

**STAFF ANALYSIS**  
**FSA18-02**

**ISSUES**

Temporary Special Action Request FSA18-02 was jointly submitted by the U.S. Fish and Wildlife Service (USFWS) and the Ninilchik Traditional Council (NTC) on February 6, 2018. The request asks the Federal Subsistence Board (Board) to make the following changes to the Cook Inlet Area Kenai River community gillnet fishery regulations at §\_\_\_\_.27(e)(10)(iv)(J):

1. Annual total harvest limits for the Kenai River for late-run Chinook Salmon, Sockeye Salmon, Coho Salmon, and Pink Salmon do not apply to the Kenai River community gillnet fishery.
2. The location of the fishery will be in the Moose Range Meadows area of the Kenai River, between approximately river mile 26.5 and river mile 29.
3. Allow retention of all incidental fish mortalities regardless of species or length. Retention will count towards released or retained totals specified under this special action, except Chinook Salmon measuring 20 inches or less.
4. Establish an early-run Chinook Salmon season for the community gillnet fishery July 1-15.
5. Establish an early-run Chinook Salmon household limit of 2 early-run Chinook Salmon per household and 1 additional for each household member.
6. Up to 50 early-run Chinook Salmon may be retained or released according to the following conditions:
  - a. Retention of early-run Chinook Salmon less than 46 inches or 55 inches and longer in length is permitted if the Alaska Department of Fish and Game announces that the Optimal Escapement Goal (OEG) for early-run Chinook Salmon has been met.
  - b. Live early-run Chinook Salmon must be released if OEG for early-run Chinook Salmon has not been met.
  - c. The community gillnet fishery will close until July 16 once 50 early-run Chinook Salmon have been retained or released.
7. Retention of up to 200 late-run Chinook Salmon permitted between July 16 and August 15. The community gillnet fishery will close August 15 or once this number has been reached, and would reopen again on September 10.
8. The following conditions apply to Rainbow Trout and Dolly Varden caught in the net:

- a. All live Rainbow Trout and Dolly Varden must be released.
  - b. Rainbow Trout and Dolly Varden that have died in the net may be retained.
  - c. The community gillnet fishery will be closed for the season once a cumulative total of 100 Rainbow Trout or 150 Dolly Varden have been released or retained.
9. State sport fishing regulation seasonal riverbank closures will not apply to the community gillnet fishery.

## **DISCUSSION**

Federal subsistence regulations for the taking of fish authorize a community gillnet fishery for the harvest of salmon from the Kenai River for the residents of Ninilchik. These regulations came into effect in 2015 following the Board adoption of fisheries Proposal FP15-10. However, implementation of the fishery as adopted has been difficult due to existing regulatory conflicts, conservation concerns, and delays in the Federal regulatory process.

The proponents request that the Board take temporary action to implement the community gillnet fishery during the 2018 season with the provisions described above. The proponents state that this fishery will not likely result in conservations concerns, but will instead provide the residents of the community of Ninilchik with the Federal subsistence harvest opportunity in the Kenai River authorized by the Board in 2015. This request asks for the same changes as temporary special action FSA17-01 submitted by the same proponents last year and approved by the Board, with a few minor changes such as limiting the fishery to the Moose Range Meadows area.

The applicable Federal regulations are found in 36 CFR 242.19(b) and 50 CFR 100.19(b) (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.*

### **Existing Federal Regulation**

#### **§ \_\_.25(e)(10) Subsistence taking of fish. Cook Inlet Area**

*(iv) You may take only salmon, trout, Dolly Varden, and other char under the authority of a Federal subsistence fishing permit. Seasons, harvest and possession limits, and methods and means for take are the same as for the taking of those species under Alaska sport fishing regulations (5 AAC 56 and 5 AAC 57) unless modified herein. Additionally, for Federally managed waters of the Kasilof and Kenai River drainages:*

...

*(D) Residents of Hope, Cooper Landing, and Ninilchik may take only sockeye salmon through a dip net and a rod and reel fishery at one specified site on the Russian River, and Sockeye, late-run Chinook, Coho, and Pink salmon through a dip net/rod and reel fishery at two specified sites on the Kenai River below Skilak Lake and as provided in this section. For Ninilchik residents, salmon taken in the Kasilof River Federal subsistence fish wheel, and dip net/rod and reel fishery will be included as part of each household's annual limit for the Kenai and Russian Rivers' dip net and rod and reel fishery. For both Kenai River fishing sites below Skilak Lake, incidentally caught fish may be retained for subsistence uses, except for early-run Chinook Salmon (unless otherwise provided for), Rainbow Trout 18 inches or longer, and Dolly Varden 18 inches or longer, which must be released. For the Russian River fishing site, incidentally caught fish may be retained for subsistence uses, except for early- and late-run Chinook Salmon, Coho Salmon, Rainbow Trout, and Dolly Varden, which must be released. Before leaving the fishing site, all retained fish must be recorded on the permit and marked by removing the dorsal fin. Harvests must be reported within 72 hours to the Federal fisheries manager upon leaving the fishing site, and permits must be returned to the manager by the due date listed on the permit. Chum Salmon that are retained are to be included within the annual limit for Sockeye Salmon. Only residents of Cooper Landing, Hope, and Ninilchik may retain incidentally caught resident species.*

*(1) The household dip net and rod and reel gear fishery is limited to three sites:*

*(i) At the Kenai River Moose Range Meadows site, dip netting is allowed only from a boat from a Federal regulatory marker on the Kenai River at about river mile 29 downstream approximately 2.5 miles to another marker on the Kenai River at river mile 26.5. Residents using rod and reel gear at this fishery site may fish from boats or from shore with up to two baited single or treble hooks June 15-August 31. Seasonal riverbank closures and motor boat restrictions are the same as those listed in State of Alaska fishing regulations (5 AAC 56 and 5 AAC 57 and 5 AAC 77.540).*

...

*(2) Fishing seasons are as follows:*

*(i) For sockeye salmon at all fishing sites: June 15-August 15;*

*(ii) For late-run Chinook, Pink, and Coho Salmon at both Kenai River fishery sites only: July 16-September30; and*

*(iii) Fishing for Sockeye, late-run Chinook, Coho, or Pink Salmon will close by special action prior to regulatory end dates if the annual total harvest limit for that species is reached or superseded by Federal special action.*

*(3) Each household may harvest their annual Sockeye, late-run Chinook, Coho, or Pink salmon limits in one or more days, and each household member may fish with a dip net or rod and reel during this time. Salmon taken in the Kenai River system dip net and rod and reel fishery by Ninilchik households will be included as part of those household's annual limits for the Kasilof River.*

*(i) For Sockeye Salmon—annual total harvest limit of 4,000 (including any retained Chum Salmon); annual household limits of 25 for each permit holder and 5 additional for each household member;*

*(ii) For late-run Chinook Salmon—annual total harvest limit of 1,000; annual household limits of 10 for each permit holder and 2 additional for each household member;*

*(iii) For Coho Salmon—annual total harvest limit of 3,000; annual household limits of 20 for each permit holder and 5 additional for each household member; and*

*(iv) For Pink Salmon—annual total harvest limit of 2,000; annual household limits of 15 for each permit holder and 5 additional for each household member.*

...

*(J) Residents of Ninilchik may harvest Sockeye, Chinook, Coho, and Pink salmon in the Federal public waters of the Kenai River with a single gillnet to be managed and operated by the Ninilchik Traditional Council. Ninilchik residents may retain other species incidentally caught in the Kenai River except for rainbow trout and Dolly Varden; all rainbow trout and Dolly Varden must be released.*

*(1) Only one community gillnet can be operated on the Kenai River. The gillnet cannot be over 10 fathoms in length, must be no larger than 5.25 inch mesh, and may not obstruct more than half of the river width with stationary fishing gear. Subsistence*

*stationary gillnet gear may not be set within 200 feet of other subsistence stationary gear.*

*(2) One registration permit will be available and will be awarded by the Federal in-season fishery manager, in consultation with the Kenai National Wildlife Refuge manager. The registration permit will be issued to the Ninilchik Traditional Council.*

*(i) As the community gillnet owner, the Ninilchik Traditional Council will be responsible for its use and removal in consultation with the Federal fishery manager.*

*(ii) As part of the permit, after the season, the Ninilchik Traditional Council must provide written documentation of required evaluation information to the Federal fishery manager including, but not limited to, persons or households operating the gear, hours of operation, and number of each species caught and retained or released.*

*(3) The Ninilchik Traditional Council may operate the net for subsistence purposes on behalf of residents of Ninilchik by requesting a subsistence fishing permit that:*

*(i) Identifies a person who will be responsible for fishing the gillnet;*

*(ii) Includes provisions for recording daily catches within 72 hours, the household to whom the catch was given, and other information determined to be necessary for effective resource management by the Federal fishery manager.*

*(4) Fishing will be allowed from July 1 through August 15 and September 10-30 on the Kenai River unless closed or otherwise restricted by Federal special action.*

*(5) Salmon taken in the gillnet fishery will be included as part of the dip net/rod and reel household annual limits of participating households.*

*(6) Fishing for each salmon species will end and the fishery will be closed by Federal special action prior to regulatory end dates if the annual total harvest limit for that species is reached or superseded by Federal special action.*

### **Proposed Federal Regulation**

*(J) Residents of Ninilchik may harvest Sockeye, Chinook, Coho, and Pink salmon in the **Moose Range Meadows area of the** Federal public waters of the Kenai River, with a single gillnet, to be managed and operated by the Ninilchik Traditional Council. ~~Ninilchik residents may retain~~*

~~other species incidentally caught in the Kenai River except for rainbow trout and Dolly Varden; all rainbow trout and Dolly Varden must be released.~~

(1) Only one community gillnet can be operated on the Kenai River. The gillnet cannot be over 10 fathoms in length, must be no larger than 5.25 inch mesh, and may not obstruct more than half of the river width with stationary fishing gear. Subsistence stationary gillnet gear may not be set within 200 feet of other subsistence stationary gear.

(2) One registration permit will be available and will be awarded by the Federal in-season fishery manager, in consultation with the Kenai National Wildlife Refuge manager. The registration permit will be issued to the Ninilchik Traditional Council.

(i) As the community gillnet owner, the Ninilchik Traditional Council will be responsible for its use and removal in consultation with the Federal fishery manager.

(ii) As part of the permit, after the season, the Ninilchik Traditional Council must provide written documentation of required evaluation information to the Federal fishery manager including, but not limited to, persons or households operating the gear, hours of operation, and number of each species caught and retained or released.

(3) The Ninilchik Traditional Council may operate the net for subsistence purposes on behalf of residents of Ninilchik by requesting a subsistence fishing permit that:

(i) Identifies a person who will be responsible for fishing the gillnet;

(ii) Includes provisions for recording daily catches within 72 hours, the household to whom the catch was given, and other information determined to be necessary for effective resource management by the Federal fishery manager.

(4) Fishing will be allowed from July 1 through August 15 and September 10-30 on the Kenai River unless closed or otherwise restricted by Federal special action.

(5) Salmon taken in the gillnet fishery will be included as part of the dip net/rod and reel household annual limits of participating households. **An additional household limit specific to the community gillnet is as follows:**

(i) **For early-run Chinook Salmon – annual household limits of 2 for each permit holder and 1 additional for each household member.**

**(6) Fishing seasons for the community gillnet fishery are as follows:**

**(i) For Sockeye, late-run Chinook, Pink, and Coho Salmon: the same as provided in the dip net/rod and reel fishery at §\_\_\_\_.25(e)(10)(D);**

**(ii) For early-run Chinook Salmon: July 1 – July 15.**

**(6) Fishing for each salmon species will end and the fishery will be closed by Federal special action prior to regulatory end dates if the ~~specified annual total harvest~~ limit for that species is reached or superseded by Federal special action.**

**(7) All incidental fish mortalities may be retained regardless of species or length. Retention will count towards release or retained totals specified under this section, except Chinook Salmon that measure 20 inches or less.**

**(8) Up to 50 early-run Chinook Salmon may be retained or released according to the following conditions:**

**(i) Retention of early-run Chinook Salmon less than 46 inches or 55 inches and longer in length is permitted if the State of Alaska Department of Fish and Game announces that the optimal escapement goal (OEG) for early-run Chinook Salmon has been met.**

**(ii) Live early-run Chinook Salmon must be released if the OEG for early-run Chinook Salmon has not been met.**

**(iii) The community gillnet fishery will close until July 16 once 50 early-run Chinook Salmon have been retained or released.**

**(9) Up to 200 late-run Chinook Salmon may be retained between July 16 and August 15. The community gillnet fishery will close August 15, or once this number has been reached.**

**(10) The following conditions apply to Rainbow Trout and Dolly Varden caught in the net:**

**(i) All live Rainbow Trout and Dolly Varden must be released;**

**(ii) Rainbow Trout and Dolly Varden that have died in the net may be retained;**

**(iii) The community gillnet fishery will be closed for the season once a cumulative total of 100 Rainbow Trout or 150 Dolly Varden have been released or retained.**

*(11) State of Alaska sport fishing regulation seasonal riverbank closures will not apply to the community gillnet fishery.*

### **Existing State Regulations**

The Kenai Peninsula is a designated nonsubsistence use area by the State of Alaska. The State's subsistence priority does not apply on the Kenai Peninsula and the Alaska Board of Fisheries may not authorize subsistence fisheries in nonsubsistence areas. Under State regulations, personal use fisheries and educational fishery permits provide opportunities for harvesting fish with gear other than rod and reel in nonsubsistence areas.

The management of Kenai River fisheries is directed by several fisheries management plans, as outlined in the State Regulatory History section below. General provisions (5 AAC 57.120) and special provisions (5 AAC 57.121) provide the specific information about seasons, bag, possession, annual, and size limits, and methods and means for the harvest of fish through the sport fishery in the Kenai River Drainage Area. In addition to the sport fishing regulations, there are also riparian habitat regulations (5 AAC 57.180) that prohibit or restrict access to fishing locations at certain times of year have been implemented for the protection of riparian habitat along the river, including within the Moose Range Meadows area. Full versions of the regulatory sections listed below can be found in **Appendix A**.

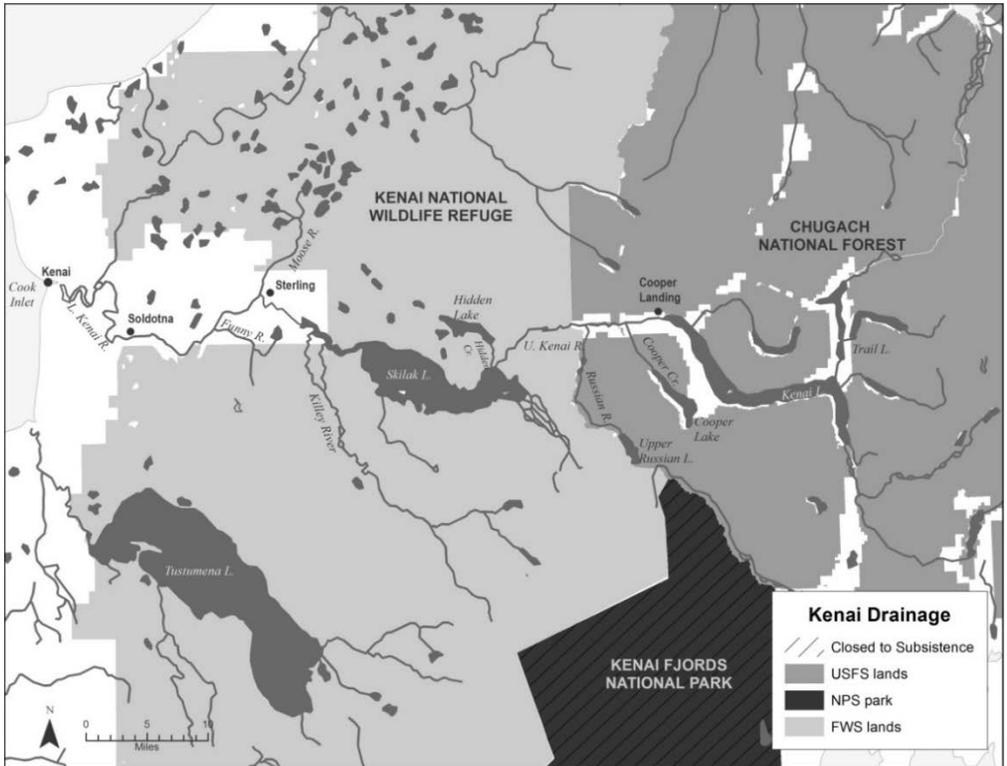
*5 AAC 57.120. General provisions for seasons, bag, possession, annual, and size limits, and methods and means for the Kenai River Drainage Area.*

*5 AAC 57.121. Special provisions for the seasons, bag, possession, and size limits, and methods and means for the Lower Section of the Kenai River Drainage Area.*

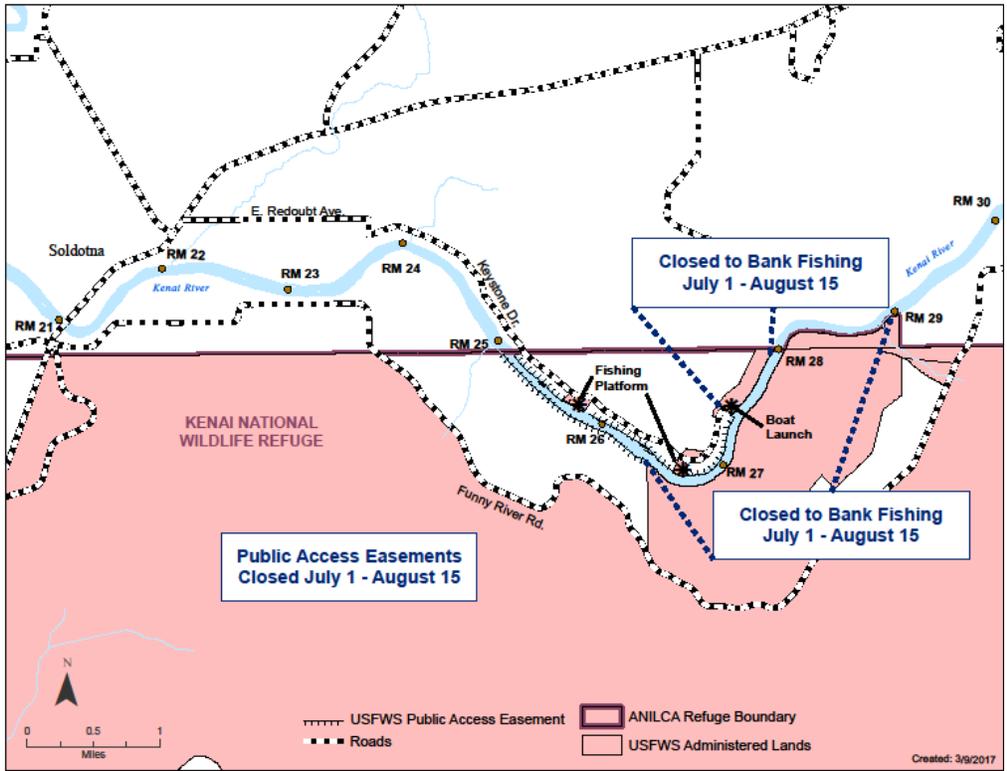
*5 AAC 57.180. Riparian Habitat Fishery Management Plan for the Kenai River Drainage Area*

### **Extent of Federal Public Waters**

Federal public waters are defined and described under 36 CFR 242.3 and 50 CFR 100.3. The Federal public waters under consideration for this analysis include all waters of the Kenai River within and adjacent to the exterior boundaries of the Kenai NWR and the Chugach National Forest (**Figure 1**). This includes Kenai and Skilak lakes and their tributaries, and the mainstem Kenai River from Kenai Lake downstream to the confluence of the upper branch of the Killey River at approximately river mile (RM) 45.5. It also includes the mainstem Kenai River between RM 26.5 and RM 29, known locally as Moose Range Meadows (MRM; **Figure 2**), and most of the upper reaches of tributaries below Skilak Lake (including the Moose, Killey, and Funny rivers).



**Figure 1** Kenai River drainage map showing land ownership and Federal public waters.



**Figure 2** Moose Range Meadows area of the Kenai National Wildlife Refuge. Map displays area of the Kenai River within Refuge boundaries and seasonal public easements and bank fishing closures.

## **Customary and Traditional Use Determinations**

Residents of the communities of Cooper Landing, Hope, and Ninilchik have a customary and traditional use determination for all fish in the Kenai Peninsula District. This includes those waters north of, and including, the Kenai River drainage within the Kenai National Wildlife Refuge and the Chugach National Forest.

## **Regulatory History**

### Pre- and Early-Statehood Fisheries

Prior to 1952, freshwater streams on the Kenai Peninsula were open to subsistence fishing, but salmon runs were decimated by poorly managed commercial fisheries, growing local and statewide populations, and increased user pressure. In 1952, a closure to subsistence fishing was enacted for all streams and lakes of the Kenai Peninsula under Territory of Alaska regulations as part of efforts to rebuild salmon runs. Only rod and reel fishing was allowed for “personal use” (Fall et al. 2004).

### Contemporary State Fisheries

Overall, the State of Alaska manages commercial and sport salmon fisheries statewide based on the principles and criteria listed in the State’s Policy for the management of sustainable salmon fisheries, 5AAC 39.222. A State regulatory management plan for Upper Cook Inlet salmon (5 AAC 21.363) provides the Alaska Board of Fisheries guiding principles and provisions for adopting management plans for specific stocks. In 1992, the State classified most of the Cook Inlet Area, including the Kenai and Kasilof River drainages, as a nonsubsistence area (5AAC 99.015(3)). The only State subsistence fisheries in Cook Inlet occur in areas that are not accessible from the road system; this includes the communities of Beluga, Nanwalek (formerly English Bay), Port Graham, Seldovia, and Tyonek (Fall et al. 2017).

The Kenai River fisheries are complex and intensively managed by the State of Alaska. There are five management plans that apply to Kenai River salmon stocks:

Upper Cook Inlet Salmon Management Plan (5 AAC 21.363)

Kenai River and Kasilof River Early-Run King Salmon Conservation Management Plan (5 AAC 57.160)

Kenai River Late-Run King Salmon Management Plan (5 AAC 21.359)

Kenai River Late-Run Sockeye Salmon Management Plan (5 AAC 21.360)

Kenai River Coho Salmon Management Plan (5 AAC 57.170)

These plans provide goals for sustained yield, guidance for mixed-species and mixed-stock fisheries, and instructions for allocation between competing fisheries. Most of the initial Federal subsistence fishing regulations for the Kenai River drainage that were put in place during the period of 2006 – 2008, were based on these plans with the intent to mirror State of Alaska regulations, conservation efforts, and management to the maximum extent possible.

The Alaska Board of Fisheries initially adopted Chinook Salmon size restrictions (also known as slot limits) in 2002 to reverse the declining proportion of age-7 (5-ocean or seven year old) fish in the early run (McKinley and Fleishman 2010). The resulting regulation required early-run Chinook Salmon between 40 inches and 55 inches (total length) caught in the sport fishery to be released alive. The regulation applied January 1 to June 30 from the Kenai River mouth upstream to Soldotna Bridge and July 1 to July 14 from the Soldotna Bridge upstream to the outlet of Skilak Lake as a means of protecting the early-run as it migrates up the river to spawn. Additional conservative regulations during the same times and areas include single hook and no-bait restrictions to further limit harvest. At the same time, a requirement was enacted to have all early-run Chinook Salmon 55 inches in length or greater sealed by the Alaska Department of Fish and Game within 3 days of harvest to collect biological and harvest site information about these trophy sized fish (McKinley and Fleishman 2010). The slot limit for early-run Chinook Salmon was reduced in 2003 (44 inches to 55 inches) and again in 2008 (46 inches to 55 inches; Boersma and Gates 2014) to afford more opportunity to harvest additional specific sized Chinook Salmon following a marked yet temporary increase in abundance of the stock. There was a trend reversal in 2014, when the limit was expanded to 42 to 55 inches with the intent to protect approximately 92% of 5-ocean fish while still leaving about 62% of the early run available for harvest (ADF&G 2014).

In 2017, the Alaska Board of Fisheries made additional changes to the Kenai River Chinook Salmon in-river fishery in response to unpredicted significant reductions in abundance of Cook Inlet and statewide Chinook Salmon populations. The *lower river* Chinook Salmon fishery now prohibits the retention of fish 36 inches and larger from January 1 to June 30, with no size limit between July 1 and July 31. Previously, there had been a slot limit of less than 42 inches or 55 inches and longer in this section of the river for early-run fish (between January 1 and June 30). The *middle river* Chinook Salmon fishery between Slikok Creek and the outlet of Skilak Lake now prohibits the retention of fish 36 inches and larger between January 1 and July 31, a time-period that covers both the early- and late-run Chinook Salmon sport fishing seasons. Previously, there had been a protective slot limit in this section of the river for the early-run fish (between January 1 and July 14), and no size limits for the late-run fish (July 15 – July 31). The new size restrictions will protect all 5-ocean fish and the majority of the 4-ocean fish while shifting Chinook Salmon sport fishing harvest to younger age-classes when their abundance is low.

The Statewide Management Standards for Wild Trout (5 AAC 75.220) provides management regulations for the optimal sustained yield of wild trout stocks in waters not yet covered by a regional trout management plan. The plan was adopted by the Alaska Board of Fisheries in 2003. In addition, the Policy for the Management of Sustainable Wild Trout Fisheries (5 AAC 75.222) establishes guiding principles for the statewide management of wild trout fisheries. In particular for Cook Inlet Waters, management objectives for this fishery are contained in the Special Management Areas and Liberal Harvest Opportunities for Trout (5 AAC 75.210; Begich et al. 2013).

There have been many modifications to the Kenai River Rainbow Trout fishery since the late 1970's (Begich et al. 2013). As participation and catch in the Rainbow Trout fishery increased, the Alaska Board of Fisheries adopted numerous regulations to promote Rainbow Trout conservation and production. Current management of this fishery allows a moderate harvest of smaller fish while protecting the larger fish that have an increased reproductive potential. Harvest regulations are more conservative in flowing

waters (one fish per day less than 16 inches) than in lakes (two fish per day and only one larger than 20 inches, with annual limit of two per year over 20 inches). In 2017, regulations were modified to align the size of fish allowed for retention to less than 16 inches in flowing waters of the Kenai River drainage. Previously, fish less than 16 inches could be retained from the upper mainstem Kenai River and Kenai River tributaries, while fish 18 inches or less could be retained from lower mainstem Kenai River and tributaries.

Historically, the State managed the Kenai River Dolly Varden/Arctic Char (hereafter Dolly Varden) sport fishery as if it was a highly productive stock capable of withstanding high harvest. However, as participation and catch in the fishery increased over time, the Alaska Board of Fisheries adopted conservative regulations to reduce harvest, in order to reduce the likelihood of potential population declines in light of increased angler use. The adoption of these conservative regulations have transformed the high harvest fishery into a primarily a catch-and-release fishery in the upper Kenai River, which allows a modest harvest of smaller, younger fish. In 2005, the Alaska Board of Fisheries aligned the Dolly Varden regulations in the Kenai River to be the same or similar to those for Rainbow Trout, at which time the bag and possession limit in the river below Skilak Lake was reduced to one fish less than 18 inches. The State considers conservative regulations for harvest, particularly of large spawning fish, to be crucial to the sustainability of this high use fishery. In 2017, regulations were modified to align the size of fish allowed for retention to less than 16 inches in flowing waters of the Kenai River drainage. Similar to Rainbow Trout, allowable sizes for retention differed through the drainage before this change.

The State also has a regulatory management plan for Upper Cook Inlet personal use salmon fisheries (5 AAC 77.540). This plan established four personal use fisheries in Cook Inlet: Kasilof River dip net, Kasilof River set gillnet, Kenai River dip net, and Fish Creek dip net. Unlike subsistence fisheries, personal use fisheries do not have a priority over other existing uses in times of resource shortages. These personal use fisheries are open to all residents of Alaska, require a household permit and sport fishing license, occur in marine and intertidal waters, and (for the Kenai River drainage fisheries) are downstream of the Federal public waters. These fisheries target Sockeye Salmon, the species of greatest abundance and for which the best stock assessment information is available. Annual harvest limits are 25 salmon for the head of each household and 10 salmon for each additional household member. The limit is combined for all four fisheries. Incidentally caught Coho, Pink, and Chum Salmon may be retained as part of the annual limit. Each household is limited to one Chinook Salmon in the Kenai River dip net fishery. Chinook Salmon may not be retained in the Kasilof River dip net fishery but may be retained from the Kasilof River gill net fishery. Both Kasilof River fisheries are separated by season dates, as the gear types are not compatible in crowded areas.

Finally, the State administers up to twelve educational fisheries each year in the Cook Inlet area under the provisions of 5 AAC 93.200 – 93.235 (Nelson et al. 1999, Fall et al. 2004). Around half of these educational fisheries occur in marine waters near the mouths of Kenai Peninsula rivers. The purpose of educational fisheries is to allow groups to practice and teach others/pass on traditional, contemporary, or experimental methods for locating, harvesting, or processing fishery resources. Educational fisheries, like personal use fisheries, do not have statutory priority over other fisheries. Therefore, during times of

resource shortages, restrictions may be placed on educational fisheries before or at the same time as restrictions to commercial, sport, and personal use fisheries.

In-season administration of State managed fisheries is primarily conducted through the State's emergency order process. For sport fishing, this tool allows for opening and closing seasons or areas, increasing or decreasing bag limits, or modifying methods of harvest. Numerous restrictive emergency orders were issued between 2010 and 2016 for Chinook Salmon in the Kenai River due to conservation concerns (**Table 1**).

### Federal Subsistence Fisheries

The Board established Federal subsistence regulations for harvest in the Cook Inlet Area in 2002 for salmon, trout, and Dolly Varden through fisheries Proposal FP02-11. A Federal subsistence permit was required and seasons, harvest and possession limits, and methods and means for take were the same as those provided under State of Alaska sport fishing regulations. This fishery was an interim measure to provide some Federal subsistence opportunity in the Cook Inlet Area for Federally qualified subsistence users. Initially, there were no customary and traditional use determinations for salmon, trout, Dolly Varden, and other species in Cook Inlet; so all rural residents of Alaska could harvest under these Federal regulations.

In January 2006 through fisheries Proposal FP06-09, the Board made customary and traditional use determinations for Hope and Cooper Landing residents for all fish in the Kenai Peninsula District (waters north of and including the Kenai River drainage within the Kenai National Wildlife Refuge and the Chugach National Forest). The Board did not support the request by Ninilchik residents for all fish within the Kenai Peninsula District, but did support their request for all fish in the Kasilof River drainage within the Kenai National Wildlife Refuge. NTC submitted fisheries Proposal FP09-07, again requesting customary and traditional use determination for all fish in the Kenai Peninsula District, which was not supported by the Board during its January 2009 meeting. As a result, NTC submitted a request for reconsideration to the Board (RFR09-01). The Board considered the threshold analysis for FRF09-01 at their November 2009 meeting and voted to reconsider at a later date. In November 2010, the Board reversed their earlier decision on FP09-07 and added residents of Ninilchik to the customary and traditional use determination for all fish in the Kenai Peninsula District.

For the 2007 regulatory cycle, two additional steps were included in the usual analysis and review process for regulatory proposals. First, the Southcentral Alaska Subsistence Regional Advisory Council (Council) formed a stakeholder working group, which met twice in Soldotna in February 2007 to review the analyses and suggest changes. Second, a review was conducted by NTC, the proponent of some of the regulatory proposals submitted to the Board, to assess and provide feedback on the changes suggested by the subcommittee, and to suggest other changes. Both of these steps took place prior to the Council's March 2007 meeting. Several suggested changes which resulted from these extra steps, were incorporated into the analyses as modifications to the proposed regulations and presented to the Council and, ultimately, the Board (OSM 2007).

**Table 1** Emergency orders issued by the Alaska Department of Fish and Game for Chinook Salmon in the Kenai River drainage between 2010 and 2017.

Year	Number	Start Date	End Date	Action
2010	2-KS-1-12-10	6/5/2010	7/14/2010	Partial season closure for sport fishery
2010	2-KS-1-16-10	6/12/2010	7/14/2010	Restricted reopening for sport fishery
2010	2-KS-1-19-10	6/15/2010	7/31/2010	Reopen back to standard sport fishing regulations
2011	2-KS-1-17-11	6/29/2011	7/14/2011	Restrict sport fishery
2011	2-KS-1-20-11	7/15/2011	7/31/2011	Continue duration of restricted sport fishery
2012	2-KS-1-11-12	6/15/2012	7/14/2012	Restrict sport fishery
2013	2-KS-1-11-13	5/16/2013	7/14/2013	Restrict sport fishery
2013	2-KS-1-22-13	6/20/2013	7/14/2013	Close sport fishery in some areas, restrict in others
2013	2-KS-1-24-13	7/1/2013	7/31/2013	Restrict sport fishery
2013	2-KS-1-34-13	7/10/2013	7/31/2013	Prohibit retention of Chinook Salmon in personal use fishery
2013	2-KS-1-36-13	7/15/2013	7/31/2013	Close sport fishery
2013	2-KS-1-43-13	7/25/2013	7/31/2013	Allow harvest of fish less than 20 inches or greater than 55 inches
2013	2-KS-1-45-13	7/28/2013	7/31/2013	Close sport fishery
2013	2-KS-1-46-13	8/1/2013	8/15/2013	Prohibit use of bait and limit gear in the sport fishery
2014	2-KS-1-04-14	5/1/2014	7/31/2014	Close sport fishery for early-run
2014	2-KS-1-26-14	7/1/2014	7/31/2014	Prohibit use of bait in the sport fishery
2014	2-KS-1-27-14	7/10/2014	7/31/2014	Prohibit retention of Chinook Salmon in personal use fishery
2014	2-KS-1-40-14	7/19/2014	7/31/2014	Restrict sport fishery to unbaited single barbless hook, no retention
2014	2-KS-1-42-14	7/26/2014	7/31/2014	Close sport fishery
2015	2-KS-1-05-15	5/1/2015	7/31/2015	Close sport fishery for early-run
2015	2-KS-1-35-15	7/1/2015	7/31/2015	Prohibit use of bait in the sport fishery
2015	2-KS-1-46-15	7/25/2015	7/31/2015	Restore use of bait in sport fishery, no Chinook retention
2016	2-KS-1-03-16	5/1/2016	7/31/2016	Close sport fishery for early-run
2016	2-KS-1-19-16	6/18/2016	6/30/2016	Allow harvest in sport fishery below Slikok Creek
2016	2-KS-1-24-16	7/1/2016	7/31/2016	Prohibit use of bait in the sport fishery
2016	2-KS-1-28-16	7/1/2016	7/31/2016	Maintain bait prohibition in the sport fishery
2016	2-KS-1-33-16	7/9/2016	7/31/2016	Restore use of bait in the sport fishery
2017	2-KS-1-14-17	6/13/2017	6/30/2017	Increase retention size from 36 to 46 inches below Slikok Creek in the sport fishery
2017	2-KS-1-15-17	6/21/2017	6/30/2017	Allow use of bait below Slikok Creek in the sport fishery

At the time, the Board typically held public meetings twice a year to make decisions on proposals to change Federal subsistence regulations throughout the State; once in the spring (April or May) for wildlife regulations and once in the winter (December or January) for fisheries proposals. In May 2007, the Board held a third public meeting solely to hear public testimony, deliberate and make decisions on the Kenai Peninsula fisheries proposals of the 2007 regulatory cycle (FSB 2007a).

This additional 2007 regulatory meeting specific to Kenai Peninsula fisheries generated a number of proposals, including a handful of requests for the use of gillnets in the Kenai River drainage. These included Proposals FP07-27B and C (submitted by NTC) and FP07-29 (submitted by Mr. Robert Gibson of Cooper Landing). FP07-27B and C requested a community set gillnet fishery for Chinook, Sockeye, and Pink Salmon in the Kasilof and Kenai Rivers and a community set gillnet fishery for Coho Salmon in the Kenai River. FP07-29 requested that gillnets with different mesh sizes be used to harvest Sockeye Salmon, Coho Salmon, Pink Salmon, Rainbow Trout, Dolly Varden, Lake Trout, and whitefish species in several lakes in the Kenai River drainage. The recommendation of the Council was to move forward with only the dip net and rod and reel salmon fisheries (OSM 2007). Justification for this recommendation was that a dip net fishery at Moose Range Meadows would provide additional subsistence opportunity and that limiting this fishery to dip nets from boats would address habitat and private property concerns in this area. The Council also stated that allowing incidental harvest of Rainbow Trout and Dolly Varden/Arctic Char less than 18 inches in dip net fisheries below Skilak Lake would be consistent with conservation practices, and would provide a reasonable alternative to expanded harvest opportunity in the rod and reel fishery. Lastly, the Council stated that providing up to two baited hooks in the rod and reel fishery below Skilak Lake from January 1 to August 31 would provide an additional opportunity for Chinook and Coho Salmon, and would be consistent with conservation practices for these species.

During its May 2007 meeting, the Board adopted proposals FP07-27B and C as modified by the Council. This action established the dip net/rod and reel salmon fisheries on the Kasilof and Kenai rivers, and increased previously established harvest, possession, and annual limits for salmon and selected resident species for existing rod and reel fisheries in the Kasilof and Kenai river drainages. It provided for the use of up to two single or treble hooks and bait for rod and reel fishing during specified dates for both systems. It also established both household and annual total harvest limits for salmon in the Kasilof and Kenai rivers, and prohibited the retention of Kenai River Dolly Varden and Rainbow Trout 18 inches or greater in length from the Kenai River.

The annual total harvest limits established by the Board to apply to the dip net/rod and reel fishery were developed from a 2007 NTC proposal (FP07-27B) that was submitted with the intent to have a fishery with a single set gillnet in the Kasilof River and a single set gillnet in the Kenai River. The totals from the proposal (1,000 Chinook Salmon, 4,000 Sockeye Salmon, and 2,000 Pink Salmon) were intended to be a set quantity that would be allowed for harvest in the proposed set gillnet fishery that would span both river systems, and were not derived from a biological analysis. The annual total harvest limits adopted by the Board for the Kenai River were 4,000 Sockeye Salmon, 1,000 late-run Chinook Salmon, 2,000 Pink Salmon, and 3,000 Coho Salmon. Additionally, household limits adopted for salmon from this system included: Sockeye Salmon at 25 for each permit holder and an additional 5 for each household member (hereafter written as 25/5); late-run Chinook Salmon at 10/2; Pink Salmon at 15/5; and Coho Salmon at 20/5.

In 2008, the NTC submitted Proposal FP08-08 to allow the salmon dip net fishery to occur from the shore (river bank), as well as from boats, within the Federal public waters of the Kenai River in the Moose Range Meadows area. The Council supported the proposal, after a lengthy discussion during its fall 2007 meeting, noting that allowing subsistence dip net fishing from shore as well as from a boat would provide

more of a subsistence preference in this area of the Kenai River (SCRAC 2007). Some Council members noted that limiting the dip net fishery at Moose Range Meadows to boats would limit participation by Federally qualified subsistence users without access to a boat. They also commented that while there are habitat and private property concerns in the area, it should be possible to allow some subsistence fishing from shore on Federal public lands that can be accessed without the use of a boat. During the Board's December 2007 meeting, several Board members expressed concerns about allowing dip netting from the shore. They stated that the area is prime juvenile Chinook Salmon rearing habitat with bank closures in place for habitat protection, that the area was not a safe place to use dip nets, and that opening the area to fishing from the shore would not be consistent with recognized principles of fish and wildlife management. Other Board members pointed out that adoption of the proposal would provide a "meaningful subsistence preference." Ultimately, the Board did not support passage of the proposal (FSB 2007b).

Also during the 2008 cycle, the Council submitted Proposal FP08-09 to establish a temporary community fish wheel on both the Kenai and Kasilof rivers for residents of Ninilchik, Hope, and Cooper Landing. The Council contended that the fish wheels would provide a more effective means for Federally qualified subsistence users to harvest salmon. The Council requested the establishment of fish wheels as a gear type be temporary to evaluate the feasibility of operating this type of gear. The Board adopted the proposal, with modification, to allow fish wheels to be classified as a gear type, but only in the Kasilof River (FSB 2007b). The Board felt that there were too many logistical issues to be dealt with on the Kenai River, especially with three communities having the possibility of running a single fish wheel. The Board specified that only one fish wheel with a live box would be allowed in the upper mainstem of the Kasilof River. A permit would be required to use the fish wheel and that an operational plan must be submitted to and approved by the Federal in-season manager, before the permit would be awarded. Individuals operating the fish wheel would need to have a Federal subsistence fishing permit and all harvest limits on the permit would apply to the fish wheel. Salmon harvested by the fish wheel were included as part of each household's annual limit and all fish harvested were to be reported to the in-season manager with 72 hours of leaving the fishing location. In 2013, the Board supported FP13-15 to remove the expiration date for the community fish wheel salmon fishery on the Kasilof River, allowing continued operation of the fish wheel (FSB 2013).

In 2009, the NTC submitted Proposal FP09-08, again requesting the Board to allow the salmon dip net fishery to occur from the shore (river bank), as well as from boats, within the Federal public waters of the Kenai River in the Moose Range Meadows area. Proposal FP09-08 was put on the Board's consensus agenda due to opposition of the proposal by both the Council and the Alaska Department of Fish and Game (ADF&G). The Council opposed FP09-08 with the expressed concern that there were no Federal lands available to allow fishing from the shore without serious damage to the riverbank (SCRAC 2008). The Board adopted the consensus agenda without discussion (FSB 2009).

In 2015, Proposal FP15-10 was submitted by NTC to establish a community gillnet fishery in the Kenai River in order to provide additional subsistence harvest opportunities for residents of Ninilchik. The proponent requested the use of a single community gillnet that was 10 fathoms or less in length for the harvest of salmon. Similar to the fish wheel regulations, an operational plan would be required to be

developed by a local organization on behalf of Ninilchik residents, and approved by the Federal in-season manager before a fishing permit would be authorized. The operational plan would include deployment locations, fishing times, and a methodology for distributing the harvest. All salmon taken in the Kenai River community gillnet fishery would be included as part of the existing annual households' limit for Ninilchik residents, and fishing for salmon would be closed by Federal special action prior to regulatory end dates if the annual total harvest limit for that species was reached or for other reasons as required. Proposal FP15-10 was adopted at the Board's January 2015 meeting (FSB 2015).

In 2016, NTC submitted an emergency special action request to the Board seeking implementation of the Kenai River community gillnet fishery during the 2016 season. NTC unsuccessfully submitted draft operational plans in both 2015 and 2016. Reasons provided by the Cook Inlet Area Federal In-season Manager for withholding approval for the 2016 season included conservation concerns for Chinook Salmon, Rainbow Trout, and Dolly Varden, as well as conflicts within existing Federal subsistence regulations (USFWS 2016a). During their July 2016 work session, the Board approved FSA16-02 with modification to immediately allow the use of a 10-fathom set gillnet with 5.25 inch mesh for the remainder of the 2016 community gillnet season (FSB 2016). The special action allowed the retention of up to 50 Chinook Salmon, as well as all other salmon within current Federal regulation limits, and any incidentally caught Rainbow Trout or Dolly Varden. The State riverbank closures, as adopted into Federal subsistence regulations, were temporarily removed to allow for the fishery; however, Kenai National Wildlife Refuge regulations that prohibited access to certain portions of the Moose Range Meadows Area remained in place but were not enforced.

For the 2017-2019 fisheries regulatory cycle, there were four separate proposals submitted for consideration to alter Federal subsistence regulations in the Kenai River drainage, all of which would impact the community gillnet fishery. Two submissions, FP17-06 (Cooper Landing and Hope Federal Subsistence Community Group) and FP17-07 (U.S. Fish and Wildlife Service) requested the Kenai River community gillnet fishery be removed entirely from Federal subsistence regulations for the reasons of conservation concerns, aggrievement of Federal subsistence priorities and rights, and violation of recognized principles of sound fisheries management. FP17-08 (U.S. Fish and Wildlife Service) requested revisions to the Kenai River dip net/rod and reel fishery and the separate rod and reel fishery related to the harvest of Chinook Salmon in the drainage due to concerns over the stocks, which had been mostly in decline since 2007. The request would prohibit retention of Chinook Salmon from the Federal public waters just below Skilak Lake in both fisheries, and remove distinctions in regulations between early- and late-run Chinook Salmon. It would also limit the dates that Chinook Salmon could be harvested in the Federal public waters of the Moose Range Meadow Area, decrease the harvest limits for Chinook Salmon in both fisheries, and remove the Chinook Salmon annual total limit. FP17-10 (Ninilchik Traditional Council) requested a number of changes to the Kenai River community gillnet fishery for the reasons of regulatory clarity, security for a continued fishery, and meaningful subsistence opportunity. The proposal requested expanded fishery dates, issuance of permits from OSM rather than the in-season manager, removal of the operational plan requirement, naming the Ninilchik Traditional Council as the organization conducting the fishery, removal of the annual reporting requirement, and establishment of a collective process for informing and consultation prior to any potential closures of the fishery.

Several key events occurred during the January 2017 Board meeting related to the Kenai River community gillnet fishery for residents of Ninilchik. First, a negotiated *Agreement in Principle (Agreement)* between the Board and NTC (**Appendix B**) regarding the use of a gillnet on the Kenai River was announced (FSB 2017). The negotiated *Agreement* was a product of ongoing litigation between NTC and the Board over prosecution of the community gillnet fishery. A *Pathway Table (Appendix C)* for implementation of the *Agreement* recommended achievement of the *Agreement* items through four separate steps. Implementation of those elements related to the requested changes in Fisheries Proposal FP17-10 would occur through modification of that proposal. Implementation of the additional negotiated elements necessary for the fishery to take place as agreed upon during the 2017 season would be through a temporary special action request, submitted jointly by the Ninilchik Traditional Council and the U.S. and Wildlife Service. Rulemaking would take place to make permanent in Federal subsistence regulations those changes being made during the 2017 season through the temporary special action. Lastly, the U.S. Fish and Wildlife Service would work to allow public easement access to the bank in the Moose Range Meadows area for fishery.

The Board approved the *Agreement* and *Pathway Table*, and then adopted Fisheries Proposal FP17-10 with modification. The final modification changed the fishery dates to July 1 to August 15 and September 10 to 30 and required a 72-hour reporting window for daily catches. It also removed the operational plan requirement, required the live release of all Rainbow Trout and Dolly Varden, and removed the link for this fishery to the established annual total limits for the dip net / rod-and-reel fishery. Additionally, the Board adopted specific permit conditions for the fishery, which included identifying persons responsible for overall operation of the net, provisions for recording daily catches and marking fish, identifying households to whom catch was distributed, reporting of daily catches, submission of an annual report, and submitting samples of genetics from retained Chinook Salmon. The Board took no action on proposal FP17-06, and proposals FP17-07 and FP17-08 were both withdrawn at the proponents request during the Board meeting.

Temporary Special Action FSA17-01, submitted by the Ninilchik Traditional Council and the U.S. Fish and Wildlife Service, requested those changes to the Kenai River community gillnet fishery as described in the *Agreement* and *Pathway Table* adopted by the Board during its January 2017 meeting. The Board approved the request during a telephonic work session on April 3, 2017. The approved request allowed for full implementation of the fishery as described in the *Agreement* between the two parties.

In-season administration of the Federal subsistence fishery is conducted through the special action process, analogous to the State's emergency order system. Authority for the use of this tool is provided through a delegation letter from the Board to in-season managers, and varies from letter to letter. The Cook Inlet delegation letter allows the in-season manager to open or close Federal subsistence fishing periods or areas, specify methods and means of harvest, specify permit requirements, and to set harvest and possession limits for Federal subsistence fisheries. The delegation also allows the in-season manager to close and re-open Federal waters to non-subsistence fishing. The delegation may be exercised only when it is necessary to conserve fish stocks or continue subsistence uses, and the intent of the Board is that management by Federal officials be coordinated with the ADF&G and involve Council representatives. Similar to State management between 2010 and 2017, numerous special actions were

issued during portions of this period to protect Chinook Salmon in the Kenai River due to conservation concerns (**Table 2**).

**Current Events**

Rulemaking Action for the Cook Inlet Area

At the direction of the Board, and through the *Agreement (Appendix B)* and *Pathway Table (Appendix C)*, the Office of Subsistence Management has initiated the process to update the Federal subsistence regulations for fish in the Cook Inlet Area. The stated purposes of this update are to implement the remaining items from the *Pathway Table* and to reorganize the items in this section for clarity and ease of use. There have been delays to this process due to a stoppage in the review of submissions to the Federal Register following the change in administrations. An initial draft of the rule will be presented to the Board, and is currently working through the process for publication in the Federal Register. There will be a public comment period on the proposed changes, and opportunity for the Council to comment, followed by review of comments and incorporation of changes by Office of Subsistence Management staff. Current expectation is to have this process completed in advance of the fishing season for 2019.

**Table 2** Federal special actions for Chinook Salmon in Federal public waters of the Kenai River drainage between 2010 and 2017.

Year	Number	Start Date	End Date	Action
2010	10-KS-01-10	6/4/2010	7/14/2010	Close to subsistence fishing for early-run
2010	10-KS-02-10	6/15/2010	7/14/2010	Reopen under restricted subsistence harvest guidelines for early-run
2010	10-KS-03-10	6/15/2010	8/31/2010	Open to subsistence fishing under normal regulations
2011	10-KS-02-11	7/15/2011	7/31/2011	Restrict harvest of early-run
2012	10-KS-01-12	6/15/2012	7/14/2012	Restrict harvest of early-run
2012	10-KS-02-12	6/22/2012	7/14/2012	Close to subsistence fishing for early-run
2012	10-KS-03-12	7/16/2012	7/31/2012	Close to subsistence fishing for late-run
2013	10-KS-02-13	6/20/2013	7/14/2013	Close to subsistence fishing for Chinook Salmon
2013	10-KS-03-13	7/15/2013	8/15/2013	Extend closure of subsistence fishing for Chinook Salmon
2014	10-KS-01-14	6/19/2014	7/14/2014	Close to subsistence fishing for Chinook Salmon
2014	10-KS-02-14	7/15/2014	8/17/2014	Extend closure of subsistence fishing for Chinook Salmon
2015	10-KS-01-15	6/18/2015	8/15/2015	Close to subsistence fishing for early-run

Public hearing in Soldotna

The Office of Subsistence Management held a public meeting in Soldotna on March 16, 2018, to accept comments to the Board concerning FSA18-02. There were three comments provided in person and no comments provided over the phone. Two of the in person comments were in support of the special action and one comment was in opposition. There were issues with the phone line, but two callers were able to get through with operator assistance. Both callers were representing agencies, and did not choose to provide comment on the special action.

Two Federally qualified subsistence users and residents of Ninilchik attended the meeting and testified in support of the special action. They both discussed the success of the fishery for the past two seasons, and noted how the fishery has almost exclusively captured Sockeye Salmon. One commented on the efforts to get a fishery of this type into regulation since 2001, that it has been an extensive process for a fishery that targets Sockeye Salmon, and that none of the predicted undesirable results, voiced through negative comments about the fishery from the previous year's public hearing, came to be. He also noted that the USFWS, the Ninilchik Traditional Council, and the Board agreed to these terms at the January 2017 Board Meeting. They both commented that the fishery does not have any conservation concerns associated with it, nor has it caused any negative impacts. They both spoke to the fishery providing a benefit to the community, about the Ninilchik Traditional Council's outreach and distribution activities, and how this fishery provides fish to those unable to fish for themselves. One stated that "this non-controversial special action request to provide a meaningful fishery for residents of Ninilchik was necessary as the revised rule to enact changes to the fishery was not yet completed", and suggested that the Board should support it.

The one individual that testified in opposition to the special action was a Federally qualified subsistence user and resident of the community of Cooper Landing. He commented that a meaningful priority already exists through the use of dip nets, and that gillnets are not selective enough in the species of fish harvested. He expressed concerns with the low King (Chinook) Salmon abundance in the Kenai River, the large number of Rainbow Trout that the fishery would be allowed to capture, and the lack of harvest limits for Sockeye and Coho Salmon. He also noted that the fishery dates in September would target Coho Salmon, a run for which there is limited data and has seen lower returns recently.

#### Consultation with Tribes

A tribal consultation session occurred on Tuesday, March 27, 2018, for FSA18-02 at the Office of Subsistence Management in Anchorage in person and by teleconference. Federal Subsistence Board member Karen Mouritsen of the Bureau of Land Management and a designee of the Board member representing the U.S. Fish and Wildlife Service attended in person. Designees of Board members for the US. Forest Service, the Bureau of Land Management, and the Bureau of Indian Affairs attended by teleconference. Three representatives from the Ninilchik Traditional Council (NTC) called into the consultation. The NTC representatives spoke in support of FSA18-02, and included some of the following comments related to the special action request:

- The special action is necessary as the revised rule, which was unanimously agreed to, has not yet been finalized or published.
- There are frustrations regarding the delays and extended timeline associated with implementation of the final changes for the fishery.
- The request was the same as approved and successfully fished last year.

- NTC representatives provided information on the two seasons that the fishery has operated, including capture and harvest totals, and highlighted that this information shows the fishery is not a conservation concern.
- NTC representatives shared that Chinook and Coho Salmon have been the preference of the village and the subsistence fish that they relied upon most in the past.
- The low level of attendance at the March 16, 2018 public hearing is an indication that this fishery is no longer as controversial as it has previously had been, and is not impacting other species.
- The U.S. Fish and Wildlife Service and the Federal Subsistence Board have a trust responsibility to the Ninilchik Traditional Council as a Federally recognized tribe to enact this fishery.
- NTC recommends the Board approve this request and move forward in cooperation.

In addition, the representatives from NTC also discussed concerns related to the permit reporting process for Federal subsistence users and the delegation of authority letter from the Federal Subsistence Board to the Federal in-season manager for the Cook Inlet Area.

#### Consultation with State of Alaska

The State of Alaska provided formal comments on the special action request on March 23, 2018 (**Appendix D**). The State clarified that sonar counts (as identified in the request) do not represent escapement to the system, which also takes into account harvest above the sonar. The State highlighted recent adjustments to the early-run Chinook Salmon sport fishing regulations related to retention lengths, where the prior slot limit had been replaced with a maximum size limit of under 36 inches. They recommended that their under 36-inch limit for retention of early-run Chinook Salmon be adopted into this request and into the upcoming rulemaking action that will finalize changes to the community gillnet fishery. In addition, they requested that language be added to the regulation or permit condition for the fishery requiring the net to be closely attended.

#### **Biological Background**

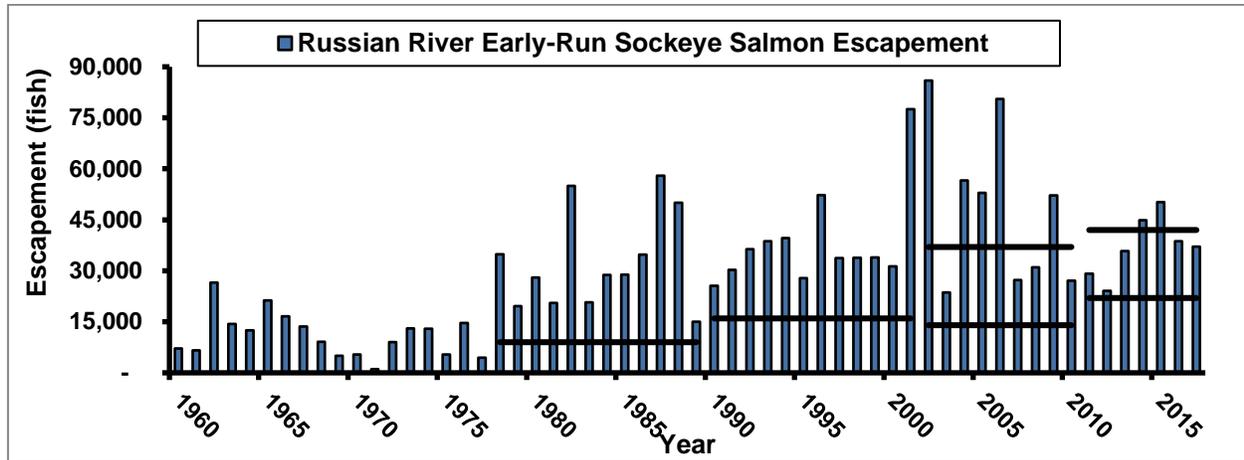
The Kenai River drainage supports significant returns of four species of Pacific salmon as well as resident species including Dolly Varden, Rainbow Trout, and others. This section will be limited to the four Pacific salmon species, Dolly Varden, and Rainbow Trout as they are all specifically listed in the request.

#### Sockeye Salmon

Sockeye Salmon runs in the Kenai River drainage are categorized into early and late runs. Early-run Sockeye Salmon return almost exclusively to the Russian River, while the larger late-run returns to locations throughout the drainage.

### Early-Run Sockeye Salmon

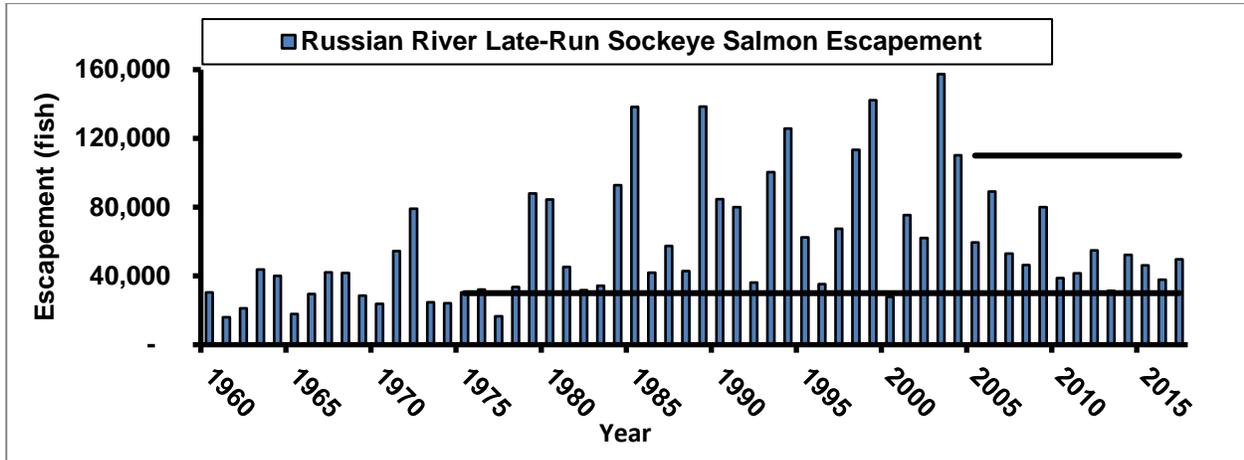
Early-run Sockeye Salmon enter the Kenai River from mid-May through mid-July. The majority of this run spawns in the Russian River, a tributary of the Kenai River upstream of Skilak Lake. Escapement into the Russian River system is estimated using a weir below the outlet of Upper Russian Lake. Escapement goals have varied over time, but they have been achieved or exceeded in all years since 1977 (Begich et al. 2013). The current biological escapement goal (BEG) is 22,000 to 42,000 fish. There has been some variation in escapement totals since 1981, as recorded at the weir, but escapements are mostly of the same magnitude averaging around 30,000 fish (**Figure 3**).



**Figure 3** Early-run Sockeye Salmon escapement totals past the ADF&G weir in the Russian River, 1960 to 2017. Horizontal black bars represent escapement goals for 1978-1989 and 1990-2001, and escapement goal ranges for 2002-2010 and 2011-2017 (Gamblin et al. 2004; Fair et al. 2010; Fair et al. 2013).

### Late-Run Sockeye Salmon

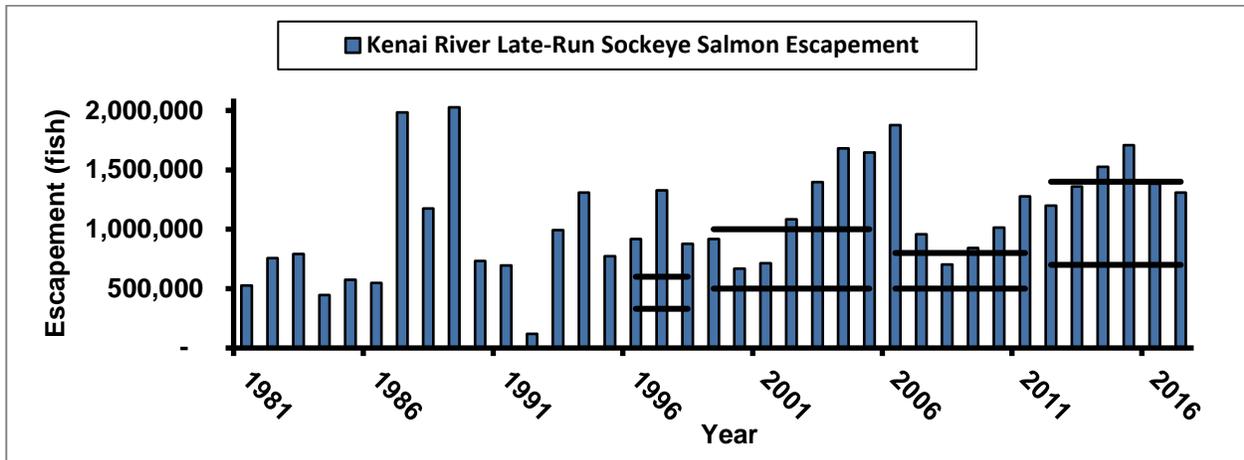
Late-run Sockeye Salmon enter the Kenai River from early July through mid-August. The late-run Sockeye Salmon spawn throughout the drainage, with 35%-42% spawning within the mainstem Kenai River above Skilak Lake, 10%-20% spawning within the mainstem Kenai River at the outlet of Skilak Lake, 11%-21% spawning in the upper tributaries of the watershed, and 7%-11% spawning in Skilak Lake and its tributaries (Willette et al. 2012). Escapement is measured both via weir below the outlet of Upper Russian Lake and via sonar in the lower mainstem of the Kenai River. The current Russian River sustainable escapement goal (SEG) is 30,000 to 110,000 fish was set in 2005 (Clark et al. 2007), and has been met for all years that this goal has been in place (**Figure 4**). The current drainage wide optimal escapement goal (OEG), which is considered the actual spawning escapement (inriver sonar estimate at RM 19 minus the inriver sport harvest above the sonar), was set in 2011 at 700,000 to 1,400,000 Sockeye Salmon (Begich et al. 2013). The new OEG has been met each year since implementation in 2011 (Begich et al. 2017; **Figure 5**).



**Figure 4** Late-run Sockeye Salmon escapement totals past the ADF&G weir in the Russian River, 1960 to 2017. Horizontal black bars represent escapement goals for 1975-2004 and escapement goal ranges for 2005-2017 (Gamblin et al. 2004; Clark et al. 2007).

Chinook Salmon

Chinook Salmon runs in the Kenai River drainage are also categorized into early and late runs. A series of radio-telemetry studies and in-river abundance estimation techniques for Chinook Salmon in the Kenai River indicate a bimodal distribution, with the early component of the run peaking between June 8 and June 20 and a later component peaking between July 17 and July 25 (Hammarstrom and Larson 1986; Conrad and Larson 1987; Conrad 1988; Carlon and Alexandersdottir 1989; Alexandersdottir and Marsh 1990; Miller et al. 2011; Reimer 2013). Chinook Salmon entering the Kenai River prior to July are considered early-run fish and primarily spawn in tributaries, while Chinook Salmon entering the Kenai River during July and August are considered late-run fish and almost exclusively spawn in the main-stem Kenai River (Begich et al. 2013). Each run is managed independently due to differences in run size, run timing, and spatial distribution of spawning fish.



**Figure 5** Late-run Sockeye Salmon escapement totals past the ADF&G sonar in the lower Kenai River, 1981 to 2017. Horizontal black bars represent escapement goal ranges for 1996-1998, 1999-2005, and 2011-2017 (Gamblin et al. 2004; Fair et al. 2010; Fair et al. 2013).

While Kenai River Chinook Salmon are managed as early and late runs, the two runs are perhaps more appropriately delineated as mainstem and tributary spawning groups. The early returning fish are predominantly tributary bound, and are genetically distinct from the later returning mostly mainstem spawners (Adams et al. 1994; Barclay and Habicht 2015; Reimer and Fleischman 2017). Recent analyses, which used a more comprehensive sample collection from throughout the drainage, found additional genetic structure within Kenai River Chinook Salmon beyond mainstem and tributary (Rogers Olive et al. 2013). The study confirmed the broad scale genetic structure between the temporal runs (early and late), but also found three mid-scale structure groups (upper tributaries, lower tributaries, and mainstem) and six fine-scale structure groups. The fine-scale groups were 1) Upper mainstem/Juneau Creek, 2) Lower mainstem, 3) Quartz/Dave's/Crescent Creeks, 4) Grant Creek/Russian River, 5) Benjamin Creek/Killey River, and 6) Funny River/Slikok Creek). Although temporal designations are likely the most appropriate for management purposes, it is important to note that the two broad scale genetic groups overlap in time to some extent. As such, some early returning mainstem spawners (late-run fish) are in the river below Skilak Lake during the early-run time period (before July 1), and some late returning tributary spawners (early-run fish) are in the river below Skilak Lake during the late-run time period (after June 30).

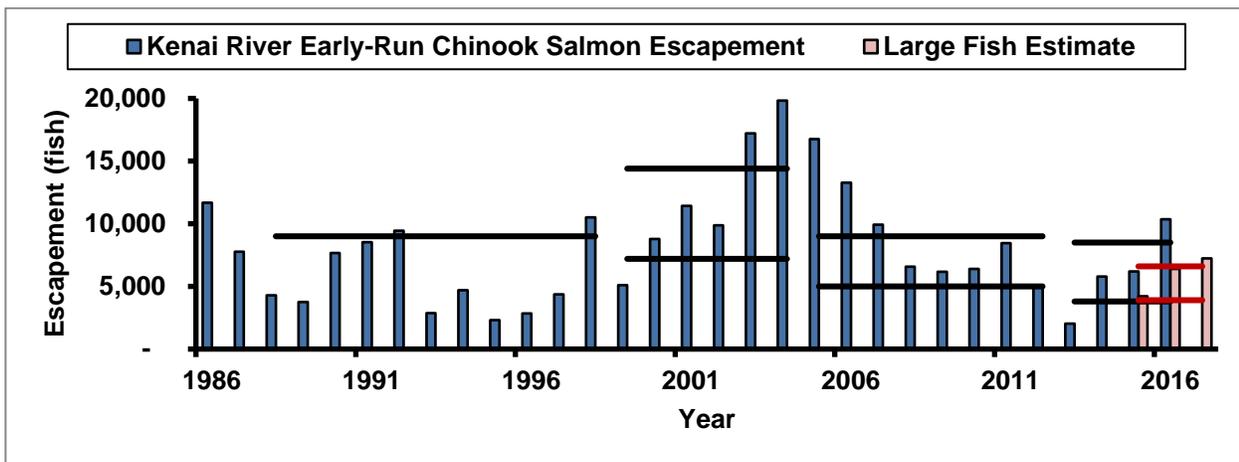
Chinook Salmon abundance in the Kenai River and throughout Alaska has been mostly decreasing since around 2007 (ADF&G Chinook Salmon Research Team 2013). A portion of these stocks are also exhibiting declining trends in size and age, including Kenai River Chinook Salmon that spawn on the Kenai National Wildlife Refuge, either in tributary streams (Boersma and Gates 2016) or the main-stem Kenai River (Lewis et al. 2015). Several potential, yet unproven, causal factors for this downward trend in abundance include size-selective harvest, competitive interactions, and changing environmental conditions (Lewis et al. 2015).

#### *Early-Run Chinook Salmon*

Early-run Chinook Salmon enter the Kenai River from mid-May through late-June and spawn primarily in Kenai River tributaries. Spawning locations include the Killey, Russian, and Funny rivers, and Benjamin and Juneau creeks (Burger et al. 1985; Reimer 2013, Eskelin and Reimer 2017). A spawning distribution study conducted during 2014 and 2015 showed Killey River, Benjamin Creek, and Funny River to be the primary spawning destinations for these fish, with other locations (Slikok Creek, Russian River, Quartz Creek, Grant Creek, and Ptarmigan Creek) contributing at smaller amounts (Eskelin and Reimer 2017). Staging behavior (preparing for spawning) in the mainstem Kenai River generally occurs between early- and mid-July, while spawning primarily takes place mid-July through August (Reimer 2013). A small segment (7% – 20%) of Chinook Salmon utilize the main stem Kenai River for spawning during the early-run period (Burger et al. 1983; Bendock and Alexandersdottir 1992). In recent years (2007-2014), between 31% and 79% of all fish entering the Kenai River during the last two weeks in June are destined to spawn in the mainstem Kenai River or Juneau Creek (Reimer and Fleischman 2017) and are counted as part of the early-run escapement.

Early-run Chinook Salmon escapement is monitored by sonar at RM 14 between mid-May and the end of June. Sonar operations at RM 14 officially began in 2015; however, sonars at both RM 14 and at the

previous downstream location (RM 8.6) were run concurrently for the years 2013 and 2014 to assess any differences between the two. The placement of the sonar at the RM 14 location allows an increased proportion of the river to be monitored with less impact associated with tidal influence. The goal of the location change was to obtain a more accurate assessment of total run size (ADF&G 2015). Additionally, a gillnet at RM 9 is used to provide the relative proportion of large Chinook Salmon, small Chinook Salmon, and Sockeye Salmon for apportionment of sonar counts (ADF&G 2016a). The State had been managing for an optimal escapement goal (OEG) range for early-run Chinook Salmon of 5,300 to 9,000 fish (Fair et al. 2013). In 2017, the escapement goal was modified from an all fish goal to a large fish (Chinook Salmon over 34 inches) goal range of 3,900 to 6,600 through Alaska Board of Fisheries action (ADF&G 2017a). The spawning escapement has been mostly declining since the last peak in 2004; however, returns appear to have rebounded slightly since the last low in 2013 (Figure 6).



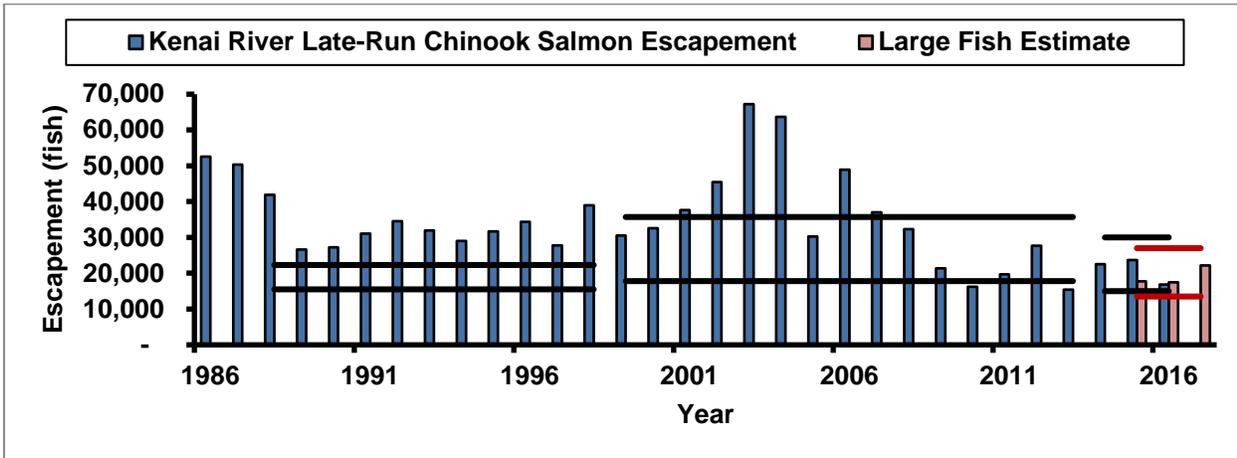
**Figure 6** Early-run Chinook Salmon escapement totals past the ADF&G sonar in the lower Kenai River, 1986 to 2016 represented by vertical blue columns. Large fish (> 34 inches) escapement for 2017 and converted escapement for 2015 and 2016 represented by red vertical columns. Horizontal black bars represent escapement goal ranges for 1988-1998, 1999-2004, 2005-2012, and 2013-2016 (Gamblin et al. 2004; Fair et al. 2010; Fair et al. 2013). Horizontal red bars represent new escapement goal range for 2017 (ADF&G 2017a).

*Late-Run Chinook Salmon*

Late-run Chinook Salmon enter the Kenai River from late-June through late-July and spawn primarily in the mainstem of the river (Reimer 2013). However, in recent years (2007-2014), most Chinook Salmon that spawn in Grant Creek and the Russian River enter the Kenai River after July 1<sup>st</sup> (Reimer and Fleischman 2017). An estimated 20%-40% of late-run fish spawn between RM 10 and the Soldotna Bridge at RM 21, more than half spawn between the Soldotna Bridge and the outlet of Skilak Lake, and about 9% spawn within or above Skilak Lake (Burger et al. 1983; Hammarstrom et al. 1985; Bendock and Alexandersdottir 1992; ADF&G 2016b). The mainstem Kenai River between RM 46 and RM 47 supports the highest density of spawners in the drainage (Reimer 2013). Staging behavior generally occurs from late-July to mid-August, while most spawning takes place from mid-August to mid-September.

As with the early run, escapement for late-run Chinook Salmon is monitored by sonar at RM 14 through mid-August, with the apportionment gillnet at RM 9 to provide the relative proportion of large Chinook

Salmon, small Chinook Salmon, and Sockeye Salmon (ADF&G 2016a). The State had been managing for a sustainable escapement goal (SEG) range for late-run Chinook Salmon of 15,000 to 30,000 fish (Fair et al. 2013). In 2017, the escapement goal was modified from an all fish goal to a large fish (Chinook Salmon over 34 inches) goal range of 13,500 to 27,000 through Alaska Board of Fisheries action (ADF&G 2017b). The spawning escapement has been mostly declining since the last major peak in 2003; however, returns since that time have all met or exceeded the past and current SEGs (**Figure 7**).



**Figure 7** Late-run Chinook Salmon escapement totals past the ADF&G sonar in the lower Kenai River, 1986 to 2016 represented by vertical blue columns. Large fish (> 34 inches) escapement for 2017 and converted escapement for 2015 and 2016 represented by red vertical columns. Horizontal black bars represent escapement goal ranges for 1988-1998, 1999-2013, and 2014-2016 (Gamblin et al. 2004; Fair et al. 2013). Horizontal red bars represent new escapement goal range for 2017 (ADF&G 2017a).

Coho Salmon

Coho Salmon are the last of the salmon species to enter the Kenai River each year. The majority of the run enters the Kenai River from late-July through mid-September, but continues at lower rates into November (Begich et al. 2013). Although genetic studies have shown differences between and within early and late returning spawning components (Olsen et al. 2003; Crane et al. 2007), the entire run is currently managed as a single stock by the State. Coho Salmon spawn in the mainstem Kenai River, as well as tributaries, with mainstem spawning observed as late as January (Burger et al. 1983).

Documented spawning occurs from RM 40 upstream to RM 74.5, with large numbers of spawning Coho Salmon observed below Skilak Lake (RM 40 – RM50). There is no escapement goal for Kenai River Coho Salmon, and the run (in both marine and fresh waters) is managed primarily for take in State sport fisheries.

Pink Salmon

Considerably less research has been conducted on Pink Salmon in the Kenai River compared to the other salmon species. The run enters the river between July and September, with the majority entering in August (ADF&G 2017c). Inriver distribution tends to be limited to the lower sections of the river near tidewater before the fish mature and push further into the system, which creates large schools targeted by sport anglers (Begich et al. 2017). Pink Salmon have a two-year life cycle and return in stronger numbers

to the Kenai River in even-numbered years. There is no escapement goal set for Pink Salmon, and administration of the fishery occurs through harvest regulations without in-season management.

### Rainbow Trout

The Kenai River supports one of the largest Rainbow Trout sport fisheries in the United States, with annual catches that have been trending upward since the 1980's (Begich et al. 2013). The fishery has seen increasingly restrictive regulations since the 1950's due to public concern and an initial lack of biological data. ADF&G began population estimation projects in 1986 using mark-recapture methods, and have repeated estimation projects multiple times since then. The State sport fishery is closed from May 1 through June 11 to protect Rainbow Trout during their spawning period. Radio telemetry projects have found the majority of Rainbow Trout from the area of the Kenai River drainage downstream of Skilak Lake spawn between RM 45.8 and RM 48 during that period (Palmer 1998; Eskelin 2016, pers. comm.). Measurements of spawning Rainbow Trout in the Kenai River demonstrated that 95% of females 20 inches in length or larger are spawners, and that the minimum length at spawning is approximately 16 inches (OSM 2007). Estimations between 1986 and 2009 have shown increases in the size of the Rainbow Trout population as further restrictions have been enacted on the fishery.

Rainbow Trout abundance estimates have been generated several times for index sections of the Kenai River since the mid 1980's. Abundance estimates of fish over 200mm (~7.8 inches) in the upper Kenai River index area have taken place in 1986 (3,640 fish, SE 456), 1987 (4,950 fish, SE 376), 2001 (8,553 fish, SE 806), and 2009 (5,916 fish, SE 481; Begich et al. 2013). The upper Kenai River index area is the most heavily fished section of the upper Kenai River (King and Breakfield 2007), and is situated above Skilak Lake and below the Russian River between RM 69.7 and RM 73.2. Abundance estimates for fish of the same size in the middle Kenai River index area have taken place in 1987 (1,750 fish) and 1999 (7,883 fish). The middle Kenai River index area is the most heavily fished section of the middle Kenai River (Larson and Hanson 2000), and is located above Naptowne Rapids and below Skilak Lake between approximately RM 38 and RM 50. There have been no drainage-wide estimates generated to date.

### Dolly Varden

A Dolly Varden sport fishery also occurs in the Kenai River drainage. There are assumed to be both resident and anadromous forms of Dolly Varden in the Kenai River. Anadromous fish are believed to enter the Kenai River in July (Begich et al. 2013). Both forms move within the Kenai River drainage from summer feeding sites to spawning locations by mid-to-late September. Spawning occurs between mid-September and late October, after which fish move to overwintering locations (Palmer and King 2005). Migration out of the drainage by anadromous fish occurs in April and May. Minimum length at spawning for this population is approximately 12 inches, and the majority of females 18 inches or longer in length are spawners (OSM 2007). There are no Dolly Varden population estimates for the Kenai River.

## Harvest History

Harvest of Pacific salmon returning to the Kenai River drainage occur in Federal subsistence fisheries as well as State commercial, sport, personal use, and educational fisheries. Resident species, including Rainbow Trout and Dolly Varden, are also highly sought after in the sport fishery. Harvest history information for Federal subsistence fisheries is presented prior to the description of State harvest history throughout this section.

Federal subsistence regulations have provided for the harvest of fish in the Kenai River drainage for the rural residents of Cooper Landing, Hope, and Ninilchik since 2007. Management of the Federal subsistence fishery occurs through general and Cook Inlet Area specific subsistence regulations, as well as in-season management actions. A Federal subsistence fishing permit is required for the harvest of salmon, trout, and char, and all harvest must be reported to the Federal in-season manager following the fishing season. A rod and reel fishery exists in Federal public waters of the Kenai River. In addition, there exists three areas in the Kenai River drainage (Russian River Falls; Kenai River below Skilak Lake, RM 45.5 to RM 48; and Kenai River Moose Range Meadows, RM 26.5 to RM 29) where Federally qualified subsistence users of these communities may harvest salmon by dip net and rod and reel. The community gillnet fishery for the residents of Ninilchik is restricted to the two Kenai River sites.

The State's Upper Cook Inlet Salmon Management Plan (5 AAC 21.363) establishes long-term direction for the management of Upper Cook Inlet salmon stocks. It provides mandatory criteria that the Alaska Board of Fisheries must consider when adopting management plans for specific fish stocks, and establishes a set of guiding principles for the adoption of regulations governing salmon fisheries. The plan focuses the commercial fisheries take on late-run Sockeye Salmon, while early-run Sockeye, early- and late-run Chinook, and Coho Salmon runs are primarily managed for sport fisheries. Considerable information has been compiled on abundance and distribution of Sockeye, Chinook, and Coho Salmon runs, but little information is available on either Pink or Chum Salmon runs. Spawning escapement goals have been set for Sockeye and Chinook Salmon runs, and sustainable harvest levels have been estimated for Sockeye, Chinook, and Coho Salmon.

### Sockeye Salmon

Federal subsistence harvests of Sockeye Salmon are not delineated by early- or late-run, but rather by general fishing location, gear type, fishery, and community. The dip net/rod and reel fishery, which is open to all three communities with a customary and traditional use determination and may take place at three specified locations in the drainage referenced previously, had been the primary source of Sockeye Salmon harvests in this area. During the 2016 and 2017 seasons however, Sockeye Salmon harvest also occurred through the community gillnet fishery in the Moose Range Meadows area of the Kenai River by residents of the community of Ninilchik.

Cooper Landing and Hope residents have fished almost exclusively in the Russian River Falls area over the past eleven years. Cooper Landing residents have reported a total cumulative harvest of 11,380 Sockeye Salmon between the 2007 and 2017 seasons; 10,585 by dip net and 795 by rod and reel (**Table 3**). Hope residents have reported a harvest of 3,059 Sockeye Salmon between the 2007 and 2017 seasons;

2,838 by dip net and 221 by rod and reel (**Table 4**). Ninilchik residents have harvested in the Russian River Falls area to a much lesser extent. They have utilized dip net at this location in seven of the eleven years that it has been a harvest option, with a total reported harvest of 193 Sockeye Salmon across those years. They have utilized rod and reel three of the nine years (2007–2009), with a total reported harvest of 281 Sockeye Salmon for those three years (**Table 5**).

A cumulative total of 55 Sockeye Salmon have been reported as harvested in the Kenai River area below Skilak Lake (RM 45.5 – 50) for the years 2007 to 2017. These fish were harvested by dip net users from Ninilchik in 2009 and Cooper Landing in 2017 (**Tables 3 & 5**). There have been no reported Sockeye Salmon harvests in this area by Hope residents (**Table 4**).

**Table 3** Kenai River Federal subsistence salmon harvests by residents of the community of Cooper Landing between the years 2007 and 2017 (USFWS 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016b, 2017, 2018).

<b>Dip Net Harvests</b>										
Year	Russian River Falls			Kenai River (RM 45.5-48)			Moose Range Meadows			Total
	Sockeye	Coho	Chinook	Sockeye	Coho	Chinook	Sockeye	Coho	Chinook	
2007	437	n/a	n/a	0	0	0	0	0	0	437
2008	960			0	0	0	0	0	0	960
2009	706			0	0	0	0	0	0	706
2010	622			0	0	0	0	0	0	622
2011	794			0	0	0	0	0	0	794
2012	998			0	0	0	0	0	0	998
2013	996			0	0	0	0	0	0	996
2014	1,216			0	0	0	0	0	0	1,216
2015	1,176			0	0	0	0	0	0	1,176
2016	1,334			0	0	0	0	0	0	1,334
2017	1,346			25	0	0	0	0	0	1,371
TOTAL	10,585	n/a	n/a	25	-	-	-	-	-	10,610
Average	962	n/a	n/a	2	0	0	0	0	0	965
<b>Rod and Reel Harvests</b>										
Year	Upper Kenai/Russian River			Kenai River (RM 45.5-50)			Moose Range Meadows			Total
	Sockeye	Coho	Chinook	Sockeye	Coho	Chinook	Sockeye	Coho	Chinook	
2007	169	5	n/a	0	0	0	0	0	0	174
2008	108	7		0	0	0	0	0	0	115
2009	46	9		0	0	0	0	0	0	55
2010	57	0		0	0	0	0	0	0	57
2011	46	0		0	0	0	6	0	0	52
2012	43	0		0	0	0	11	0	0	54
2013	49	4		0	0	0	12	0	0	65
2014	97	2		0	0	0	9	0	0	108
2015	89	0		0	0	0	6	0	0	95
2016	9	0		0	0	1	0	0	0	10
2017	82	0		0	0	1	12	0	0	95
TOTAL	795	27	n/a	-	-	2	56	-	-	880
Average	72	2	n/a	0	0	0	5	0	0	80

For the Moose Range Meadows area of the Kenai River (RM 26.5 – 29), Cooper Landing residents reported harvesting 56 Sockeye Salmon by rod and reel for the years 2007–2017, but have not reported harvest of any fish in the dip net fishery for this area (**Table 3**). Hope residents have reported no harvest by dip net or rod and reel in this area (**Table 4**). In 2007, Ninilchik residents reported a harvest of 12 Sockeye Salmon by dip net in this area, but have reported no further harvest by this method since that time. Ninilchik residents reported a total harvest of 774 Sockeye Salmon by rod and reel between the years 2007–2017 (**Table 5**).

**Table 4** Kenai River Federal subsistence salmon harvests by residents of the community of Hope between the years 2007 and 2017 (USFWS 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016b, 2017, 2018).

<b>Dip Net Harvests</b>										
Year	Russian River Falls			Kenai River (RM 45.5-48)			Moose Range Meadows			Total
	Sockeye	Coho	Chinook	Sockeye	Coho	Chinook	Sockeye	Coho	Chinook	
2007	85	n/a	n/a	0	0	0	0	0	0	85
2008	280			0	0	0	0	0	0	280
2009	103			0	0	0	0	0	0	103
2010	172			0	0	0	0	0	0	172
2011	159			0	0	0	0	0	0	159
2012	287			0	0	0	0	0	0	287
2013	252			0	0	0	0	0	0	252
2014	402			0	0	0	0	0	0	402
2015	402			0	0	0	0	0	0	402
2016	307			0	0	0	0	0	0	307
2017	389			0	0	0	0	0	0	389
TOTAL	2,838	n/a	n/a	-	-	-	-	-	-	2,838
Average	258	n/a	n/a	0	0	0	0	0	0	258
<b>Rod and Reel Harvests</b>										
Year	Upper Kenai/Russian River			Kenai River (RM 45.5-50)			Moose Range Meadows			Total
	Sockeye	Coho	Chinook	Sockeye	Coho	Chinook	Sockeye	Coho	Chinook	
2007	169	5	n/a	0	0	0	0	0	0	174
2008	6	0		0	0	0	0	0	0	6
2009	18	0		0	0	0	0	0	0	18
2010	0	0		0	0	0	0	0	0	0
2011	0	0		0	0	0	0	0	0	0
2012	0	0		0	0	0	0	0	0	0
2013	19	0		0	0	0	0	0	0	19
2014	3	0		0	0	0	0	0	0	3
2015	0	0		0	0	0	0	0	0	0
2016	0	0		0	0	0	0	0	0	0
2017	6	0		0	0	0	0	0	0	6
TOTAL	221	5	n/a	-	-	-	-	-	-	226
Average	20	0	n/a	0	0	0	0	0	0	21

**Table 5** Kenai River Federal subsistence salmon harvests by residents of the community of Ninilchik between the years 2007 and 2017 (USFWS 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016b, 2017, 2018).

<b>Dip Net Harvests</b>										
Year	Russian River Falls			Kenai River (RM 45.5-48)			Moose Range Meadows			Total
	Sockeye	Coho	Chinook	Sockeye	Coho	Chinook	Sockeye	Coho	Chinook	
2007	5	n/a	n/a	-	-	-	12	-	-	17
2008	41			-	-	-	-	-	-	41
2009	-			30	-	-	-	-	-	30
2010	10			-	-	-	-	-	-	10
2011	-			-	-	-	-	-	-	-
2012	-			-	-	-	-	-	-	-
2013	19			-	-	-	-	-	-	19
2014	54			-	-	-	-	-	-	54
2015	26			-	-	-	-	-	-	26
2016	-			-	-	-	-	-	-	-
2017	38			-	-	-	-	-	-	38
TOTAL	193	n/a	n/a	30	-	-	12	-	-	235
Average	18	n/a	n/a	3	-	-	1	-	-	21
<b>Rod and Reel Harvests</b>										
Year	Upper Kenai/Russian River			Kenai River (RM 45.5-50)			Moose Range Meadows			Total
	Sockeye	Coho	Chinook	Sockeye	Coho	Chinook	Sockeye	Coho	Chinook	
2007	169	5	n/a	-	-	-	-	-	-	174
2008	11	-		-	-	-	202	5	-	218
2009	101	-		-	-	-	93	-	-	194
2010	-	-		-	-	-	42	-	-	42
2011	-	-		-	-	-	84	-	-	84
2012	-	-		-	-	-	75	-	-	75
2013	-	-		-	-	-	61	-	-	61
2014	-	-		-	-	-	115	-	-	115
2015	-	-		-	-	-	69	-	-	69
2016	-	-		-	-	-	6	-	-	6
2017	-	-		-	-	-	30	-	-	30
TOTAL	281	5	n/a	-	-	-	777	5	-	1,068
Average	26	0	n/a	-	-	-	71	0	-	97
<b>Community Gillnet Harvest</b>										
Year				Moose Range Meadows				Total		
				Sockeye	Coho	Chinook	Pink			
2016				723	12	1	6	742		
2017				2,169	12	1	11	2,193		
TOTAL				2,892	24	2	17	2,935		
Average				1,446	12	1	9	1,468		

In addition to the rod and reel and dip net/rod and reel fisheries, residents of Ninilchik have harvested Sockeye Salmon in the Moose Range Meadows area through a community gillnet fishery during the past two seasons. In 2016, through Board approval of Emergency Special Action FSA16-02, an experimental community gillnet fishery took place late July through mid-August. At the conclusion of the 2016

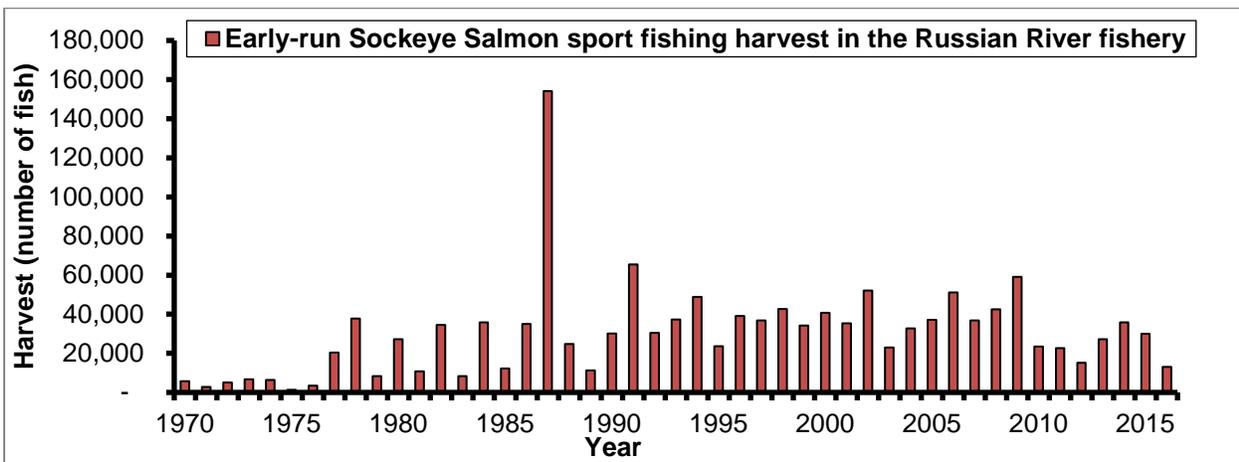
fishery, after executing the fishery for 16 days, the Ninilchik community harvested 723 Sockeye Salmon. In 2017, through Board approval of Temporary Special Action FSA17-01, a community gillnet fishery took place early July through early August and for a few days in mid-September. The Ninilchik community harvested 2,169 Sockeye Salmon over the course of the fishing season for 2017.

Reporting of Sockeye Salmon harvests from State managed in-river fisheries (sport, personal use, and educational) is provided by early-run and late-run, and is further discussed below by run.

*Early-Run Sockeye Salmon*

The State’s Russian River Sockeye Salmon Management Plan (5 AAC 57.150) establishes escapement objectives and provides guidelines for the State management of State fisheries targeting the early run. The State manages the harvest of this run to occur primarily within the sport fishery, while minimizing the harvest in other fisheries.

Sport fishing for early-run Sockeye Salmon mainly occurs within the Russian River area. This fishery includes the lower Russian River up to a marker 600 yards below Russian River Falls, and the mainstem Kenai River from the confluence down to the power line crossing. The fishery is restricted to fly fishing gear only, and the fishery opens June 11 at the conclusion of the spawning season closure for Rainbow Trout. Bag and possession limits for Sockeye Salmon throughout the Kenai River drainage are three per day and six in possession. Sport fishery harvests of early-run Russian River Sockeye Salmon during 2007–2016, the most recent 10-year period for which data are available, have averaged 30,585 fish (Begich et. al. 2017; Pawluk 2018, pers. comm.). This average harvest is similar to the average over all years since 1970, with a few notable exceptions (**Figure 8**).



**Figure 8** Early-run Sockeye Salmon harvest totals in the Russian River fishery, 1970 to 2015 (Begich et al. 2017), and 2016 (Pawluk 2018, pers. comm.).

The Kenaitze Indian Tribe conducts an educational fishery in marine waters adjacent to the Kenai River mouth and the mainstem Kenai River from just upstream of the Warren Ames Bridge downstream to the mouth. Conditions of the permit for this fishery have changed over time, but the 2016 permit set a harvest limit of up to 2,000 Sockeye Salmon prior to July 1. Harvests of early-run Sockeye Salmon during 2007–

2016, the most recent 10-year period available, have ranged between 275 and 2,374 Sockeye Salmon and averaged 1372 over that same period (Begich et. al. 2017).

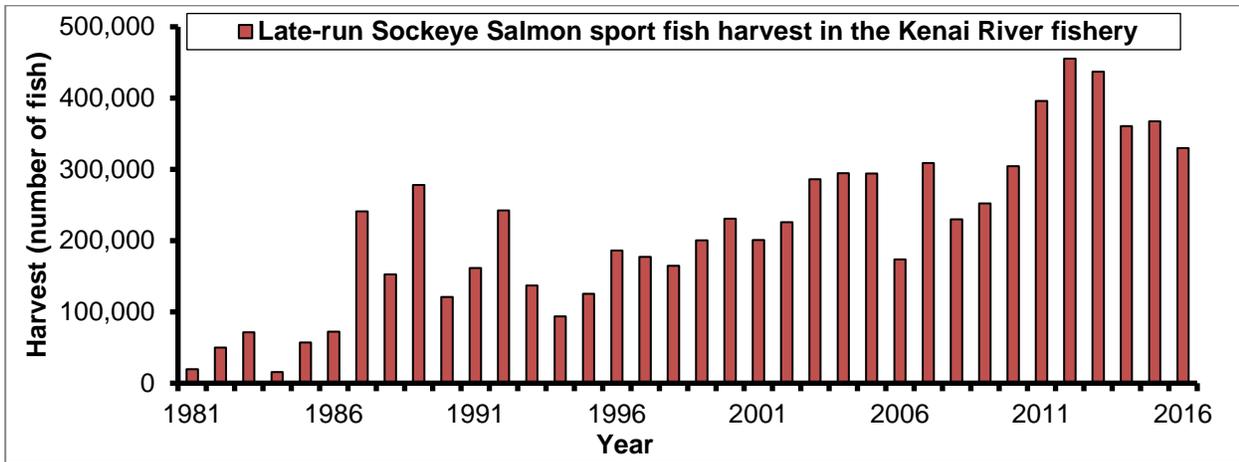
*Late-Run Sockeye Salmon*

The harvest of late-run Sockeye Salmon occurs in commercial, personal use, sport, and educational fisheries (Begich et. al. 2013). Commercial fisheries take place in the marine waters of Cook Inlet using both drift and set gillnets. During 2007–2016, the commercial harvest of Upper Cook Inlet Sockeye Salmon, including Kenai River bound Sockeye Salmon, has ranged between 2,059,742 and 5,283,655 late-run Sockeye Salmon (Shields and Dupuis 2017). About half of the commercial harvest happens within a few days around July 20.

A personal use dip net fishery occurs at the mouth of the Kenai River and extends upstream as far as the Warren Ames Bridge. Dip nets can be fished from boats in the section of river from the City Dock upstream to the Warren Ames Bridge. To target effort on late-run Sockeye Salmon, and reduce harvests of late-run Chinook Salmon and Coho Salmon, this dip net fishery is only open July 10–31. All Alaska residents may participate, permits and sport fishing licenses are required, and the annual household limit is 25 salmon for the permit holder and 10 additional salmon for each household member. During 2006 to 2015, a range between 12,685 and 36,380 household days of effort occurred for this fishery, and late-run Sockeye Salmon harvests ranged from 127,630 to 537,765 fish (Begich et al. 2017). Residents of Cooper Landing, Hope, and Ninilchik all participate in the State personal use fisheries. From 2010 to 2015, the average number of households with a personal use fishery permit was 24 for Cooper Landing, 20 for Hope, and 188 for Ninilchik (Fall et al. 2013a&b; Fall et al. 2014; Fall et al. 2015; Fall et al. 2017; Fall et al. 2018). The average number of Sockeye harvested in each community during this time was 243 fish for Cooper Landing, 256 fish for Hope, and 2,701 fish for Ninilchik (**Table 6**).

**Table 6** Personal Use fishery harvest estimates for Kasilof River set net fishery, Kasilof River dip net fishery, Kenai River dip net fishery, Fish Creek (Knik Arm) dip net fishery from 2010 to 2014 for residents of Cooper Landing, Hope, and Ninilchik (Fall et al. 2013a&b; Fall et al. 2014; Fall et al. 2015; Fall et al. 2017; Fall et al. 2018).

Year	Cooper Landing (Pop. 289) (161 households)			Hope (Pop. 210) (107 households)			Ninilchik (Pop. 1,476) (682 households)		
	Sockeye	Coho	Chinook	Sockeye	Coho	Chinook	Sockeye	Coho	Chinook
2010	235	1	2	245	1	0	3,000	10	10
2011	361	2	2	306	1	0	3,316	8	10
2012	283	0	0	277	1	0	2,968	7	0
2013	206	1	0	312	1	0	2,222	13	0
2014	169	1	0	227	1	0	2,566	8	0
2015	203	1	0	166	1	0	2,131	14	0
<b>TOTAL</b>	1,457	6	4	1,533	6	0	16,203	60	20
<b>Average</b>	243	1	1	256	1	0	2,701	10	3
<b>Per household Average</b>	1.5			2.4			4.0		



**Figure 9** Late-run Sockeye Salmon harvest totals in the Kenai River sport fishery, 1981 to 2015 (Begich et al. 2017), and 2016 (Pawluk 2018, pers. comm.).

Sport fishery bag and possession limits for late-run Sockeye Salmon are three per day and six in possession, but may be liberalized in-season per allocative management plans based on return abundance. Total sport fish harvests in the main stem of the Kenai River have increased dramatically between 1981 and present (**Figure 9**), which has been attributed to a change in terminal fishing gear (Begich et al. 2017). Since 2010, sport harvests have all been greater than 300,000 fish. For the Russian River fishery, sport harvests have ranged between 9,333 and 20,146 late-run Sockeye Salmon since 2010 (**Figure 10**).

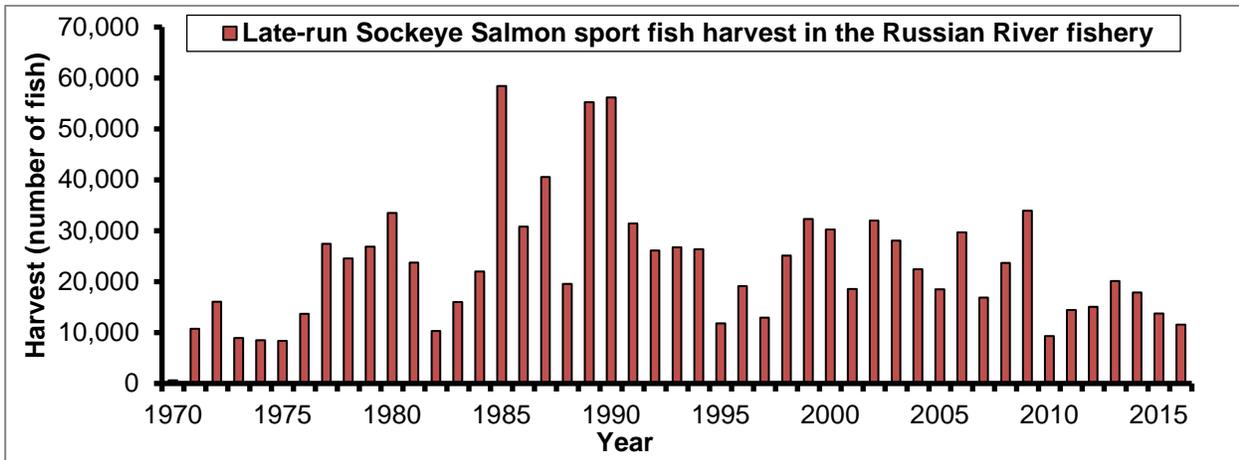
The Kenaitze Indian Tribe educational fishery primarily targets late-run Sockeye Salmon. Harvest of late-run Sockeye Salmon during 2007-2016, the most recent 10-year period available, have ranged between 2,246 and 6,563 Sockeye Salmon and averaged 4,009 over that same period (Begich et al. 2017).

Chinook Salmon

Federal subsistence regulations for the harvest of Kenai River Chinook Salmon are delineated into early- and late-runs, similar to Sockeye Salmon. The dip net/rod and reel fishery allows harvest of only late-run Chinook Salmon, between July 16 and September 30, within the two delineated Kenai River Federal public waters areas below Skilak Lake (RM 48 – 45.5 and RM 29 – 26.5). Associated with this fishery is an annual total harvest limit of 1,000, and annual household limits of 10 for each permit holder and 2 additional for each household member. The additional rod and reel fishery allows harvest of both early-run and late-run Kenai River Chinook Salmon. Seasons, area restrictions, and methods and means for this fishery are the same as for the taking of salmon under Alaska sport fishing regulations, except as follows: early-run Chinook Salmon may be retained if less than 46 inches or 55 inches or longer, and the daily limit and possession limit are both two; late-run Chinook Salmon also have a daily limit and possession limit of two. The total Chinook Salmon annual limit for this fishery is 4 for fish greater than 20 inches length.

There was zero harvest of Chinook Salmon (early- or late-run) by residents of Cooper Landing, Hope, or Ninilchik in any Federal subsistence fisheries between 2007 and 2015 at any of the three locations.

However, there were closures in place for the retention of Chinook Salmon for the years 2013, 2014, and 2015 (**Table 2**). In both 2016 and 2017, residents of Hope harvested a single Chinook Salmon in the rod and reel fishery below Skilak Lake (**Tables 3-5**). Additionally, a single Chinook Salmon was harvested in both 2016 and 2017 in the Moose Range Meadows area as part of the community gillnet fishery for the residents of Ninilchik (**Table 5**).



**Figure 10** Late-run Sockeye Salmon harvest totals in the Russian River sport fishery, 1970 to 2015 (Begich et al. 2017), and 2016 (Pawluk 2018, pers. comm.).

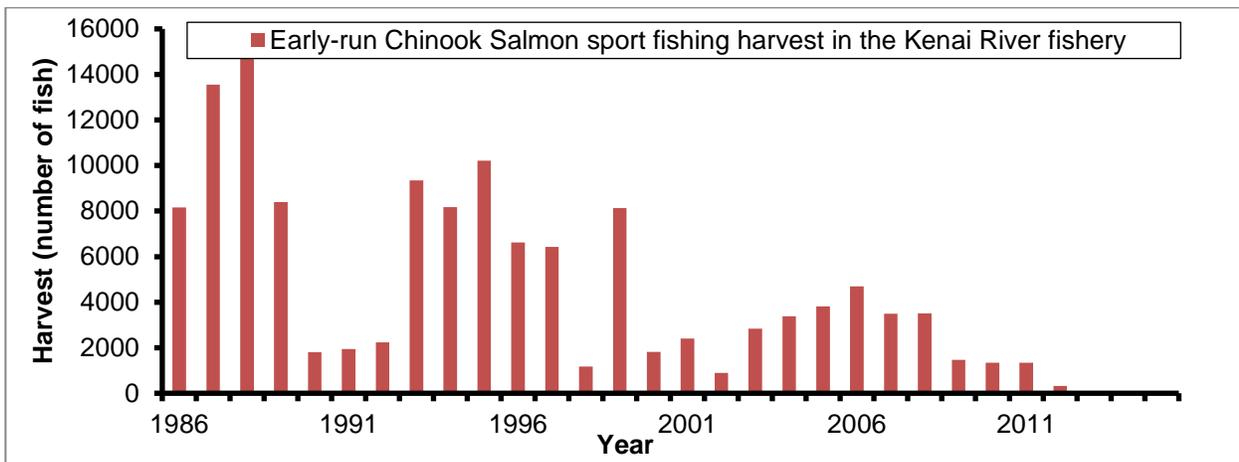
Reporting of Chinook Salmon harvests from State managed sport and educational in-river fisheries is provided by early-run and late-run, and is further discussed below by run. There is some small harvest of Chinook Salmon from the Personal Use fisheries that occur in the Cook Inlet Area. The harvest estimates for residents of Cooper Landing, Hope, and Ninilchik participating in the Personal Use fisheries have been at zero from 2012 to 2015 (**Table 6**).

#### *Early-Run Chinook Salmon*

The State’s Kenai River and Kasilof River Early-Run King Salmon Conservation Management Plan (5 AAC 57.160) establishes escapement objectives and guidelines for the management of all existing fisheries harvesting this run. This plan also tries to ensure that the age and size composition of the harvest closely matches that of the run. The primary harvest of this run occurs within the sport fishery. Most of the sport harvest is taken within the Kenai River, although the Deep Creek marine sport fishery takes an undetermined, but likely small number, of Kenai River early-run Chinook Salmon based on tag recoveries (King and Breakfield 2002). The State manages other fisheries to minimize the harvest of this run. The commercial and personal use fisheries open after most early-run Chinook Salmon have entered the Kenai River, and the personal use fishery has a seasonal limit of one Chinook Salmon per household.

All sport fishing for early-run Chinook Salmon in the Kenai River occurs downstream from Skilak Lake. The bag and possession limit is one Chinook Salmon per day and one in possession. Additionally, there is an annual limit of two Chinook Salmon from the Kenai River. Only Chinook Salmon less than 36 inches in length may be retained in the sport fishery unless the regulations are liberalized. Sport fishery harvests of early-run Kenai River Chinook Salmon during 2006-2015 have been as high as 4,693, but have been

listed as zero for the years 2013-2015 because of closures related to poor returns (**Figure 11**; Begich et al. 2017). A small sport harvest of early-run Chinook Salmon occurred in 2017, but the final totals are not yet available (Pawluk 2018, pers. comm.).



**Figure 11** Early-run Chinook Salmon harvest totals in the Kenai River sport fishery, 1986 to 2015 (Begich et al. 2017).

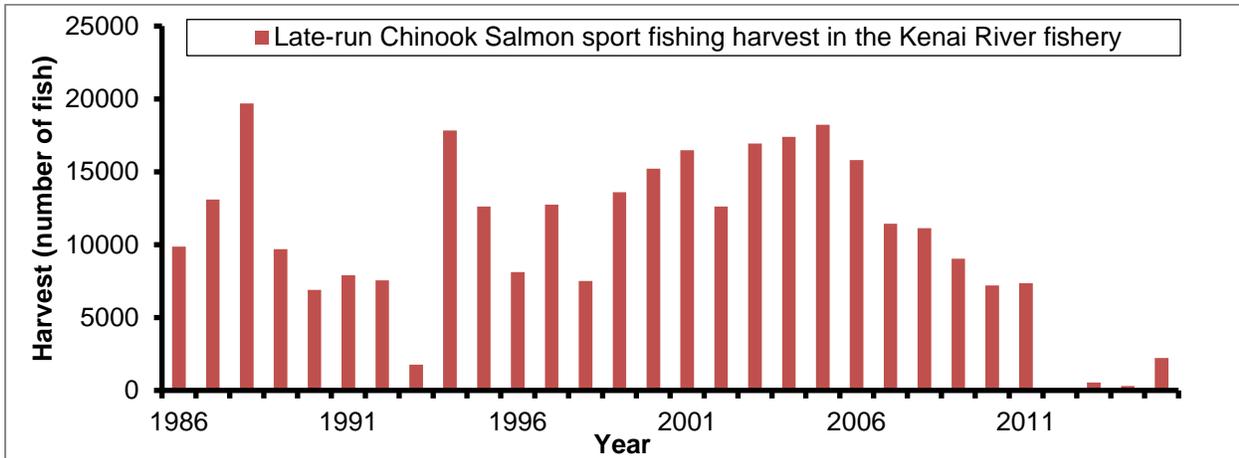
The Kenaitze Indian Tribe’s educational fishery has historically had a seasonal limit of 300 Chinook Salmon, but has been decreased to 50 Chinook Salmon since 2014 to conserve returning fish. The Kenaitze Indian Tribe’s educational fishery harvest has ranged from 1 to 198 early-run Chinook Salmon over all years of the fishery (1994-2016) and from 1 to 49 over the most recent ten years available (2007-2016), with an annual average of 22 fish over the last ten years (Begich et al. 2017). No estimates of the number of early-run Kenai River Chinook salmon harvested in commercial fisheries are available, but due to the timing of these fisheries the harvests are assumed to be negligible.

*Late-Run Chinook Salmon*

The State’s Kenai River Late-Run King Salmon Management Plan (5 AAC 21.359) establishes escapement objectives and guidelines for the management of all existing fisheries harvesting this run. While this run is primarily managed for use by the sport fishery, the incidental harvest in Sockeye Salmon targeted commercial fisheries occurs in both the set gillnet fishery on the east side of Cook Inlet and drift gillnet fishery. Most of the sport harvest occurs downstream of the Soldotna Bridge within the Kenai River, although some are taken in marine waters in the Deep Creek sport fishery. The bag and possession limit is one Chinook Salmon per day and one in possession. For July 1 to July 31, in the lower river (river mouth to below Slikok Creek), there is no size limit; while in the mid river (below Slikok Creek upstream to Skilak Lake) Chinook Salmon must be less than 36 inches in length to be retained. Additionally, there is an annual limit of two Chinook Salmon from the Kenai River. The personal use fishery has a seasonal limit of one Chinook Salmon per household, and the Kenaitze Indian Tribe’s educational fisheries seasonal limit decreased to 50 Chinook Salmon beginning in 2014.

The harvest of late-run Chinook Salmon is monitored in the commercial, personal use, sport, and educational fisheries (Begich et al. 2013). Commercial fishery harvests during 2006–2015 have ranged

from 621 to 9,083 Kenai River late-run Chinook Salmon, with an annual average of 4,934 fish. Harvests in the Deep Creek marine sport fishery have ranged from 30 to 996 Kenai River late-run Chinook Salmon during 2003–2012, with an annual average of 591 fish. Sport fishery harvests in the Kenai River during 2006 to 2015 have ranged from 103 to 15,812 late-run Chinook Salmon (Begich et al. 2017). A sport harvest of late-run Chinook Salmon occurred in 2017, but the final totals are not yet available (Pawluk 2018, pers. comm.). The harvest trend for this fishery in recent years has been similar to that of the early-run (**Figure 12**). The Kenaitze Indian Tribe’s educational fishery harvests have ranged from 0 to 21 late-run Chinook Salmon over all years of the fishery (1994-2016), and have averaged 8 fish a year over the most recent ten years of data available (2007-2016; Begich et al. 2017).



**Figure 12** Late-run Chinook Salmon harvest totals in the Kenai River sport fishery, 1986 to 2015 (Begich et al. 2017).

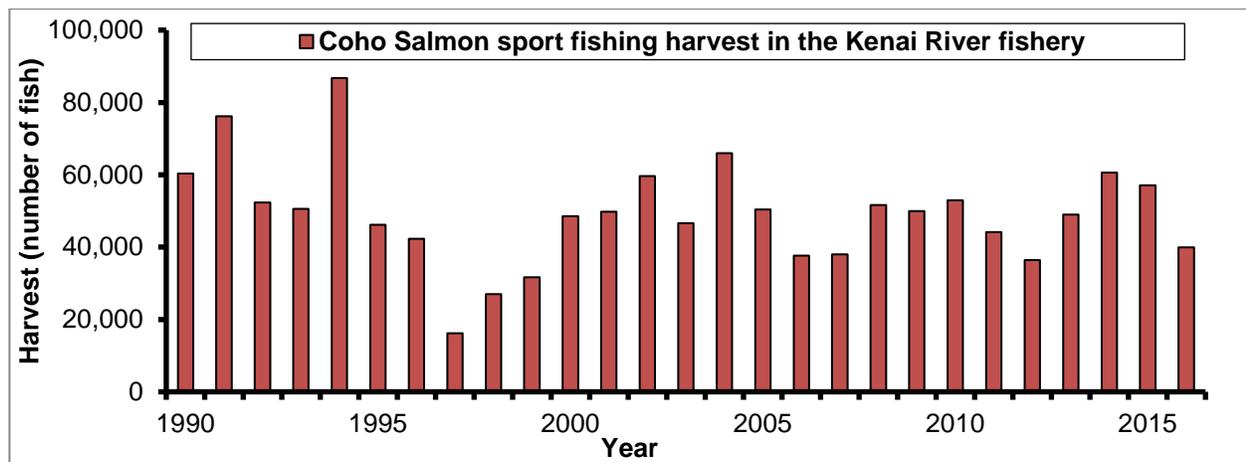
Coho Salmon

Federal subsistence harvest of Coho Salmon in the Kenai River drainage by the communities of Cooper Landing, Hope, and Ninilchik have been negligible since 2007 (**Tables 3-5**). There have been no Coho Salmon harvested by any of the three communities by dip net. Cooper Landing residents have harvested Coho Salmon by rod and reel in the Upper Kenai/Russian River area at low rates, with 27 fish harvested since 2007 for a harvest rate of less than 3 fish per year. Hope residents have not directly targeted Coho Salmon through the Federal subsistence fishery, having harvested only 5 Coho Salmon by rod and reel in 2007 from the Upper Kenai/Russian River area. Similarly, Ninilchik residents have not actively targeted Coho Salmon by rod and reel or dip net, having harvested 5 from the Upper Kenai/Russian River area in 2007, and 5 from the Moose Range Meadows area in 2008. They did, however, harvest 12 Coho Salmon in the community gillnet fishery in the Moose Range Meadows area in both 2016 and 2017 (**Table 5**).

The State manages Kenai River Coho Salmon primarily for take in sport fisheries through the Kenai River Coho Salmon Management Plan (5 AAC 57.170), which establishes management actions and guidelines for sport harvest. The harvest of Coho Salmon is monitored in all existing commercial, personal use, sport, and educational fisheries, but stock specific information for commercial fisheries, based on coded-wire tag returns, is only available through 2003 (Lafferty et al. 2005). The sport fishery takes place in the

mainstem Kenai River downstream of Skilak Lake. Fishing efforts shift to this fishery following the Chinook Salmon season at the end of July. Sport fishing regulations allow for the harvest of 2 per day and 2 in possession from July 1 to August 31, and 3 per day and 6 in possession from September 1 to November 30.

While total harvests of Coho Salmon in Upper Cook Inlet commercial fisheries are generally several hundreds of thousands each year, harvests of Kenai River Coho Salmon are likely a small component of the total (Massengill 2008). Total Kenai River sport fishery harvests have ranged from 36,407 to 60,566 Coho Salmon during 2007-2016, with an annual average over that same period of 47,957 (Begich et al. 2017; Pawluk 2018, pers. comm.). The level of harvest for this fishery has been relatively consistent through time (**Figure 13**). Estimates of Coho Salmon harvest by residents of Cooper Landing, Hope, and Ninilchik between 2010 and 2015 through Personal Use fisheries has been negligible, with a cumulative sum over that time and across the three communities of less than 100 fish (**Table 6**). The Kenaitze Indian Tribe’s educational fishery harvests have ranged from 63 to 1,254 Coho Salmon during 2007–2016, with an average of 563 fish (Begich et al. 2017).



**Figure 13** Coho Salmon harvest totals in the Kenai River sport fishery, 1990 to 2015 (Begich et al. 2017), and 2016 (Pawluk 2018, pers. comm.).

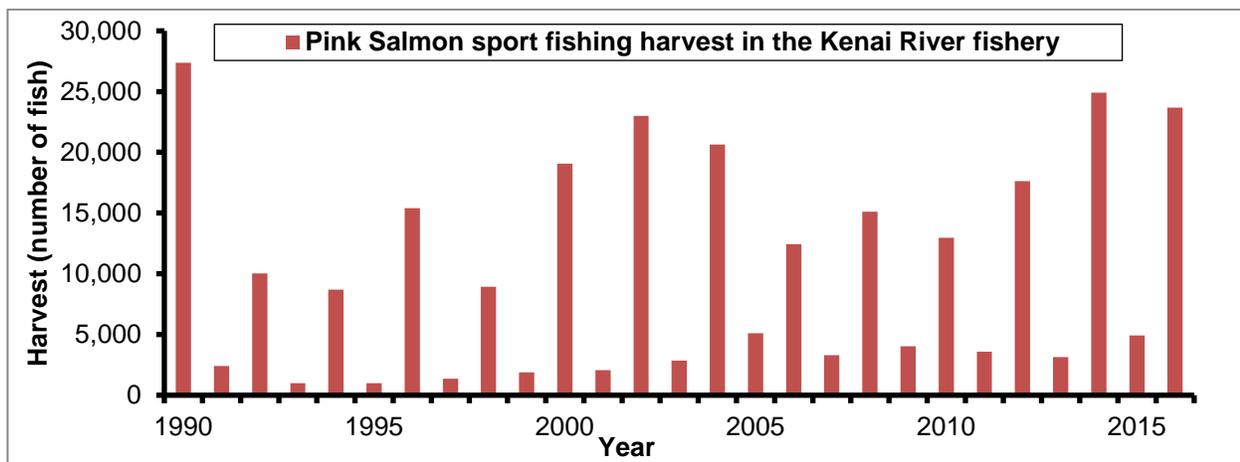
Pink Salmon

There have been no reported harvests of Pink Salmon in the Federal subsistence fishery with dip net or hook and line by residents of the three communities with a customary and traditional use determination for this area. However, a small harvest of Pink Salmon has taken place through the community gillnet fishery by residents of Ninilchik over the past two years (6 in 2016, and 11 in 2017).

The State does not have a sport fish management plan for Kenai River Pink Salmon, but instead manages the fishery entirely through regulation. There is no escapement goal for the Kenai River, and in-season management actions have not been required for this fishery to date (Begich et al. 2017). Pink Salmon return to the river in all years, but are in greater abundance in even numbered years as shown by harvest numbers (**Figure 14**). Fishery performance assessment occurs post-season through the statewide harvest survey. Catch data indicate a high rate of catch and release in the sport fishery, with an average retention

of only 18% of fish between 1990 and 2004 (Gamblin et al. 2004). The Alaska record weight for pink salmon was broken on two occasions (on the same day) during the 2016 season, likely increasing angler interest in this fishery for that year (Begich et al. 2017). Sport fishing regulations allow for the harvest of 6 per day and 6 in possession for fish 16 inches and longer.

Kenai River Pink Salmon sport fishery harvests have ranged from 3,130 to 24,919 during 2007-2016 (Begich et al. 2017; Pawluk 2018, pers. comm.). However, run strength is different between even and odd year runs. Even year run harvests since 1990 average 17,137, while odd-year run harvests average 2,822 over that same period (**Figure 14**). The Kenaitze Indian Tribe’s educational fishery harvests have ranged from 4 to 553 Pink Salmon during 2007–2016 (Begich et al. 2017).



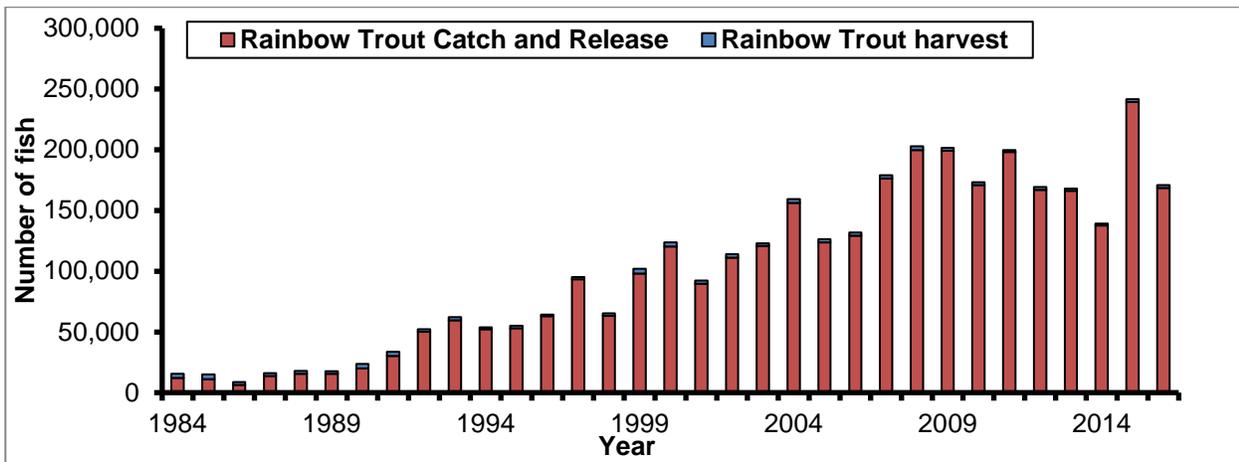
**Figure 14** Pink Salmon harvest totals in the Kenai River sport fishery, 1990 to 2015 (Begich et al. 2017), and 2016 (Pawluk 2018, pers. comm.).

Rainbow Trout

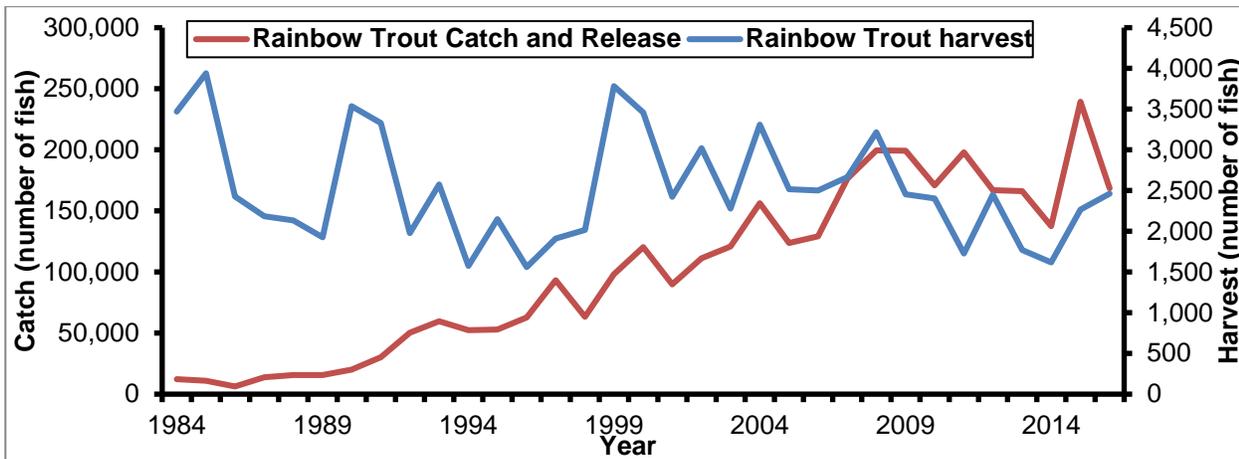
The Federal subsistence dip net and rod and reel fishery prohibits the retention of Rainbow Trout 18 inches or longer in length at the three specified harvest locations in the Kenai River drainage. The separate rod and reel fishery in Federal public waters allows for the harvest of one Rainbow Trout per day under 18 inches in length and one in possession below the Skilak Lake outlet or one per day and one in possession under 16 inches in length above the Skilak Lake outlet. There have been no reported harvests of Rainbow Trout in the Federal subsistence fishery with dip net or hook and line by residents of the three communities with a customary and traditional use determination for this area. There has been no catch or harvest of Rainbow Trout in the community gillnet fishery in 2016 and 2017.

State sport fishing regulations for Rainbow Trout in flowing waters of the Kenai River drainage that are open to harvest allow for the retention of 1 fish per day and 1 in possession. There is a closure to retention from May 1 to June 10 in all flowing waters of the drainage except for the lower river below the outlet of Skilak Lake. There are also opportunities to harvest Rainbow Trout in lakes and ponds in the drainage, with some variation in harvest limits depending upon whether or not the lakes are stocked.

Monitoring of sport fishing effort for Rainbow Trout in the Kenai River occurs through the statewide harvest survey. The information is broken into “catch” (meaning all catch) and “harvest” (meaning caught fish that were retained). Annual catch and release totals of Rainbow Trout in the Kenai River have been on a mostly upward trend since 1984 (Figure 15), and have ranged between 6,295 and 239,386 (Begich et al. 2017). The annual average catch and release total during 2007–2016, the most recent 10-year period available, was 182,278 fish (Begich et al. 2017; Pawluk 2018, pers. comm.). Rainbow Trout harvests, however, are substantially smaller (Figure 15). They have ranged between 1,560 and 3,940 since 1984, with an average during 2007–2016 of 2,303. Although the catch and release fishery has increased substantially over time, the level of harvest since 1984 has remained relatively constant (Figure 16).



**Figure 15** Rainbow Trout catch and harvest totals in the Kenai River sport fishery, 1984 to 2015 (Begich et al. 2017), and 2016 (Pawluk 2018, pers. comm.).



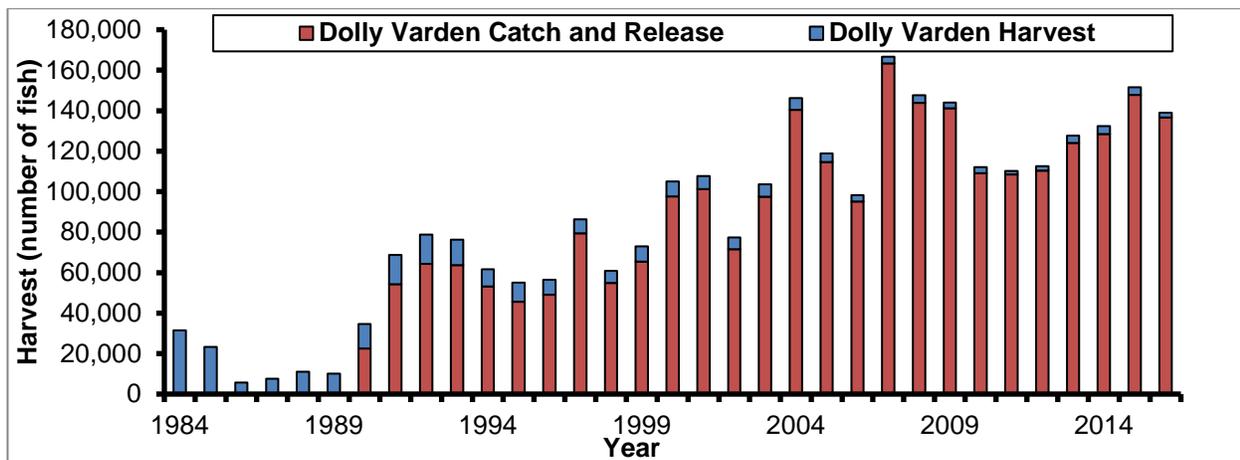
**Figure 16** Rainbow Trout catch (red line) and harvest (blue line) totals in the Kenai River sport fishery, 1984 to 2015 (Begich et al. 2017), and 2016 (Pawluk 2018, pers. comm.). Note that the catch rate is associated with the primary (left) vertical axis, while harvest rate is associated with the secondary (right) vertical axis.

## Dolly Varden

The Federal subsistence dip net and rod and reel fishery prohibits the retention of Dolly Varden 18 inches or longer in length at the three specified harvest locations in the drainage. The separate rod and reel fishery in Federal public waters allows for the harvest of one Dolly Varden per day under 18 inches in length and one in possession below the Skilak Lake outlet or one per day and one in possession under 16 inches in length above the Skilak Lake outlet. There have been no reported harvests of Dolly Varden in the Federal subsistence fishery with dip net or hook and line by residents of the three communities with a customary and traditional use determination for this area. There has been a very small catch of Dolly Varden in the community gillnet fishery by residents of Ninilchik (2 fish in 2016), but no harvest reported in 2016 or 2017.

State sport fishing regulations for Dolly Varden vary in the different section of the Kenai River drainage for harvest limits and seasonal openings and closures. However, for the Kenai River from the mouth of the river to above Skilak Lake, the regulations allow for retention of one fish per day, with one in possession, which must be less than 16 inches in length.

Like for Rainbow Trout, sport fishing effort for Dolly Varden in the Kenai River is monitored through the statewide harvest survey. The information is broken into “catch” (meaning all catch) and “harvest” (meaning caught fish that were retained). Catch and release totals of Dolly Varden in the Kenai River have been on a mostly upward trend since 1990 (**Figure 17**), and have ranged between 22,595 and 163,342 (Begich et al. 2017). The annual average catch during 2007–2016, the most recent 10-year period available, was 131,329 fish (Begich et al. 2017; Pawluk 2018, pers. comm.). Similar to Rainbow Trout, Dolly Varden harvest has been substantially smaller than catch (**Figure 17**), and has ranged since 1984 between 1,789 and 31,407, with an average during 2007–2016 of 3,039.



**Figure 17** Dolly Varden catch (1990-2016) and harvest (1984-2016) totals in the Kenai River sport fishery (Begich et al. 2017, Pawluk 2018, pers. comm.).

## Other Mortality Sources

Two other notable sources of fish mortality are relevant to the Kenai River outside of fishing harvest: mortality associated with catch and release fisheries, and mortality associated with release of fish from the research gillnet operated by the ADF&G.

### *Catch and Release Mortality*

As described above in the sections for Rainbow Trout and Dolly Varden, catch and release fishing is a very popular activity on the Kenai River for these species (**Figures 15 and 17**), and is also practiced as a management tool for species such as Chinook Salmon to still provide fishing opportunity in times of conservation concern. Managers use catch and release fishing as a conservation method to decrease harvest, while still acknowledging that some amount of mortality from this practice is going to occur.

A number of studies have examined mortality rates of catch and release fishing. Mortality rates vary across studies due to factors such as species, life stage, water temperature, and gear type. A review of 18 studies by Taylor and White (1992) found a 3.8% mortality rate associated with fly-fishing, a 4.9% rate associated with lures, and a 31.4% rate associated with bait. Another review of 7 studies by Schill and Scarpella (1997) found a 4.5% mean mortality rate for barbed hooks compared to 4.2% for barbless. Lindsay (et al. 2004) found a 12.2% rate of mortality in Chinook Salmon in the lower Willamette River of Oregon, while DeCicco (1994) found rates below 2% for Dolly Varden from the Nome and Snake rivers of Northwest Alaska.

Specific to the Kenai River, Bendock and Alexandersdottir (1990) found Chinook Salmon mortality rates of 13% for males and 7% for females associated with the catch and release fishery. At the January 2017 Federal Subsistence Board meeting, ADF&G staff stated the Department estimates about a 6% mortality associated with the catch and release fishery based on studies that use all gear types including bait and multiple hooks (FSB 2017). Mortality estimates provided in the Kenai River annual management reports for the early-run Chinook Salmon sports fishery range from 0 to 389 fish for the years 1986-2015, while mortality estimates for the late-run Chinook Salmon sport fishery range from 16 to 1,803 over that same time period (Begich et al 2017). Although no estimates of catch and release mortality exist for Rainbow Trout, a recent stock assessment performed in the Kenai River drainage (Eskelin and Evans 2013) reported that over 92% of the Rainbow Trout were observed to have hooking injuries. The authors suggested that it was likely that the trout in some sections of the river had been caught and released multiple times annually. No Kenai River specific estimates of catch and release mortality exist for Dolly Varden.

Overall, some amount of mortality is a recognized consequence of catch and release fisheries, including those currently authorized in the Kenai River.

### *Gillnet Release Mortality*

ADF&G uses a research gillnet at RM 9 each day from mid-May to mid-August to provide the relative proportion of large Chinook Salmon, small Chinook Salmon, and Sockeye Salmon for apportionment of

sonar counts for the early and late runs of Chinook Salmon (ADF&G 2016a). This platform is also used during years that Chinook Salmon are captured and outfitted with radio transmitters as a part of run-timing and distribution studies (Eskelin and Reimer 2017). These gillnets are 60 feet in length and are constructed of 5 and 7.5 inch mesh. The intent of these smaller mesh size selections is to reduce both size selectivity and the probability of damage to gill filaments.

The Washington Department of Fish and Wildlife undertook a review of research conducted to examine the rates of mortality for a variety of fish caught and released from gill and tangle nets (WDFW 2014). The review summarized 13 papers based in a variety of locations ranging from Alaska to Finland. The study sites were mainly concentrated in Washington or British Columbia, with only two sites in Alaska (Bristol Bay and Kodiak). The study years for these projects ranged from 1955 to 2007 (median ~ 2000) and a majority of them focus on salmonid species being captured and immediately released in estuarine locations. Variables considered in these studies included mesh size, fish size, soak time, water temperature, location type, maturity state, and migration duration. Those studies that focus on fish released from gillnets demonstrated a wide range of mortality. Immediate mortality rates ranged between 0.5% and 98% depending on the variables considered and within the context of the studies considered in the literature review. For example, the lowest mortality rate was for Chinook Salmon in the spring (cooler water) in a freshwater environment with a 5.5-inch mesh gillnet whereas the 98% mortality was also for Chinook Salmon in July (warmer water) in an estuary environment with an 8-inch mesh gillnet. Long-term mortality rates ranged between 2.3% and 60.6%, again depending on the variable and within the context of the studies considered in the literature review.

Specific to the Kenai River, the ADF&G also discussed this source of mortality at the 2017 Federal Subsistence Board meeting (FSB 2017). ADF&G staff clarified that the net is for research purposes, not harvest, and that the crews do everything that they can to keep the fish alive. The net is pulled as soon as a fish is entangled so that it can be quickly sampled for age, sex composition, length, and a genetic sample prior to release. They have been able to determine a mortality rate associated with the net of 20 to 25%. However, these rates are for fish that have additional handling beyond what is described above as they have also been outfitted with radio tags as part of a separate project that also utilizes fish from this same netting operation.

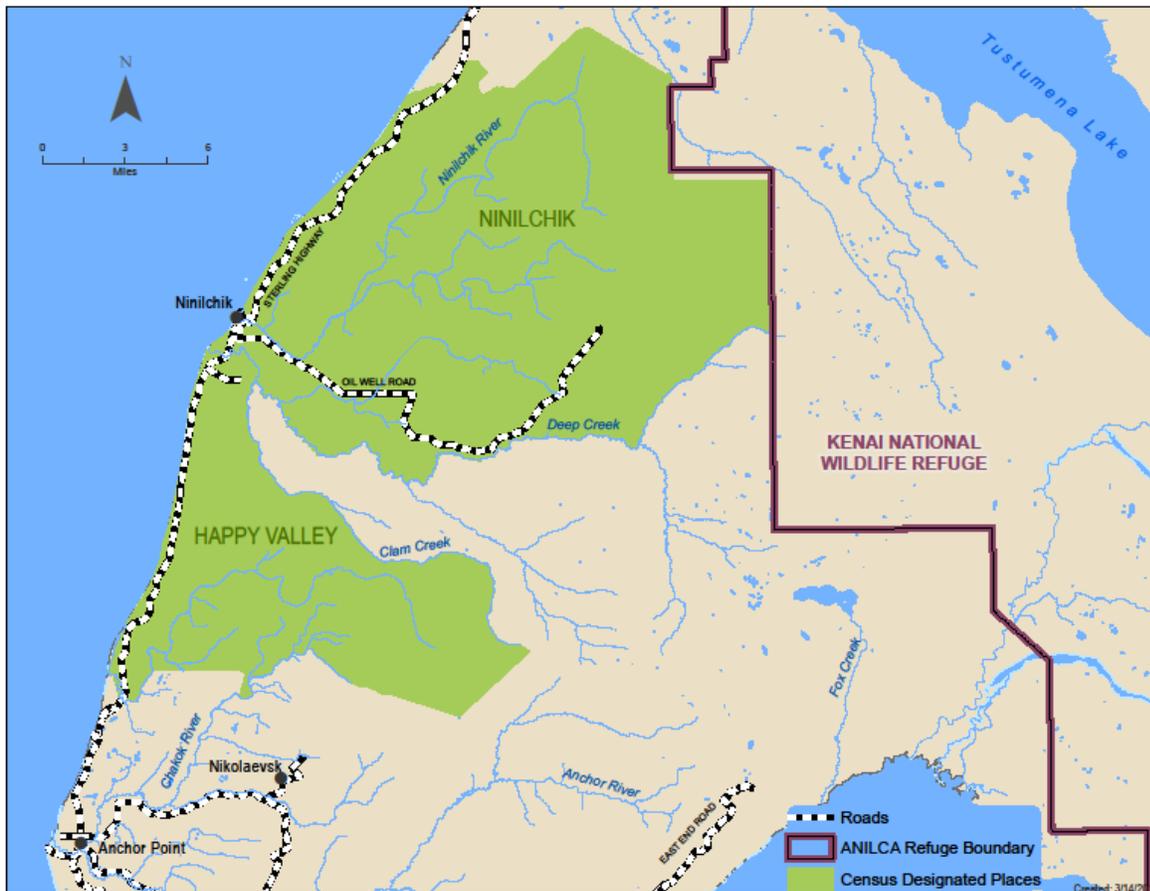
Overall, some amount of unintended mortality is a recognized consequence of releasing fish captured in gillnets.

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

For the purposes of Federal subsistence regulations, the Ninilchik community is comprised of two census-designated places (CDPs): Ninilchik and Happy Valley (**Figure 18**). ADF&G subsistence use studies conducted in 2002–03 on Ninilchik included Ninilchik and Happy Valley CDPs (Fall et al. 2004). Thus, when reference is made to Ninilchik in this analysis, it includes people living in the Ninilchik CDP as well as the Happy Valley CDP. In the 2010 U.S. Census, Ninilchik CDP had 883 year-round permanent residents in 412 households and Happy Valley had 593 year-round permanent residents in 270 households

(U.S. Census Bureau 2010); thus the total population for the two CDPs from the last census is 1,476 in 682 households.

The Ninilchik tribal government (Ninilchik Traditional Council or NTC) is the only local government in the Ninilchik area. There is no local municipal government (the town is not incorporated), although Ninilchik is part of the Kenai Peninsula Borough and under borough and State jurisdiction for general services including a school, highway snow-removal, and an Alaska State Trooper post. The community of Ninilchik is similar to road-connected rural portions of the Copper River Basin where the local governments of communities are tribal, not municipal (Stratton and Georgette 1984).



**Figure 18** Ninilchik and Happy Valley Census Designated Places (CDPs)

The Kenai River watershed is within the traditional territory of the *Dena'ina* Athabaskans, which dates to around 1000 A.D. The area extends from Kachemak Bay on the south end of the Kenai Peninsula, west across Cook Inlet to Lake Clark and the Stony River, and northeast to the Susitna Basin. Borders are shared with the traditional territory of the *Sugpiaq* (Alutiiq) which includes the southern portion of the Kenai Peninsula, bridging the *Sugpiaq* territories of Prince William Sound with Kodiak Island and the Alaska Peninsula (de Laguna 1934, Krauss 1982, Stanek 1980).

Non-Native settlement of the Kenai Peninsula began in the 18th century with the Russians and the fur trade, and later mining efforts in Kachemak Bay. At the end of the 19th century, commercial fishing brought about new settlements, such as the herring saltery at Seldovia in 1896. The next major non-Native settlement period began during the Gold Rush era at the end of the 19th century. Hope and Cooper Landing settlements are related to this period. Homesteading in the Homer region occurred from 1915 through 1940. With the construction of roads and local oil development after in the 1950s, the population of the Kenai Peninsula increased substantially through in-migration of people born outside Alaska.

From the early 1900s, the annual subsistence pattern of the *Dena'ina* included commercial fishing in the spring and summer at the mouth of the Kenai River before moving up-river in the fall to harvest Coho Salmon and freshwater fish, hunt moose, and trap furbearers. This cycle continued until the 1940s when the creation of the Kenai National Moose Range disrupted traditional harvest patterns. Despite new Federal refuge enforcement efforts, many *Dena'ina* continued to access their Stepanka camps, long used settlements up the Kenai River near Skilak Lake (Fall et al. 2004).

Commercial and subsistence fishing were also an important aspect of the annual cycle of the Kenai Peninsula homesteaders. In freshwater, gillnets and seines were used in the Kenai, Skilak, and Tustumena Lakes to harvest lake trout, grayling, whitefish, and char. Trappers in the upper Kenai River area maintained gillnets and caught salmon and trout for personal use. Other uses mentioned were taking Coho Salmon through the ice in the winter and steelhead below Skilak Lake in the late 1940s and early 1950s (Fall et al. 2004). Andrew Berg, who lived from 1869 to 1939 and was a guide on the Kenai Peninsula, documented his use of subsistence resources including harvesting trout in Tustumena Lake and Dolly Varden, salmon, and whitefish at the mouth of Indian Creek (Cassidy and Titus 2003).

Subsistence fishing in the freshwaters of the Kenai Peninsula was prohibited from 1952 until the Federal Subsistence Board created a subsistence fishery in 2002, which initially mirrored the State sport fishing regulations. In this area, preferred traditional methods and means include nets, an efficient method and means of harvest for subsistence users who traditionally harvest as much fish as they can process at once. Rod and reel is considered an authorized subsistence gear type under Federal subsistence regulations and under State regulations in some parts of the state. In some cases under State regulations, rod and reel has been recognized as traditional gear in places where fish fences or traps are no longer a legal means to harvest fish and rod and reel is the only legal alternative (Williams et al. 2005).

In 1952, gillnets were made illegal in many freshwaters, and the Kenai Peninsula *Dena'ina* ceased using gillnets during their fall occupation of their upriver harvest sites. The Stepanka fishery, that had been a traditional, long-standing source of salmon for the *Dena'ina* (Kenaitze) Indians, was closed. As a result of this closure, snagging became the primary harvest method until it was made illegal in 1973. Local residents turned to sport fishing without snagging, and continued to fish the beaches of Cook Inlet with gillnets in the State subsistence fishery. In the 1970s, sport fishing had grown in popularity and the Kenai had become a favorite spot for fishing and recreation. The Kenai Peninsula is unique in that rural communities are interspersed among much larger nonrural communities. By the early 1980s, the Alaska Board of Fisheries added more restrictions on subsistence and personal use fishing along the Cook Inlet

beaches, closing beaches to subsistence gillnetting. By the mid-1990s, only two personal use fisheries remained at the mouth of the Kenai and Kasilof rivers (Fall et al. 2004).

Regulations relating to areas, seasons, and methods have changed consistently over the past 54 years, and have become more restrictive, requiring residents to take different approaches to obtaining subsistence resources. For example, in the case of salmon, as regulations and conditions have changed, residents have adapted their traditional practices to continue to obtain salmon—trade it, buy it, or harvest it in new ways under various regulatory regimes (Georgette 1983). In 1993, as the result of a lawsuit filed by the Kenaitze Indian Tribe, a State judge ordered the development of educational fisheries for the NTC, the Knik Tribal Council, the Native Village of Eklutna, and the Kenaitze Indian Tribe (Loshbaugh 1993). The educational fishery provided another means for residents to harvest salmon using gillnets. The educational permits, however, were a compromise: “Villagers—who have traditionally focused on early-run king salmon will be catching mostly reds under the proposed permit” (Loshbaugh 1993).

### **Effects of the Proposal**

All of the changes requested as part of this special action request are to section §\_\_\_\_.27(e)(10)(iv)(J), regarding the Kenai River community gillnet fishery for residents of the community of Ninilchik. If the temporary special action is adopted by the Board, the following specific effects may occur for the 2018 fishing season on the Kenai River:

- Annual total harvest limits for the Kenai River for late-run Chinook Salmon, Sockeye Salmon, Coho Salmon, and Pink Salmon would not apply to the Kenai River community gillnet fishery.
- The location of the fishery will be in the Moose Range Meadows area of the Kenai River, between approximately river mile 26.5 and river mile 29.
- All incidental fish mortalities resulting from the gillnet fishery would be allowed to be retained regardless of species or length. Retention would count towards released or retained totals specified under this special action, except for Chinook Salmon that measure 20 inches or less.
- An early-run Chinook Salmon harvest season for the community gillnet fishery would be established between July 1 and July 15.
- An early-run Chinook Salmon household limit of 2 early-run Chinook per household and 1 additional for each household member would be established for the community gillnet fishery.
- Up to 50 early-run Chinook Salmon would be allowed for retention or release according to the following conditions:
  - Retention of early-run Chinook Salmon less than 46 inches or 55 inches and longer in length would be permitted if the State of Alaska Department of Fish and Game announces that the optimal escapement goal (OEG) for early-run Chinook Salmon has been met.

- Live early-run Chinook Salmon must be released if OEG for early-run Chinook Salmon has not been met.
- The community gillnet fishery would close until July 16 once 50 early-run Chinook Salmon had been retained or released.
- Up to 200 late-run Chinook Salmon would be allowed for retention between July 16 and August 15. The community gillnet fishery would close August 15 or once this number has been reached, and would reopen on September 10.
- The following conditions would apply to Rainbow Trout and Dolly Varden caught in the net:
  - All live Rainbow Trout and Dolly Varden must be released.
  - Rainbow Trout and Dolly Varden that have died in the net may be retained.
  - The community gillnet fishery would be closed for the season once 100 Rainbow Trout or 150 Dolly Varden had been released or retained.
- The State of Alaska sport fishing regulation seasonal river bank closures would not apply to the community gillnet fishery.

The Kenai River community gillnet fishery for residents of Ninilchik is currently linked to the harvest limits provided in the Kenai River dip net/rod and reel fishery (section §\_\_\_27(e)(10)(iv)(D)). This includes both household limits and annual total limits. This special action would temporarily remove the linkage between the community gillnet fishery and the drainage wide annual total limits for all Federally qualified subsistence users, keeping in place only the existing household limits. Removal of the annual total limit for this fishery, which effectively acts as an overall cap on how many late-run Chinook, Sockeye, Pink, and Coho Salmon may be harvested, would have the effect on the resource of likely allowing a greater number of fish to be harvested. For instance, if all 412 households from the community of Ninilchik were to harvest their household limit of 25 Sockeye Salmon, the primary target of this fishery, they would end up with 10,300 fish, which exceeds the current annual total limit of 4,000 fish. However, this would likely have little to no effect on the runs as a whole given the current escapement levels (**Figures 3, 4, and 5**), and would be insignificant compared to current harvest in the State managed fisheries (**Figures 8, 9, 10**). This change, however, would have the effect of alleviating one of the major concerns of the two other communities (Hope and Cooper Landing) with a customary and traditional use determination for this resource. Residents of those communities have expressed concerns that the annual total limits could be met through the community gillnet fishery prior to them being able to fish at their preferred location further up the drainage (SCRAC 2016).

This request would specify that the fishery is to take place in the Moose Range Meadows area of the Kenai River. Current regulations for the fishery (section §\_\_\_27(e)(10)(iv)(J)) specify that the fishery is to take place in the Federal public waters of the Kenai River that currently consists of the Moose Range Meadows area and the area just downstream of the outlet of Skilak Lake. This change would limit the

number of locations available for the fishery to take place. However, the Moose Range Meadows area was the agreed to portion of the river for the fisheries in 2016 and 2017, and both proponents agreed to this specific location for the current request.

The special action would allow for the retention of any incidental mortalities from the community gillnet fishery. Retention of these fish would count towards released or retained totals specified for the fishery through this special action, except for Chinook Salmon that measure less than 20 inches in length. The current regulations specify seasons for each of the salmon species as well as size restrictions on the retention of Dolly Varden and Rainbow Trout (must be less than 18 inches). The potential to harvest fish outside of the current regulatory dates as well as Dolly Varden or Rainbow Trout 18 inches or greater in length has been a primary conservation/regulatory concern for the fishery. It is expected that this regulatory change would result in the retention of some additional non-target fish. However, the purpose of the community gillnet is to harvest fish for Federally qualified subsistence users, and this change would allow for the retention of even non-target fish for that purpose rather than discarding fish that died as a result of entanglement in the net at the site of capture.

This special action would provide several changes to allow for the potential harvest of early-run Chinook Salmon in the community gillnet fishery. An early-run Chinook Salmon season would be established specifically for the community gillnet fishery, from July 1 to July 15. An early-run Chinook Salmon household limit of 2 early-run Chinook Salmon for each permit holder and 1 additional for each household member would be established specifically for the community gillnet fishery. Allowance of harvest of up to 50 early-run Chinook Salmon less than 46 inches or 55 inches or longer in length would be permitted in the community gillnet fishery if the State of Alaska Department of Fish and Game announces that the optimal escapement goal (OEG) for early-run Chinook Salmon has been met. All live early-run Chinook Salmon must be released if the OEG is not met. Lastly, the community gillnet fishery would close until July 16 once 50 early-run Chinook Salmon had been retained or released.

The community gillnet fishery is currently linked to the dip net/rod and reel regulations for specifying allowable harvest periods for the various salmon species. These regulations do not provide a time period or household limit for the harvest of early-run Chinook Salmon. The current community gillnet regulations, however, allow for the use of a gillnet on June 15, which has caused conservation/regulatory concern for the harvest of early-run Chinook Salmon. There is a separate Kenai River rod and reel fishery for Federally qualified subsistence users (section §\_\_\_\_.27(e)(10)(iv)(E)) that does provide for the harvest of early-run Chinook Salmon, however this fishery is not linked to the community gillnet fishery. The seasons for the separate Kenai River rod and reel fishery are the same as those provided under State of Alaska regulations, and it contains a size slot limit that prohibits the retention of early-run Chinook between 46 to 55 inches to protect the 5-ocean fish whose proportion in the run as a whole have been declining.

The changes requested in this special action, in addition to season changes (July 1-August 15 and September 10 – 30) for community gillnet provided by the adoption of FP17-10 by the Federal Subsistence Board, would allow for a greater possibility of harvest of early-run Chinook Salmon through the community gillnet fishery. However, this harvest would only take place in the event that the State

announces the OEG has been met, would require fish between 46 inches or 55 inches to be released, and would have a cap of 50 fish released or retained, thus providing some degree of conservation for the stock. The OEG is a range of 3,900 to 6,600 large (greater than 34 inches in length) early-run Chinook Salmon, and is counted as the number of fish estimated past the sonar at river mile 14 minus harvest. The lower end of the previous OEG range for early-run Chinook Salmon was met in 2014 and 2015, and the upper end exceeded in 2016 (**Figure 3**). The upper end of the new large fish goal range for early-run Chinook Salmon was exceeded in 2017. Harvest through the State's sport fishery was held at zero for the years 2013-2015 out of concern for the stock (**Figure 11**), but a small amount of harvest was permitted in 2016 (Pawluk 2018, pers. comm.) and harvest was permitted in 2017 after the upper end of the OEG was projected to be passed. The harvest of 50 fish under the current escapement pattern is unlikely to have detrimental effects on the run as a whole. Chinook Salmon in this portion of the drainage during this period of time are a mixture of the larger mainstem stock and smaller stocks from multiple tributaries. Given this, there are potential consequences to the smaller stocks if they are disproportionately captured. The 2017 community gillnet fishery caught and retained zero early-run Chinook Salmon. These changes related to early-run Chinook Salmon would provide additional harvest opportunities for Federally qualified subsistence users from the community of Ninilchik and would resolve the issues in current regulations for the community gillnet related to these fish.

The request specifying that the OEG be met before the potential harvest of up to 50 early-run Chinook Salmon can take place may prove problematic due to its vagueness. As stated before the OEG is a range of 3,500 to 6,600, and requires both the sonar count and harvest to be taken into account before a determination can be made about it being met. As stated, this qualifier may require that the top end of the goal be substantially exceeded in order for this harvest to take place. It may be worth consideration to specify which part of the goal is to be exceeded (lower end or top end), and whether it can be projected to be exceeded before harvest take place rather than simply exceeded.

The special action would allow for the retention of up to 200 late-run Chinook Salmon between July 16 and August 15. The community gillnet fishery would close on August 15, or before then if the 200 late-run Chinook Salmon limit has been met prior to that date. It would re-open September 10-30 to target Coho Salmon. The current season for late-run Chinook Salmon, as provided from the linked dip net/rod and reel fishery, is July 16-September 30, the household limit is 10 fish for each permit holder and 2 additional for each household member, and the annual total harvest limit is 1,000 for the three qualified communities. The 200 fish cap imposed by the special action would potentially result in fewer late-run Chinook Salmon being harvested than allowed for under the current regulations, affording additional protections to this stock of fish. However, harvest of late-run Chinook Salmon to date in the Federal subsistence fisheries has been extremely low up to this point, including a single fish retained from the 2017 community gillnet fishery (**Tables 3, 4, and 5**).

This special action would provide several changes to how the fishery handles Dolly Varden and Rainbow Trout. It would provide a mandate to release all live Dolly Varden and Rainbow Trout. However, it would allow for the retention of any Dolly Varden or Rainbow Trout that died in the net, regardless of size. The community gillnet fishery would be closed for the duration of the season if either 150 Dolly Varden or 100 Rainbow Trout had been caught, whether released or retained. The potential to harvest

Dolly Varden or Rainbow Trout greater than 18 inches has been a primary conservation/regulatory concern for the fishery, and the new conditions specified in this special action request are an attempt to alleviate this concern. Current regulations for the community gillnet allow for the retention of any Dolly Varden or Rainbow Trout less than 18 inches in length, and require all fish larger than this to be released.

The various changes associated with the special action would likely increase the incidental capture of Dolly Varden and Rainbow Trout 18 inches and over 18 in length given the extended time period that the net would be in the river. Increased harvest will depend upon various factors associated with the release of these fish once entangled in the net. The retention or release caps imposed by the temporary special action would afford added protections in the event that large numbers of these fish were encountered by closing the community gillnet fishery for the duration of the season. The agreed upon caps are conservative in nature compared to even a low rate of catch and release mortality of 3% in the sport fishery for the system (given the 2% to 31.4% range cited in the catch and release mortality section above). For 2015, a 3% mortality in the catch and release fishery would have resulted in the mortality of 4,546 Dolly Varden and 7,250 Rainbow Trout based on reported totals (**Figures 15, 16, and 17**). It should be noted, however, that the mesh size of the gillnet would target the largest Dolly Varden and Rainbow Trout, which are the most sought after by sport fishermen. There have been two Dolly Varden captured during the two seasons of the community gillnet fishery, but there has been zero harvest of Dolly Varden or Rainbow Trout. The provisions of this special action related to Dolly Varden and Rainbow Trout would allow the fishery to take place, and would therefore provide additional harvest opportunities for federally qualified subsistence users from the community of Ninilchik.

Lastly, this special action would temporarily modify Federal subsistence regulation such that State of Alaska fishing regulation seasonal riverbank closures do not apply to the community gillnet fishery in the Moose Range Meadows area of the Kenai River. Currently, the linked Kenai River dip net/rod and reel fishery states that seasonal riverbank closures and motor boat restrictions are the same as those listed in State of Alaska fishing regulations (5 AAC 57.180). The State riverbank closures apply between RM 26.4 and RM 30 on the South bank of the river and between RM 27.3 and RM 28 on the North bank of the river. The State restricts fishing in riparian areas of the Kenai River except from a boat that is located more than 10 feet from shore and not connected to the shore or any riparian habitat. These closures were initiated when late-run Sockeye Salmon fishing dramatically increased in the area during the 1980's and 1990's, resulting in extensive habitat damage and social conflicts between fishers and private property owners. The temporary removal of the riverbank closure regulations for the community gillnet fishery may cause some degree of riparian habitat degradation in the area that the gillnet is fished given repeated trips up and down the bank to deploy and monitor the net, standing on the bank while gear is fishing, and boat anchoring and shore fast attachment. Providing clear admittance to the fishing area would increase the likelihood of additional harvest opportunities for Federally qualified subsistence users from the community of Ninilchik.

## **SUBSISTENCE REGIONAL ADVISORY COUNCIL RECOMMENDATION**

### **Southcentral Alaska Subsistence Regional Advisory Council**

**Support** Temporary Special Action FSA18-02.

#### **Justification**

The Council feels this proposal enhances and improves subsistence opportunities and does not present any conservation concerns. The Council appreciates the conservation measures included in the proposal. Some Council members expressed pleasure that the concerns Hope and Cooper Landing expressed regarding harvest limits were heard and that solutions seem to have been found to address those issues. The Council notes that this same special action request worked well last year and hopes it works well again this summer.

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## INTERAGENCY STAFF COMMITTEE COMMENTS

### Approve Temporary Special Action FSA 18-02.

#### Justification:

- Approval of temporary special action FSA18-02 to implement the community gillnet fishery during the 2018 season will provide residents of the community of Ninilchik with the Federal subsistence harvest opportunity in the Kenai River authorized by the Board in 2015. The action also alleviates concerns raised by Cooper Landing and Hope residents concerning the impact of the gillnet fishery on their customary and traditional use determination for this resource.
- The *Commitment Statement by the Federal Subsistence Board and the US Fish and Wildlife Service* states that, in the event that final regulations implementing all elements of the *Pathway Table* are not in effect by February 1, 2018, the US Fish and Wildlife Service and the Ninilchik Traditional Council will jointly submit a special action request to authorize all elements. This action fulfills that commitment.
- The proponent's request to implement the community gillnet fishery during the 2018 season as described in FSA18-02 and the *Pathway Table* will not result in conservation concerns for reasons including:
  - The main target species are Sockeye and Coho Salmon and the net will be placed in shallower nearshore waters.
  - Early-run Chinook Salmon will be protected, with no use of the gillnet prior to July 1 and no retention of Chinook Salmon until July 16 unless the State determines that the optimal escapement goal for the early-run has been met.
  - Proposed conservative retention and encounter rates will help address potential conservation concerns for Chinook Salmon, Rainbow Trout, and Dolly Varden.
  - Permit conditions will be in place to ensure the fishery is well managed and operated.
  - There are two seasons of experience that demonstrate the operator runs a responsible fishery.
- The temporary special action FSA18-02, *Agreement in Principle*, and *Pathway Table* address conflicting regulatory concerns previously identified.

- The State of Alaska Department of Fish and Game recently changed the harvest size limit for Chinook Salmon in the Kenai River to protect Chinook Salmon that are greater than 36 inches (5ACC 57.120). It may be appropriate for the Ninilchik Traditional Council to consider a similar restriction in future regulations to aid in conservation efforts to protect larger, older females as part of a rebuilding plan for early run Chinook Salmon.

## **Appendix A – State sport fishing regulations for the Kenai River; including general and special provisions for harvest, and the riparian habitat fishery management plan**

### ***5 AAC 57.120. General provisions for seasons, bag, possession, annual, and size limits, and methods and means for the Kenai River Drainage Area.***

*(a) Unless otherwise specified in 5 ACC 57.121 – 5 AAC 57.123 or by emergency order issues under AS 16.05.060, the following are the general seasons, bag, possession, annual and size limits, and methods and means that apply to sport fishing for finfish in the Kenai River Drainage Area:*

*(1) salmon may be landed only with the aid of a landing net or by hand;*

*(2) king salmon 20 inches or greater in length as follows:*

*(A) may be taken only from January 1 - July 31, in the Kenai River from its mouth upstream to an ADF&G regulatory marker located at the outlet of Skilak Lake, with a bag and possession limit of one fish, as follows:*

*(i) from January 1 - June 30, from its mouth upstream to an ADF&G regulatory marker located at the outlet of Skilak Lake, and from July 1 - July 31, from an ADF&G regulatory marker located approximately 300 yards downstream from the mouth of the Slikok Creek upstream to an ADF&G regulatory marker located at the outlet of Skilak Lake, only king salmon that are 36 inches or less in length as measured from tip of snout to tip of tail may be retained;*

*(ii) if retention is permitted under this subparagraph, a king salmon 20 inches or greater in length that is removed from the water must be retained and becomes part of the bag limit of the person originally hooking it; a person may not remove a king salmon from the water before releasing the fish; except as provided in (b)(1) of this section, there is an annual limit of two king salmon and a harvest record is required as specified in 5 AAC 75.006;*

*(iii) repealed 6/8/2017;*

*(iv) from January 1 - July 14, a person may not possess a king salmon that has been filleted, headed, mutilated, or otherwise disfigured in a manner that prevents determination of the length of fish taken until the fish is permanently offloaded from a vessel if the fish was taken from a vessel or permanently transported away from the fishing site if the fish was taken from the riverbank; for the purposes of this sub-subparagraph, "fishing site" means the riverbank where the fish was hooked and removed from the water becoming part of the angler's bag*

*limit;*

*(B) king salmon 20 inches or greater in length may not be taken*

*(i) in the Kenai River upstream from an ADF&G regulatory marker located at the outlet of Skilak Lake, including Kenai Lake; and*

*(ii) in the Kenai River drainage lakes and tributaries including Kenai Lake tributaries, except the lower Moose River*

*(C) a person, after taking and retaining a king salmon 20 inches or greater in length from the Kenai River, may not sport fish from a boat in the Kenai River downstream from an ADF&G regulatory marker located at the outlet of Skilak Lake for any species of fish on that same day;*

*(3) king salmon less than 20 inches in length may be taken in*

*(A) flowing waters and unstocked lakes and ponds only from January 1 - July 31; bag and possession limit of 10 fish;*

*(B) repealed 6/12/2011;*

*(4) salmon, other than king salmon,*

*(A) 16 inches or greater in length, as follows:*

*(i) sockeye, pink, and chum salmon may be taken from January 1 - December 31;*

*(ii) coho salmon may be taken in the Lower Section only from July 1 - November 30 and in the Middle Section only from July 1 - October 31; a person after taking and retaining a bag limit of coho salmon 16 inches or greater in length from the Kenai River may continue to sport fish only from the Soldotna Bridge upstream to the ADF&G regulatory markers at the outlet of Skilak Lake; notwithstanding the provision of this sub-subparagraph (a)(4)(A)(ii), coho salmon may not be taken from November 1 - November 30 in the Lower Section from the Biogs Landing boat launch upstream to an ADF&G regulatory marker located at the outlet of Skilak Lake;*

*(iii) except as provided in (iv) of this subparagraph, the bag and possession limit for sockeye, coho, and chum salmon in combination is three fish per day and six in possession, of which no more than two per day and in possession may be coho salmon; in addition, the bag and possession limit for pink salmon is six fish;*

*(iv) from September 1 - November 30, in the flowing waters of the Kenai River, excluding the tributaries, the bag and possession limit for coho salmon is three fish per day;*

*(v) if retention of coho salmon is allowed under this chapter, a coho salmon 16 inches or greater in length that is removed from the water must be retained and becomes part of the bag limit of the person originally hooking it; a person may not remove a coho salmon from the water before releasing the fish;*

*(B) less than 16 inches in length; bag and possession limit of 10 fish, as follows:*

*(i) sockeye, pink, and chum salmon may be taken from January 1 - December 31;*

*(ii) coho salmon may be taken in the Lower Section only from July 1 - November 30, and in the Middle Section only from July 1 - October 31, except that coho salmon may be taken in lakes and ponds, excluding Skilak Lake, from January 1 - December 31;*

*(5) Arctic char/Dolly Varden may be taken from*

*(A) January 1 - December 31, in all flowing waters from the mouth of the Kenai River upstream to Skilak Lake, and the waters of Skilak Lake upstream to Kenai Lake, including the flowing waters of the Kenai Lake drainage; bag and possession limit of one fish less than 16 inches in length; Arctic char/Dolly Varden 16 inches or greater in length may not be retained; Arctic char/Dolly Varden caught that are 16 inches or greater in length must be released immediately;*

*(B) January 1 - December 31, in the lakes and ponds of the Kenai River drainage, including Kenai Lake and lakes tributary to Kenai Lake, except Skilak Lake; bag and possession limit of two fish, of which only one may be 20 inches or greater in length;*

*(C) repealed 6/8/2017;*

*(6) rainbow/steelhead trout*

*(A) are subject to an annual limit of two fish 20 inches or greater in length, except as provided in (b)(2) of this section, and a harvest record is required as specified in 5 AAC 75.006;*

*(B) may be taken from January 1 - December 31, in all flowing waters from the mouth of the Kenai River upstream to Skilak Lake, and the waters of Skilak Lake upstream to Kenai Lake, including the flowing waters of the Kenai Lake drainage; bag and possession limit of one fish less than 16 inches in length; rainbow/steelhead trout 16 inches or greater in length may not be retained; rainbow/steelhead trout caught that are 16 inches or greater in length must be released immediately;*

*(C) repealed 6/8/2017;*

*(D) may be taken from January 1 - December 31, in the lakes and ponds, including Kenai Lake and lakes tributary to Kenai Lake, except Skilak Lake and stocked lakes; bag and possession limit of two fish, of which only one may be 20 inches or greater in length;*

*(E) repealed 6/12/2011;*

*(7) Arctic grayling may be taken from January 1 - December 31; bag and possession limit of five fish; no size limit;*

*(8) lake trout*

*(A) 20 inches or greater in length may be taken from January 1 - December 31; bag and possession limit of two fish;*

*(B) less than 20 inches in length may be taken from January 1 - December 31; bag and possession limit of 10 fish;*

*(9) repealed 6/8/2017;*

*(10) burbot: may be taken from January 1 - December 31; bag and possession limit of two fish; no size limit;*

*(11) other finfish not specified in this section may be taken from January 1 - December 31; no bag, possession, or size limits.*

*(b) Notwithstanding an annual limit established in this section for*

*(1) king salmon, the annual limit for king salmon in the combined waters of the Kenai River Drainage Area and the other areas in the Cook Inlet region that are open to sport fishing for king salmon under 5 AAC 56 - 5 AAC 62 is five king salmon 20 inches or greater in length, not more than two of which may be taken from that portion of the Kenai River drainage open to king salmon fishing, and not more than two of which may be taken, in combination, from Deep Creek and the Anchor River, except that from January 1 through June 30, a king salmon less than 28 inches in length taken from the Kenai River does not count towards the annual limit;*

*(2) rainbow/steelhead trout, the annual limit for rainbow/steelhead trout in the combined waters of the Kenai River Drainage Area and the other areas in the Cook Inlet region that are open to sport fishing for rainbow/steelhead trout under 5 AAC 56 - 5 AAC 62 is two rainbow/steelhead trout 20 inches or greater in length.*

**5 AAC 57.121. Special provisions for the seasons, bag, possession, and size limits, and methods and means for the Lower Section of the Kenai River Drainage Area.**

*(a) Unless otherwise specified by an emergency order issued under AS 16.05.060, the following are the special provisions and localized exceptions to the general seasons, bag, possession, and size limits, and methods and means set out in 5 AAC 57.120 and 5 AAC 57.75 for the Lower Section of the Kenai River Drainage Area:*

*(1) sport fishing gear restrictions:*

*(A) from January 1 - June 30, in the Kenai River, and from July 1 - July 14, in the Kenai River from an ADF&G regulatory marker located approximately 300 yards downstream from the mouth of Slikok Creek upstream to an ADF&G regulatory marker located at the outlet of Skilak Lake, only one unbaited, single-hook, artificial lure may be used;*

*(B) from July 1 – 31, in the Kenai River from its mouth upstream to an ADF&G regulatory marker located approximately 300 yards downstream of the mouth of Slikok Creek, and from July 15 – July 31, in the Kenai River from its mouth upstream to an ADF&G regulatory marker located at the outlet of Skilak Lake, only one single hook may be used;*

*(C) from September 1 - December 31, in the Kenai River from the mouth of the Upper Killey River upstream to an ADF&G regulatory marker located at the outlet of Skilak Lake, only one unbaited, single-hook, artificial lure may be used;*

*(D) from December 1 - December 31, in the Kenai River from its mouth upstream to an ADF&G regulatory marker located at the outlet of Skilak Lake, only unbaited, artificial lures may be used;*

**5 AAC 57.121. Special provisions for the seasons, bag, possession, and size limits, and methods and means for the Lower Section of the Kenai River Drainage Area.**

*(a) Unless otherwise specified by an emergency order issued under AS 16.05.060, the following are the special provisions and localized exceptions to the general seasons, bag, possession, and size limits, and methods and means set out in 5 AAC 57.120 and 5 AAC 57.75 for the Lower Section of the Kenai River Drainage Area:*

*(1) sport fishing gear restrictions:*

*(A) from January 1 - June 30, in the Kenai River, and from July 1 - July 14, in the Kenai River from an ADF&G regulatory marker located approximately 300 yards downstream from the mouth of Slikok Creek upstream to an ADF&G regulatory marker located at the outlet of Skilak Lake, only one unbaited, single-hook, artificial lure may be used;*

*(B) from July 1 – 31, in the Kenai River from its mouth upstream to an ADF&G regulatory marker located approximately 300 yards downstream of the mouth of Slikok Creek, and from July 15 – July 31, in the Kenai River from its mouth upstream to an ADF&G regulatory marker located at the outlet of Skilak Lake, only one single hook may be used;*

*(C) from September 1 - December 31, in the Kenai River from the mouth of the Upper Killey River upstream to an ADF&G regulatory marker located at the*

*outlet of Skilak Lake, only one unbaited, single-hook, artificial lure may be used;*

*(D) from December 1 - December 31, in the Kenai River from its mouth upstream to an ADF&G regulatory marker located at the outlet of Skilak Lake, only unbaited, artificial lures may be used;*

*(E) from May 1 - July 31, in the portion of the Kenai River from ADF&G regulatory markers located approximately 100 yards downstream of the mouth of the Moose River, upstream to ADF&G regulatory markers located approximately 100 yards upstream of the mouth of the Moose River, and the Moose River from its confluence with the Kenai River upstream to the upstream edge of the Sterling Highway Bridge, only one unbaited, single-hook, artificial fly may be used;*

*(F) from May 1 - July 31, in the following waters only one unbaited, single-hook, artificial fly may be used:*

*(i) that portion of the Kenai River from an ADF&G regulatory marker located approximately 300 yards downstream from the mouth of Slikok Creek, upstream to an ADF&G regulatory marker located approximately 300 yards upstream from the mouth of Slikok Creek;*

*(ii) that portion of the Kenai River from an ADF&G regulatory marker located approximately one mile downstream from the mouth of Funny River, upstream to an ADF&G regulatory marker located approximately 200 yards upstream from the mouth of the Funny River;*

*(G) from May 1 - July 31, that portion of the Kenai River from an ADF&G regulatory marker located approximately three-quarters of a mile downstream from the mouth of the Lower Killey River, upstream to an ADF&G regulatory marker located approximately one mile upstream from the mouth of the Lower Killey River, only one unbaited, single-hook, artificial fly may be used;*

*(H) repealed 5/18/2014;*

*(I) repealed 6/8/2017;*

*(J) repealed 6/8/2017;*

*(K) from November 1 - December 31 in the Kenai River from Bings Landing upstream to the mouth of the Upper Killey River, only one unbaited, single-hook, artificial lure may be used;*

*(L) in all tributaries of the Lower Section, only one unbaited, single-hook, artificial lure, with a gap between the point and shank of three-eighths inch or less, may be used:*

(2) *the following waters are closed to sport fishing, as follows:*

*(A) from May 1 - July 31, Slikok Creek, Funny River, and Killey River;*

*(B) from May 1 - June 10, the flowing waters of all tributaries of the Lower Section not specified in subparagraph (2)(A) of this section, including Beaver Creek and Soldotna Creek, except in the Moose River, only upstream of the upstream edge of the Sterling Highway Bridge;*

*(C) repealed 6/8/2017;*

*(D) from May 1 - July 31, that portion of the Kenai River from an ADF&G regulatory marker located approximately one mile downstream from the mouth of the Funny River, upstream to an ADF&G regulatory marker located approximately 200 yards upstream from the mouth of the Funny River, is closed to the taking of king salmon;*

*(E) repealed 6/8/2017;*

*(F) repealed 6/8/2017;*

*(G) from May 1 - July 31, that portion of the Kenai River from an ADF&G regulatory marker located approximately three-quarters of a mile downstream from the mouth of the Lower Killey River, upstream to an ADF&G regulatory marker located approximately one mile upstream from the mouth of the Lower Killey River, is closed to the taking of king salmon;*

*(H) repealed 5/18/2014;*

*(I) from July 1 - August 15, the Kenai River riparian habitats described in 5 AAC 57.180(d) are closed to all sport fishing, except to sport fishing from a boat that is more than 10 feet from shore and is not connected to the shore or any riparian habitat;*

*(J) from May 1 - July 31, the waters in that portion of the Kenai River from an ADF&G regulatory marker located approximately 300 yards downstream from the mouth of Slikok Creek, upstream to an ADF&G regulatory marker located approximately 300 yards upstream from the mouth of Slikok Creek, is closed to the taking of king salmon;*

*(K) from May 1 - June 10, in that portion of the Kenai River from an ADF&G regulatory marker located approximately one mile upstream from the mouth of the Lower Killey River upstream to an ADF&G regulatory marker located at the outlet of Skilak Lake;*

*(L) from July 1 - August 30, the waters of the Soldotna Centennial Campground boat launch lagoon inside a line from an ADF&G regulatory marker located at the upstream end of the disabled fishing platform to the downstream end of the rock pile jetty to the southernmost end of the lagoon;*

*(M) all tributaries of the Lower Section are closed to sport fishing for salmon, except in the Moose River from its mouth upstream to the upstream edge of the Sterling Highway Bridge;*

*(3) a person may not sport fish from a boat*

*(A) on any Monday in May, June, and July, except Memorial Day, in that portion of the Kenai River from the Sterling Highway Bridge upstream to an ADF&G regulatory marker located at the outlet of Skilak Lake, except that unguided sport fishing from a nonmotorized vessel is allowed on Mondays in May, June, and July as described in 5 AAC [21.359\(c\)](#) (3); for the purposes of this subparagraph, "nonmotorized vessel" is a vessel that does not have a motor on board;*

*(B) from May 1 - July 31, in the following waters:*

*(i) in that portion of the Kenai River from an ADF&G regulatory marker located approximately 300 yards downstream from the mouth of Slikok Creek upstream to an ADF&G regulatory marker located approximately 300 yards upstream from the mouth of Slikok Creek;*

*(ii) in that portion of the Kenai River from an ADF&G regulatory marker located approximately one mile downstream from the mouth of the Funny River, upstream to an ADF&G regulatory marker located approximately 200 yards upstream from the mouth of Funny River;*

*(C) from May 1 until the end of the king salmon season, or July 31, whichever is later, in the following waters:*

*(i) in that portion of the Kenai River from an ADF&G regulatory marker located approximately 250 yards downstream from the upper breakwater at Centennial Park boat launch, upstream to the Sterling Highway Bridge at Soldotna;*

*(ii) in that portion of the Kenai River from an ADF&G regulatory marker located approximately 100 yards downstream from the landing at Morgan's Hole, at river mile 31, upstream to an ADF&G regulatory marker located at the north section line of Section 28, Township 5 North, Range 9 West, Seward Meridian;*

*(iii) in that portion of the Kenai River from ADF&G regulatory markers located approximately 100 yards downstream of the mouth of the Moose River, upstream to ADF&G regulatory markers located approximately 100 yards upstream from the mouth of the Moose River, and the Moose River upstream to the upstream edge of the Sterling Highway Bridge;*

*(D) from May 1 - July 31, in that portion of the Kenai River from an ADF&G regulatory marker located approximately three-quarters of a mile downstream from the mouth of the Lower Killey River, upstream to an ADF&G regulatory marker located approximately one mile upstream from the mouth of the Lower Killey River;*

*(E) that is anchored in that portion of the Kenai River from an ADF&G regulatory marker located at the outlet of Skilak Lake, downstream to an ADF&G regulatory marker located at approximately river mile 47, from August 1 - December 31; for the purposes of this paragraph, "anchored vessel" means a vessel on which any device other than oars, paddles, or a motor is used to slow or stop the downstream drift of the vessel;*

*(F) on any Monday in May, June, and July, except Memorial Day, in that portion of the Kenai River from its mouth upstream to the Sterling Highway Bridge, except as described in 5 AAC 21.359(c) (3); a vessel that has on board the vessel no more than one motor, with that motor not more than 10 horsepower, may be used between the mouth of the Kenai River and ADF&G regulatory markers located at Cunningham Park, but only after fishing from the vessel has ceased for that day; a person may not deploy sport fishing gear from a vessel after a motor has been used to propel that vessel on the same day;*

*(G) from July 1 - July 31, in that portion of the Kenai River from an ADF&G regulatory marker located at approximately river mile 11 upstream to an ADF&G regulatory marker located at approximately river mile 12, a person may not sport fish for any species of fish from a vessel that is making upstream progress relative to the water with the aid of a motor;*

*(4) sport fishing from guided vessels is restricted in waters of the Kenai River as specified in 5 AAC 57.140;*

*(5) repealed 5/18/2014;*

*(6) repealed 5/18/2014;*

**5 AAC 57.180. Riparian Habitat Fishery Management Plan for the Kenai River Drainage Area**

*(a) the Board of Fisheries (board) finds that freshwater fisheries in upper Cook Inlet, including the Kenai River Drainage Area, subject to access limitations of federal, state, and local landowners, are a recognized use of the fishery resources of upper Cook Inlet. The board also finds that, in some situations, freshwater fisheries negatively affect riparian habitats of upper Cook Inlet.*

*(b) The board recognizes the importance of maintaining the structural and functional integrity of upper Cook Inlet riparian habitats. Given this, the board will consider, as part of its deliberations, avoidable impacts to upper Cook Inlet riparian habitats related to sport fishing.*

*(c) If the commissioner determines that freshwater fisheries are likely to result in riparian habitat loss which could negatively affect the fishery resources of upper Cook Inlet, the commissioner may close, by emergency order, those riparian areas to fishing. This authority extends only to riparian areas in which there is a state, federal, or municipal property interest. The commissioner may reopen, by emergency order, those riparian areas to fishing if the commissioner determines that an opening will not compromise the integrity of the riparian habitats the emergency order is designed to protect. During seasons in areas opened by emergency order, the commissioner may establish fishing periods and may designate any or all of the following as locations from which fishing may occur:*

- (1) boats;*
- (2) boardwalks or similar structures;*
- (3) docks;*
- (4) gravel bars;*
- (5) natural formations identified by the commissioner;*
- (6) other areas identified by the commissioner as areas where use for fishing will not compromise the integrity of the habitat the closure is designed to protect.*

*(d) From July 1 through August 15, the following Kenai River riparian habitats are closed to all fishing, except fishing from a boat that is located more than 10 feet from shore and not connected to the shore or any riparian habitat:*

- (1) on the north bank of the Kenai River, between ADF&G regulatory markers located at river mile 6.6 and river mile 6.8;*
- (2) in the Alaska State Park's Eagle Rock Unit, on the south bank of the Kenai River, between ADF&G regulatory markers located at river mile 10.7 and river mile 12.0;*
- (3) on islands located between river miles 11 and 14 and at river miles 17.0 and 17.3;*
- (4) at the Alaska State Park's Pillars Unit, on the north bank of the Kenai River, between ADF&G regulatory markers located at river mile 12.4 and river mile 12.6;*
- (5) at the Alaska State Park's Honeymoon Cove Unit, on the south bank of the Kenai River, between ADF&G regulatory markers located at river mile 12.5 and river mile 13.0;*
- (6) on the north bank of the Kenai River, between ADF&G regulatory markers located at river mile 13.0 and river mile 13.4, and between ADF&G regulatory markers located at river mile 13.5 and river mile 14.0; except for lot 3 within Larry's Fishing Hole Subdivision;*
- (7) on the west bank of the Kenai River, between ADF&G regulatory markers located at river mile 14.0 and river mile 14.4;*

- (8) on the south bank of the Kenai River, between ADF&G regulatory markers located at river mile 14.4 and river mile 14.6;
- (9) on the west bank of the Kenai River, between ADF&G regulatory markers located at river mile 17.5 and river mile 17.6;
- (10) on the north bank of the Kenai River, between ADF&G regulatory markers located at river mile 18.6 and river mile 18.8;
- (11) on the north bank of the Kenai River, between ADF&G regulatory markers located at river mile 18.9 and at river mile 20.2;
- (12) on the south bank of the Kenai River, between ADF&G regulatory markers located at river mile 20.9 and river mile 21.0;
- (13) at the Soldotna Airport property, on the south bank of the Kenai River, between ADF&G regulatory markers located at river mile 22.7 and river mile 23.5;
- (14) on the south bank of the Kenai River, between ADF&G regulatory markers located at river mile 23.8 and river mile 24.2;
- (15) on the south bank of the Kenai River, between ADF&G regulatory markers located at river mile 26.4 and river mile 30.0;
- (16) on the north bank of the Kenai River from an ADF&G regulatory marker located at the upstream edge of the boat ramp at the end of Keystone Drive at approximately river mile 27.3, upstream to ADF&G regulatory markers located at the Kenai National Wildlife Refuge boundary delineated by the power line at river mile 28.0;
- (17) in the Caymas Subdivision, on the north bank of the Kenai River, between ADF&G regulatory markers located at river mile 31.5 and 32.5;
- (18) on the south bank of the Kenai River, between ADF&G regulatory markers located at river mile 31.5 and river mile 32.5;
- (19) at the Alaska State Park's Nilnunqua Unit, on the south bank of the Kenai River, between ADF&G regulatory markers located at river mile 36.0 and river mile 36.6;
- (20) on the north bank of the Kenai River, between ADF&G regulatory markers located approximately 150 feet apart at approximately river mile 44.6;
- (21) on the north bank of the Kenai River, between ADF&G regulatory markers located at river mile 45.8 and river mile 46.3;
- (22) at Jim's Landing, on the north bank of the Kenai River, from an ADF&G regulatory marker located at the large rock at river mile 69.7 to an ADF&G regulatory marker located just downstream from the boat launch;

*(23) on lands commonly referred to as Sportman's, on the north bank of the Kenai River, upstream from the ferry crossing from an ADF&G regulatory marker located at river mile 73.5 to an ADF&G regulatory marker located at river mile 73.6;*

*(24) on the south bank of the Kenai River, near river mile 82.0 at the outlet of Kenai Lake, from an ADF&G regulatory marker located at the Sterling Highway bridge to an ADF&G regulatory marker located approximately 1,000 feet downstream;*

*(25) on the north bank of the Kenai River, between ADF&G regulatory markers located at river mile 22.0 and river mile 22.1.*

*(e) For purposes of this section, "riparian habitat" means all areas within 10 feet in either direction from the Kenai River waterline.*

## **Appendix B -Summary of Agreement in Principle between Ninilchik Traditional Council and the Federal Subsistence Board Regarding a Proposed Action for Use of a Gillnet on the Kenai River**

On December 9, 2016, a negotiation between Ninilchik Traditional Council (NTC) representatives and two members representing the Federal Subsistence Board resulted in an agreement in principle for the use of a gillnet on the Kenai River. It is anticipated that the proposed agreement will be presented to the Board for its consideration in the form of a motion made and supported by the USF&WS member in response to FP17-10 and FP17-07. Present at the negotiation were Greg Siekaniec, Lynn Pollaca, Greg Encelewski, Ivan Encelewski, Sky Starkey, and Ken Lord. Key elements considered in reaching this agreement are:

- Ninilchik residents must be given a meaningful opportunity to use a single gillnet that is established through a regulation which includes the essential elements of the fishery and eliminates any potential conflicts with existing regulations, and is therefore is not dependent upon annual approval of an operational plan and issuance of a permit
- Main target species are sockeye and coho, with the net to be placed accordingly in shallower nearshore waters
- Early run Chinook must be protected, with no use of the gillnet at all prior to July 1 and no retention of Chinook until July 16 unless the State concludes that the optimum escapement goal for the early run has been met and harvest guidelines for the rod and reel fishery are followed
- Conservative retention and encounter rates will help to address conservation concerns for Chinook, rainbow trout and Dolly Varden
- The Board's blanket prohibition against retention of early run Chinook should be modified or revoked to allow for retention for subsistence uses when appropriate
- The Board's size restrictions regarding rainbows and Dolly Varden should be modified or revoked to allow for retention of dead fish for subsistence uses regardless of size
- Retention of dead incidentally caught fish for subsistence purposes is appropriate, but those retained will be counted towards the total harvest or encounter limits
- Some level of subsistence take is appropriate when non-subsistence take is being permitted
- Replacing the maximum total subsistence allocation of 4000 sockeye with a household limit of 25 with an additional 5 for each member of the household is a more equitable way to distribute subsistence caught fish that addresses concerns raised by Cooper Landing and Hope residents concerning Ninilchik's ability to take large numbers of fish with a gillnet; the subsistence allocation for coho and pink salmon should be similarly adjusted from an total annual allocation for all communities to a household limit
- A September opening will allow Ninilchik residents to target coho while minimizing the take of other species of concern
- The subsistence gillnet fishery may be closed if necessary in accordance with section \_\_.19 of the federal subsistence regulations, but not unless federally managed waters are also closed to sport fishing
- The Fish and Wildlife Service has committed to engaging in the necessary processes to allow Ninilchik residents access to a specific location or locations on refuge managed lands along the

bank of the Kenai River in the Moose Range Meadows area for the purpose of anchoring the net and engaging in other related low impact activities for subsistence uses for the 2017 season and the duration of the regulation that authorizes the gill net fishery

- Both parties see the benefit of improving a cooperative relationship related to management of Ninilchik's subsistence fisheries and agree to work in good faith to develop a memorandum of understanding that results in meaningful tribal consultation prior to the USF&WS taking fishery management actions that impact Ninilchik's subsistence opportunity and to develop a plan for NTC's access and use of USF&WS managed lands in the Moose Range Meadows area for subsistence uses of salmon

With those principles in mind, the specific proposal that will be presented to the Board is that regulatory requirements of an operational plan and permit be removed from regulation and replaced with specific requirements as follows:

Prior to July 1 – no use of a gillnet

From July 1-15

- If the State announces that the optimum escapement goal for early run Chinook has not been met, then there is no retention of Chinook allowed except for those that are already dead. When 50 Chinook have been encountered, whether dead or alive, the gillnet fishery closes until July 16.
- If the State announces that the optimum escapement goal for early run Chinook has been met, then retention of up to 50 Chinook is permitted. Once 50 Chinook have been retained or encountered, the gillnet fishery closes until July 16.

From July 16 – August 15

- Retention of up to 200 Chinook. Fishery closes until September 10 when that number is reached.

September 10-30

- Gillnet fishing allowed using the same gear type as before, with coho as the target species.

For the entire season

- The bag limit for the Ninilchik gillnet fishery is the total of the household limits for all households participating in the Ninilchik Kenai gillnet fishery. The household limits are: 25 sockeye per participating household permit holder and 5 additional sockeye for each additional household member – this replaces the 4000 total sockeye bag limit currently in regulation; 20 coho salmon per participating household permit holder and 5 additional coho for each additional member of the household – this replaces the 3000 total coho bag limit currently in regulation; and, 15 pink salmon per participating household permit holder and 5 additional pink salmon for each additional member of the household – this replaces the 2000 total pink salmon bag limit currently in regulation. These bag limits are not cumulative with State harvest limits.

- There is a maximum encounter rate of 100 rainbow trout or 150 Dolly Varden. If these numbers are reached, then the gillnet fishery is closed. All live rainbow trout and Dolly Varden will be released.
- Retention of all dead fish is permitted regardless of size or species, but such retention counts towards the encounter and retention numbers for specific species.
- The ensnarement of a jack Chinook, which is not spawning, does not count as a retained or encountered fish. A jack Chinook is a Chinook under 20 inches in length.
- Existing net length (ten fathoms) and mesh size (5<sup>7</sup>/<sub>4</sub>"") restrictions will remain unchanged.
- Only one net is permitted.
- NTC will record daily catches and report all harvested fish to the Federal in-season manger within 72 hours of leaving the gillnet location and file an annual report after the end of the season
- NTC will coordinate with the Federal in-season manger to provide samples of retained Chinook salmon for genetic testing
- NTC will be permitted to place an in-river anchor and buoy marker below the line of mean high water, which may be left in situ from July 1 until September 30.

## Appendix C –Pathway Table for implementation of the Agreement

Specific Requests from Agreement	2018 Season and Beyond Implementation
1. 10 fathom gillnet length	Already in regulation at § ____.27(e)(10)(iv)(J)(1)
2. Single gillnet permitted	Already in regulation at § ____.27(e)(10)(iv)(J)(1)
3. Fishery to take place in Moose Range Meadows	Already in regulation at § ____.27(e)(10)(iv)(J)
4. Fishery dates (7/1-8/15, 9/10-9/30)	FP17-10
5. Reporting daily catches within 72 hours	FP17-10
6. Remove operational plan requirement	FP17-10
7. Live release of all Rainbow Trout and Dolly Varden	FP17-10
8. Salmon taken in the gillnet fishery included as part of the dipnet/rod and reel fishery annual household limits only	FP17-10
9. Gillnet must have mesh size no larger than 5.25 inches	FP17-10 (permit stipulation)
10. Submission of an annual report to the Federal fishery manager	FP17-10 (permit stipulation)
11. Collection of samples from all harvested Chinook Salmon for genetic testing	FP17-10 (permit stipulation)
12. Anchor point and buoy (any color but red)	FP17-10 (permit stipulation)
13. Eliminate annual total harvest limit for late-run Chinook Salmon	Rulemaking
14. Eliminate annual total harvest limit for Sockeye, Coho and Pink salmon	Rulemaking
15. Early-run Chinook season (7/1-7/15), harvest/ encounter limit, closure until 7/16 once limit is met	Rulemaking
16. Establish late-run Chinook harvest limit associated with time period (7/16-8/15), and closure of gillnet fishery until 9/10 if limit is reached	Rulemaking
17. Establish specific limits and select time periods for Chinook Salmon harvest	Rulemaking
18. Establish early-run Chinook Salmon household limit	Rulemaking
19. Resident fish encounter limits (100 Rainbow, 150 Dolly Varden), closure of fishery for season if limits reached, retention of fish that die in net	Rulemaking
20. Retention of all incidental mortalities regardless of species or length. Retentions count towards encounter and harvest totals for specified species	Rulemaking
21. Retention of jack Chinook Salmon (less than 20 inches in length), which does not count towards encounter or harvest totals	Rulemaking
22. Remove language adopting State seasonal riverbank closures from Federal subsistence regulations.	Rulemaking

## Appendix D – Consultation letter from the State of Alaska



THE STATE  
of **ALASKA**  
GOVERNOR BILL WALKER

### Department of Fish and Game

OFFICE OF THE COMMISSIONER  
Headquarters Office

1255 West 8th Street  
P.O. Box 115526  
Juneau, Alaska 99811-5526  
Main: 907.465.4100  
Fax: 907.465.2332

**Date:** March 23, 2018

**To:** Federal Subsistence Board  
Anthony Christianson, Chair

**From:** Alaska Department of Fish and Game  
Sam Cotten, Commissioner through Scott Kelley, Director Commercial Fisheries, Hazel Nelson, Director Subsistence Division, and Tom Brookover, Director Sport Fisheries

**Subject:** The State of Alaska Department of Fish and Game (ADF&G) respectfully submits comments on Fisheries Special Action FSA 18-02: Temporary Special Action Request from the Nimiichik Traditional Council (NTC) and the US Fish and Wildlife Service (USFWS) requesting that the Federal Subsistence Board implement several temporary regulatory changes in the Cook Inlet area Federal subsistence fisheries regulations to facilitate implementation of the Kenai River community gillnet during the 2018 season.

#### **Background:**

This request asks for changes to 36 CFR 242.27(e)(10)(iv)(J) and 50 CFR 100.27(e)(10)(iv)(J) related to the Kenai River community gillnet fishery in the Moose Range Meadows area of the Kenai River, between approximately river mile 26.5 and river mile 29. Harvest of late-run Chinook, sockeye, coho, and pink salmon and other incidental species would be allowed.

The proponents stated the early-run Chinook salmon return to the Kenai River was near the upper end of the new large fish optimal escapement goal (OEG) in 2016 and exceeded the upper end of the OEG in 2017. This may be due to incorrectly equating the sonar passage estimate with escapement. Harvest and catch-and-release mortality must be subtracted from sonar passage to determine escapement. These figures will not be known until after the Statewide Harvest Survey is completed by the Division of Sport Fish in September 2018.

It is ADF&G understanding that due to the delay in proposed rulemaking, the NTC and the USFWS are requesting temporary changes in regulation related to the Kenai River community gillnet fishery.

#### **Discussion:**

The proposal states that up to 50 early-run Chinook salmon may be retained or released according to the following conditions:

1. Retention of early-run Chinook salmon less than 46 inches or 55 inches and longer in length is permitted if the State of Alaska Department of Fish and Game announces that the optimal escapement goal (OEG) for early-run Chinook salmon has been met.

The "slot limit" was repealed by the Board of Fisheries in 2017. The slot limit was replaced by maximum size limit of 36 inches. Only Chinook salmon that are less than 36 inches should be allowed to be retained in the early-run if the preseason forecast projects the inriver run to be within or above the OEG, or if the inseason run projection is within the OEG. If the inseason inriver run projection exceeds the OEG range of 3,900-6,600 Chinook salmon 75cm mid-eye to tail fork length or longer, the ADF&G may liberalize the sport fishery by allowing the use of bait, and/or modifying the maximum size limit allowed for retention only in the waters downstream of Slikok Creek.

It is important to note that the inriver run projection includes all fish entering the mouth of the Kenai River and does not subtract harvest. Also, to determine if the escapement goal has been met, the ADF&G must subtract harvest and catch-and-release mortality to determine spawning escapement. The sonar count does not equal escapement.

The ADF&G recommends that the newly adopted language by the Board of Fisheries be adopted in this SAR for the 2018 fishery and also in the upcoming rulemaking.

2. Live early-run Chinook salmon must be released if the OEG for early-run Chinook salmon has not been met.
3. The community gillnet fishery will close and remain closed until July 16 once 50 early-run Chinook salmon have been retained or released.

The ADF&G understands that the following change in the regulation will apply to conditions 2 & 3 above, as well as towards the retention of up to 200 late-run Chinook salmon permitted between July 16 and August 15 and states the community gillnet fishery will close August 15 or once this number has been reached, stating that only salmon greater than 20 inches counts towards the retention or release of Chinook salmon.

- Allow retention of all incidental fish mortalities regardless of species or length. Retention will count towards released or retained totals specified under this special action, except Chinook salmon that measure 20 inches or less.

If this is not accurate, then the ADF&G recommends clarifying the sizes of early-run and late-run Chinook salmon that can be retained or released.

The Niniilchik Traditional Council has made assurances the net would be closely attended, so the ADF&G requests that the regulation or permit stipulations should require the net be closely attended.

Thank you for consideration of our comments.

Cc: Scott Kelley, Director Commercial Fisheries  
Tom Brookover, Director Sport Fisheries  
Hazel Nelson, Director Subsistence Division  
Seth Beausang, Assistant Attorney General, Department of Law

April 27, 2018

Jennifer Hardin  
jennifer\_hardin@fws.gov  
(907) 786-3677

Re: Ninilchik Traditional Council's Proposed Revision to FSA18-02

Dear Jennifer:

Temporary special action request FSA18-02 was submitted by the Ninilchik Traditional Council and the U.S. Fish and Wildlife Service to implement the Kenai River community gillnet fishery during the 2018 season. The Office of Subsistence Management received public comments on FSA18-02 on March 16, 2018. I understand that the Federal Subsistence Board will consider FSA18-02 during its meeting on May 16-17, 2018.

It has come to NTC's attention that some of the wording in FSA18-02 discussing the retention and release of early-run Chinook Salmon in relation to the optimal escapement goal (OEG) must be revised to clarify the temporary special action request. Specifically, the following language ~~in bold strikethrough~~ in FSA18-02 should be removed, and the following language *in bold red italics* should be included:

"...Up to 50 early-run Chinook Salmon may be retained or released according to the following conditions:

1. Retention of early-run Chinook Salmon less than 46 inches or 55 inches and longer in length is permitted *if* the State of Alaska Department of Fish and Game announces that the optimal escapement goal (OEG) for early-run Chinook Salmon ~~has been is~~ *projected to be* met.
2. Live early-run Chinook Salmon must be released if OEG for early-run Chinook Salmon has not been *projected to be* met..."

Please let me know if additional action is required to ensure that this revision is made. Please don't hesitate to contact me if you have any questions.

Very truly yours,



Anna C. Crary

cc: Ivan Encelewski, Ninilchik Traditional Council



May 3, 2018

Jennifer Hardin  
[Jennifer\\_hardin@fws.gov](mailto:Jennifer_hardin@fws.gov)  
(907) 786-3677

Re: Ninilchik Traditional Council's Response to OSM's Question Regarding the  
OEG for the Kenai River Early-Run Chinook Salmon Stock

Dear Jennifer:

Thank you for the opportunity to respond to OSM's additional question regarding FSA18-02. As you know, FSA18-02 implements the Ninilchik Traditional Council's (the Tribe) Kenai River community subsistence gillnet fishery, pending publication of final regulations for that fishery at 50 CFR 100.27(e)(10)(iv)(J). Included within this subsistence fishery is an early-run Chinook Salmon fishery between July 1 and July 15, where the Tribe can retain up to 50 early-run Chinook Salmon if the Alaska Department of Fish and Game (ADFG) optimal escapement goal (OEG) for Kenai River early-run Chinook Salmon is projected to be met.

OSM's analysis of FSA18-02 notes that it may be "worth considering whether to specify which part of the goal is to be exceeded (lower end or top end), and whether it can be projected to be exceeded before harvest takes place rather than simply exceeded." OSM asked the Tribe's to recommend a point within the OEG that should be projected to be met such that the Tribe is permitted to retain early-run Chinook Salmon.

It is the Tribe's position that it would be inconsistent with State regulations and the spirit and intent of the settlement discussions between FWS and the Tribe to require a specific number within the OEG range to be met before the Tribe is permitted to retain early-run Chinook Salmon.

State fish and wildlife regulations apply to public lands when they are not inconsistent with other subsistence management regulations for public lands in Alaska.<sup>1</sup> Management of Kenai River early-run Chinook Salmon occurs under the ADFG's Kenai River and Kasilof River Early-Run King Salmon Management Plan (the Plan).<sup>2</sup> Federal managers have adopted

<sup>1</sup> 50 CFR 100.14(a).

<sup>2</sup> See 5 AAC 57.160 et seq.



the Plan to guide their management of early-run Chinook Salmon within Federal public lands. The Plan establishes specific escapement goals, based upon estimates for the upcoming season, for the Kenai River early-run Chinook Salmon stock. The current OEG for Kenai River early-run Chinook Salmon established by the Plan is 3,900-6,600 fish.<sup>3</sup>

The nature of fisheries management requires that management decisions be based upon these preseason forecast estimates. If the preseason forecast for Kenai River early-run Chinook Salmon falls above or within the OEG range, the State opens a sport fishery for early-run Chinook Salmon until an in-season projection is available.<sup>4</sup> This regulation does not specify or require a specific number within the range of 3,900-6,600 that needs to be met in order to open the fishery, nor do the regulations state which part of the OEG – i.e., the lower end or the top end – must be met in order to open the fishery. It is also important to point out that these regulations do not require that a specific number within the OEG range actually be met before the fishery is allowed to proceed.

Every spring, ADFG releases preseason forecasts for specific stocks, estimating the total run outlook for those stocks. On March 5, 2018, ADFG released the preseason forecast for Kenai River early-run Chinook Salmon. A copy of this preseason forecast is attached for the Board's reference. The forecasted total run of early-run Chinook Salmon is 5,499 fish. Because this forecast is within the OEG range, ADFG is currently managing a sport fishery for early-run Chinook Salmon until June 30.

The Tribe interprets the plain language of this regulation to mean that if there is a preseason forecast, and if that forecast number falls within the range of the OEG – i.e., between 3,900 and 6,600 – the Tribe can retain up to 50 early-run Chinook Salmon. The Tribe does not interpret these regulations as requiring a specific number within the OEG range to be met in order to open the fishery. Furthermore, the Tribe believes that if the State is operating a sport fishery that allows retention of early-run Chinook Salmon based upon a preseason forecast that falls within the OEG range, it would be arbitrary for the Board to require that a specific number within the OEG be achieved before the Tribe is permitted to retain early-run Chinook Salmon caught in its subsistence fishery. Doing so would also be contrary to ANILCA's mandate to provide a subsistence priority for rural residents. The Board should interpret 5 AAC 57.160(d)(2)(D) consistent with the State such that if the preseason forecast falls within or above the OEG range, the Tribe is permitted to retain up to 50 early-run Chinook Salmon.

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<sup>3</sup> 5 AAC 57.160(b).

<sup>4</sup> 5 AAC 57.160(d)(2)(D).

Please let me know if OSM has additional questions regarding FSA18-02 that the Tribe can answer.

Very truly yours,

LANDYE BENNETT BLUMSTEIN LLP



Anna C. Crary

Enclosure: ADFG's Preseason Forecast for Kenai River Early-Run Chinook Salmon

cc: Ivan Encelewski, Ninilchik Traditional Council



THE STATE  
of **ALASKA**  
GOVERNOR BILL WALKER

## Fish and Game

DIVISION OF SPORT FISH  
Soldotna

43961 Kalifornsky Beach Road, Suite B  
Soldotna, Alaska 99669-8276  
Main: 907.262.9368  
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### Department of MEMORANDUM

TO: Distribution

DATE: March 5, 2018

SUBJECT: Kenai River early run  
Chinook salmon 2018  
outlook

FROM: Robert Begich  
Division of Sport Fish, Region II

The outlook for the early run of Kenai River Chinook salmon in 2018 is below average, with a large fish ( $\geq 75$  cm mideye-to-tail-fork-length or approximately  $\geq 34$  inches in total length) forecast of 5,499 fish. The 2018 forecasted total run of large fish is within the optimum escapement goal of 3,900 to 6,600 fish so, as per the management plan, the season will begin with normal regulations (please see the News Release for more information: <http://www.adfg.alaska.gov/sf/EONR/index.cfm?ADFG=region.NR&Year=2018&NRID=2526>). The expectation is that the 2018 total run outlook of 5,499 large early-run Kenai River Chinook salmon will be less than (about 58 percent of) the 1986–2017 average total run of approximately 9,500 large fish (Table 1). If realized, the 2018 run will rank as the 7th lowest measured (27th out of 33 years) and be less than the preliminary estimate of the 2017 total run of 7,393 large fish.

The 2018 total run forecast of large fish is the sum of individual age-specific forecasts of abundance which are primarily ages 5, 6 and 7. Forecast abundance for each age class (Table 2) was calculated from models based on relationships between adult returns (ages 5, 6, and 7) or siblings from previous years ages (6, 7) (Table 3). The model estimates selected for each of the predominant age classes for inclusion in the 2018 large fish forecast had the minimum mean absolute deviation (MAD) in 2013 – 2017 hindcasts-of-forecasts, as compared to the actual runs in those years. In recent forecasts of Kenai River Chinook salmon run size, models with the smallest MAD have provided the best forecast accuracy.

For age-5 fish, the median (for brood years 1981–2012) was selected (a run of 2,732 fish). The forecast of this age class approximates one-half of the estimated size of the 2017 run of age-5 fish (4,901), which was approximately 64% of the 2017 total run. Since 2014 the age-5 fish have comprised an average of 62% of the total run of large fish.

For age-6 fish the most recent sibling model estimate of 2,709 fish was selected. This forecast of age-6 fish is similar to the preliminary estimate of the actual run of age-6 fish in 2017 (2,362 fish). Historically age-6 fish are the predominant age class; however, since 2014 the large fish run has been comprised of an average of approximately 35% age-6 fish. Of interest: the 5-year mean sibling model has performed nearly as well in recent years (MAD of 603 vs MAD of 590 for the selected forecast model), and forecasts a run of approximately 2,000 more fish in 2018.

For age-7 fish, the recent 5-year mean was selected (a run of 58 fish). If realized, this would be similar to runs of this age class since 2012.

The error associated with the point estimate for this total run forecast is the average of the squared difference of forecasted total runs and actual total runs from 2013 – 2017. The probability the 2018 total run will be fall within the observed difference of forecasted and actual total runs was set at 80%. The 80% prediction interval for the 2018 run of large fish is 3,468 to 7,528 fish. However, the 2017 hindcast of this forecast method was for a total run of approximately 6,505 large fish, while the preliminary estimated actual total run was approximately 7,393 large fish which was about eleven percent (888 fish) over the forecast. The small amount of error in the 2017 forecast was mostly due to under-forecasting the production of age-5 fish from the 2012 brood year and over-forecasting the age-6 fish production from the 2011 brood year.

Table 1. Estimated number of Kenai River large early-run Chinook salmon by age class and year, 1986 – 2017.

Year	Total Age in Years <sup>a</sup>				Total Run
	4	5	6	7	
1986		6,648	6,108	1,387	14,143
1987		6,874	11,037	437	18,348
1988		2,226	13,367	1,944	17,537
1989		1,267	8,020	1,072	10,359
1990		1,901	5,354	570	7,825
1991		2,042	6,556	526	9,124
1992		2,624	7,243	647	10,514
1993		3,235	8,824	509	12,568
1994		1,873	9,349	555	11,777
1995		2,268	9,570	609	12,447
1996		2,099	6,157	229	8,485
1997		3,139	6,429	131	9,699
1998		3,188	4,214	317	7,719
1999		5,846	4,566	59	10,471
2000		3,791	4,956	65	8,812
2001		2,754	5,943	240	8,937
2002		4,108	4,902	432	9,442
2003		3,783	10,469	229	14,481
2004		6,249	11,092	994	18,335
2005		4,131	10,672	611	15,414
2006		2,709	7,331	565	10,605
2007		3,923	4,412	150	8,485
2008		3,457	4,012	135	7,604
2009		1,474	3,835	126	5,435
2010		2,534	1,648	73	4,255
2011		2,621	3,812	110	6,543
2012		1,138	2,168	70	3,376
2013		548	1,069	71	1,688
2014		1,881	754	55	2,690
2015		2,324	1,897	82	4,303
2016		4,290	2,266	81	6,637
2017	121	4,901	2,371	0	7,272

<sup>a</sup>Total age in years for 2016-2017 preliminary estimates from the Kenai River Chinook stock assessment programs, 1986-2015 estimated by Fleischman, S. J., and A. M. Reimer. 2017. Spawner-recruit analyses and

escapement goal recommendations for Kenai River Chinook salmon. Alaska Department of Fish and Game, Fishery Manuscript Series No. 17-02, Anchorage.

Table 2.—2018 Kenai River large early-run Chinook salmon forecasts using several models, and the fit of each model to the previous 5 years of actual runs. Shaded boxes indicate forecasts with the lowest associated MAD and hence were selected to be part of the total run forecast for each age class. Transparent boxes indicate the lowest MAD, MAPE, and MD for each age class. See Table 3 for a description of each model.

Model	Forecast	5-year		
	2018	MAD <sup>a</sup>	MAPE <sup>b</sup>	MD <sup>c</sup>
<b>Age-5</b>				
Mean	3,183	1,360	132%	360
5-year mean	2,789	1,374	93%	-911
Median	2,732	1,222	109%	-75
<b>Forecast estimate</b>	<b>2,732</b>			
<b>Age-6</b>				
Mean	5,950	4,705	372%	4,705
5-year mean	1,671	970	94%	541
Median	5,649	4,402	346%	4,402
Mean sibling	10,049	2,701	143%	2,701
5-year mean sibling	4,755	603	31%	542
Median sibling	8,136	1,821	94%	1,821
Most recent sibling	2,709	590	32%	443
<b>Forecast estimate</b>	<b>2,709</b>			
<b>Age-7</b>				
Mean	409	389	249%	389
5-year mean	58	30	42%	26
Median	235	271	142%	271
Mean sibling	131	51	75%	35
5-year mean sibling	112	43	67%	14
Median sibling	122	46	69%	28
Most recent sibling	0	63	56%	25
<b>Forecast estimate</b>	<b>58</b>			
<b>TOTAL RUN FORECAST</b>	<b>5,499</b>			

<sup>a</sup>mean absolute deviation

<sup>b</sup>mean absolute percent error

<sup>c</sup>mean deviation

Table 3.—Description of models used in forecasting the Kenai River large early-run Chinook salmon.

Model	Description
Mean	Mean using all brood years <sup>a</sup>
5-year mean	Mean of the 2013-2017 run for the specified age class.
Median	Median return of all brood years
Mean sibling	Mean of sibling ratios (age/age minus 1) for all returns multiplied by the return of age minus 1 siblings.
5-year mean sibling	Mean of sibling ratios (age/age minus 1) for previous 5 brood years multiplied by the return of age minus 1 siblings.
Median sibling	Median of sibling ratios (age/age minus 1) for all returns multiplied by return of age minus 1 siblings.
Most recent sibling	Most recent sibling ratio (age/age minus 1), multiplied by the return of age minus 1 siblings.

<sup>a</sup>1981-2012 for age-5 fish, 1980-2011 age-6 fish, 1979-2010 for age-7 fish.

Distribution:

Headquarters: Kelley, Bowers, Taube

Anchorage: Brookover, Hasbrouck, Vania, Erickson, Fleischman, M. Miller, McKinley, J. Miller, Bosch, Blaine, Baumer, Lewis, Templin, Munro

Palmer: Ivey, Oslund, Decovich

Homer: Kerkvliet, Booz

Soldotna: Marston, Eskelin, Frothingham, Perschbacher, Key, Reimer, Shields, Willette