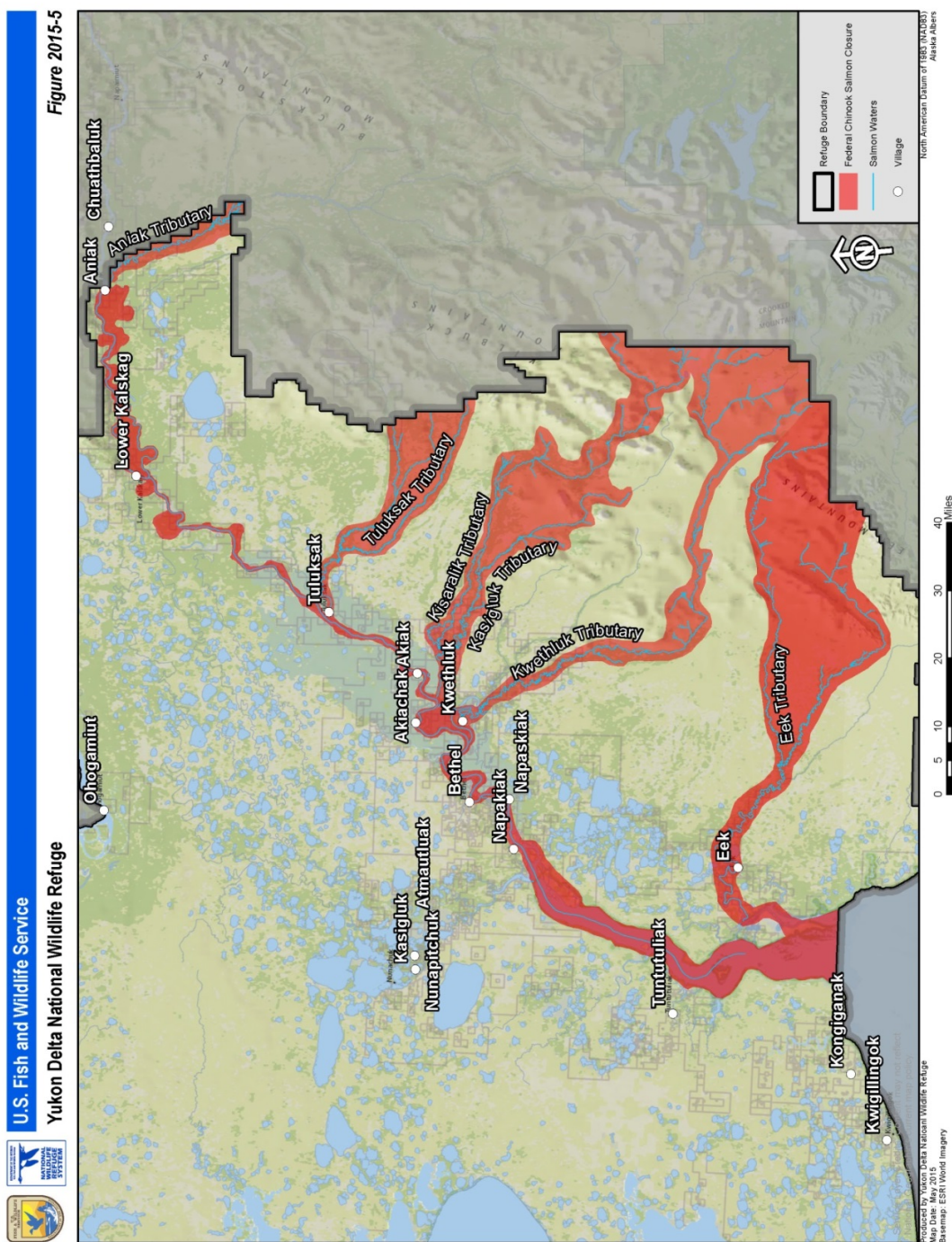
2014 KUSKOKWIM RIVER DRAINAGE SUBSISTENCE FISHING		
State Emergency Orders	Effective Date	Action
EO 3-S-WR-14-14	July 3, 2014 until further notice	Chuathbaluk upriver to Holitna River, fishing for chum and sockeye salmon will be allowed with gillnets with 6-inch or less mesh size not exceeding 50-fathoms 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.

## SALMON MANAGEMENT IN 2015

Appendix Table C-3. Federal special actions, Kuskokwim River drainage, 2015.

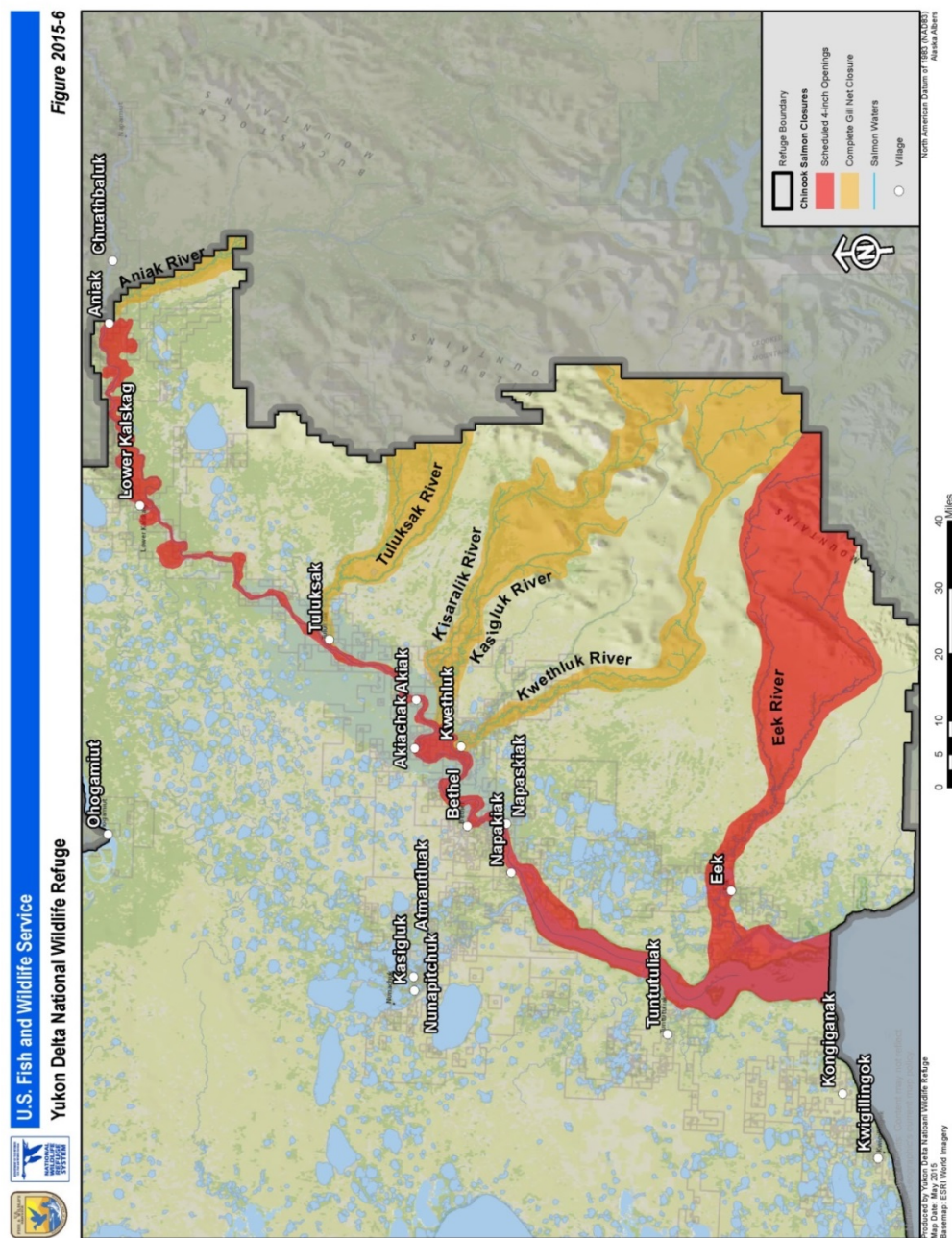
2015 YUKON DELTA NATIONAL WILDLIFE REFUGE KUSKOKWIM RIVER DRAINAGE—SUBSISTENCE FISHING		
Federal Special Actions	Effective Date	Action
SA 3-KS-01-15	May 21–July 20, 2015	All waters within and adjacent to the Refuge boundary are closed to the harvest of <b>Chinook Salmon</b> except by residents of the Kuskokwim drainage and the villages of Chefornak, Kipnuk, Kwigillingok, and Kongiganek.
SA 3-KS-02-15	May 21–28, 2015	The mouth of the Kuskokwim River upriver to Tuluksak and its salmon tributaries within and adjacent to the Refuge boundary are closed to the harvest of <b>Chinook Salmon</b> by all users.  Salmon tributaries are the Eek, Kwethluk, Kasigluk, Kisaralik, and Tuluksak rivers and their salmon tributaries.  Gillnets must be set and are restricted to 4-inch or less mesh size not exceeding 60-feet long and 45-meshes deep, only 72 hours/week, 6:00 am Thur.–6:00 am Sunday.
SA 3-KS-03-15	May 28–July 20, 2015	The Kuskokwim River and its salmon tributaries within and adjacent to the Refuge boundary are closed to the harvest of <b>Chinook Salmon</b> by all users ( <b>Appendix Figure C-1</b> ).
SA 3-KS-04-15	June 7–July 20, 2015	Kwethluk, Kasigluk, Kisaralik, Tuluksak, and Aniak rivers and their salmon tributaries within and adjacent to the boundaries of the Refuge are closed to the use of <b>gillnets</b> by all users ( <b>Appendix Figure C-2</b> ).  Nonsalmon tributaries are Birch Creek, Akulikutak River, Columbia Creek, and Reindeer Slough 100-yards upstream from their confluences with salmon tributaries.
SA 3-KS-05-15 supersedes SA 3-KS-03-15	June 5–July 20, 2015	All waters within and adjacent to the Refuge boundary are closed to the harvest of <b>all fish</b> except by residents of the Kuskokwim drainage and the villages of Chefornak, Kipnuk, Kwigillingok, and Kongiganek.  The Kuskokwim River and its salmon tributaries within and adjacent to the Refuge boundary are closed to the harvest of <b>Chinook Salmon</b> by all users.  Gillnets must be set and are restricted to 4-inch or less mesh size not exceeding 60-feet long and 45-meshes deep, only 72 hours per week, 6:00 am Thur.–6:00 am Sunday ( <b>Appendix Figure C-2</b> ).

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**Appendix Figure C-1.** Federal Special Action SA 3-KS-03-15 closure to the harvest of Chinook Salmon by all users.



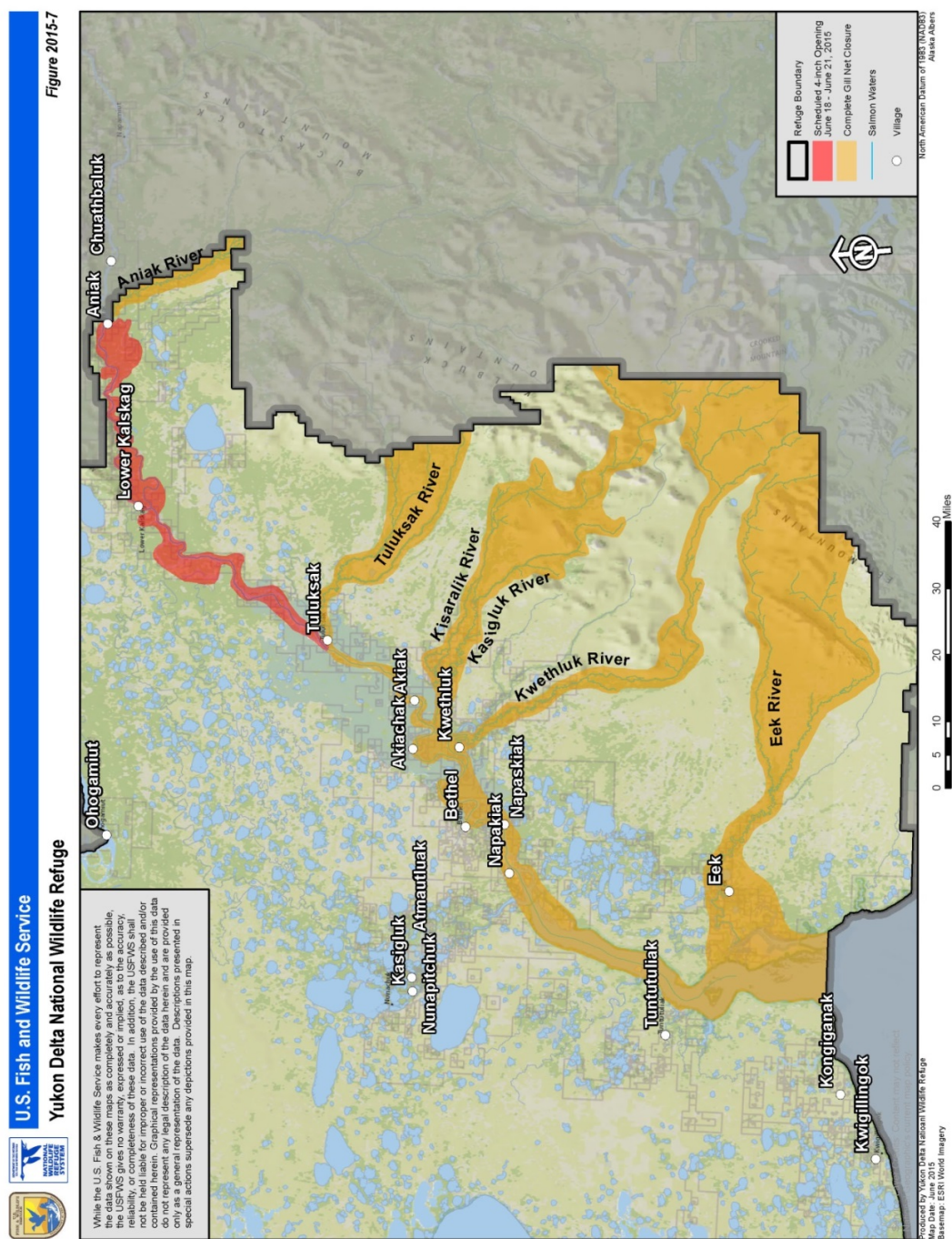


**Appendix Figure C-2.** Federal Special Actions SA 3-KS-04-15 (closure to gillnets) and SA 3-KS-05-15 (scheduled openings to 4-inch mesh nets).

**Appendix Table C-3.** Federal special actions, Kuskokwim River drainage, 2015 (*continued from previous page*).

<b>2015 YUKON DELTA NATIONAL WILDLIFE REFUGE KUSKOKWIM RIVER DRAINAGE–SUBSISTENCE FISHING</b>		
<b>Federal Special Actions</b>	<b>Effective Date</b>	<b>Action</b>
SA 3-KS-06-15	June 10–30, 2015	<p>Unless superseded by subsequent Special Action, waters within and adjacent to the Refuge boundary are closed to the harvest of <b>Chinook Salmon</b> except by Federally qualified subsistence users in possession of a Federal Community Harvest Permit. Dates and harvest limits will be described on each permit.</p> <p>Chinook Salmon may be targeted using dip-nets, beach seines, fish wheels, and gillnets. Gillnets are restricted to 6-inch or less mesh, not exceeding 300-feet long, and 45-meshes deep, and shall be drift net only. Chinook Salmon fishing is only permitted in the Kuskokwim River, the Eek River, and salmon tributaries of the Eek River. This permit is not valid on the Kwethluk, Kasigluk, Kisaralik, Tuluksak, and Aniak rivers and their salmon tributaries.</p>
SA 3-KS-07-15 supersedes SA 3-KS-05-15	June 18–July 20, 2015	<p>Waters within and adjacent to the Refuge boundary are closed to the harvest of <b>all fish</b> except by residents of the Kuskokwim drainage and the villages of Chefornek, Kipnuk, Kwigillingok, and Kongiganek.</p> <p>The Kuskokwim River and its salmon tributaries within and adjacent to the Refuge boundary are closed to the harvest of <b>Chinook Salmon</b> by all users.</p> <p>The Kuskokwim River and its salmon tributaries downstream of Tuluksak within and adjacent to the boundaries of the Refuge are closed to the use of <b>gillnets</b> by all users (<b>Appendix Figure C-3</b>).</p> <p>The closure does not affect the Chinook Salmon harvest opportunity with Federal Community Harvest Permits (SA 3-KS-06-15).</p>
SA 3-KS-08-15	June 18–21, 2015	<p>Federal public waters of the Kuskokwim River drainage upriver from the Tuluksak River are closed to the harvest of <b>nonsalmon fishes</b> except by Federally qualified subsistence users using 4-inch or less mesh set gillnets not exceeding 60-feet long and 45-meshes deep, only 72 hours per week, 6:00 am Thur.–6:00 am Sunday (<b>Appendix Figure C-3</b>).</p>

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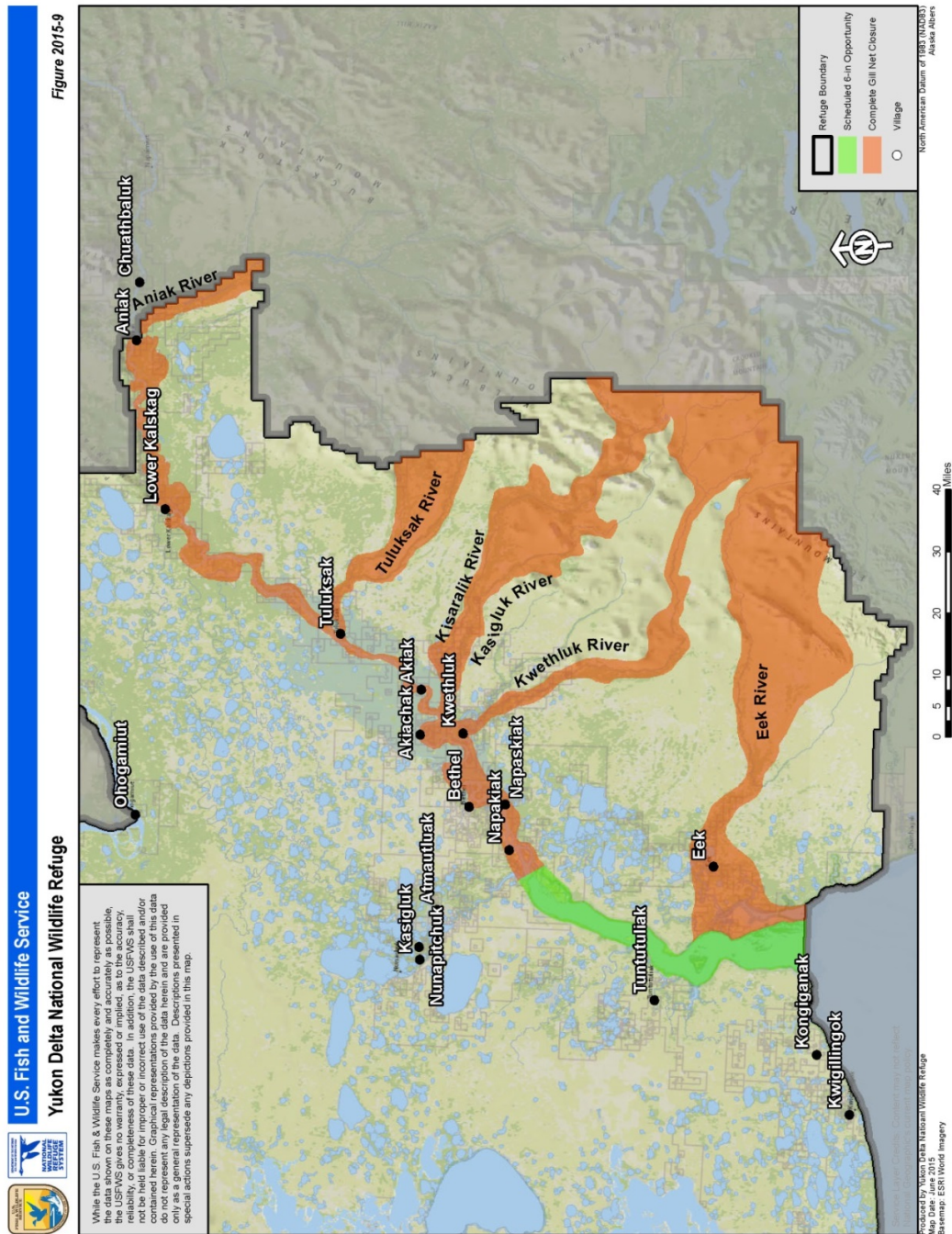
**Appendix Figure C-3.** Federal Special Actions SA 3-KS-07-15 (closure to gillnets) and SA 3-KS-08-15 (scheduled opening to 4-inch mesh nets).



**Appendix Table C-3.** Federal special actions, Kuskokwim River drainage, 2015 (*continued from previous page*).

<b>2015</b> <b>YUKON DELTA NATIONAL WILDLIFE REFUGE</b> <b>KUSKOKWIM RIVER DRAINAGE—SUBSISTENCE FISHING</b>		
<b>Federal Special Actions</b>	<b>Effective Date</b>	<b>Action</b>
SA 3-KS-09-15  supersedes SA 3-KS-08-15	June 22–July 20, 2015	<p>Waters within and adjacent to the Refuge boundary are closed to the harvest of <b>all fish</b> except by residents of the Kuskokwim drainage and the villages of Chefornek, Kipnuk, Kwigillingok, and Kongiganek.</p> <p>The closure does not affect the Chinook Salmon harvest opportunity with Federal Community Harvest Permits (SA 3-KS-06-15).</p> <p>Waters within and adjacent to the Refuge boundary are closed to the harvest of <b>Chinook Salmon</b> except by Federally qualified subsistence users on Monday June 22, 4:00 pm–8:00 pm.</p> <p>Only drift gillnets with 6-inch or less mesh, not exceeding 300-feet long and 45-meshes deep may be used. Fishing is only permitted in the Kuskokwim River below the mouth of the Johnson River, excluding the Eek River and its salmon tributaries, within and adjacent to the Refuge boundary (<b>Appendix Figure C-4</b>).</p> <p>Except for users with a Federal Community Harvest Permit or participating in a temporary opening, all <b>gillnets</b> are prohibited in the Kuskokwim River and its salmon tributaries within and adjacent to the Refuge boundary.</p> <p>Subsistence fishing in the Kuskokwim River and its salmon tributaries by Federally qualified subsistence users is open with all other legal subsistence gear, which are dip net, beach seine, fish wheel, or rod and reel. However, Chinook Salmon must be immediately released.</p>

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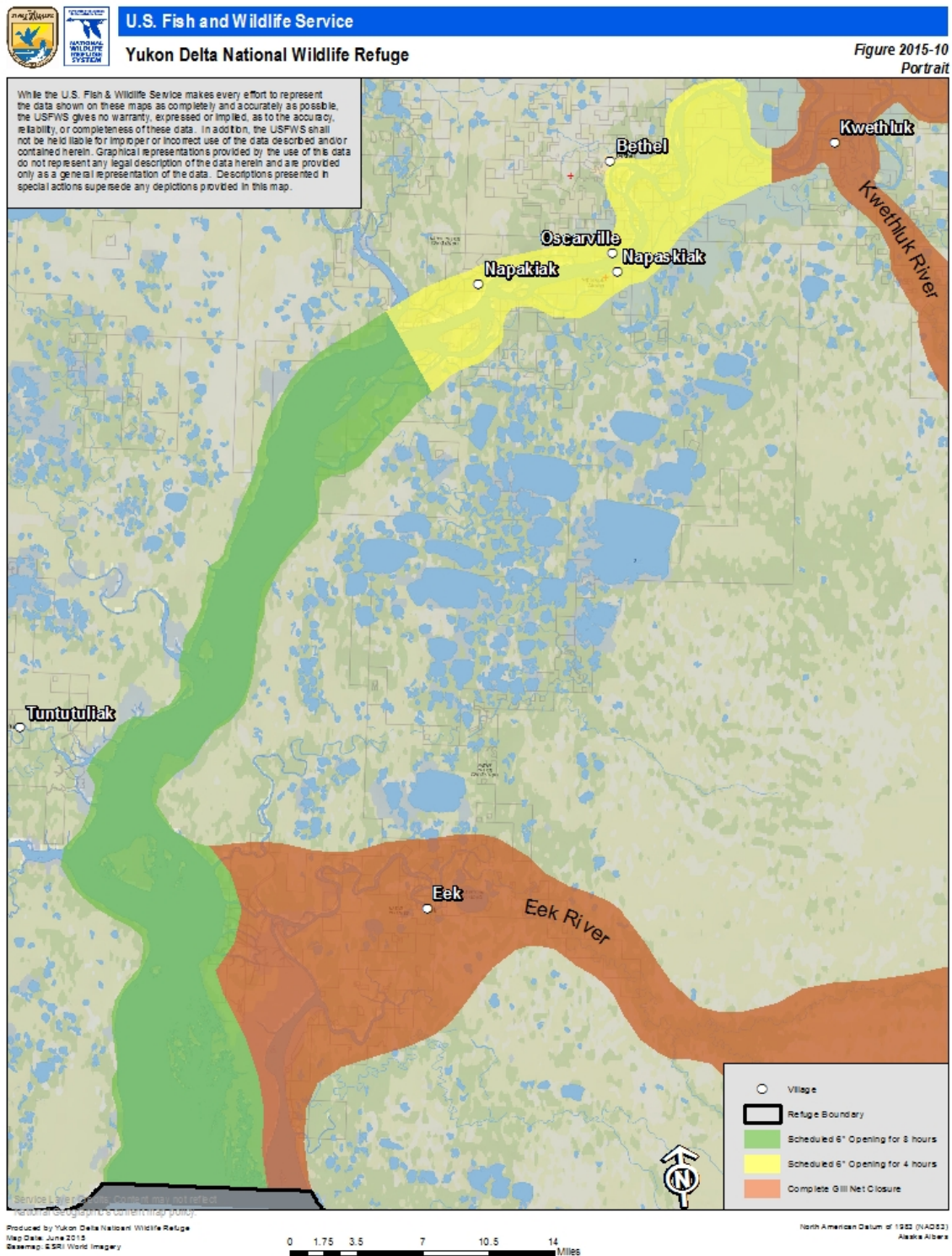


**Appendix Figure C-4.** Federal Special Actions SA 3-KS-09-15 (scheduled opening to 6-inch mesh nets).

**Appendix Table C-3.** Federal special actions, Kuskokwim River drainage, 2015 (*continued from previous page*).

<b>2015 YUKON DELTA NATIONAL WILDLIFE REFUGE KUSKOKWIM RIVER DRAINAGE–SUBSISTENCE FISHING</b>		
<b>Federal Special Actions</b>	<b>Effective Date</b>	<b>Action</b>
SA 3-KS-10-15  supersedes SA 3-KS-09-15	June 26–July 20, 2015	<p>Waters within and adjacent to the Refuge boundary are closed to the harvest of <b>all fish</b> except by residents of the Kuskokwim drainage and the villages of Chefornek, Kipnuk, Kwigillingok, and Kongiganek.</p> <p>The Kuskokwim River and its salmon tributaries within and adjacent to the Refuge boundary are closed to the harvest of <b>Chinook Salmon</b> except:</p> <p style="padding-left: 40px;">The Kuskokwim River below the mouth of the Johnson River is open to the harvest of Chinook Salmon by Federally qualified subsistence users Friday June 26, 2:00 pm–10:00 pm.</p> <p style="padding-left: 40px;">The Kuskokwim River between Kuskokuak Slough and the Johnson River are open to the harvest of Chinook Salmon by Federally qualified subsistence users Friday June 26, 6:00 pm–10:00 pm.</p> <p style="padding-left: 40px;">Only drift gillnets with 6-inch or less mesh, not exceeding 300-feet long and 45-meshes deep may be used (<b>Appendix Figure C-5</b>).</p> <p>The closures do not affect the Chinook Salmon harvest opportunity with Federal Community Harvest Permits (SA 3-KS-06-15).</p> <p>Except for users with a Federal Community Harvest Permit or fishing in a temporary opening, all gillnets are prohibited in the Kuskokwim River and its salmon tributaries within and adjacent to the Refuge boundary.</p> <p>The Kuskokwim River and its salmon tributaries are closed to the harvest of all fish except Federally qualified subsistence users using all other legal subsistence gear, which are dip net, beach seine, fish wheel, or rod and reel. However, Chinook Salmon must be immediately released.</p>

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**Appendix Figure C-5.** Federal Special Actions SA 3-KS-10-15 (scheduled opening to 6-inch mesh nets).

**Appendix Table C-3.** Federal special actions, Kuskokwim River drainage, 2015 (*continued from previous page*).

<b>2015</b> <b>YUKON DELTA NATIONAL WILDLIFE REFUGE</b> <b>KUSKOKWIM RIVER DRAINAGE—SUBSISTENCE FISHING</b>		
<b>Federal Special Actions</b>	<b>Effective Date</b>	<b>Action</b>
SA 3-KS-11-15  supersedes SA 3-KS-10-15	June 30–July 20, 2015	<p>The Kuskokwim River and its salmon tributaries within and adjacent to the Refuge boundary are closed to the harvest of <b>all fish</b> except by Federally qualified subsistence users</p> <p>The Kuskokwim River and its salmon tributaries within and adjacent to the Refuge boundary are closed to the harvest of <b>Chinook Salmon</b> except:</p> <p style="padding-left: 40px;">The Kuskokwim River below the mouth of the Johnson River is open to the harvest of all fish by Federally qualified subsistence users Tuesday June 30, 2:00 pm–6:00 pm.</p> <p style="padding-left: 40px;">The Kuskokwim River between the Johnson River and the Aniak River are open to the harvest of all fish by Federally qualified subsistence users Tuesday June 30, 6:00 pm–6:00 pm.</p> <p style="padding-left: 40px;">Only drift gillnets with 6-inch or less mesh, not exceeding 300-feet long and 45-meshes deep may be used.</p> <p>Except for users with a Federal Community Harvest Permit or fishing in a temporary opening, all gillnets are prohibited in the Kuskokwim River and its salmon tributaries within and adjacent to the Refuge boundary.</p> <p>The Kuskokwim River and its salmon tributaries are closed to the harvest of all fish except Federally qualified subsistence users using all other legal subsistence gear, which are dip net, beach seine, fish wheel, or rod and reel. However, Chinook Salmon must be immediately released.</p>
SA 3-KS-12-15	July 2, 2015	For the Kuskokwim Fishery Management 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.



**Appendix Table C-4.** State emergency orders, Kuskokwim River drainage, 2015

<b>2015 KUSKOKWIM RIVER DRAINAGE SUBSISTENCE FISHING</b>		
<b>State Emergency Order</b>	<b>Effective Date</b>	<b>Actions</b>
EO 3-KS-01-15	April 1–July 25, 2015	The Kuskokwim River drainage and Kuskokwim Bay tributaries are closed to sport fishing for <b>Chinook Salmon</b> Wednesday, April 1 through Saturday, July 25, 2015. All Chinook Salmon caught while fishing for other species may not be removed from the water and must be released immediately. In addition, anglers may use only one unbaited, single-hook, artificial lure in the entire Kuskokwim-Goodnews Area.
EO 3-S-WR-01-15	June 4, 2015, until further notice	<p>From the Aniak River upriver to the Holitna River fishing for <b>salmon</b> is closed. Fishing for nonsalmon species with gillnets is restricted to 4-inch or less mesh size not exceeding 60-feet long and 45-meshes deep, setnets only:</p> <p>6:00 a.m. Thursday, June 4 until 6:00 a.m. Sunday, June 7;          6:00 a.m. Thursday, June 11 until 6:00 a.m. Sunday, June 14;          6:00 a.m. Thursday, June 18 until 6:00 a.m. Sunday, June 21;          6:00 a.m. Thursday, June 25 until 6:00 a.m. Sunday, June 28.</p> <p>Subsistence fishing with hook and line for Chinook Salmon is closed; any Chinook Salmon caught must be returned alive to the water.</p> <p>Subsistence fishing with dip nets is allowed; any Chinook Salmon caught in a dip net must be returned immediately to the water alive.</p> <p>Subsistence fishing with fish wheels is allowed; fish wheels are required to have a live box with no less than 45 cubic feet of water and must be checked at least every 6 hours; fish wheels can be equipped with a chute and must be closely attended while in operation; any Chinook Salmon caught must be returned alive to the water.</p>
EO 3-S-WR-02-15	June 7, 2015 until further notice	The Aniak River is closed to the use of all <b>gillnets</b> . All other legal subsistence fishing gear is allowed (beach seine, hook and line, handline, or fishwheel); any Chinook Salmon caught must be returned alive to the water.
EO 3-S-WR-03-15	May 28, 2015 until further	Marine waters near the Kuskokwim River mouth (Ishkowik River to the northern boundary of District W-4 at Weelung Creek), fishing for <b>salmon</b> is closed.

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**Appendix Table C-4.** State emergency orders, Kuskokwim River drainage, 2015 (*continued from previous page*).

2015 KUSKOKWIM RIVER DRAINAGE SUBSISTENCE FISHING		
State Emergency Order	Effective Date	Action
EO 3-S-WR-04-15	June 11–July 2, 2015	<p>From the Holitna River mouth to the headwaters of the Kuskokwim River subsistence salmon fishing is closed.</p> <p>Subsistence fishing for <b>nonsalmon fish</b> is restricted to the use of set gillnets with 4-inch or less mesh size not exceeding 60-feet long and 45-meshes deep:          6:00 a.m. Thursday, June 11 until 6:00 a.m. Sunday, June 14;          6:00 a.m. Thursday, June 18 until 6:00 a.m. Sunday, June 21;          6:00 a.m. Thursday, June 25 until 6:00 a.m. Sunday, June 28;          6:00 a.m. Thursday, July 2 until 6:00 a.m. Sunday, July 5.</p> <p>Subsistence fishing with hook and line for <b>Chinook Salmon</b> is closed; any Chinook Salmon caught must be returned alive to the water.</p> <p>Subsistence fishing with dip nets is allowed; any Chinook Salmon caught in a dip net must be returned immediately to the water alive.</p> <p>Subsistence fishing with fish wheels is allowed; fish wheels are required to have a live box with no less than 45 cubic feet of water and must be checked at least every 6 hours; fish wheels can be equipped with a chute and must be closely attended while in operation; any Chinook Salmon caught must be returned alive to the water.</p>
EO 3-S-WR-05-15	June 20, 2015	<p>From the Aniak River to the headwaters of the Kuskokwim River is open to subsistence <b>salmon</b> fishing with 6-inch or less mesh gillnets, 45-meshes deep, and not to exceed 10-fathoms long, for Alaska residents 60 years of age or older, Saturday June 20, 2:00 p.m.–6:00 p.m.</p> <p>An Alaska resident 60 years of age or older must be present while fishing activities are being conducted but may be assisted by family members within the second degree of kindred. A gillnet longer than 10 fathoms may be used as long as only 10 fathoms is in a fishable condition and the remainder of the gillnet is either tied up or secured so that it is not in the water in a fishing condition.</p>
EO 3-S-WR-06-15	June 27, 2015	<p>From the Aniak River to the headwaters of the Kuskokwim River is open to subsistence <b>salmon</b> fishing with 6-inch or less mesh gillnets, 45-meshes deep, and not to exceed 10-fathoms long, Saturday June 27, 12:00 p.m.–6:00 p.m.</p>
EO 3-S-WR-07-15	June 27, 2015	<p>The Kuskokwim River and its tributaries from the Holitna River to the headwaters is open to subsistence fishing with a hook and line for <b>Chinook Salmon</b>, Saturday June 27 for 24 hours,. The Chinook Salmon harvest limit for this hook and line opportunity is 5 fish.</p>

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**Appendix Table C-4.** State emergency orders, Kuskokwim River drainage, 2015 (*continued from previous page*).

2015 KUSKOKWIM RIVER DRAINAGE SUBSISTENCE FISHING		
State Emergency Order	Effective Date	Action
EO 3-S-WR-08-15	July 1, 2015	The Kuskokwim River from the Aniak River to the headwaters of the Kuskokwim River is open to subsistence <b>salmon</b> fishing with 6-inch or less mesh gillnets, 45-meshes deep, and not to exceed 10-fathoms long, Wednesday, July 1, 12:00 p.m.–8:00 p.m.
EO 3-S-WR-09-15	July 1, 2015	The Kuskokwim River and its tributaries, from the Holitna River to the headwaters of the Kuskokwim River, is open to subsistence fishing with a hook and line for <b>Chinook Salmon</b> , Wednesday, July 1, 12:01 a.m.–11:59 p.m. The Chinook Salmon bag limit for this hook and line opportunity is 5 fish.
EO 3-S-WR-10-15	July 1, 2015 until further notice	Subsistence fishing on the Stony River upstream of the confluence with the Stink River is unrestricted.
EO 3-S-WR-11-15	July 2, 2015 until further notice	<p>The Kuskokwim River drainage from the mouth of the Kuskokwim River to the Aniak River subsistence fishing for <b>Chinook Salmon</b> with hook and line is closed. Any Chinook Salmon caught must be released alive to the water.</p> <p>Subsistence fishing with fish wheels is 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. Fish wheels can be equipped with a chute and must be closely attended while in operation. All Chinook salmon must be returned alive to the water.</p> <p>Subsistence fishing with dip nets is closed.</p> <p>Subsistence fishing with <b>gillnets</b> is closed in the Kwethluk, Kasigluk, Kisaralik, Tuluksak, and Aniak river drainages and the Kuskokwim River.</p>
EO 3-S-WR-12-15	July 4, 2015	<p>The Kuskokwim River from the mouth of the Kuskokwim River to the mouth of the Johnson River is open to subsistence salmon fishing with 6-inch or less mesh gillnets, 45-meshes deep, and not to exceed 50-fathoms long, Saturday, July 4, 12:00 p.m.–8:00 p.m.</p> <p>From the Johnson River to Tuluksak with 6-inch or less mesh gillnets, 45-meshes deep, and not to exceed 25-fathoms long, Saturday, July 4, 4:00 p.m.–8:00 p.m.</p> <p>From the Tuluksak to the Holitna River with 6-inch or less mesh gillnets, 45-meshes deep, and not to exceed 25-fathoms long, Saturday, July 4, 12:00 p.m.–8:00 p.m.</p>
EO 3-S-WR-13-15	July 4, 2015 until further notice	The Kuskokwim River and its tributaries from the Holitna River to the headwaters of the Kuskokwim River is open to subsistence fishing with a hook and line for Chinook Salmon. The Chinook Salmon limit for this hook and line opportunity will be 3 fish per day, 6 in possession.

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**Appendix Table C-4.** State emergency orders, Kuskokwim River drainage, 2015 (*continued from previous page*).

2015 KUSKOKWIM RIVER DRAINAGE SUBSISTENCE FISHING		
State Emergency Order	Effective Date	Action
EO 3-S-CS-01-15	July 6–August 31, 2015	The Kuskokwim River drainage is closed to sport fishing for Chum Salmon. Only unbaited, single-hook, artificial lures may be used in the Kuskokwim-Goodnews Area. All Chum Salmon caught unintentionally while fishing for other species may not be removed from the water and must be released immediately.
EO 3-S-CS-02-15 supersedes EO 3-S-CS-01-15	July 10–Aug. 31, 2015	The Kuskokwim River drainage ( <b>excluding Kuskokwim Bay</b> ) is closed to sport fishing for Chum Salmon. Only unbaited, single-hook, artificial lures may be used in the Kuskokwim-Goodnews Area. All Chum Salmon caught unintentionally while fishing for other species may not be removed from the water and must be released immediately.
EO 3-S-WR-14-15	July 8, 2015	<p>The Kuskokwim River from the mouth of the Kuskokwim River to the mouth of the Johnson River is open to subsistence salmon fishing with 6-inch or less mesh gillnets, 45-meshes deep, and not to exceed 50-fathoms long, Wednesday, July 8, 9:00 a.m.–9:00 p.m.</p> <p>From the Johnson River to Tuluksak with 6-inch or less mesh gillnets, 45-meshes deep, and not to exceed 50-fathoms long, Wednesday, July 8, 5:00 p.m.–9:00 p.m.</p> <p>From Tuluksak to the headwaters of the Kuskokwim River with 6-inch or less mesh gillnets, 45-meshes deep, and not to exceed 50-fathoms long, Wednesday, July 8, 9:00 a.m.–9:00 p.m.</p> <p>The waters of the Kuskokwim River from Aniak downstream to a line formed between two points lat 61° 35.076' N, long 159° 32.527' W and lat 61° 35.263' N, long 159° 32.088' W is closed to subsistence fishing with gillnets Wednesday, July 8, 9:00 a.m.–9:00 p.m. (<b>Appendix Figure C-6</b>).</p>
EO 3-S-WR-15-15	July 8, 2015 until further notice	Subsistence fishing in the Stony River and its tributaries is unrestricted. The Chinook salmon limit for subsistence hook and line is 3 fish per day, 6 in possession.
EO 3-S-WR-16-15	July 8, 2015 until further notice	<p>From the Holitna River to the headwaters of the Kuskokwim River (excluding the Holitna and Swift rivers), subsistence fishing is allowed with 6-inch or less mesh gillnets, 45-meshes deep, and not to exceed 50-fathoms long.</p> <p>The use of dip nets for subsistence salmon fishing is discontinued in the Kuskokwim River drainage from the Holitna River to the headwaters of the Kuskokwim River.</p> <p>The use of a live box or chute is not required while operating a fish wheel from the Holitna River to the headwaters of the Kuskokwim River.</p>

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**Appendix Figure C-6.** State of Alaska Emergency Order EO 3-S-WR-14-15 (closed area in front of Aniak).

**Appendix Table C-4.** State emergency orders, Kuskokwim River drainage, 2015 (*continued from previous page*).

2015 KUSKOKWIM RIVER DRAINAGE SUBSISTENCE FISHING		
State Emergency Order	Effective Date	Action
EO 3-S-WR-17-15	July 11, 2015	<p>From the Johnson River to the mouth of the Kuskokwim River subsistence salmon fishing is allowed with 6-inch or less mesh gillnets, 45-meshes deep, and not to exceed 50-fathoms long Saturday, July 11, 9:00 a.m.–9:00 p.m.</p> <p>From the Johnson River to Tuluksak subsistence salmon fishing is allowed with 6-inch or less mesh gillnets, 45 meshes deep, and not to exceed 50-fathoms long Saturday, July 11, 10:00 a.m.–2:00 p.m.</p> <p>From Tuluksak to the Holitna River subsistence salmon fishing is allowed with 6-inch or less mesh gillnets, 45-meshes deep, and not to exceed 50-fathoms long Saturday, July 11, 9:00 a.m.–9:00 p.m.</p>
EO 3-S-WR-18-15	July 11, 2015	The waters of the Kuskokwim River from Aniak downstream to a line formed between two points lat 61° 35.076' N, long 159° 32.527' W and lat 61° 35.263' N, long 159° 32.088' W ( <b>Appendix Figure C-6</b> ) is closed to subsistence fishing with gillnets Saturday, July 11, 9:00 a.m.–9:00 p.m.
EO 3-S-WR-19-15	July 11, 2015 until further notice	The use of dip nets for subsistence salmon fishing is discontinued in the Kuskokwim River drainage from Aniak to the Holitna River.
EO 3-S-WR-20-15	July 13 and 15, 2015	<p>From the Johnson River to the mouth of the Kuskokwim River subsistence salmon fishing is allowed with 6-inch or less mesh gillnets, 45-meshes deep, and not to exceed 50-fathoms long Monday, July 13, 9:00 a.m.–9:00 p.m., and Wednesday, July 15, 2015, 9:00 a.m.–9:00 p.m.</p> <p>From the Johnson River to Tuluksak subsistence salmon fishing is allowed with 6-inch or less mesh gillnets, 45-meshes deep, and not to exceed 50-fathoms long, Monday, July 13, 1:00 p.m.–7:00 p.m., and Wednesday, July 15, 3:00 p.m.–9:00 p.m.</p> <p>From Tuluksak to the Holitna River subsistence salmon fishing is allowed with 6-inch or less mesh gillnets, 45-meshes deep, and not to exceed 50-fathoms long, Monday, July 13, 9:00 a.m.–9:00 p.m., and Wednesday, July 15, 9:00 a.m.–9:00 p.m.</p>
EO 3-S-WR-21-15	July 13 and 15, 2015	The waters of the Kuskokwim River from Aniak downstream to a line formed between two points lat 61° 35.076' N, long 159° 32.527' W and lat 61° 35.263' N, long 159° 32.088' W ( <b>Appendix Figure C-6</b> ) is closed to subsistence fishing with gillnets Monday, July 13, 9:00 a.m.–9:00 p.m., and Wednesday, July 15, 9:00 a.m.–9:00 p.m.

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**Appendix Table C-4.** State emergency orders, Kuskokwim River drainage, 2015 (*continued from previous page*).

<b>2015 KUSKOKWIM RIVER DRAINAGE SUBSISTENCE FISHING</b>		
<b>State Emergency Order</b>	<b>Effective Date</b>	<b>Action</b>
EO 3-S-WR-22-15	July 13, 2015 until further notice	Marine waters near the Kuskokwim River mouth (Ishkowiik River to the northern boundary of District W-4 at Weelung Creek) are open to subsistence fishing.
EO 3-S-WR-23-15	July 15, 2015 until further notice	Subsistence salmon fishing with gillnets is allowed in the Kuskokwim River from the mouth of the Kuskokwim River to the Holitna River, with 6-inch or less mesh gillnets.
EO 3-S-WR-24-15	July 15, 2015 until further notice	The use of a live box or chute is not required while operating a fish wheel from the mouth of the Kuskokwim River to the Holitna River.
EO 3-S-WR-25-15	July 15, 2015 until further notice	The waters of the Kuskokwim River from Aniak downstream to a line formed between two points lat 61° 35.076' N, long 159° 32.527' W and lat 61° 35.263' N, long 159° 32.088' W ( <b>Appendix Figure C-6</b> ) is closed to subsistence fishing with gillnets.
EO 3-S-WR-26-15	August 4, 2015	The following restrictions to the Kuskokwim River subsistence salmon fishery are rescinded: gillnet use in the Kwethluk, Kasigluk, Kisaralik, Tuluksak, and Aniak rivers (EO 3-S-WR-11-15); 6-inch or less mesh requirements for subsistence gillnets (EO 3-S-WR-16-15; EO 3-S-WR-23-15; EO 3-S-WR-25-15); closed waters at the mouth of the Aniak (EO 3-S-WR-25-15); and restrictions to hook and line bag and possession limits for Chinook salmon (EO 3-S-WR-01-15, 3-S-WR-02-15, EO 3-S-WR-11-15).

## SALMON MANAGEMENT IN 2016

**Appendix Table C-5.** Federal special actions, Kuskokwim River drainage, 2016.

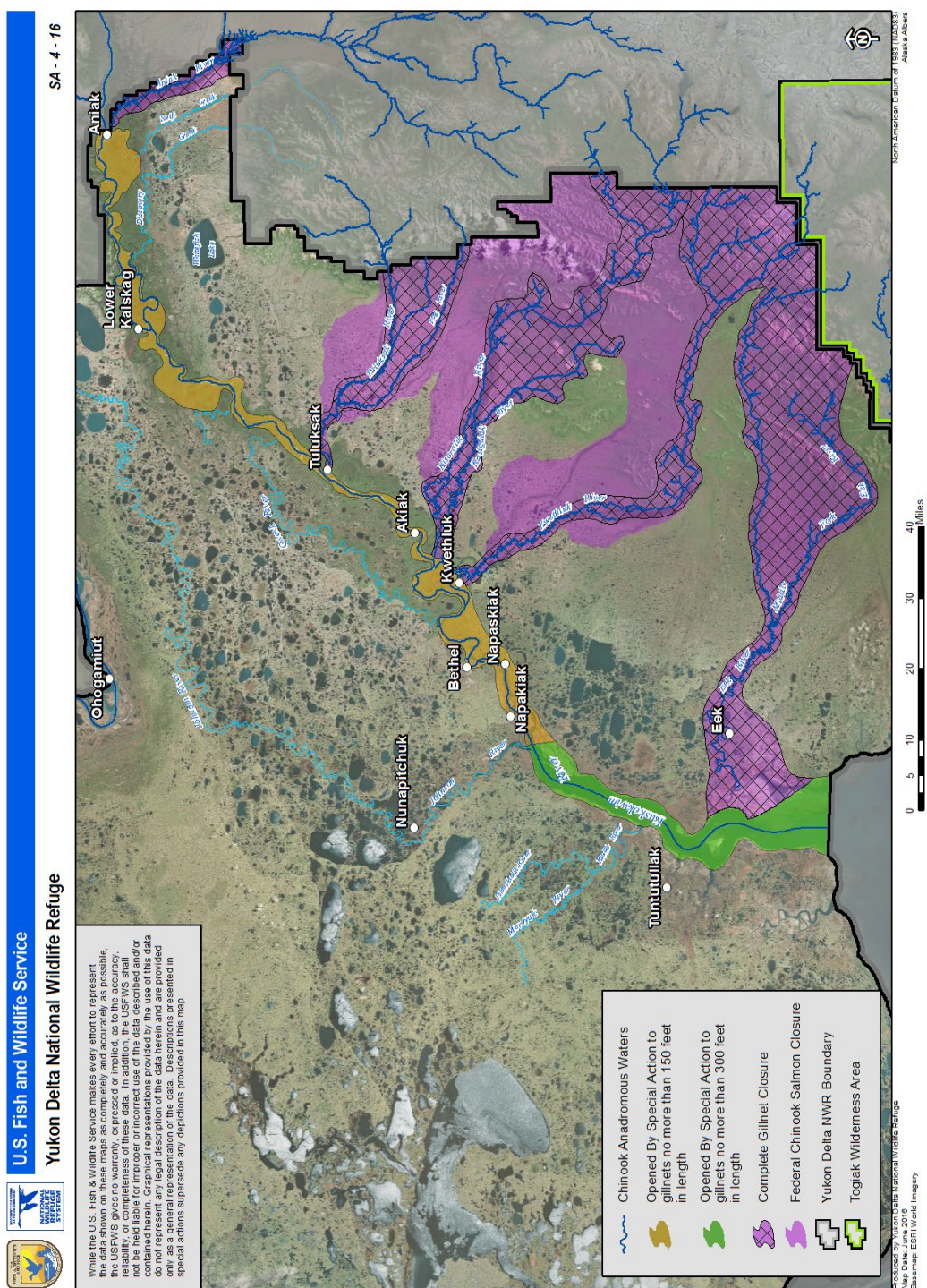
2016 KUSKOKWIM RIVER DRAINAGE SUBSISTENCE FISHING		
Federal Special Actions	Effective Date	Action
SA 3-KS-01-16	June 1, 2016- June 12, 2016	All waters within and adjacent to the Refuge boundary are closed to the harvest of <b>Chinook and Chum Salmon</b> except by Federally qualified subsistence users that are residents of the Kuskokwim drainage and the villages of Chefnak, Kipnuk, Kwigillingok, and Kongiganek.
SA 3-KS-01a-16	June 3, 2016-July 7, 2016	Federal waters of the Kuskokwim River are closed to the harvest of <b>Chinook and Chum Salmon</b> by Federally qualified users. Fishing openings, closings, and fishing methods for Federally qualified subsistence users will be announced by subsequent Federal Special Actions.
SA 3-KS-02-16	June 12, 2016	Federal public waters of the Kuskokwim River drainage are open to the harvest of <b>Chinook and Chum Salmon</b> by Federally qualified subsistence users that are residents of the Kuskokwim drainage and the villages of Chefnak, Kipnuk, Kwigillingok, and Kongiganek.  Legal gear includes drift and set gillnets restricted to 6-inch or less mesh size, not exceeding 45-meshes deep, 300-feet long from the Refuge boundary at the mouth of the Kuskokwim to the Johnson River, and 150-feet long from the Johnson River to the Refuge boundary at Aniak. Harvest allowed for 12 hours only from June 12, 2016 from 12:01 pm (noon) until 11:59 pm (midnight).
SA 3-KS-03-16	June 12, 2016-July 7, 2016	The use of gillnets for fishing on the Eek, Kwethluk, Kasigluk, Kisaralik, Tuluksak, and Aniak Rivers as well as their salmon tributaries are closed within the boundaries of the Refuge ( <b>Appendix Figure C-7</b> ).
SA 3-KS-04-16	June 16, 2016- June 17, 2016	Federal public waters of the Kuskokwim River drainage are open to the harvest of <b>Chinook and chum salmon</b> by Federally qualified subsistence users that are residents of the Kuskokwim drainage and the villages of Chefnak, Kipnuk, Kwigillingok, and Kongiganek.  Legal gear includes drift and set gillnets, hook and line, fish wheels, dip nets, beach seines and all other gear types identified in Federal subsistence regulations. Gillnets restricted to 6-inch or less mesh size, not exceeding 45-meshes deep, 300-feet long from the Refuge boundary at the mouth of the Kuskokwim to the Johnson River, and 150-feet long from the Johnson River to the Refuge boundary at Aniak ( <b>Appendix Figure C-7</b> ). Harvest allowed for 24 hours only from June 16, 2016 from 12:01 pm (noon) until June 17, 2016 at 11:59 am (noon).

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**Appendix Table C-5.** Federal special actions, Kuskokwim River drainage, 2016 (*continued from previous page.*)

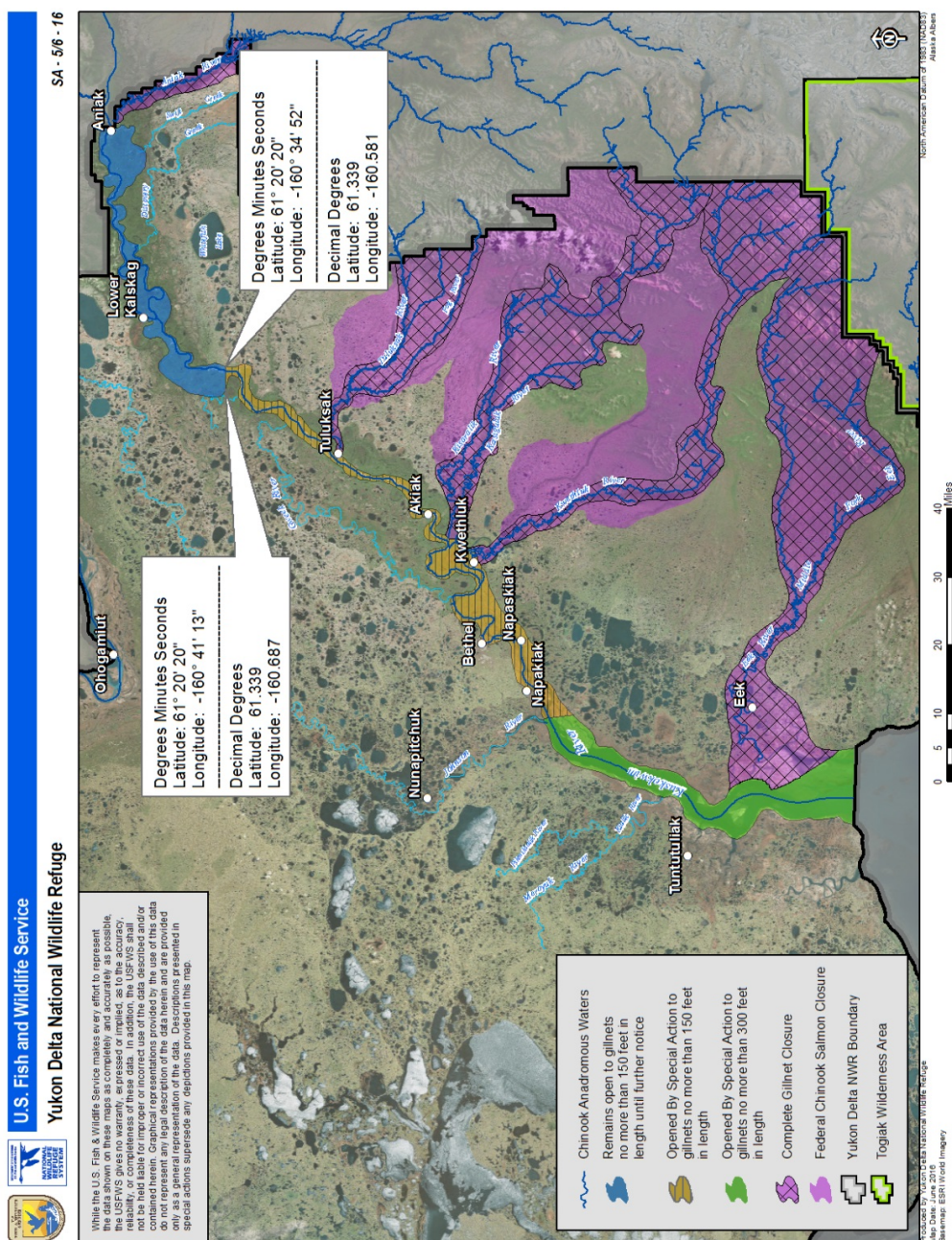
2016 KUSKOKWIM RIVER DRAINAGE SUBSISTENCE FISHING		
Federal Special Actions	Effective Date	Action
SA 3-KS-05-16	June 21, 2016-July 7, 2016	<p>Federal public waters of the Kuskokwim River from a line downstream of Kalskag at the south edge of Uknavik Slough and then due east to the edge of the bluff line to the Refuge boundary at Aniak (<b>Appendix Figure C-8</b>) are open to harvest of <b>Chinook and chum salmon</b> by Federally qualified subsistence users that are residents of the Kuskokwim drainage and the villages of Cheforak, Kipnuk, Kwigillingok, and Kongiganek until further notice.</p> <p>Legal gear includes drift and set gillnets, hook and line, fish wheels, dip nets, beach seines and all other gear types identified in Federal subsistence regulations. Gillnets restricted to 6-inch or less mesh size, not exceeding 45-meshes deep, and 150-feet long</p>
SA 3-KS-06-16	June 21, 2016-June 24, 2016	<p>Federal public waters of the Kuskokwim River drainage are open to the harvest of <b>Chinook and chum salmon</b> by Federally qualified subsistence users that are residents of the Kuskokwim drainage and the villages of Cheforak, Kipnuk, Kwigillingok, and Kongiganek.</p> <p>Legal gear includes drift and set gillnets, hook and line, fish wheels, dip nets, beach seines and all other gear types identified in Federal subsistence regulations. Gillnets restricted to 6-inch or less mesh size, not exceeding 45-meshes deep, 300-feet long from the Refuge boundary at the mouth of the Kuskokwim to the Johnson River, and 150-feet long from the Johnson River to the Refuge boundary at Aniak (<b>Appendix Figure C-8</b>). Harvest allowed for 72 hours only from June 21, 2016 from 12:01 pm (noon) until June 24, 2016 at 11:59 am (noon).</p>
SA 3-KS-07-16	June 29, 2016-July 2, 2016	<p>Federal public waters of the Kuskokwim River drainage are open to the harvest of <b>Chinook and chum salmon</b> by Federally qualified subsistence users that are residents of the Kuskokwim drainage and the villages of Cheforak, Kipnuk, Kwigillingok, and Kongiganek.</p> <p>Legal gear includes drift and set gillnets, hook and line, fish wheels, dip nets, beach seines and all other gear types identified in Federal subsistence regulations. Gillnets restricted to 6-inch or less mesh size, not exceeding 45-meshes deep, 300-feet long from the Refuge boundary at the mouth of the Kuskokwim to the Johnson River, and 150-feet long from the Johnson River to the Refuge boundary at Aniak (<b>Appendix Figure C-8</b>). Harvest allowed for 72 hours only from June 29, 2016 from 12:01 pm (noon) until July 2, 2016 at 11:59 am (noon).</p>
SA 3-KS-08-16	July 7, 2016-present	For the Kuskokwim River drainage, all previously issued special actions were rescinded.





**Appendix Figure C-7.** Federal Special Actions SA 3-KS-04-16, temporary harvest of Chinook and Chum salmon by Federally qualified subsistence users and SA-3-KS-03-16, temporary closure of rivers in Refuge boundary.





**Appendix Figure C-8.** Federal Special Actions SA 3-KS-05-16, SA 3-KS-06-16, and SA 3-KS-07-16, temporary harvest of Chinook and Chum salmon by Federally qualified subsistence users.



**Appendix Table C-6.** State emergency orders, Kuskokwim River drainage, 2016.

<b>2016</b> <b>KUSKOKWIM RIVER DRAINAGE</b> <b>SUBSISTENCE FISHING</b>		
<b>State Emergency Order</b>	<b>Effective Date</b>	<b>Actions</b>
EO 3-KS-01-16	May 1, 2016- July 25, 2016	The Kuskokwim River drainage and tributaries are closed to sport fishing for <b>Chinook Salmon</b> Sunday May 1, 2016 through Monday July 25, 2016. All Chinook Salmon caught while fishing for other species may not be removed from the water and must be released immediately. In addition, anglers may use only one unbaited, single-hook, artificial lure in the entire Kuskokwim Area.
EO 3-S-WR-01-16	May 20, 2016-June 12, 2016;  June 1, 2016-June 12, 2016	<p>On May 20, subsistence fishing with gillnets is closed in the Kuskokwim River drainage from the Yukon Delta National Wildlife Refuge boundary at the mouth of the Kuskokwim River to the ADF&amp;G markers downstream of the Holitna River mouth until further notice. Subsistence fishing with hook and line for <b>Chinook salmon</b> is closed in this area to further notice. Subsistence fishing with fish wheels, dip nets, and beach seines are allowed in this area until further notice, but all <b>Chinook salmon</b> caught must be immediately be released alive.</p> <p>Subsistence fishing with gillnets is closed beginning on June 1 in the Kuskokwim River upstream from the ADF&amp;G markers near the Holitna River mouth to the headwaters of the Kuskokwim River, the Kwethluk River drainage including its confluence with Kuskokuak Slough and downstream to ADF&amp;G regulatory markers located at the downstream mouth of the slough, the Kasigluk and Kisaralik river drainages including Old Kuskokuak Slough to ADF&amp;G regulatory markers at the confluence of Old Kuskokuak Slough with Kuskokuak Slough, the Tuluksak River drainage including its confluence with the Kuskokwim River and downstream approximately one mile to ADF&amp;G regulatory markers, and the Aniak River drainage to ADF&amp;G regulatory markers at its confluence with the Kuskokwim River until further notice.</p> <p>Beginning on June 1, Subsistence fishing with hook and line for Chinook salmon is closed to further notice on the Kuskokwim River above the ADF&amp;G markers downstream of the Holitna River mouth until further notice. Subsistence fishing with fish wheels, dip nets, and beach seines are allowed in this area until further notice, but all Chinook salmon caught must be immediately be released alive.</p>

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**Appendix Table C-6.** State emergency orders, Kuskokwim River drainage, 2016 (*continued from previous page*).

2016 KUSKOKWIM RIVER DRAINAGE SUBSISTENCE FISHING		
State Emergency Order	Effective Date	Actions
EO 3-S-WR-02-16, EO 3-S-WR-03-16	June 12, 2016-June 14, 2016;  June 12, 2016 until further notice	<p>The area from the YDNWR border at Aniak to the mouth of the Holitna River (not including the Aniak River) is open to subsistence fishing with 6-inch or less mesh, 25-fathoms (150 ft.) long or less gillnets for 48 hours from June 12, 12:00 pm (noon)-June 14, 12:00 pm (noon).</p> <p>The area from the mouth of the Holitna River to the Kuskokwim River headwaters is open to subsistence fishing with 6-inch or less mesh gillnets from June 12, 2016 at 12:00 pm (noon) until further notice.</p> <p>Subsistence fishing is also allowed with beach seines, dip nets, and hook and line from the YDNWR boundary at Aniak to the Kuskokwim River headwaters from June 12, 2016 at 12:00 pm (noon) until further notice.</p>
EO 3-S-WR-04-16	June 16, 2016 until further notice	<p>The area from the YDNWR border at Aniak to the headwaters of the Kuskokwim River (not including the Aniak River) is open to subsistence fishing with 6-inch or less mesh from 12:00 pm (noon) June 16, 2016 until further notice.</p>
EO 3-S-WR-5-16	July 7, 2016 until further notice	<p>Subsistence fishing is allowed for qualified Alaska residents from the YDNWR boundary at the mouth of the Kuskokwim River to the headwaters of the Kuskokwim River until further notice. Gillnets must be 6-inch or less mesh.</p> <p>Subsistence fishing with gillnets is closed in the following areas:</p> <ul style="list-style-type: none"> <li>• The Kwethluk River drainage including its confluence with Kuskokuak Slough and downstream to ADF&amp;G regulatory markers located at the downstream mouth of the slough.</li> <li>• The Kasigluk and Kisaralik river drainages including Old Kuskokuak Slough to ADF&amp;G regulatory markers at the confluence of Old Kuskokuak Slough with Kuskokuak Slough.</li> <li>• The Tuluksak River drainage including its confluence with the Kuskokwim River and downstream approximately one mile to ADF&amp;G regulatory markers.</li> <li>• The Aniak River drainage to ADF&amp;G regulatory markers at its confluence with the Kuskokwim River.</li> <li>• The Eek River.</li> <li>• The waters of the Kuskokwim River from the Yukon Delta NWR boundary at Aniak downstream to a line formed between two points lat 61° 35.076' N, long 159° 32.527' W and lat 61° 35.263' N, long 159° 32.088' W (Figure 3).</li> </ul>

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**Appendix Table C-6.** State emergency orders, Kuskokwim River drainage, 2016 (*continued from previous page*).

2016 KUSKOKWIM RIVER DRAINAGE SUBSISTENCE FISHING		
State Emergency Order	Effective Date	Actions
EO 3-S-WR-6-16	July 27, 2016-Until further notice	Effective 9:00 a.m. Wednesday, July 27, 2016, the following restrictions to the Kuskokwim River subsistence salmon fishery are rescinded: <ul style="list-style-type: none"> <li>Gillnet use in the Kwethluk, Kasigluk, Kisaralik, Tuluksak, Aniak and Eek Rivers;</li> <li>6-inch or less mesh requirements for subsistence gillnets; and</li> <li>The closed waters at the mouth of the Aniak River.</li> </ul>
EO 3-S-WR-7-16	July 29, 2016	Subdistrict 1-A will open to commercial <b>salmon</b> fishing for 6 hours from 2:00 p.m. until 8:00 p.m. Friday, July 29, 2016. This area is defined as that portion of District 1 upstream of regulatory markers located at Bethel to ADF&G regulatory markers at the mouth of Bogus Creek.  As there are no commercial salmon processors registered in the Kuskokwim Management Area, this opportunity is being provided for those individuals registered with the department as catcher/sellers.
EO 3-S-WR-8-16	August 12, 2016	Subdistrict 1-A will open to commercial <b>salmon</b> fishing for 6 hours from 2:00 p.m. until 8:00 p.m. Friday, August 12, 2016. This area is defined as that portion of District 1 upstream of regulatory markers located at Bethel to ADF&G regulatory markers at the mouth of Bogus Creek.  As there are no commercial <b>salmon</b> processors registered in the Kuskokwim Management Area, this opportunity is being provided for those individuals registered with ADF&G as catcher/sellers.

## SALMON MANAGEMENT IN 2017

Appendix Table C-7. Federal special actions, Kuskokwim River drainage, 2017

2017 KUSKOKWIM RIVER DRAINAGE SUBSISTENCE FISHING		
Federal Special Actions	Effective Date	Actions
SA 3-KS-01-17	June 12 – August 10, 2017	Waters under Federal subsistence fisheries jurisdiction of the Kuskokwim River main stem and salmon tributaries including the Eek, Kwethluk, Kasigluk, Kisaralik, Tuluksak, and Aniak rivers will be closed to the use of all gillnets by all users. All Chinook salmon caught with other legal methods must be immediately released.
FSA 17-03 (FSB ACTION)	June 12, 2017	Beginning on June 12, 2017, Federal public waters of the Kuskokwim River drainage were closed to the harvest of Chinook Salmon except by Federally qualified subsistence users
FSA 17-04 (FSB ACTION)	June 12, 2017	Beginning on June 12, 2017, Federal public waters of the Kuskokwim River drainage were closed to the harvest of Chinook Salmon except by Federally qualified subsistence users identified in the Section 804 subsistence users prioritization analysis. Those eligible to harvest Chinook Salmon under Federal regulations were restricted to Federally qualified subsistence users residing in the Kuskokwim River drainage and the coastal communities of Chefornak, Kongiganek, Kipnuk, and Kwigillingok.
SA 3-KS-02-17	June 12 – August 10, 2017	Waters under Federal subsistence fisheries jurisdiction of the Kuskokwim River main stem and salmon tributaries including the Eek, Kwethluk, Kasigluk, Kisaralik, Tuluksak, and Aniak rivers will be closed to the harvest of Chinook salmon by all Federally qualified subsistence users.
SA 3-KS-03-17	June 12, 2017	<p>Opened a 12-hour opportunity for Federally qualified subsistence users identified in the Section 804 analysis, which included residents of the Kuskokwim River drainage and the villages of Chefornak, Kipnuk, Kwigillingok, and Kongiganek, to harvest Chinook Salmon on Federal public waters of the Kuskokwim River on June 12, 2017, from 12:01 p.m. until 11:59 p.m.</p> <p>Drift or set gillnets were limited to 6-inch or less mesh and could not exceed 45 meshes in depth. Nets from the Yukon Delta National Wildlife Refuge (Refuge) boundary at the Kuskokwim River mouth to the Johnson River could not exceed 50 fathoms (300 feet) in length. Nets up river from the Johnson River to the Refuge boundary at Aniak could not exceed 25 fathoms (150 feet) in length.</p> <p>The area around the Old Kuskokuak and the Kuskokuak were closed to the harvest of Chinook Salmon.</p>

**Appendix Table C-7.** Federal special actions, Kuskokwim River drainage, 2017 (*continued from previous page*)

2017 KUSKOKWIM RIVER DRAINAGE SUBSISTENCE FISHING		
Federal Special Actions	Effective Date	Actions
SA 3-KS-04-17	June 24, 2017	<p>Opened a 12-hour gillnet opportunity for Federally qualified subsistence users to harvest fish other than Chinook Salmon on Federal public waters of the mainstem of the Kuskokwim River on June 24, 2017, from 12:01 p.m. until 11:59 p.m.</p> <p>Drift or set gillnets were limited to 6-inch or less mesh and could not exceed 45 meshes in depth. Nets could not exceed 25 fathoms (150 feet) in length.</p> <p>Federally qualified subsistence users identified in the ANILCA Section 804 subsistence user prioritization could retain Chinook Salmon incidentally harvested in gillnets.</p> <p>The waters of the Kuskokwim River around the boundary of the Yukon Delta NWR near Aniak was closed to subsistence gillnet fishing.</p> <p>Subsistence fishing with dip nets, beach seines, fish wheels, and rod and reel were allowed to be used during this opportunity. However, there were some restrictions to fish wheel regulations. Any Chinook Salmon caught in these other gear types had to be returned to the water alive.</p>
SA 3-KS-05-17	July 1, 2017	<p>Opened a 6-hour gillnet opportunity for Federally qualified subsistence users to harvest fish other than Chinook Salmon on Federal public waters of the main-stem of the Kuskokwim River from the mouth of the river to approximately 10 miles upriver from Upper Kalskag on July 1, 2017, from 3:00 p.m. until 9:00 p.m.</p> <p>Gear restrictions and authorizations, as well as Chinook Salmon release requirements for non-gillnet gear types were the same as SA 3-KS-04-17.</p> <p>Federally qualified subsistence users identified in the ANILCA Section 804 subsistence user prioritization could retain Chinook Salmon incidentally harvested in gillnets.</p>
SA 3-KS-06-17	July 3, 2017	<p>Opened a 12-hour gillnet opportunity for Federally qualified subsistence users to harvest fish other than Chinook Salmon on Federal public waters of the main-stem of the Kuskokwim River on July 3, 2017, from 12:01 p.m. until 11:59 p.m.</p> <p>Gear restrictions and authorizations, as well as Chinook Salmon release requirements for non-gillnet gear types were the same as SA 3-KS-04-17.</p> <p>Federally qualified subsistence users identified in the ANILCA Section 804 subsistence user prioritization could retain Chinook Salmon incidentally harvested in gillnets.</p> <p>The waters of the Kuskokwim River around the boundary of the Yukon Delta NWR near Aniak was closed to subsistence gillnet fishing.</p>
SA 3-KS-07-17	July 7, 2017	<p>Rescinded all previously issued special actions regarding the management of Chinook Salmon in the Kuskokwim River drainage.</p> <p>Federal public waters within the Yukon Delta NWR opened to the harvest of Chinook Salmon by non-Federally qualified subsistence users.</p>

**Appendix Table C-8.** State emergency orders, Kuskokwim River drainage, 2017.

2017 KUSKOKWIM RIVER DRAINAGE SUBSISTENCE FISHING		
State Emergency Order	Effective Date	Actions
EO 3-S-WR-01-17	Multiple effective dates depending on area of Kuskokwim River (May 20, 2017 – June 4, 2017)	<p>Subsistence fishing with gillnets in the Kuskokwim River will be closed during the following times and areas:</p> <ul style="list-style-type: none"> <li>Beginning 12:01 a.m. Saturday, May 20, 2017, the Kuskokwim River Drainage from the Yukon Delta NWR boundary at the mouth of the Kuskokwim River to ADF&amp;G markers approximately one-half mile upstream of the Tuluksak River mouth;</li> <li>Beginning 12:01 a.m. Thursday, May 25, 2017, from the ADF&amp;G markers approximately one-half mile upstream of the Tuluksak River mouth to the Yukon Delta Refuge boundary near Aniak;</li> <li>Beginning 12:01 a.m. Thursday, June 1, 2017, from the Yukon Delta Refuge boundary near Aniak to the ADF&amp;G regulatory markers near the Holitna River mouth; and</li> <li>Beginning 12:01 a.m. Sunday, June 4, 2017, upstream of the ADF&amp;G regulatory markers located near the Holitna River mouth to the headwaters of the Kuskokwim River.</li> </ul> <p>The following subsistence fishing restrictions and tributary gillnet fishing closures will also go into effect beginning 12:01 a.m. Saturday, May 20, 2017, until further notice:</p> <ul style="list-style-type: none"> <li>The Kwethluk River drainage including its confluence with Kuskokuak Slough and downstream to ADF&amp;G regulatory markers located at the downstream mouth of the slough.</li> <li>The Kasigluk and Kisaralik river drainages including Old Kuskokuak Slough to ADF&amp;G regulatory markers at the confluence of Old Kuskokuak Slough with Kuskokuak Slough.</li> <li>The Tuluksak River drainage including its confluence with the Kuskokwim River and downstream approximately 1-mile to ADF&amp;G regulatory markers.</li> <li>The Aniak River drainage to ADF&amp;G regulatory markers at its confluence with the Kuskokwim River.</li> </ul> <p>Additionally, subsistence fishing with hook and line for Chinook Salmon will close until further notice. Subsistence fishing with fish wheels will be allowed until further notice. Subsistence fishing with dip nets and beach seines is currently allowed until further notice. Any Chinook salmon caught in a dip net or beach seine must be returned immediately to the water alive.</p>

**Appendix Table C-8.** State emergency orders, Kuskokwim River drainage, 2017 (*continued from previous page*).

<b>2017 KUSKOKWIM RIVER DRAINAGE SUBSISTENCE FISHING</b>		
<b>State Emergency Order</b>	<b>Effective Date</b>	<b>Actions</b>
EO 3-S-WR-02-17	May 27, 2017	Subsistence fishing will be allowed on the Kuskokwim River mainstem within the Yukon Delta Refuge boundaries with 4-inch or less mesh size set gillnets from 9:00 a.m. until 9:00 p.m. Saturday, May 27, 2017. Gillnets may not to exceed 60 feet in length or 45 meshes in depth and may not be operated more than 100 feet from the ordinary high water mark.
EO 3-S-WR-03-17	June 3, 2017	Subsistence fishing will be allowed within the mainstem Kuskokwim River from the Yukon Delta Refuge boundaries at the mouth of the Kuskokwim River to the ADF&G regulatory markers downstream of the mouth of the Holitna River with 4-inch or less mesh size set gillnets from 9:00 a.m. until 9:00 p.m. Saturday, June 3, 2017. Gillnets may not to exceed 60 feet in length or 45 meshes in depth and may not be operated more than 100 feet from the ordinary high water mark.
EO 3-S-WR-04-17	June 10, 2017	Subsistence fishing will be allowed within the mainstem Kuskokwim River from the Yukon Delta Refuge boundary at the mouth of the Kuskokwim River to the headwaters with 4-inch or less mesh size set gillnets from 10:00 a.m. until 10:00 p.m. Saturday, June 10, 2017. Gillnets may not exceed 60 feet in length or 45 meshes in depth and may not be operated more than 100 feet from the ordinary high water mark. Chinook salmon incidentally harvested in gillnets during this opportunity may be retained.
EO 3-S-WR-05-17	June 12, 2017	From the Yukon Delta NWR boundary at Aniak up to the Holitna River mouth: Section 4. Subsistence fishing with 6-inch or less mesh gillnets, not to exceed 25 fathoms in length, will be allowed for 24 hours from 12:00 p.m. noon, Monday, June 12 until 12:00 p.m. noon, Tuesday, June 13, 2017.
EO 3-S-WR-06-17	June 12, 2017	From the Holitna River mouth to the headwaters of the Kuskokwim River: Section 5 Subsistence fishing with 6-inch or less mesh gillnets will be allowed from 12:00 p.m. noon, Monday, June 12 until further notice.
EO 3-S-WR-07-17	June 13, 2017	From the Yukon Delta NWR boundary at Aniak up to the Holitna River mouth: Section 4. Subsistence fishing with hook and line, fish wheels equipped with live boxes or chutes, beach seines, and dip nets is currently allowed until further notice, however retention of Chinook salmon caught with these gear types will close at 12:00 p.m. noon, Tuesday, June 13, 2017. Any Chinook salmon caught with these gear types must be returned immediately to the water alive
EO 3-S-WR-08-17	June 24, 2017	From the Yukon Delta NWR boundary at Aniak up to the Holitna River mouth: Section 4. Subsistence fishing with 6-inch or less mesh gillnets, not to exceed 25 fathoms in length and 45 meshes in depth, will be allowed for approximately 12 hours from 12:01 p.m. until 11:59 p.m., Saturday, June 24, 2017.

**Appendix Table C-8.** State emergency orders, Kuskokwim River drainage, 2017 (*continued from previous page*).

2017 KUSKOKWIM RIVER DRAINAGE SUBSISTENCE FISHING		
State Emergency Order	Effective Date	Actions
EO 3-S-WR-09-17	July 3, 2017	<p>From the Yukon Delta NWR boundary at Aniak up to the Holitna River mouth: Section 4. Subsistence fishing with 6-inch or less mesh gillnets, not to exceed 25 fathoms in length and 45 meshes in depth, will be allowed for approximately 12 hours from 12:01 p.m. until 11:59 p.m., Monday, July 3, 2017.</p> <p>The waters of the Kuskokwim River from the Yukon Delta NWR boundary at Aniak upstream to a line formed between two points lat 61° 35.308' N, long 159° 29.167' W and lat 61° 34.731' N, long 159° 28.939'W (Figure 1) will be closed to subsistence fishing with gillnets from 12:01 p.m. until 11:59 p.m., Monday, July 3, 2017.</p>
EO 3-S-WR-10-17	July 7, 2017	<p>Subsistence fishing in the Kuskokwim River Drainage, from the Yukon Delta NWR boundary at the mouth of the Kuskokwim River up to the mouth of the Holitna River (Sections 1–4), will be allowed from 12:01 p.m. Saturday, July 8, 2017 until further notice. Gillnets are restricted to 6-inch or less mesh, 45 meshes deep, and 25 fathoms in length. The waters of the Kuskokwim River from a line formed between two points lat 61° 35.264' N, long 159° 33.459' W and lat 61° 35.611' N, long 159° 33.260'W upstream to a line formed between two points lat 61° 35.308' N, long 159° 29.167' W and lat 61° 34.731' N, long 159°28.939'W will be closed to subsistence fishing with gillnets from 12:01p.m.Saturday, July 8, 2017 until further notice.</p>
EO 3-S-WR-11-17	July 13, 2017	<p>Subsistence fishing in the Kuskokwim River Drainage, from the Yukon Delta NWR boundary at the mouth of the Kuskokwim River up to the confluence of the Johnson River (Section 1), will be allowed from 12:01 p.m. Thursday, July 13, 2017 with gillnets restricted to 6-inch or less mesh, 45 meshes deep, and 50 fathoms in length until further notice.</p>
EO 3-S-WR-12-17	July 27, 2017	<p>Kuskokwim River Drainage: Effective 12:01 p.m. Thursday, July 27, 2017, the following restrictions to the mainstem Kuskokwim River subsistence salmon fishery are rescinded:</p> <ul style="list-style-type: none"> <li>• 6-inch or less mesh requirements for subsistence gillnets;</li> <li>• 25 fathom gillnet length restrictions from the mouth of the Johnson River up to the mouth of the Holitna River (Sections 2–4);</li> <li>• The live release requirement of Chinook salmon caught in beach seines, fish wheels, and by hook and line;</li> <li>• The use of dip nets for the taking of salmon; and</li> <li>• The closed waters within Kuskokuak and Old Kuskokuak sloughs and around the mouth of the Aniak River.</li> </ul> <p>Subsistence fishing with gillnets will remain closed in the following tributaries:</p> <ul style="list-style-type: none"> <li>• The Kwethluk River drainage to its confluence with Kuskokuak Slough.</li> <li>• The Kasigluk and Kisaralik river drainages to their confluence with Old Kuskokuak Slough.</li> </ul>



**Appendix Table C-8.** State emergency orders, Kuskokwim River drainage, 2017 (*continued from previous page*).

2017 KUSKOKWIM RIVER DRAINAGE SUBSISTENCE FISHING		
State Emergency Order	Effective Date	Actions
EO 3-S-WR-13-17	August 23, 2017	All subsistence fishing restrictions in Kuskokwim River tributaries have been lifted.

**SALMON MANAGEMENT IN 2018****Appendix Table C-9.** Federal special actions, Kuskokwim River drainage, 2018

<b>2017 KUSKOKWIM RIVER DRAINAGE SUBSISTENCE FISHING</b>		
<b>Federal Special Actions</b>	<b>Effective Date</b>	<b>Actions</b>
FSA 18-01 (FSB ACTION)	June 12 – July 15, 2018	Beginning on June 12, 2018, Federal public waters of the Kuskokwim River drainage were closed to the harvest of Chinook Salmon except by Federally qualified subsistence users identified in the Section 804 subsistence users prioritization analysis. Those eligible to harvest Chinook Salmon under Federal regulations were restricted to Federally qualified subsistence users residing in the Kuskokwim River drainage and the coastal communities of Chefornak, Kongiganek, Kipnuk, and Kwigillingok.
3-KS-03-18	June 12, 2018	Beginning on June 12, 2018, Federal public waters of the Kuskokwim River main stem, the non-salmon tributaries within 100 yards of their confluence with the main stem of the Kuskokwim River, and salmon bearing tributaries were closed to the harvest of Chinook Salmon by all Federally qualified subsistence users
3-KS-04-18	June 12, 2018	<p>Opened a 12-hour opportunity for Federally qualified subsistence users identified in the Section 804 analysis, which included residents of the Kuskokwim River drainage and the villages of Chefornak, Kipnuk, Kwigillingok, and Kongiganek, to harvest Chinook Salmon on Federal public waters of the Kuskokwim River on June 12, 2018, from 10:00 a.m. until 10:00 p.m..</p> <p>Drift or set gillnets were limited to 6-inch or less mesh and could not exceed 45 meshes in depth. Nets from the Yukon Delta National Wildlife Refuge (Refuge) boundary at the Kuskokwim River mouth to the Johnson River could not exceed 50 fathoms (300 feet) in length. Nets up river from the Johnson River to the Refuge boundary at Aniak could not exceed 25 fathoms (150 feet) in length.</p> <p>Eek River, Kwethluk River deainage including its confluence with Kuskokuak Slough and downstream to ADF&amp;G regulatory markers located at the downstream mouth of the slough; Kasigluk and Kisaralik river drainages including Old kuskokuak Slough to ADF&amp;G regulatory markers at the confluence of Old Kuskokuak Slough with Kuskikuak Slough; Tuluksak River Drainage including its confluence with the Kuskokwim River and downstream approximately 1-mile to ADF&amp;G regulatory markers; and the Aniak River drainage to ADF&amp;G regulatory markers at its confluence with the Kuskokwim River to the harvest of Chinook Salmon by All Federally qualified subsistence users.</p>

**Appendix Table C-9.** Federal special actions, Kuskokwim River drainage, 2018 (*continued from previous page*).

SA 3-KS-05-18	June 16, 2018	<p>Opened a 12-hour opportunity for Federally qualified subsistence users identified in the Section 804 analysis, which included residents of the Kuskokwim River drainage and the villages of Chefnak, Kipnuk, Kwigillingok, and Kongiganek, to harvest Chinook Salmon on Federal public waters of the Kuskokwim River on June 16, 2018, from 10:00 a.m. until 10:00 p.m..</p> <p>Drift or set gillnets were limited to 6-inch or less mesh and could not exceed 45 meshes in depth. Nets from the Yukon Delta National Wildlife Refuge (Refuge) boundary at the Kuskokwim River mouth to the Johnson River could not exceed 50 fathoms (300 feet) in length. Nets up river from the Johnson River to the Refuge boundary at Aniak could not exceed 25 fathoms (150 feet) in length.</p> <p>Eek River, Kwethluk River deainage including its confluence with Kuskokuak Slough and downstream to ADF&amp;G regulatory markers located at the downstream mouth of the slough; Kasigluk and Kisaralik river drainages including Old kuskokuak Slough to ADF&amp;G regulatory markers at the confluence of Old Kuskokuak Slough with Kuskikuak Slough; Tuluksak River Drainage including its confluence with the Kuskokwim River and downstream approximately 1-mile to ADF&amp;G regulatory markers; and the Aniak River drainage to ADF&amp;G regulatory markers at its confluence with the Kuskokwim River to the harvest of Chinook Salmon by All Federally qualified subsistence users.</p>
SA 3-KS-06-18	June 24, 2018	<p>Opened a 12-hour opportunity for Federally qualified subsistence users identified in the Section 804 analysis, which included residents of the Kuskokwim River drainage and the villages of Chefnak, Kipnuk, Kwigillingok, and Kongiganek, to harvest Chinook Salmon on Federal public waters of the Kuskokwim River on June 24, 2018, from 10:00 a.m. until 10:00 p.m..</p> <p>Drift or set gillnets were limited to 6-inch or less mesh and could not exceed 45 meshes in depth. Nets from the Yukon Delta National Wildlife Refuge (Refuge) boundary at the Kuskokwim River mouth to the Johnson River could not exceed 50 fathoms (300 feet) in length. Nets up river from the Johnson River to the Refuge boundary at Aniak could not exceed 25 fathoms (150 feet) in length.</p> <p>Eek River, Kwethluk River deainage including its confluence with Kuskokuak Slough and downstream to ADF&amp;G regulatory markers located at the downstream mouth of the slough; Kasigluk and Kisaralik river drainages including Old kuskokuak Slough to ADF&amp;G regulatory markers at the confluence of Old Kuskokuak Slough with Kuskikuak Slough; Tuluksak River Drainage including its confluence with the Kuskokwim River and downstream approximately 1-mile to ADF&amp;G regulatory markers; and the Aniak River drainage to ADF&amp;G regulatory markers at its confluence with the Kuskokwim River to the harvest of Chinook Salmon by All Federally qualified subsistence users.</p>

**Appendix Table C-9.** Federal special actions, Kuskokwim River drainage, 2018 (*continued from previous page*).

SA 3-KS-07-18	June 24, 2018	Reopened opportunity for Federally qualified subsistence users identified in the section 804 subsistence user prioritization analysis to harvest Chinook Salmon on Federal public waters of the Kuskokwim River Main Stem from a line downstream of Kalskag at the south edge of Uknarik Slough, due east to the edge of the bluff line to the Yukon Delta NWR boundary at Aniak beginning on June 24, 2018, until superseded by subsequent emergency special action in that portion of the Federal public waters of the Kuskokwim River main stem, excluding the previously mentioned closures around Aniak. All drift or set nets were limited to 6-inch or less mesh, and could not exceed 45 meshes in depth or 25 fathoms (150 feet) in length.
3-KS-08-18	June 29, 2018	<p>Opened a 12-hour opportunity for Federally qualified subsistence users identified in the Section 804 analysis, which included residents of the Kuskokwim River drainage and the villages of Cheforak, Kipnuk, Kwigillingok, and Kongiganek, to harvest Chinook Salmon on Federal public waters of the Kuskokwim River on June 29, 2018, from 12:00 p.m. (noon). until 6:00 p.m..</p> <p>Refuge waters of the Kuskokwim River main stem from the mouth to a line downstream of Kalskag at the south edge of Uknarik Slough and then due east to the edge of the bluff line for 6 hours allowing the harvest of Chinook Salmon by those Federally qualified subsistence users identified in the Section 804 subsistence User Prioritization analysis for June 29, 2018. Drift or set gillnets were limited to six inch or less mesh and could not exceed 45 meshes in depth. Nets from the Refuge boundary at the Kuskokwim River mouth to the Johnson River could not exceed 50 fathoms (300 feet), while nets upriver from the Johnson River to the Refuge boundary at Aniak could not exceed 25 fathoms (150 feet) in length. Salmon bearing tributaries remained closed to the harvest of Chinook salmon.</p>

**Appendix Table C-9.** Federal special actions, Kuskokwim River drainage, 2018 (*continued from previous page*).

3-KS-09-18	July 5, 2018	<p>Opened a 12-hour opportunity for Federally qualified subsistence users identified in the Section 804 analysis, which included residents of the Kuskokwim River drainage and the villages of Cheforak, Kipnuk, Kwigillingok, and Kongiganek, to harvest Chinook Salmon on Federal public waters of the Kuskokwim River on July 5, 2018, from 9:00 A.M. until 9:00 p.m..</p> <p>Refuge waters of the Kuskokwim River main stem from the mouth to a line downstream of Kalskag at the south edge of Uknarik Slough and then due east to the edge of the bluff line for 6 hours allowing the harvest of Chinook Salmon by those Federally qualified subsistence users identified in the Section 804 subsistence User Prioritization analysis for June 29, 2018. Drift or set gillnets were limited to six inch or less mesh and could not exceed 45 meshes in depth. Nets from the Refuge boundary at the Kuskokwim River mouth to the Johnson River could not exceed 50 fathoms (300 feet), while nets upriver from the Johnson River to the Refuge boundary at Aniak could not exceed 25 fathoms (150 feet) in length. Salmon bearing tributaries remained closed to the harvest of Chinook salmon.</p>
3-KS-10-18	July 6, 2018	<p>Emergency special action rescinding all previously issued special actions regarding the management of Chinook Salmon in the Kuskokwim River drainage, and the Yukon Delta NWR waters will open to the harvest of Chinook salmon by non-Federally qualified subsistence users</p>

## SALMON MANAGEMENT IN 2018

**Appendix Table C-10.** State emergency orders, Kuskokwim River drainage, 2018.

2018 KUSKOKWIM RIVER DRAINAGE SUBSISTENCE FISHING		
State Emergency Order	Effective Date	Actions
EO 3-S-WR-01-18	May 25, 2018	<p><b>Subsistence fishing with gillnets in the Kuskokwim River will be closed during the following times and areas, <u>until further notice</u>:</b></p> <ul style="list-style-type: none"> <li>• <u>Sections 1 &amp; 2</u>: Beginning 12:01 a.m. Friday, May 25, 2018, the Kuskokwim River Drainage from the Yukon Delta NWR boundary at the mouth of the Kuskokwim River to ADF&amp;G markers approximately one-half mile upstream of the Tuluksak River mouth;</li> <li>• <u>Section 3</u>: Beginning 12:01 a.m. Wednesday, May 30, 2018, from the ADF&amp;G markers approximately one-half mile upstream of the Tuluksak River mouth to the Yukon Delta Refuge boundary near Aniak;</li> <li>• <u>Section 4</u>: Beginning 12:01 a.m. Monday, June 4, 2018, from the Yukon Delta Refuge boundary near Aniak to the ADF&amp;G regulatory markers near the Holitna River mouth; and</li> <li>• <u>Section 5</u>: Beginning 12:01 a.m. Saturday, June 9, 2018, upstream of the ADF&amp;G regulatory markers located near the Holitna River mouth to the headwaters of the Kuskokwim River.</li> </ul> <p><b>The following subsistence fishing restrictions and tributary gillnet fishing closures go into effect beginning 12:01 a.m. Friday, May 25, 2017 until further notice:</b></p> <ul style="list-style-type: none"> <li>• The Kwethluk River drainage including its confluence with Kuskokuak Slough and downstream to ADF&amp;G regulatory markers located at the downstream mouth of the slough.</li> <li>• The Kasigluk and Kisaralik river drainages including Old Kuskokuak Slough to ADF&amp;G regulatory markers at the confluence of Old Kuskokuak Slough with Kuskokuak Slough.</li> <li>• The Tuluksak River drainage including its confluence with the Kuskokwim River and downstream approximately 1-mile to ADF&amp;G regulatory markers.</li> <li>• The Aniak River drainage to ADF&amp;G regulatory markers at its confluence with the Kuskokwim River.</li> </ul>

**Appendix Table C-10.** State emergency orders, Kuskokwim River drainage, 2018 (*continued from previous page*).

EO 3-S-WR-01-18 (Continued)	May 25, 2018	<p><b>Subsistence fishing with hook and line for Chinook salmon will close until further notice.</b> Any Chinook salmon caught must be returned alive to the water.</p> <p><b>Subsistence fishing with fish wheels will be allowed until further notice.</b> 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. Fish wheels may be equipped with a chute and must be closely attended while in operation. All Chinook salmon must be returned alive to the water.</p> <p><b>Subsistence fishing with dip nets and beach seines is currently allowed until further notice.</b> Any Chinook salmon caught in a dip net or beach seine must be returned immediately to the water alive.</p>
EO 3-S-WR-02-18	May 30, 2018	<p>Subsistence fishing will be allowed on the Kuskokwim River mainstem within the Yukon Delta Refuge boundaries with 4-inch or less mesh size set gillnets from 11:00 a.m. until 11:00 p.m. Wednesday, May 30, 2018. Set gillnets may not exceed 60 feet in length and 45 meshes in depth and may not be operated more than 100 feet from the ordinary high water mark.</p> <p>As previously announced subsistence fishing with hook and line, fish wheels equipped with live boxes or chutes, beach seines, and dip nets is currently allowed until further notice though any Chinook salmon caught with these gear types must be returned immediately to the water alive.</p>
EO 3-S-WR-03-18	June 6, 2016	<p>Subsistence fishing will be allowed on the Kuskokwim River mainstem from the Yukon Delta Refuge boundary at the mouth of the Kuskokwim River to the Holitna River mouth (Sections 1–4) with 4-inch or less mesh size set gillnets from 11:00 a.m. until 11:00 p.m. Wednesday, June 6, 2018. Set gillnets may not exceed 60 feet in length and 45 meshes in depth and may not be operated more than 100 feet from the ordinary high water mark.</p> <p>As previously announced subsistence fishing with hook and line, fish wheels equipped with live boxes or chutes, beach seines, and dip nets is currently allowed until further notice though any Chinook salmon caught with these gear types must be returned immediately to the water alive.</p>
EO 3-S-WR-04-18	June 12, 2018	<p>From the Yukon Delta NWR boundary at Aniak upstream to the Holitna River mouth: Section 4 Subsistence fishing with 6-inch or less mesh gillnets, not to exceed 25 fathoms in length and 45 meshes in depth, will open for 12 hours from 10:00 a.m. until 10:00 p.m., Tuesday, June 12, 2018. Chinook salmon may be retained if caught with fish wheels, beach seines, and hook and line, and gillnets during this gillnet opener.</p> <p>The waters of the Kuskokwim River from the Yukon Delta NWR boundary at Aniak upstream to a line formed between two points lat 61° 35.308' N, long 159° 29.167' W and lat 61° 34.731' N, long 159° 28.939'W (Figure 1)</p>

**Appendix Table C-10.** State emergency orders, Kuskokwim River drainage, 2018 (*continued from previous page*).

EO 3-S-WR-04-18 (Continued)	June 12, 2018	<p>will remained closed to subsistence fishing with gillnets until further notice. These closed waters are in place to help provide protection for Chinook salmon bound for the Aniak River.</p> <p>As previously announced, subsistence fishing with gillnets remains closed in the Aniak River</p> <p>From the Holitna River mouth to the headwaters of the Kuskokwim River: Section 5</p> <p>Subsistence fishing with 6-inch or less mesh gillnets, not to exceed 25 fathoms in length and 45 meshes in depth , will be allowed from 10:00 a.m., Tuesday, June 12 until further notice.</p> <p>Chinook salmon may be retained if caught with fish wheels, beach seines, and hook and line gear until further notice in Section 5.</p>
EO 3-S-WR-05-18	June 12, 2018	<p>From the Yukon Delta NWR boundary at Aniak upstream to the Holitna River mouth: Section 4:</p> <p>Beginning 10:01 p.m., June 12, 2018, subsistence fishing with the King Salmon permit will be allowed until further notice during times that the subsistence gillnet fishery is closed. Regulations for fishing with this permit are stated below:</p> <ul style="list-style-type: none"> <li>• Only one permit may be issued per household. Annual permit harvest limit is 10 king salmon.</li> <li>• Permit must be on your person while fishing.</li> <li>• Gillnets must be 6-inch or less mesh, not to exceed 25 fathoms in length and 45 meshes depth.</li> <li>• King salmon may also be harvested with hook and line, fish wheels, and beach seines.</li> <li>• All king salmon harvested by any gear type count toward the household's annual permit limit.</li> <li>• The waters of the Kuskokwim River from the Yukon Delta NWR boundary at Aniak upstream to a line formed between two points lat 61° 35.308' N, long 159° 29.167' W and lat 61° 34.731' N, long 159° 28.939'W (Figure 1) will remained closed to subsistence fishing with gillnets.</li> </ul> <p>Subsistence fishing with a permit may only occur from the Yukon Delta NWR boundary at Aniak upstream to the mouth of the Holitna River. Once permit holders harvest the annual limit of 10 King Salmon, the permit is no longer valid and fishers must wait until a regularly scheduled opening to continue subsistence fishing. All other fish caught while fishing with the permit may be retained.</p> <p><i>As Previously Announced:</i></p>



**Appendix Table C-10.** State emergency orders, Kuskokwim River drainage, 2018 (*continued from previous page*).

EO 3-S-WR-05-18 (Continued)	June 12, 2018	<p>From the Yukon Delta NWR boundary at Aniak upstream to the Holitna River mouth: Section 4</p> <p>Subsistence fishing with 6-inch or less mesh gillnets, not to exceed 25 fathoms in length and 45 meshes in depth, will open for 12 hours from 10:00 a.m. until 10:00 p.m., Tuesday, June 12, 2018. King salmon may be retained if caught with fish wheels, beach seines, and hook and line, and gillnets during this gillnet opener.</p> <p>From the Holitna River mouth to the headwaters of the Kuskokwim River: Section 5</p> <p>Subsistence fishing with 6-inch or less mesh gillnets, not to exceed 25 fathoms in length and 45 meshes in depth, will be allowed from 10:00 a.m., Tuesday, June 12 until further notice.</p> <p>King salmon may be retained if caught with fish wheels, beach seines, and hook and line gear until further notice in Section 5.</p>
EO 3-S-WR-06-18	June 19, 2018	<p>From the Yukon Delta NWR boundary at Aniak upstream to the Holitna River mouth: Section 4</p> <p>Subsistence fishing with 6-inch or less mesh gillnets, not to exceed 25 fathoms in length and 45 meshes in depth, will open for 24 hours from 10:00 a.m. Tuesday, June 19 until 10:00 a.m., Wednesday, June 20, 2018. Chinook salmon may be retained if caught with fish wheels, beach seines, and hook and line, and gillnets during this gillnet opener.</p> <p>The waters of the Kuskokwim River from the Yukon Delta NWR boundary at Aniak upstream to a line formed between two points lat 61° 35.308' N, long 159° 29.167' W and lat 61° 34.731' N, long 159° 28.939'W (Figure 1) will remained closed to subsistence fishing with gillnets until further notice. These closed waters are in place to help provide protection for Chinook salmon bound for the Aniak River.</p> <p>Beginning 10:01a.m., Wednesday, June 20, 2018, subsistence fishing with the King Salmon permit will be allowed until further notice.</p>
EO 3-S-WR-07-18	June 25, 2018	<p>From the Yukon Delta NWR boundary at Aniak upstream to the Holitna River mouth: Section 4</p> <p>Subsistence fishing with 6-inch or less mesh gillnets, not to exceed 25 fathoms in length and 45 meshes in depth, will open at 12:01 a.m. Monday, June 25, 2018 until further notice. Chinook salmon may be retained if caught with fish wheels, beach seines, and hook and line, and gillnets during this gillnet opener.</p> <p>The waters of the Kuskokwim River from the Yukon Delta NWR boundary at Aniak upstream to a line formed between two points lat 61° 35.308' N, long 159° 29.167' W and lat 61° 34.731' N, long 159° 28.939'W (Figure 1)</p>

**Appendix Table C-10.** State emergency orders, Kuskokwim River drainage, 2018 (*continued from previous page*).

EO 3-S-WR-07-18 (Continued)		<p>will remain closed to subsistence fishing with gillnets until further notice. Subsistence fishing with hook and line, fish wheels equipped with a live box or chute, beech seines and dip nets is allowed in these waters, but all Chinook salmon caught must be returned to the water alive. These closed waters are in place to help provide protection for Chinook salmon bound for the Aniak River.</p> <p>As previously announced, subsistence fishing with gillnets remains closed in the Aniak River.</p>
EO 3-S-WR-08-18	July 6, 2018	<p>Yukon Delta NWR boundary at the mouth of the Kuskokwim River upstream to the Yukon Delta NWR boundary at Aniak (Sections 1–3):</p> <p>Subsistence fishing will be allowed beginning 3:00 p.m. Friday, July 6 until further notice. Below the Johnson River, gillnets are restricted to 6-inch or less mesh, 45 meshes in depth, and 50 fathoms in length. Above the Johnson River, gillnets are restricted to 6-inch or less mesh, 45 meshes in depth, and 25 fathoms in length.</p> <p>In addition, the waters of the Kuskokwim River near Aniak, from a line formed between two points lat 61° 35.264' N, long 159° 33.459' W and lat 61° 35.611' N, long 159° 33.260' W upstream to a line formed between two points lat 61° 35.308' N, long 159° 29.167' W and lat 61° 34.731' N, long 159° 28.939' W (Figure 1), will be closed to subsistence fishing with gillnets beginning 3:00 p.m. Friday, July 6, 2018 until further notice. Subsistence fishing with hook and line, fish wheels equipped with a live box or chute, beech seines and dip nets is allowed, but all Chinook salmon caught must be returned to the water alive. These closed waters are in place to help provide protection for Chinook salmon bound for the Aniak River.</p>
EO 3-S-WR-09-18	July 26, 2018	<p>Kuskokwim River Drainage: Effective 12:01 a.m. Thursday, July 26, 2018, the following restrictions to the mainstem Kuskokwim River subsistence salmon fishery are rescinded:</p> <ul style="list-style-type: none"> <li>• 6-inch or less mesh requirements for subsistence gillnets;</li> <li>• 25 fathom gillnet length restrictions from the mouth of the Johnson River upstream to the headwaters of the Kuskokwim River (Sections 2–5);</li> <li>• The live release requirement of Chinook salmon caught in beach seines, fish wheels, and by hook and line;</li> <li>• The use of dip nets for the taking of salmon; and</li> <li>• The closed waters within Kuskokuak and Old Kuskokuak sloughs and around the mouth of the Aniak River.</li> </ul> <p>Subsistence fishing with gillnets will remain closed in the following tributaries:</p>

**Appendix Table C-10.** State emergency orders, Kuskokwim River drainage, 2018 (*continued from previous page*).

EO 3-S-WR-09-18 (Continued)		<p>The Kwethluk River drainage to its confluence with Kuskokuak Slough.</p> <ul style="list-style-type: none"> <li>• The Kasigluk and Kisaralik river drainages to their confluences with Old Kuskokuak Slough.</li> <li>• The Tuluksak River drainage including its confluence with the Kuskokwim River and downstream approximately 1-mile to ADF&amp;G regulatory markers.</li> <li>• The Aniak River drainage to ADF&amp;G regulatory markers at its confluence with the Kuskokwim River.</li> </ul> <p>In addition, subsistence fishing with hook and line for Chinook salmon will remain closed within the Kwethluk, Kisaralik, Kasigluk, Tuluksak, and Aniak river drainages. Any Chinook salmon caught must be returned to the water alive.</p>
EO 3-S-WR-010-18	August 5, 2018	<p>Subdistrict 1-A will open to commercial salmon fishing for 6 hours from 10:00 a.m. until 4:00 p.m. Sunday, August 5, 2018. This area is defined as that portion of District 1 upstream of regulatory markers located at Bethel to ADF&amp;G regulatory markers at the mouth of Bogus Creek.</p> <p>As there are no commercial salmon processors in the Kuskokwim Management Area at this time, this opportunity is being provided for those individuals registered with the department as catcher/sellers.</p>
EO 3-S-WR-011-18	August 8, 2018	<p>Subdistrict 1-A will open to commercial salmon fishing for 6 hours from 2:00 p.m. until 8:00 p.m. Wednesday, August 8, 2018. This area is defined as that portion of District 1 upstream of regulatory markers located at Bethel to ADF&amp;G regulatory markers at the mouth of Bogus Creek. Subsistence fishing will be allowed during this timeframe.</p> <p>As there are no commercial salmon processors in the Kuskokwim Management Area at this time, this opportunity is being provided for those individuals registered with the department as catcher/sellers.</p>
EO 3-S-WR-012-18	August 15, 2018	<p>Subdistrict 1-A will open to commercial salmon fishing for 6 hours from 6:00 p.m. until 11:59 p.m. Wednesday, August 15, 2018. This area is defined as that portion of District 1 upstream of regulatory markers located at Bethel to ADF&amp;G regulatory markers at the mouth of Bogus Creek. Subsistence fishing will be allowed during this timeframe.</p> <p>As there are no commercial salmon processors in the Kuskokwim Management Area at this time, this opportunity is being provided for those individuals registered with the department as catcher/sellers.</p>
EO 3-S-WR-013-18	August 16, 2018	<p>Effective 9:00 a.m. Thursday, August 16, 2018, all subsistence fishing restrictions in Kuskokwim River mainstem and tributaries have been lifted.</p>

**Appendix Table C-10.** State emergency orders, Kuskokwim River drainage, 2018 (*continued from previous page*).

EO 3-S-WR-014-18	August 21, 2018	<p>Subdistrict 1-A will open to commercial salmon fishing for 6 hours from 10:00 a.m. until 4:00 p.m. Tuesday, August 21, 2018. This area is defined as that portion of District 1 upstream of regulatory markers located at Bethel to ADF&amp;G regulatory markers at the mouth of Bogus Creek. Subsistence fishing will be allowed during this timeframe.</p> <p>As there are no commercial salmon processors in the Kuskokwim Management Area at this time, this opportunity is being provided for those individuals registered with the department as catcher/sellers.</p>
EO 3-S-WR-015-18	August 31, 2018	<p>Subdistrict 1-A will open to commercial salmon fishing for 6 hours from 10:00 a.m. until 4:00 p.m. Tuesday, August 31, 2018. This area is defined as that portion of District 1 upstream of regulatory markers located at Bethel to ADF&amp;G regulatory markers at the mouth of Bogus Creek. Subsistence fishing will be allowed during this timeframe.</p> <p>As there are no commercial salmon processors in the Kuskokwim Management Area at this time, this opportunity is being provided for those individuals registered with the department as catcher/sellers.</p>

## APPENDIX D

### 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. 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 Postseason Salmon Harvest Survey, the estimated number of Bethel households that harvested salmon 2008–2013 is displayed below (**Table F-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 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 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 2008–2012 five-year average harvest was 22,508 fish, a decrease of 20%. In contrast, 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).

**Table F-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 <sup>a</sup>
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 (+/- ) <sup>b</sup>
2009	2,005	3.34	941 (+/- 50)	47%	6,688 (+/- 206)	26,170 (+/- ) <sup>b</sup>
2008	1,981	3.42	886 (+/- 68)	45%	6,770 (+/- 315)	27,800 (+/- ) <sup>b</sup>

Source: Carroll and Hamazaki 2012; Sheldon, Hamazaki, Horne-Brine, Roczicka, Thalhauser, and Carroll 2014; Sheldon, Hamazaki, Horne-Brine, Chavez, and Fry 2015.

<sup>a</sup> 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).

<sup>b</sup> 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.

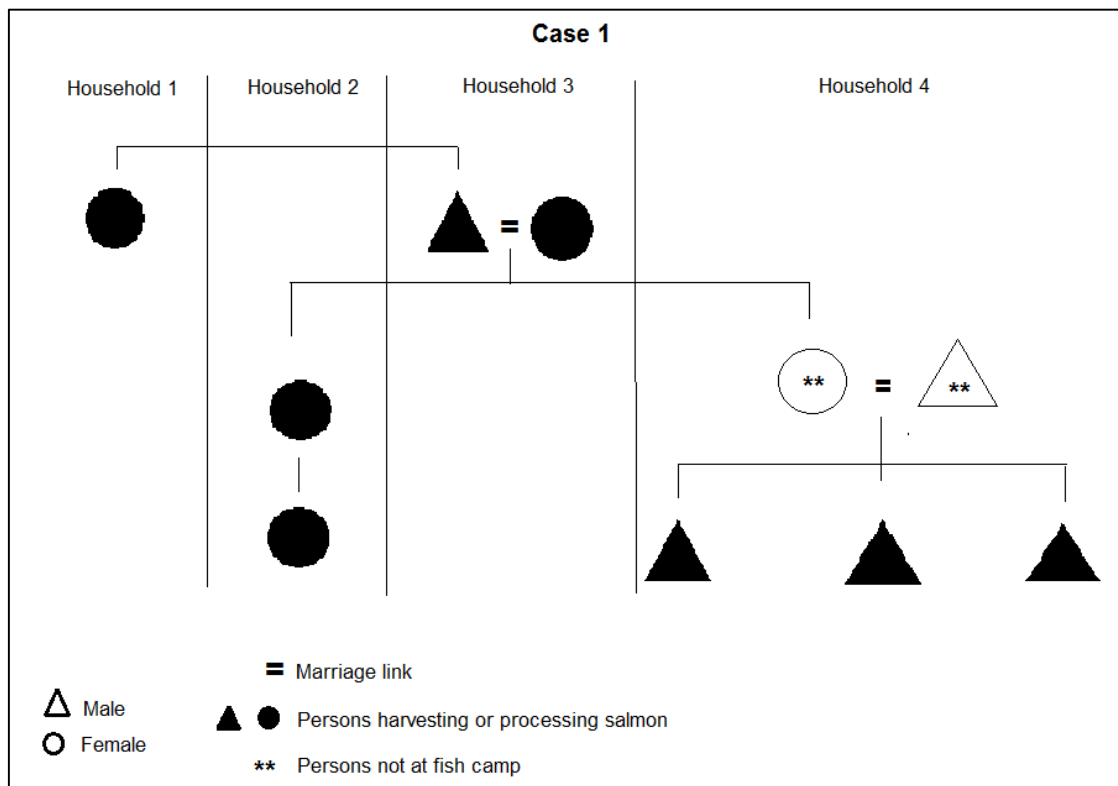
How long people fish often depends on the size of their families, their fish harvest goals, and success in meeting those goals. For example, fish camps harvesting for extended families fish throughout the run to meet their needs; or at times when the fish returns are low all fishermen usually take longer 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.





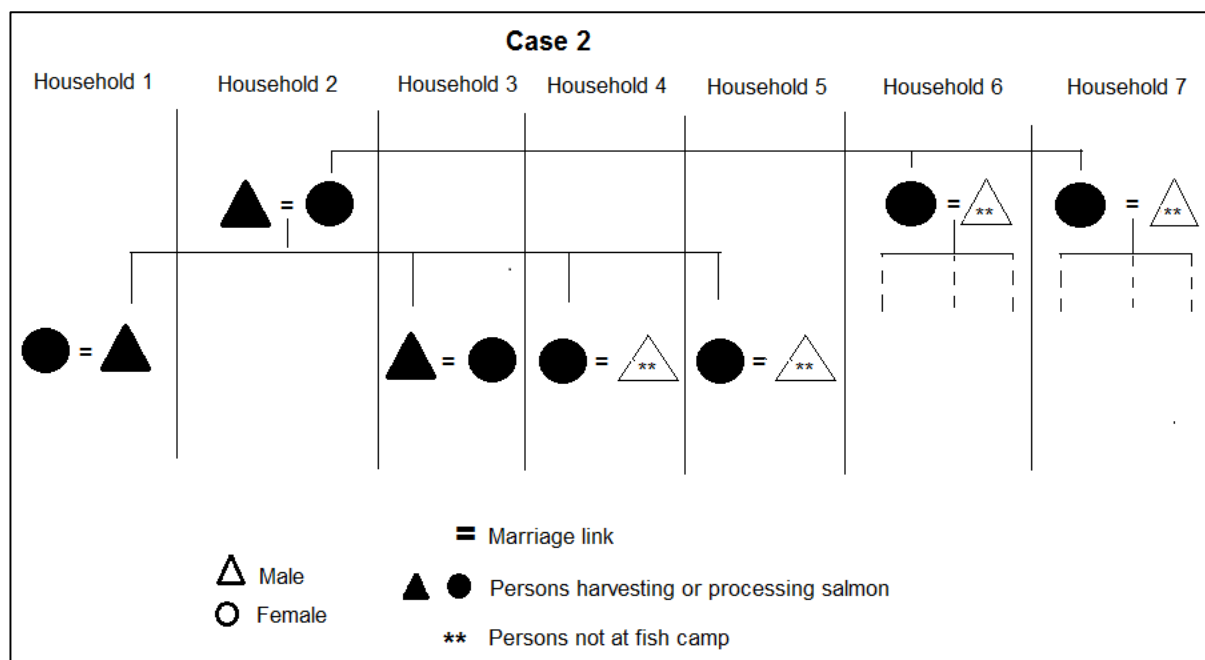
The husband's sister lives in a nearby village. The wife, her sister-in-law, and one daughter do most of the processing. The husband and his three grandsons do most of the harvesting.

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.

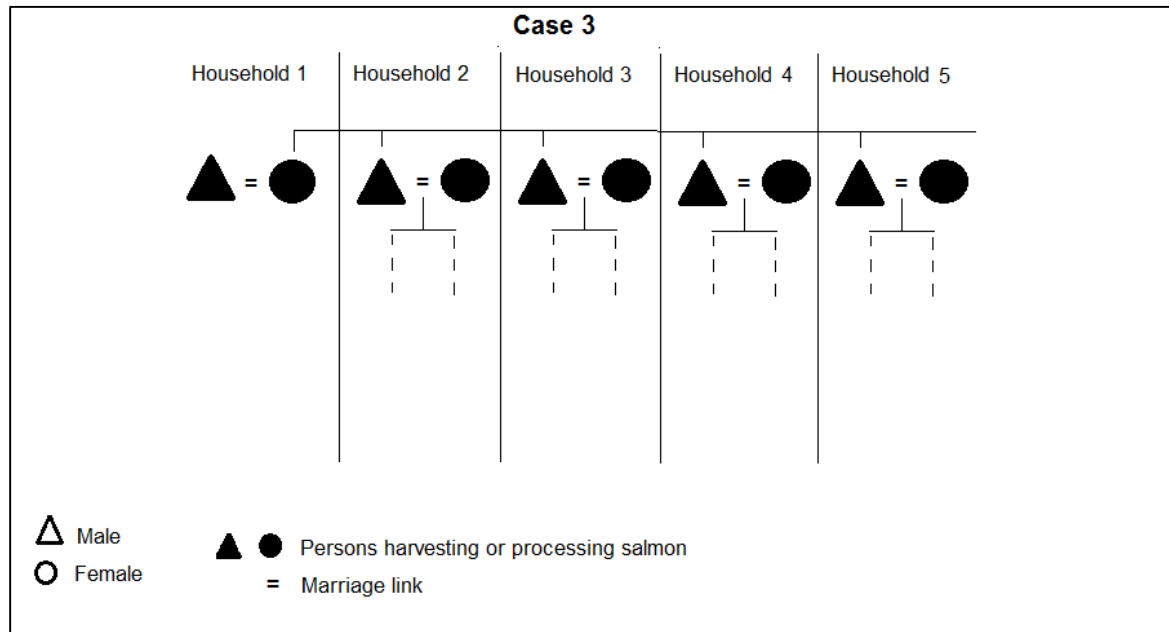
Whitefish are processed along with salmon. Some salmon and whitefish are fermented in a hole in the ground several feet deep by layering the fish with guts and grass. Plants are picked at the fish camp such as wild celery. Occasionally, other family members are present. The river bank at the fish camp 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 Orutsarmiut, 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.



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 2014b). 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.

**APPENDIX E**

**MEMORANDUM OF UNDERSTANDING BETWEEN UNITED STATES DEPARTMENT OF  
THE INTERIOR U.S. FISH AND WILDLIFE SERVICE ALASKA REGION, AND  
KUSKOKWIM RIVER INTER-TRIBAL FISH COMMISSION**



MEMORANDUM OF  
UNDERSTANDING BETWEEN  
UNITED STATES DEPARTMENT OF THE INTERIOR  
U.S. FISH AND WILDLIFE SERVICE ALASKA REGION

AND

KUSKOKWIM RIVER INTER-TRIBAL FISH COMMISSION

This Memorandum of Understanding (MOU) is entered into in order to formalize the fishery management partnership between the United States Department of the Interior (Department), U.S Fish and Wildlife Service (Service) and the Kuskokwim River Inter-Tribal Fish Commission (hereinafter referred to as "Commission").

ARTICLE I – BACKGROUND AND OBJECTIVES

In his address to the Alaska Federation of Natives Convention in October 2014, and to the National Congress of American Indians in February 2015, Deputy Secretary Mike Connor announced plans to develop a meaningful Partnership Project that could be implemented administratively, with the goal of more meaningfully integrating Kuskokwim Tribes and Federally qualified users into Federal fisheries management on the Kuskokwim River drainage. Development of this MOU is one component of the Kuskokwim River Partnership Project. It formalizes a management partnership that begins to address the long-standing desire of Alaska Native Tribes in the Kuskokwim Drainage to engage as co-managers of fish resources.

The Association of Village Council Presidents (AVCP) and Tanana Chiefs Conference (TCC) are regional Tribal organizations whose membership includes all of the federally recognized tribes in the Kuskokwim drainage. The AVCP and TCC were instrumental in the establishment of the Commission and in the development of this MOU. Both AVCP and TCC have adopted resolutions that support the Commission's participation in the Kuskokwim River Partnership Project through the signing of this MOU.

The Partnership Project sets forth a two-part structure to meaningfully integrate Kuskokwim Tribes and Federally qualified users into the decision-making process for fisheries management on Federal public waters of the Kuskokwim River drainage. The MOU represents one component of a two part structure that will implement the 2014 directive from the Deputy Secretary to establish a demonstration project for the Kuskokwim River Drainage that integrates Alaska Natives into Federal fishery management into the decision-making process. The MOU builds upon the experience and success gained from consultations between the Commission and the Yukon Delta National Wildlife Refuge Manager related to Federal in-season fishery management decisions for the 2015 season, and will provide an opportunity to advance issues that are critical to the Commission and Federally qualified users in future years. The second component of the Partnership Project is a proposal cooperatively developed by the Commission, the Office of Subsistence Management (OSM), and the Service which was submitted to the two Regional Advisory Councils (Councils) in the Kuskokwim River drainage for a subcommittee jointly chartered by the two Councils. The goals of the proposal include providing a meaningful role for the Commission in the Federal subsistence management process and developing unified recommendations for fishery management for the Kuskokwim River drainage.

The Department of the Interior and the Service also share a mutual concern with the Commission for the

conservation of fish resources and their habitats and ensuring the opportunity for the continuation of the subsistence way of life. Both are engaged in fish management strategies and programs and desire to develop and maintain a cooperative relationship which will be in the best interests of the Parties and the resource.

Additionally, the Department, Service, and Commission share the goal of meaningfully integrating the tribal governments located in Kuskokwim River drainage, through their membership and participation in the Commission, as broadly as possible, into the management of Federal public waters in the Kuskokwim River drainage fisheries.

The Parties share the goal of effective and timely communication of all information and consultation and collaboration for in-season fishery management actions;

## ARTICLE II - AUTHORITY

The following authorities support the MOU:

- Alaska National Interest Lands Conservation Act (ANILCA) Title VIII
- Alaska Native Claims Settlement Act
- Executive Order 13175 "Consultation and Coordination with Indian Tribal Governments"
- Secretarial Order 3317, Department of Interior Policy on Consultation with Indian Tribes (December 2011)
- Secretarial Order 3335 "Reaffirmation of the Federal Trust Responsibility to Recognized Indian Tribes and Individual Indian Beneficiaries"
- U.S. Fish and Wildlife Service Native American Policy (1994)
- Federal Subsistence Board regulations 36 CFR 242 and 50 CFR 100

The Federal Subsistence Board (Board) is vested with authority delegated by the Secretaries of the Interior and Agriculture to manage subsistence uses and resources on the Federal public lands in Alaska. The Board may delegate specific regulatory authority related to the in-season management of fish species for the Federal public waters in the Kuskokwim Area. The manager of the Yukon Delta National Wildlife Refuge (Refuge) is currently delegated this authority. The Letter of Delegation from the Board to the Refuge manager is attached as an appendix.

The Department has a government-to-government relationship and trust responsibility with the Federally recognized tribes in the Kuskokwim River Drainage and is committed to implementing programs that further tribal self-determination. The Federally recognized Kuskokwim River Tribes are the governing bodies for the tribal members who are residents of these rural communities in the Kuskokwim River Drainage. The Kuskokwim River Tribes established the Commission for the purpose of engagement in the management of Kuskokwim River fisheries.

## ARTICLE III - STATEMENT OF WORK

This MOU formalizes an agreement for substantive consultation between the Federal in-season manager and the Commission prior to in-season management decisions and actions. The MOU also acknowledges the collaborative development of a proposal by the Parties for a fisheries subcommittee jointly chartered by the Western Interior and Yukon-Kuskokwim Delta Regional Advisory Councils (Councils).



THE SERVICE AGREES:

1. The Federal in-season manager will consult with the Commission for the purpose of collaboratively making fisheries management decisions with the integration and application of Commission knowledge, information, and management strategies.
2. All relevant data and information will be provided by the Service to the Commission at the earliest practicable time before consultation.
3. The Federal in-season manager will serve as the primary point of contact for the agency.
4. To engage the Commission as partners in the development and implementation of fishery management projects for the Kuskokwim River drainage, such as research, monitoring, harvest surveys, subsistence studies, test fisheries, and other programs, and to enter into cooperative funding agreements with the Commission to support such capacity building to the degree funding is available from the Service or the Department.
5. To provide a timely written justification to the Commission when the Refuge manager is unable to reach consensus with the Commission regarding Kuskokwim Fisheries in-season management decisions. The justification will include an explanation of how the Commission's traditional and scientific information and position were integrated and considered in the management decision.

THE COMMISSION AGREES:

1. To maintain its status as a tribal organization with membership open to all of the Federally recognized Tribes in the Kuskokwim River drainage, that the Commission represents a significant majority Kuskokwim tribes representing all segments of the drainage, and that the Commission is authorized by its member tribes to engage in the management activities formalized through this MOU.
2. To recognize the Refuge Manager at Yukon Delta National Wildlife Refuge as the Federal in-season manager to the extent such authority has been delegated by the Board, including delegated authority to issue emergency special actions for the management of fish within the Federal public waters of the Kuskokwim River drainage. The scope of delegation set by the Board and limited by 36 CFR 242.10(d)(6) and 50 CFR 100.10(d)(6).
3. To provide all relevant data and information to the Service at the earliest practicable time before consultation, including local and traditional observations and knowledge and regional customary and traditional fishing practices.
4. To inform the Kuskokwim River Villages about in-season and other fishery management plans and actions.
5. To meaningfully engage in consultations with the Service to collaboratively manage fish in the Kuskokwim River drainage.
6. To designate an in-season consultation committee composed of the fewest number of Commissioners that can adequately represent the member tribes, understanding that the lower, middle, and upper regions of the watershed will be equitably represented.

7. To assist the Service with communication and outreach of critical biological and regulatory information to Commission members throughout the year.

THE PARTIES MUTUALLY AGREE:

1. To engage in consultation and collaboration throughout the year to coordinate planning for management actions regarding fish resources on Federal public waters of the Kuskokwim River, and to facilitate development of a unified management strategy that is informed by traditional ways of knowing and science that is biologically, environmentally and culturally sound.
2. Each party will engage in consultation and collaboration with an open mind and without committing to a special action before consultation occurs between the Parties. The Parties will notify each other, in a timely manner, of discussions with other management agencies and provide a summary of the information exchanged.
3. Both parties acknowledge the dynamics of in-season management and that in certain instances, due to the need for a timely decision, immediate consultation and collaboration may not be possible or will need to be abbreviated. Both parties will, in good faith, minimize the instances when abbreviated consultations occur and will meet soon thereafter to discuss the management action taken and modifications that may be necessary.
4. The Service and Commission will contribute to and support a Technical Advisory Body (TAB) that consists of fisheries biologists/scientists, social scientists, and traditional knowledge experts. The TAB will meet as requested by the Service or Commission, freely exchange information, and strive to cooperatively develop a unified presentation of information for consideration during negotiation, consultation and collaboration.
5. The Federal in-season manager and the Commission will negotiate for the purpose of striving to reach consensus on in-season management decisions. The parties expect that consensus will be reached for a large majority of issues. If consensus cannot be reached by negotiation, the Commission may take one or more of the actions below:
  - A. The Commission may request that a conference call or meeting occur with the Service Regional Director/Deputy Regional Director, the Assistant Regional Director of OSM, the Federal in-season manager, and, at the request of the Commission, the Bureau of Indian Affairs Regional Director or Deputy Regional Director, in a timely fashion to engage knowledgeable experts and key decision makers in a discussion for the purpose of achieving a mutually beneficial compromise. This strategy is consistent with the *qasgiq* model, a Yup'ik problem-solving framework, similar to a collaborative decision-making framework widely practiced among Federal agencies known as operational leadership. The Federal in-season manager maintains delegated authority. Members of the TAB may be requested to attend the meeting.
  - B. The Commission may submit a Special Action Request with urgency to the Board in an effort to address a concern. The Service agrees to request that the Commission's Special Action Request be addressed with urgency.
  - C. The Commission may submit a request to the Board to reconsider an in-season management action.
6. To support the development and establishment of a joint subcommittee appointed by the Councils. The

goal for the Subcommittee is to develop recommendations to the Councils on the initiation, review, and evaluation of proposals for regulations, policies, management plans, special actions (in-season management), and other matters or potential impacts relating to management, conservation, and subsistence users of fish in the Kuskokwim River Area, or for fisheries which have impacts on Kuskokwim River Area stocks. Fishery proposals developed by the Subcommittee and forwarded to the Board by both Councils as recommendations will be entitled to deference in accordance with Section 805 of ANILCA and Board policy.

7. If the Councils choose not to establish a Subcommittee that incorporates the substance of the Parties' proposal, the Parties will jointly develop a proposal for the Department of the Interior under the authority of ANILCA Section 805(a) or other legal authority that incorporates the objectives of the Subcommittee.

8. To send the same representatives to attend consultations. The parties may send an alternate to consultations only when necessary, recognizing this should only occur on a very limited basis.

9. To develop supplemental memoranda of understanding between the Commission and the Refuge, as may be required to implement the objectives of the Partnership Project as it develops.

10. To attend and meaningfully participate in consultations during in-season fisheries management and at other times when requested by either Party, and to promote a professional, productive, and collaborative atmosphere, while avoiding confrontational speech or behaviors.

11. To actively encourage and seek the participation of the State of Alaska fishery managers in the consultation and collaboration process.

12. To jointly develop a proposal to the Board for an abbreviated process that will, to the degree practicable, provide an opportunity for timely relief when a request is submitted to reconsider an in-season management action.

#### ARTICLE IV - TERMS OF AGREEMENT

1. This MOU shall become effective upon the signature of the Service and the Commission.

2. This MOU shall continue until terminated by the Service or the Commission. A party may terminate this MOU by providing sixty (60) days advance written notice to the other party. Upon notice of termination, the Parties will meet promptly to discuss the reasons for the notice and to try to resolve their differences.

3. Amendments to this MOU may be proposed by the Service or the Commission and shall become effective upon the signature of the Parties.

4. If the Board changes the delegation of authority for the Kuskokwim River Federal in-season manager, this MOU will be carried forward and amended to reflect the new delegation.

5. Any significant change in the scope of Federal public lands or tribal lands in the Kuskokwim region will require a re-evaluation and possible amendment of this MOU.

6. This MOU shall be re-evaluated by the Parties after two (2) years from the date of execution.

ARTICLE V - KEY OFFICIALS

A. Key officials are essential to ensure maximum coordination and communication between the Parties and the work being performed. They are:

**For the Commission:**

Mike Williams, Chair KRITFC Bethel, AK 99559

[Mwilliams19522004@yahoo.com](mailto:Mwilliams19522004@yahoo.com)

Telephone: 907-765-2061

**For the Refuge:**

Refuge Manager

Yukon Delta National Wildlife Refuge

State Highway

Box 346

Bethel, Alaska 99559

Telephone: 907-543-3151

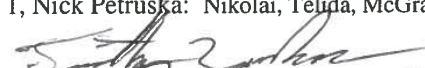
Facsimile: 907-543-4413

**ARTICLE XI - SIGNATURES**

IN WITNESS WHEREOF, the parties hereto have executed this MOU on the date(s) set forth below.

**FOR THE KUSKOKWIM RIVER INTER-TRIBAL FISH COMMISSION:****Executive Council:**

 . Date: 4/5/16  
Unit 1, Nick Petruska: Nikolai, Telida, McGrath, Takotna


 . Date: 4/3/16  
Unit 2, Tim Zaukar: Stony River, Lime Village, Sleetmute, Red Devil, Georgetown, Crooked Creek

 . Date: 3-17-16  
Unit 3, Gerald Kameroff: Napaimute, Chuathbaluk, Aniak, Upper Kalskag, Lower Kalskag

 . Date: 3/29/16  
Unit 4, James Nicorj: Tuluksak, Akiak, Kwethluk, Akiachak

 . Date: 5/11/16  
Unit 5, Greg Roczicka: Bethel

 . Date: 4-1-2016  
Unit 6, Gola Frederick: Oscarville, Napaskiak, Napakiak, Atmauthluak, Kasigluk, Nunapitchuk

 . Date: 3/29/16  
Unit 7, James Charles: Tuntutuliak, Eek, Kongiganak, Kwigillingok, Chefnak, Kipnuk, Quinhagak

**Officers:**

 . Date: 3/3/16  
Mike Williams, KRITFC Chair

 . Date: 3-29-16  
Nick Kameroff, KRITFC Vice-Chair

 . Date: 4/1/16  
Charlene Erik, KRITFC Secretary


**FOR THE U.S. DEPARTMENT OF INTERIOR U.S. FISH AND WILDLIFE SERVICE:**

 . Date: 2/19/16  
Geoffrey Haskett, USFWS Director - Alaska Region

 . Date: 2/26/16  
Vernon Born, Manager - Yukon Delta National Wildlife Refuge

**SUPPORTING AGENCIES/ORGANIZATIONS:**

 Date: 04-15-2016  
Myron Nameng, President – Association of Village Council Presidents

 Date: 4-18-16  
Victor Joseph, President – Tanana Chiefs Conference

## **APPENDIX F**

### **ALASKA DEPARTMENT OF FISH AND GAME COMMENTS ON FSA19-02**





**Department of Fish and Game**OFFICE OF THE COMMISSIONER  
Headquarters Office1255 West 8th Street  
P.O. Box 115526  
Juneau, Alaska 99811-5526  
Main: 907.465.4100  
Fax: 907.465.2332

Date: March 27, 2019

To: Anthony Christensen, Chair  
Federal Subsistence BoardFrom: Alaska Department of Fish and Game  
Ben Mulligan, Deputy Commissioner *BSM*

Subject: The State of Alaska Department of Fish and Game (ADF&amp;G) respectfully submits comments on Fisheries Special Action (FSA) 19-02.

Temporary Special Action Request FSA 19-02 from the Akiak Native community has requested the Federal Subsistence Board (FSB) close federal public waters of the Kuskokwim River drainage to the harvest of Chinook salmon except by federally qualified subsistence users, and further reduce the pool of eligible harvesters based on the ANILCA 804 subsistence user prioritization analysis that was implemented in 2017.

FSA 19-02 has since been submitted by the Akiak Native Community as a temporary special action request to:

- 1) Close Federal public waters of the Kuskokwim River drainage to the harvest of Chinook Salmon except by federally-qualified subsistence users possessing a community harvest permit between June 1, 2019 and July 1, 2019;
- 2) Reduce the pool of eligible harvesters within the Kuskokwim River drainage based on the ANILCA Section 804 subsistence user prioritization that was implemented in 2017;
- 3) Consult with 33 federally-recognized Kuskokwim River Tribes named in the 2014 Office of Subsistence Management (OSM) 804 analysis to establish an appropriate harvest allocation of Chinook salmon to be distributed among named Tribes within the Kuskokwim River drainage.

**Background:**

Since 2010, the Kuskokwim River has experienced poor king salmon runs. Total run estimates for Kuskokwim River king salmon in 2012, 2013, and 2014 are the three lowest on record. From 2010 through 2013, the majority of tributary escapement goals were not achieved and the

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established Kuskokwim River drainagewide escapement goal was not achieved in 2013. Beginning in 2014, the most restricted subsistence fishing seasons have occurred on the Kuskokwim River, but have led to the majority of tributary escapement goals being achieved. In addition, the drainage wide escapement levels have been near the upper end of the established escapement goal of 65,000–120,000 king salmon, since 2015. It is worth noting that if this drainagewide goal had been in place since 2000, we would have achieved or exceeded it in 16 of 18 years.

The total Chinook salmon run in 2015 was approximately 125,000 fish, with a spawning escapement of 108,502 and a subsistence harvest of 16,100 Chinook salmon. An additional yield of approximately 16,000 fish was available for harvest, which would have resulted in a spawning escapement near the midpoint of the drainagewide goal.

The 2016 total Chinook salmon run was approximately 128,600 fish, with a spawning escapement of 97,478 and subsistence harvest of 30,600 Chinook salmon.

The 2017 total Chinook salmon run was approximately 133,100 fish, with a spawning escapement of 116,508 and a subsistence harvest of 16,300 Chinook salmon. An additional yield of approximately 24,000 fish was available for harvest, which would have resulted in a spawning escapement near the midpoint of the drainagewide goal.

The 2018 total Chinook salmon run was approximately 132,300 fish, with a spawning escapement of 109,583 and a preliminary subsistence harvest of 22,200 Chinook salmon. An additional yield of approximately 16,500 fish was available for harvest, which would have resulted in a spawning escapement near the midpoint of the drainagewide goal.

Over the last three years (2016–2018) total run sizes have been below the long-term historical average of 216,000 Chinook salmon and above the recent 10-yr average of 126,000 Chinook salmon. During this time period, run sizes have been large enough to provide for escapement needs and there has been additional yield available for subsistence uses. Subsistence harvests have been severely restricted by regulation and by the sacrifices of subsistence fishermen along the river even though there have been additional yields available.

**Discussion:**

The Board of Fisheries has determined that 67,200–109,800 Chinook salmon are reasonably necessary for subsistence uses. This is known as an “amount reasonably necessary for subsistence” (ANS) and is one way to determine if the regulations are providing a normally diligent fisherman a reasonable opportunity to harvest salmon for subsistence uses. While the FSB does not use ANS, the federal manager has referenced the average subsistence harvest of 87,000 which is just below the midpoint of the ANS range of 88,500.

If adopted this special action request (SAR) would close federal public waters of the Kuskokwim River drainage to the harvest of Chinook salmon except by federally qualified subsistence users, and further reduce the pool of eligible harvesters based on the ANILCA 804 subsistence user prioritization analysis that was implemented in 2018.



If implemented, this SAR will prevent non-federally qualified users from fishing for Chinook salmon in federal waters of the Kuskokwim River. This includes preventing subsistence users from outside the area from “taking” fish—they cannot pursue, trap, net, capture, collect, or kill fish. Only users prioritized under the ANILCA Section 804 analysis will be allowed to take fish in the subsistence fishery in federal public waters.

ADF&G is capable of conserving Chinook salmon and for providing subsistence opportunities to traditional harvesters of salmon in the Kuskokwim River drainage. The Kuskokwim River Salmon Management Plan has an annual regulatory front end closure to Chinook salmon fishing: the end date is 11:59 p.m. June 11, and the beginning date is determined with input from stakeholders of the Kuskokwim River drainage. Starting June 12, the plan calls for at least one open subsistence fishing period per week, if ADF&G projects the run will meet the escapement goal for Chinook salmon. Prior to any Chinook salmon openings, ADF&G has authority to provide subsistence fishing opportunity for whitefish, an important first taste of fresh fish, with legal gear being setnets with a maximum of 4-inch mesh. ADF&G also has authority to provide a limited Chinook salmon opportunity in waters upstream of federal public waters during times of setnet closure under a permit allowing harvest of 10 Chinook salmon per household.

The Kuskokwim River Salmon Management Working Group (Working Group) was established by the Alaska Board of Fisheries to allow all stakeholders, as well as members of the general public to participate and provide advice and input in an open public forum to the department on how to ensure equitable harvest and distribution of salmon resources throughout the Kuskokwim River drainage utilizing information from inseason management assessment projects to provide fishery openings. Through this process, stakeholders and members of the public provide extensive local and traditional knowledge, expertise, management recommendations, and other data during weekly public meetings that occur throughout the entire salmon season. A preseason meeting is also provided for all stakeholders and members of the general public to attend and give input to managers prior to the fishing season. That meeting will take place in Bethel sometime in May this year. These, and other tools, enable ADF&G to collaboratively manage for conservation purposes to protect Chinook salmon while allowing for subsistence opportunity of other healthy species.

The preliminary 2019 season outlook of 115,000–150,000 Chinook salmon is expected to be similar in run size to the past three years, all of which were large enough to meet the drainagewide escapement goal and provide for some subsistence harvest. If the run materializes as expected, even at the lower end of the outlook, there is enough potential surplus for a limited subsistence harvest and to achieve the drainagewide escapement goal. However, if the 2019 run size is nearer the midpoint of the forecast range (132,000 fish), as it has been the last 3 years, there will be adequate surplus to provide for a more liberal subsistence fishery and be within the drainage wide escapement goal range.

After the regulatory front-end closure, ADF&G recommends early season openings of one period per week, based on the preseason forecast, because it may be too early for inseason indicators to provide accurate run projections. The Bethel Test Fishery is more reliable as a run projection later in the season. Forecasts since 2013 have been more accurate based on the prior year forecast method. Starting June 12, one period would be announced for a specific number of hours and with gear type as discussed with the Yukon Delta National Wildlife Refuge manager, state and federal researchers, and stakeholders, which includes the Working Group, the

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Kuskokwim River Inter-Tribal Fish Commission, and other members of the public.

ADF&G supports the continued attendance of refuge staff at Working Group meetings. If the run comes in lower than expected, then ADF&G can delay weekly periods until the chum and sockeye salmon ratios are high enough to warrant subsistence fishing openings focused on these healthy stocks and will continue to implement management measures along the entire length of the drainage.

If the FSB determines a closure of federal public lands is justified, a start date after the front-end closure is prudent per the local and traditional knowledge, and recommendations of rural resident stakeholders in the region. The Alaska Board of Fish in 2016 passed language that would annually close directed subsistence fishing for king salmon in the Kuskokwim River until after June 11. The intent of this closure was to distribute fish throughout the drainage for equitable harvest opportunity. Consequently, the front-end closure also takes into account assessment/run strength uncertainty and conserves fish for escapement purposes. In 2017, the board provided the department with additional guidance by directing the department to provide at least one subsistence fishing opportunity per week with 4-inch or less mesh set gillnets during the closure. This allows subsistence fishermen the opportunity to harvest species other than salmon during the regulated early season closure. An early season king salmon subsistence fishing closure, similar to the approach taken in 2014-2018, will again be recommended to the Working Group at the 2019 spring preseason meeting ADF&G has heard concerns from rural residents of the region expressing their traditional custom to process salmon in the earlier part of the summer due to the more favorable drying weather during that time and understands this important tradition, yet, for rebuilding and continuance of the Chinook salmon runs, also needs to move fish upriver to spawning grounds.

The request to return to the allocation system used in 2015 should be discussed among stakeholders due to the local knowledge and concerns about the allocation system expressed by stakeholders following the season. Although different from the allocation system used in 2014, there was dissatisfaction expressed by some stakeholders that fish distribution systems within the communities were not equitable.

In conclusion, we would like to reiterate, the ADF&G is capable of managing and conserving Kuskokwim River salmon throughout the entire length of the drainage in cooperation and coordination with all stakeholders of the region.

Thank you for consideration of our comments.

Cc: Sam Rabung, Director, Commercial Fisheries  
Dave Rutz, Director, Sport Fish  
Lisa Olson, Acting Director, Subsistence  
Bradley Meyen, Assistant Attorney General, Department of Law

## TEMPORARY SPECIAL ACTION REQUEST FSA19-02 INTERAGENCY STAFF COMMITTEE RECOMMENDATION

The Interagency Staff Committee (ISC) **supports FSA19-02 with modification** to remove the language requiring implementation of a community-based allocation system. Instead, the ISC recommends that the authority for developing and implementing a Chinook Salmon harvest allocation system be added to the delegated authority of the Federal inseason manager, should the collaborative process called for in the inseason manager's delegation of authority letter result in agreement that allocation of Chinook Salmon is warranted.

The modified regulation would read:

§\_\_\_\_.27(e)(4) Kuskokwim Area—Fish

(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.

***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 Salmon, except by Federally qualified subsistence users identified in the ANILCA Section 804 subsistence user prioritization, which includes residents of the Kuskokwim River drainage and the villages of Chefornek, Kipnuk, Kwigillingok and Kongiganek, effective June 1, 2019 through July 1, 2019. Federal subsistence fishing schedules, openings, closures, fishing methods and allocation strategies will be determined by the Yukon Delta National Wildlife Refuge Manager.***

### Justification

Approval of FSA19-02 as modified by the ISC would close Chinook Salmon fishing except by Federally qualified subsistence users identified in the Section 804 subsistence user prioritization analysis from June 1 through July 1, in order to conserve Chinook Salmon and provide opportunity for subsistence uses. The modification of FSA19-02 would allow the inseason manager to determine and implement allocation strategies, if necessary, in addition to the authority to determine fishing schedules, openings, closures, and fishing methods provided in the delegation of authority letter from the Federal Subsistence Board (Board).

Because the inseason manager is able to gather in-season run data and also collaborate with the Kuskokwim River Inter-Tribal Fish Commission (KRITFC), Alaska Department of Fish and Game (ADF&G), and representatives of the Yukon-Kuskokwim Delta and Western Interior Regional Advisory Councils, it would be more efficient for the inseason manager to have the flexibility to consider, develop and implement a mutually agreed upon allocation system, as necessary, rather than mandating the use of community-based allocations.



Approving FSA19-02 as modified by the ISC would provide a management framework using the dates requested in FSA19-02 to close the harvest of Chinook Salmon to all except Federally qualified subsistence users identified in the Section 804 subsistence user prioritization and also provide flexibility to the inseason manager regarding decisions related to the possible allocation of Chinook Salmon.

This proposed modification is being made in light of the varied perspectives offered by residents of the drainage about the community allocation system implemented in 2015. It is hoped that the inseason manager, in collaboration with others, will continue to work on an approach that addresses the concerns expressed while providing a mechanism for subsistence opportunities earlier in the season without jeopardizing conservation efforts and escapement.

It is important to note that an ANILCA Section 804 closure to all but Federally qualified subsistence users that initiates on June 1 is a departure from the later closure dates that have been adopted in recent years. The effects of enacting this closure period are unknown since specific management actions have not yet been identified. As detailed in the analysis, conservation measures for Chinook Salmon were initiated after the 2010-2013 period as populations had notably declined. The conservation efforts implemented since 2013 indicate Chinook Salmon populations are starting to recover. The 2019 pre-season forecasts indicate that a harvestable surplus similar to 2018 levels is likely available for Chinook Salmon. It is also noted in the analysis and through public testimony, that prematurely permitting unlimited harvest of Chinook Salmon could potentially negatively affect the conservation gains that have been made since 2013. The recent management strategy used since 2015 has been for the inseason manager, along with the KRITFC, ADF&G and other stakeholder groups to assess river conditions and run data as it is collected in-season to determine when in-season emergency actions should occur to provide harvest opportunities. The modified ISC recommendation does not seek to alter this approach, as the specific details and timing of actual harvest opportunities and strategies would continue to be defined and announced by the Federal inseason manager through Delegation of Authority from the Board.

In closing, there is a clear desire by all users to see healthy sustainable Chinook Salmon populations rebuilt and conserved for current and future generations. There is also a strong desire to fish earlier as has been the customary practice and to increase the harvest of Chinook Salmon, where possible. As reflected in the public and tribal comments, there are substantial statements in support of and against the allocation portion of this special action request. These decisions are difficult and complex and require a dedicated team of many experts to evaluate the data and assess the risks of various actions. In-season management data will be a key factor informing the decisions along with a continual collaborative process and timely communication with affected users.