STAFF ANALYSIS
TEMPORARY SPECIAL ACTION REQUEST
FSA23-01

ISSUES

Fisheries Special Action request FSA23-01, submitted by the Native Village of Kwinhagak,[1] requests the Federal Subsistence Board (Board) close the Federal public waters of the Kanektok River drainage to the harvest of Chinook and Chum salmon except by federally qualified subsistence users from June 1 through June 30, 2023, and from June 1 through June 30, 2024.

DISCUSSION

The proponent states it submitted this request because Chum Salmon runs throughout western coastal Alaska are in serious decline with the poorest returns on record, and escapement goals throughout the Arctic-Yukon-Kuskokwim Region are largely not being met. Chinook Salmon all over the state have also been in a long period of decline.

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

50 CFR 100.27(e)(4) Subsistence taking of fish—Kuskokwim Area

(ii) For the Kuskokwim area, Federal subsistence fishing schedules, openings, closings, and fishing methods are the same as those issued for the subsistence taking of fish under Alaska Statutes (AS 16.05060 [emergency orders]), except the use of gillnets with 6-inch or less mesh size is allowed before June 1 in the Kuskokwim River drainage, unless superseded by a Federal Special Action.

[1] Kwinhagak is the Tribe, while Quinhagak is the USGS spelling on maps.

Proposed Federal Regulation

50 CFR 100.27(e)(4) Subsistence taking of fish—Kuskokwim Area

(ii) For the Kuskokwim area, Federal subsistence fishing schedules, openings, closings, and fishing methods are the same as those issued for the subsistence taking of fish under Alaska Statutes (AS 16.05060 [emergency orders]), except the use of gillnets with 6-inch or less mesh size is allowed before June 1 in the Kuskokwim River drainage, unless superseded by a Federal Special Action.

Federal public waters of the Kanektok River drainage are closed to the harvest of Chinook and Chum salmon except by federally qualified subsistence users fishing under these regulations, effective June 1 through June 30, 2023, and from June 1 through June 30, 2024. The Federal Fisheries in-season Manager will adjust Federal subsistence fishing schedules, openings, closures, and fishing methods as needed.

Existing State Regulation

Kuskokwim Area—Subsistence Fishery

5.AAC 01.260. Fishing seasons and periods

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

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(c) In Districts 4 and 5, salmon may be taken at any time, except that from June 1 through September 8, salmon may not be taken for 16 hours before, during, and six hours after each commercial salmon fishing period in each district.

5 AAC 01.275. Waters closed to subsistence fishing

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(c) The Kanektok River is closed to the subsistence taking of fish by nets upstream of ADF&G regulatory markers placed near the mouth 16 hours before, during, and six hours after each open commercial salmon fishing period.

Kuskokwim Area—Commercial Fishery

5 AAC 07.367. Districts 4 and 5 Salmon Management Plan

(a) The objective of the Districts 4 and 5 Salmon Management Plan is to maintain a level of sustained yield which will provide for subsistence needs, the long-term economic health of the commercial and sport fishing industries, and recreational opportunities in the districts and freshwater systems flowing into the districts.

(b) The District 4 commercial salmon fishery is to open before June 16.

(c) When the catch of king salmon in the commercial fishery is less than 50 percent of the catch of king and sockeye salmon combined, the department shall manage, to the extent practicable, the commercial salmon fishery based on the strength of the sockeye salmon return.

(d) Commercial salmon fishing periods are established by emergency order. The department shall allow at least one fishing period per week, unless a severe conservation problem develops.

(e) When a closure of the commercial salmon fishery is required, the department shall decide, on or before the 10th day of the closure, whether to close the sport fishery to the taking of the species of the biological concern and whether additional management actions on the sport fishery are needed.

Note: The Alaska Department of Fish and Game does not anticipate any commercial gillnet openings in Kuskokwim Bay fishing Districts 4 and 5 in 2023 (see Kuskokwim Bay Salmon Fishery Announcement #1 in **Appendix 1**).

Kuskokwim Area—Sport Fishing

5 AAC 71.010. Seasons and bag, possession, annual, and size limits for the Kuskokwim-Goodnews Area

(a) Except as otherwise specified in this section or through an emergency order issued under AS 16.05.060, sport fishing is permitted year round in the waters of the Kuskokwim-Goodnews Area.

(b) Except as otherwise specified in (c) of this section [exceptions]*, the following are the general bag, possession, and size limits for finfish and shellfish in the waters of the Kuskokwim-Goodnews Area:*

> *(1) king salmon 20 inches or greater in length: the bag and possession limit is three fish, of which only two fish may be 28 inches or greater in length;*
>
> *(2) salmon, other than king salmon: the bag and possession limit is five fish, with no size limit;*

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(d) In the Kuskokwim - Goodnews Area, the following special provisions to methods and means apply:

(1) only one unbaited, single-hook, artificial lure may be used in the

(A) Aniak River drainage upstream of Doestock Creek;

(B) Kisaralik River drainage, upstream of 60º 49.50' N. lat., 160º 55' W. long. (Akiak Village Lodge site);

(C) Kwethluk River drainage, upstream of 60º 31.96' N. lat., 161º 05.47' W. long. (Pulamaneq (Pocahontas) Creek);

(D) Kasigluk River drainage;

(E) Kanektok River drainage;

(F) Goodnews River drainage;

(2) in the Kanektok and Goodnews River drainages, downstream of the Togiak National Wildlife Wilderness Area boundary, a person may not sport fish within 300 feet of a legally operating subsistence set gillnet.

Note: The Alaska Department of Fish and Game closed the Kuskokwim-Goodnews Area, including the Kanektok River drainage, to sport fishing for Chum Salmon from April 5 to December 31, 2023, to protect Chum Salmon in periods of low abundance and provide future sport fishing opportunities (see Emergency Order 3-CS-V-02-03 in **Appendix 2**).

Extent of Federal Public Waters

For purposes of this discussion, the phrase “Federal public waters” is defined as those waters described under 50 CFR 100.3. The entire Kanektok River drainage is situated within and adjacent to the exterior boundaries of the Togiak National Wildlife Refuge and Yukon Delta National Wildlife Refuge Federal conservation units and is Federal public waters (**Figure 1**).

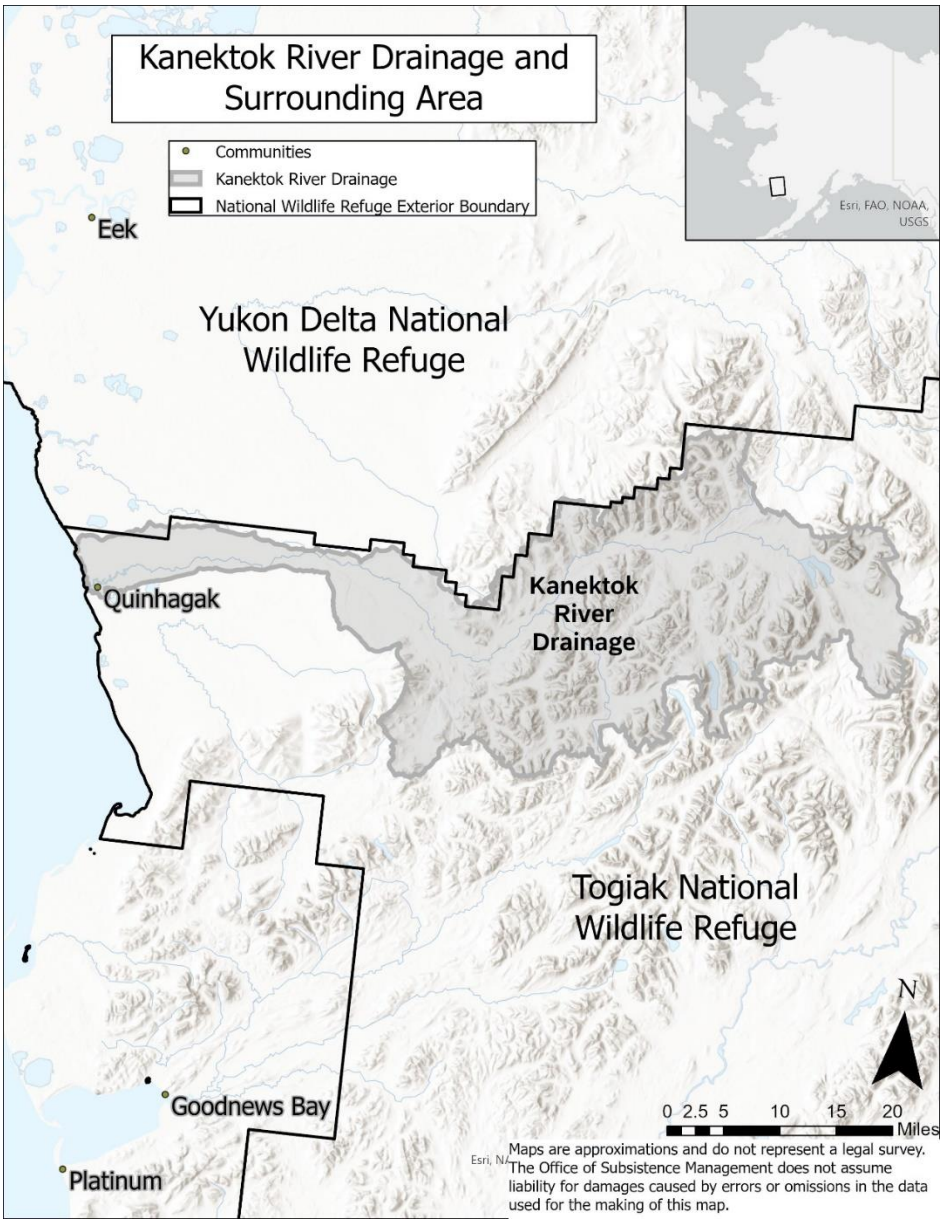

Figure 1. Extent of the Kanektok River drainage and the surrounding area.

Customary and Traditional Use Determination

Residents of the Kuskokwim Area, except those persons residing on United States military installations located on Cape Newenham, Sparrevohn USAFB, and Tatalina USAFB, have a customary and traditional use determination for Chinook and Chum salmon in the Kanektok River drainage. The area includes 40 villages. Presented from south to north, the villages are: Newtok, Tununak, Toksook Bay, Nightmute, Mekoryuk, Chefornak, Kipnuk, Kwigillingok, Kongiganek, Platinum, Goodnews Bay, Quinhagak, Tuntutuliak, Eek, Napakiak, Napaskiak, Kasigluk, Nunapitchuk, Atmautluak, Oscarville, Bethel, Kwethluk, Akiachak, Akiak, Tuluksak, Lower Kalskag, Kalskag, Aniak, Chuathbaluk, Napaimute,

Crooked Creek, Georgetown, Red Devil, Sleetmute, Stony River, Lime Village, Takotna, McGrath, Telida, and Nikolai.

Regulatory History

In the Kuskokwim Management Area, the salmon subsistence fishery was open continuously until 1977 when State managers began closures for 24 hours before, during, and six hours after commercial openings (Tiernan and Poetter 2015). The subsistence fishing closure before commercial fishing periods had since been reduced to 16 hours, and as described below, in 2023, the Alaska Board of Fisheries removed exact subsistence closure times around and during commercial fishing openings in favor of closed subsistence periods being announced through emergency orders.

During the summer of 1987, a growing conflict between subsistence fishermen and sport fishermen along the Kanektok, Togiak, and Goodnews rivers resulted in 10 proposals submitted to the Alaska Board of Fisheries for deliberation during their December 1987 meeting. Problems addressed by the proposals included gear and area conflicts, trespass on private Native lands, wasteful fishing practices, pollution, and unfair State regulations that allowed sport fishing while closing net fishing for conservation reasons (Wolfe 1987, 1988, 1989). The Alaska Board of Fisheries did not adopt any of the proposals (Wolfe 1989). Subsequent to the Alaska Board of Fisheries meeting, a planning process began that resulted in the U.S. Fish and Wildlife Service implementing its Togiak Refuge Public Use Management Plan (PUMP), to address these issues. The PUMP restricts the number of permits available for guided fishing operations and calls for regulating the timing of guided trip starts, party sizes, and camping in the most popular fishing areas. The PUMP does not restrict the amount of unguided use, but it does indicate that long-term management should be directed toward a 50/50 allocation of guided and unguided use (USFWS 2009).

In January 2016, Alaska Board of Fisheries rejected Proposal 105, submitted by the Native Village of Kwinhagak, which requested restricting certain fly-fishing gear to 9-weight rods and low tensile strength line (ADF&G 2016). The Native Village of Kwinhagak said the Chinook Salmon stocks in the Kanektok and Arolik rivers had declined in recent years. By reducing the size of their gear, sport fishermen would decrease their chances of harvesting Chinook Salmon, which are an important food for many Quinhagak residents who rely on Kanektok and Arolik river Chinook Salmon runs.

In January 2023, the Alaska Board of Fisheries rejected Proposal 94, submitted by the Native Village of Kwinhagak, which requested closing sport fishing for Chum Salmon by nonresidents in the Kanektok River from June 1 to July 15 (ADF&G 2023a). The Native Village of Kwinhagak said Chum Salmon throughout western coastal Alaska are in serious decline with the poorest returns on record and escapement goals throughout the region largely not being met. The Board of Fisheries amended Poposal 94 to change the date from July 15 to June 30 based on public comment 17 submitted by the Native Village of Kwinhagak. The Board of Fisheries voted 2-5 and the motion to pass Proposal 94 failed. The Board of Fisheries cited a lack of conservation concerns for Chum Salmon at the time and that ADF&G can address any concerns through emergency order authority as justification for the the vote (Marit Carlson-Dort, Board of Fisheries meeting, January 18, 2023; 9:27:12 AM, weblink).

Also in January 2023, the Alaska Board of Fisheries adopted Proposal 92, submitted by ADF&G, with an amendment that removed exact subsistence closure times around and during commercial fishing openings in favor of closed subsistence periods being announced through emergency orders. The regulation reads:

> *(c) In Districts 4 and 5, salmon may be taken at any time, except* ***that the commissioner may, by emergency order, close the subsistence fishing periods in the waters of Districts 4 or 5 and reopen those waters to commercial fishing****.* ~~*From June 1 through September 8, salmon may not be taken for 16 hours before, during, and six hours after each commercial fishing period in each district.*~~

Further Proposal 92 amends 5 AAC 01.275(c) to read:

> *(c) The* ***commissioner may, by emergency order, close the*** *Kanektok River* ~~*is closed*~~ *to the subsistence taking of fish by nets upstream of ADF&G regulatory markers placed near the mouth* ~~*16 hours*~~ *before, during, and* ~~*six hours*~~ *after each open commercial salmon fishing period.*

The Alaska Board of Fisheries is scheduled to meet on April 19, 2023, for the sole purpose of taking action on Proposal 173, submitted by the Native Village of Kwinhagak, which was inadvertantly overlooked during its regular meeting on January 14–18, 2023 (ADF&G 2023b). Proposal 173 requests the Board to modify regulations in the subsistence fishery: in District 4, between June 1 and July 15, only one gillnet may be operated per boat, the aggregate length of a set gillnet or drift gillnet may not exceed 50 fathoms, and subsistence fishing for salmon will be closed on Sundays between June 1 and July 15.

Proposal 173 also requests modification of regulations for the commercial fishery: in District 4, between June 1 and July 15, only one gillnet may be operated per boat and commercial fishing for salmon will be closed on Sundays.

The Native Village of Kwinhagak said:

> In an effort to conserve Kuskokwim Area king and chum salmon and to respect local customs and practices, the Native Village of Kwinhagak proposes regulatory changes to subsistence and commercial salmon fishing gear and operations. While the NVK supports commercial fishing opportunities on surplus salmon, proposing more restrictive gear and gear operations for subsistence fishing than is allowed in the commercial fishery is of concern, which is why the NVK is proposing these gear restrictions apply to both the subsistence and commercial fisheries (ADF&G 2023b).

Biological Background

Species Overview

The Kanektok River drainage supports all five species of North American Pacific salmon (Poetter et al. 2016). Of the five species, Chinook and Sockeye salmon are the predominant salmon species harvested in subsistence fisheries by residents of Quinhagak since 2008 (McDevitt and Koster 2022). However, Chum Salmon surpassed subsistence harvest of Sockeye Salmon in seven years between 1990–2007 (McDevitt and Koster 2022). Chinook and Chum salmon are the focus of this Federal Special Action request and the information provided in this section will reflect that.

Distribution and Run Timing

Chinook and Chum salmon are distributed throughout much of the Kanektok River drainage and have similar run timing as in the Kuskokwim River (Giefer and Graziano 2022, Smith et al. 2022). Chinook Salmon begin entry into the Kuskokwim River in late May and diminish in early July. Chum Salmon begin entry into the Kuskokwim River in mid-June and diminish in late July. Currently there is no real-time run timing assessment of Chinook or Chum salmon in the Kanektok River drainage but historical mid river estimates are available for a weir that was operated 2001–2015 (Smith at al. 2022). Relative run timing may also be estimated from commercial catch statistics of salmon harvest in District 4. Historical Chinook Salmon passage at the Kanektok River weir located mid river occurred from late June to early July 2001–2015 (ADF&G 2022). Historical Chum Salmon passage through the Kanektok River weir located mid river occurred in late June in all years 2001–2015, except 2007 when the first reported Chum Salmon passed the weir on June 19 (Clark and Linderman 2009, ADF&G 2022). The weir provided information to assess the escapement and run timing for Chinook and Chum salmon spawning in the Kanektok drainage in areas above the weir location; however, as previously noted, Chinook and Chum salmon spawn throughout the drainage including areas below the weir (Taylor 2014).

Escapement Monitoring

Attempts to establish a viable method for assessing salmon escapement to the Kanektok River have largely been unsuccessful. These methods, including counting towers (1960–1962, and 1999), hydroacoustic sonar operations (1982 through 1987), aerial index surveys (1980–present), and resistance board weirs (2000–2015), have all been implemented with varying degrees of success (ADF&G 1960, 1962, Schutz and Williams 1984, Huttunen 1984, 1988, Fox 1997, Menard and Caole 1999, Lindermann 2000, Burkey et al. 2001, Estensen and Diesinger 2004, Smith et al. 2022). Evaluation of Chinook and Chum salmon escapement in the Kanektok River currently occurs through aerial surveys and inferrences from historical weir-based data (Smith et al. 2022).

Aerial surveys offer a cost-effective method of obtaining escapement data across a wide and remote area such as the Kanektok River. However, survey results may be highly variable, and accuracy is dependent upon factors such as water turbidity, flight visibility, type of aircraft (for example, helicopter or fixed-wing), survey altitude, observer experience, and survey species of interest (Jones et al. 2007). Aerial survey estimates generally underestimate the true abundance because of these variables. The die-off of

early, and arrival of late spawners to spawning grounds may further confound abundance estimates. Aerial estimates in a river system may exhibit a wide range in the proportion of spawning fish estimated from season to season (Neilson and Green 1981, Jones et al. 2007). Peak abundance aerial surveys may therefore be a more suitable index of relative abundance to observe potential trends in the escapement. It is worth noting that aerial survey estimates of observed Chinook and Chum salmon represent minimum spawning escapements within the Kanektok River and do not represent the entire spawning population. Surveys are typically flown within the standardized peak spawning abundance date range of July 17 through August 5 for Chinook Salmon, and July 20 through July 31 for Chum Salmon. However, unlike for Chinook Salmon, aerial surveys are not as effective for Kanektok River Chum Salmon as they are typically less visible at survey flight altitudes (Tiernan et al. 2018).

Weirs are temporary or permanent physical structures that are built across a body of water to pass or capture fish through a chute or trap. Weirs are often used to gather data on run-timing, age-structure, and relative abundance, to help guide management decisions of migratory species such as Chinook and Chum salmon (Hubert 1996, Zimmerman and Zabkar 2007). In areas where fisheries are managed for escapement goals, weirs are useful for monitoring escapement to inform in-season management of subsistence, commercial, or sport fish fisheries. The use of weirs is often restricted to small rivers and streams due to material/construction expense and a tendency of weirs to become clogged with ice or debris, which can lead to collapse and failure of the structure (Hubert 1996). The success of a weir relies in part upon site selection where the weir is installed in a river. Considerations must be given to not only the location of the weir in relation to spawning areas, but also to the physical characteristics of the river including substrate, flow, depth, width, and timing of high water events. For example, weirs installed upstream of known spawning areas are likely to underestimate escapement. Similarly, weirs that are installed in areas that do not have wide and shallow areas of stable gravel or small cobbles may prevent the structure from laying flat on the substrate, or create gaps beneath the structure where fish may pass undetected.

The ADF&G have conducted aerial surveys to assess Chinook Salmon escapement goals for Kanektok River salmon since 1980 (**Table 1**, Smith and Gray 2022). The ADF&G currently manages for a Chinook Salmon Sustainable Escapement Goal (SEG) range of 3,900–12,000 individuals (Liller and Savereide 2022, Smith and Gray 2022). Aerial survey estimates of Kanektok River Chinook Salmon have been within the SEG range in 8 of the last 10 years excluding, 2013 and 2014 (**Table 1**, Smith and Gray 2022, Smith et al. 2022). Surveys in 2017 and 2022 were either not flown or survey conditions did not meet an acceptable survey criterion (Smith et al. 2022).

Aerial survey data for Chum Salmon escapement to the Kanektok River are scant, and currently there are no escapement goals for Chum Salmon escapement to the Kanektok River. Assessment of Chum Salmon escapement to the Kanektok River is done through limited historical aerial survey and weir data (Smith and Gray 2022). Chum Salmon aerial survey estimates are reported for 5 years within the 42-year period (1980–2021) of aerial survey data reported by ADF&G (Smith and Gray 2022). The ADF&G no longer conducts aerial surveys for assessing escapement of Chum Salmon to the Kanektok River. The last reported aerial survey estimate of Chum Salmon in the Kanektok River was 23,656 fish in 1996.

In addition to aerial surveys, ADF&G successfully operated a weir on the Kanektok River (2001–2015) to assess Chinook and Chum salmon (**Table 2**, Estensen and Diesinger 2003, Taylor 2014b, Smith et al. 2022). Operational periods of the weir varied during 2001–2015, but operated approximately June 25–August 15 each season (**Table 2**, Smith et al. 2022). The weir was discontinued at the end of 2015 due to funding reductions and the absence of a commercial fishery during that time (Dickerson et al. 2019, Smith et al. 2022). During the last year of weir operations in 2015, 10,416 Chinook Salmon and 15,048 Chum Salmon passed through the weir.

Table 1. Kanektok River Chinook and Chum salmon aerial survey estimates (source: Smith and Gray 2022).

Year	Chinook	Chum
1980	6,172	a
1981	a	69,325
1982	a	a
1983	8,890	
1984	12,182	a
1985	13,465	46,830
1986	3,643	a
1987	4,213	a
1988	11,180	20,056
1989	7,914	a
1990	a	a
1991	a	a
1992	a	4,330
1993	a	a
1994	7,386	a
1995	a	a
1996	a	23,656
1997	a	a
1998	a	a
1999	a	a
2000	a	a
2001	6,510	a
2002	a	a
2003	6,206	a
2004	28,375	a
2005	12,780	a
2006	a	a
2007	a	a
2008	3,659	a
2009	a	a
2010	1,208	a
2011	a	a
2012	a	a
2013	2,277	a
2014	1,840	a
2015	4,919	a
2016	5,631	a
2017	a	a
2018	4,246	a
2019	7,212	a
2020	4,405[b]	a
2021	4,115	a

Note: Aerial surveys are those rated as fair to good, obtained between July 17 and August 5 for Chinook Salmon and July 20–31 for Chum Salmon.

a = Survey either not flown or did not meet acceptable survey criteria.

Table 2. Kanektok River Chinook and Chum salmon escapement, 2001-2022 (source: Tiernan and Gray 2018).

Operation	Year	Operating period[a]	Chinook	Chum
Weir	2001	08/10 to 10/03	2,795 [b]	9,021[b]
Weir	2002	07/01 to 09/20	5,360 [c]	41,912[c]
Weir	2003	06/24 to 09/18	8,290	40,086
Weir	2004	06/29 to 09/20	19,745	46,008
Weir	2005	06/25 to 09/18	14,233	55,340
Weir	2006	Non-operational	n/a	n/a
Weir	2007	06/19 to 09/18	14,120	131,055
Weir	2008	07/17 to 08/21	9,799 [c]	53,605[c]
Weir	2009	07/05 to 08/11	7,065	55,846[c]
Weir	2010	06/28 to 08/05	6,537	68,186
Weir	2011	06/27 to 08/15	5,170	53,050
Weir	2012	07/06 to 08/15	1,561 [a]	28,726[a]
Weir	2013	06/25 to 08/15	3,569	43,040
Weir	2014	06/25 to 08/15	3,594	18,602
Weir	2015	06/25 to 08/15	10,416	15,048

[a] The operational period is inclusive of days when passage was estimated; unless noted otherwise, less than 20% of the total annual escapement is estimated.
[b] Field operations were incomplete and total annual escapement was not estimated.
[c] Field operations were incomplete; sum of daily counts is an underestimate of total escapement but considered reasonable. Additional estimates were not made.

Age Composition

Age class assessment of Kanektok River Chinook and Chum salmon is limited for recent years, but was determined through samples collected at the Kanektok River weir during 2002–2013 (**Appendix 3**, **Appendix 4**, Estensen and Diesinger 2003, Taylor 2014b). Chinook Salmon returning to the Kanektok River drainage usually complete their spawning migrations between the ages of 3 and 7, with the majority returning at ages 4 and 6 (**Appendix 3**),whereas Chum Salmon returning to the Kanektok River drainage usually complete their spawning migrations between the ages of 3 and 6, with the majority returning at age 4 and 5 (**Appendix 4**).

Run Size/ Run Strength

The primary means of assessing annual run strength of Kanektok River Chinook and Chum salmon is approximated through in-season commercial catch statistics and subsistence reports (Smith and Gray 2022). Commercial catch statistics may be compared with historical information; however, confounding variables and inconsistenceies may affect the usefulness of this method. For example, the number of fishers participating in a commercial fishery and the number and length of commercial fishing openers may have an effect on the catch or effort applied by participants in a commercial fishery (Smith and Gray 2022).

Commercial salmon harvest records of Chinook and Chum salmon in District 4, Kuskokwim Bay near the Kanektok River (**Figure 2**), are available for the period 1960–2022 (**Appendix 5**, Smith et al. 2022). However, commercial salmon harvest estimates for Chinook and Chum salmon are available for only two of the past 6 years, 2020 and 2021 (**Table 3**). No commercial harvest took place in District 4 2016–2019 because there was no commercial buyer (Smith et al. 2022).

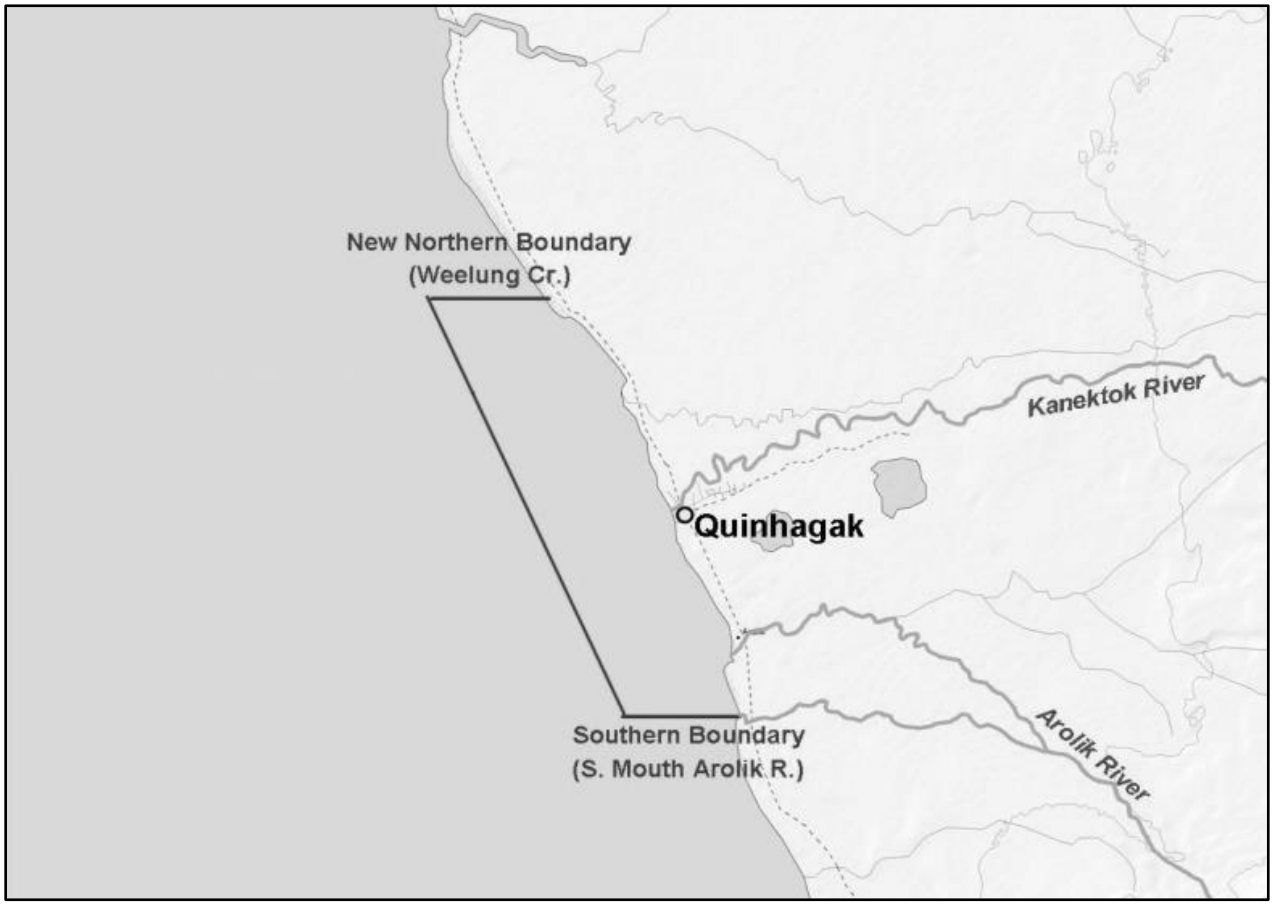

Figure 2. Map of commercial fishing District 4, Kuskokwim Management Area (source: Smith and Gray 2022).

Table 3. District 4 commercial salmon harvest 2001-2021, including personal use (source: Smith and Gray 2022).

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
2001	12,775	33,807	18,531	0	17,209	82,322
2002	11,486	17,820	26,695	0	29,319	85,320
2003	14,444	33,941	49,833	0	27,868	126,086
2004	25,465	34,661	82,398	0	25,820	168,344
2005	24,195	68,801	51,708	19	13,529	158,252
2006	19,004	106,424	26,831	0	39,151	191,410
2007	19,575	109,517	34,710	0	62,232	226,034
2008	13,812	69,776	95,073	0	57,663	236,324
2009	13,920	112,153	48,115	0	91,158	265,346
2010	14,230	138,362	13,690	0	106,610	272,892
2011	15,387	38,543	30,457	0	104,959	189,346
2012	6,675	37,688	31,214	0	61,140	136,717
2013	2,054	26,393	21,126	0	58,079	107,652
2014	2,265	58,879	52,317	0	14,563	128,024
2015	7,547	30,269	76,285	0	16,051	130,152
2016[a]	a	a	a	a	a	a
2017[a]	a	a	a	a	a	a
2018[a]	a	a	a	a	a	a
2019[a]	a	a	a	a	a	a
2020	4,345	113,849	29,374	0	6,531	154,099
2021	2,468	78,462	13,012	29	5,310	99,281
Average 2007–2020	9,981	73,522	43,188	0	57,735	184,426

[a] No commercial fishery occurred

Cultural Knowledge and Traditional Practices

Subsistence activities in the Kanektok (*Qanirtuuq*) River drainage are conducted primarily by the community of Quinhagak (*Kuinerraq, Kuingnerraq*). Quinhagak is a long-standing Yup'ik community situated near the mouth of the Kanektok River on the east shore of Kuskokwim Bay, less than a mile from the Bering Sea coast. Quinhagak is a 45-minute flight from Bethel and is otherwise accessible by boat or snowmachine. The population of Quinhagak, estimated at 776 people in 2020, has more than doubled since 1960, and most residents, over 90%, are originally from the community (Ikuta et al. 2016, ADCCED 2022). Yup'ik people have lived and traveled along the Kanektok and nearby Arolik (*Agalik*) rivers for millennia (Dumond 1987, Rearden and Fienup-Riordan 2013). Residents of other villages, including Eek, Kwethluk, Togiak, and Twin Hills, also are known to use the Kanektok River drainage to harvest fish for subsistence, though on an occasional basis (Wolfe 1987).

Quinhagak is highly dependent on salmon. Based on house-to-house surveys conducted in 2013 by Subsistence Division, ADF&G, 50% of Quinhgak's annual harvest of wild resources for subsistence, in pounds of edible weight, was fish, of which over half was salmon (103 lbs per person). Residents harvest salmon for subsistence depending on the run timing and the weather. Cool and dry weather, which is best for drying salmon, usually occurs in early summer during the Chinook Salmon run and in early fall. Most of the subsistence salmon in Quinhagak is cut, air dried, and smoked for later use. Another factor

affecting subsistence salmon harvest is commercial fishing openings. In the 1980s subsistence salmon fishing was prohibited 24 hours before, during, and 6 hours after the commercial period in Commercial Fishing District 4, which includes the Kanektok River. Wolfe (1987) observed that subsistence fishers had adapted to the commercial fishing schedule, which ultimately reduced their opportunities for harvesting. He wrote,

> The result can be a substantial reduction in potential subsistence fishing opportunities from about the second week in June through the second week of September. The community has adjusted to these restrictions in time by taking the majority of the community's salmon with nets just before and just after the commercial fishing season, during late May and early June, and during September and October. Some residents do fish with nets between commercial periods, generally drifting them in the river. Some also used rod and reel for taking subsistence salmon during the commercial season. So, rod and reel fishing can be at times the only gear type allowed seven days a week in the Kanektok River (Wolfe 1987:5–6).

The subsistence fishing closure before commercial fishing periods had since been reduced to 16 hours, and as mentioned in the Regulatory History section, above. In 2023, the Alaska Board of Fisheries removed exact subsistence closure times around and during commercial fishing openings in favor of closed subsistence periods being announced through emergency orders.

Along the Kanektok River, there are a large number of seasonal camps used for fishing and other subsistence activities. The highest concentration of camps is along the lower 15 miles (Wolfe 1987).

In the 1980s, sport fishing began to increase rapidly on the Kanektok River due to an increase in the number of guides and expansion of previously existing guiding operations. This created conflicts with subsistence users and prompted local residents and some sport fishing guides to express concern over the growing sport fishery. Residents worked with Togiak National Wildlife Refuge (Refuge) to recognize private property rights of native allotment holders along the Kanektok River and to place limits on the number of commercial guiding permits issued by the Refuge, which helped to control the level of recreational use (USFWS 2009).

One local concern over growing numbers of sport fishermen on the river was ideological, the way in which fish were treated (Wolfe 1987, 1988; USFWS 2009; Rearden and Fienup-Riordan 2013). Rearden and Fienup-Riordan (2013) explain: "[The conflict illustrates] the disparity between the non-Native view of fish as a finite, renewable resource that can and should be managed in a rational scientific manner and the Yup'ik view of animals as responsive beings who must be shown care and respect lest they take offense and disappear from view." They further explained, "To hook a fish in the mouth and then replace it in the water constitutes senseless abuse, not sport. Catch-and-release fishing is referred to in the Yup'ik language using the verb base *naanguar-* ('to play using objects as toys'), and activities of [anglers] are viewed as literally "playing with food."

Quinhagak's mixed subsistence-cash based economy is further described in the findings of a house-to-house survey conducted in 2013 by Subsistence Division, ADF&G (Ikuta et al. 2016). The top wage

source in 2013 for residents of Quinhagak was local government, providing 61% of the community's total wage income and 46% of jobs held by employed residents. Next was services providing 14% of wage income and 22% of jobs, and third was forestry and fishing providing 12% of wage income and 26% of jobs.

The amount of the community's income earned or number of jobs in the sport fishing industry in 2013 could not be determined based on available information.

Harvest History

Commercial Harvest

The Management Area consists of the entirety of the Kuskokwim River drainage, and all waters that flow into the Bering Sea in an area between the Cape Newenham and the Nakonset Peninsula, including Nunivak and St. Mathew Islands. Management of commercial salmon fisheries in the Management Area is in accordance with State of Alaska's Kuskokwim River (5 AAC 07.365) and Districts 4 and 5 (5. AAC 7.367) salmon management plans.

Four commercial districts and two sub-districts comprise the Management Area. District 1 including Subdistricts 1-A and 1-B, and District 2 are located within waters of the Kuskokwim River. District 3, the Upper Kuskokwim River area, was removed from regulation in 1966 (Smith and Gray 2022).

District 4, established in 1960 consists of Kuskokwim Bay marine waters near Quinhagak between the northernmost mouth of Weelung Creek and the southernmost edge of the mouth of the Arolik River (**Figure 2**). The northernmost boundary of District 4 has moved several times in recent years. The northernmost boundary was moved south 3 miles from its current location at the northernmost mouth of Weelung Creek to the southern edge of Oyak Creek during the January 2001 Board of Fisheries meeting. At the time it was believed that salmon bound for the Kuskokwim River were intercept in the District 4 commercial fishery. In January 2004, the Alaska Board of Fisheries expanded the northern boundary back to the previous location at the northernmost mouth of Weelung Creek citing it was not possible to quantify any reduction in harvest of Kuskokwim River bound stocks during 2001–2003. The current boundary area extends 3 miles from the coast into Kuskokwim Bay.

District 5 is located in that area of Goodnews Bay east of a line from ADF&G regulatory marker approximately two miles south on the seaward side of the entrance to Goodnews Bay and west of a line between the mouth of Ukfigag Creek and the mouth of the Tuntulik River.

The District 4 commercial salmon fishery is to open before June 16 (5 AAC 07.367) and close September 8 (5 AAC 07.310). Commercial fishing periods within District 4 and 5 are established by emergency order and, unless a severe conservation problem develops, ADF&G shall allow at least one fishing period per week. The 2021 commercial fishing season in District 4 began on July 2, ended August 13, and was opened a total of 24 times during this period (Smith and Gray 2022). The delay from the normal start date of June 15 was due to Chinook Salmon conservation concerns (ADF&G 2021).

In recent years the Management Area fisheries in District 4 experienced limited processing capacity for Chinook and Chum salmon (Smith and Gray 2022). Prior to 2013, two fish processing facilities operated in the Management Area, a fish and shellfish processing plant in Bethel and the Coastal Village Seafood processing facility near Platinum. The Bethel fish and shellfish processing facility closed in 2013, followed in 2016 with the closure of Coastal Village Seafood's Platinum facility. A single salmon processor operating in the Management Area provided limited commercial harvest opportunities despite there being no registered catcher-sellers in District 4 in 2020 and 2021. In 2022, no processor returned to the Kuksokwim Bay area and no commercial fishing occurred.

The District 4 commercial fishery targets Chinook, Sockeye, Coho, and Chum salmon. Pink Salmon are harvested incidentally and are the least commercially valuable salmon species. Chinook and Chum salmon, the focal species of this analysis, have been harvested in commercial fisheries throughout the Management Area. However, recent years have seen an increase in the number of Special Management Actions and Emergency Closures restricting salmon harvest within Districts 1 and 2.

Participation in the District 4 commercial fishery since 1980 has averaged 223 permit holders per year and ranged from 67 to 408 annual permit holders per year (Smith and Gray 2022). However, participation in 2020 and 2021 was among the lowest on record. In 2021 alone, 74 total permit holders participated in the fishery with an average of 29 permit holders participating per commercial period (range 1–54) (Smith and Gray 2022). The record low participation in 2020 and 2021 is attributed to processor limitations in the region and buying restrictions imposed from the lone processor operating in the region. Commercially caught fish were only purchased from those sellers approved by the Independent Fishermen of Quinhagak Cooperative, which included permit holders from Eek, Quinhagak, and Goodnews Bay.

The commercial harvest of Chinook Salmon in District 4 has varied throughout the past 60 years (**Appendix 5**). Since 2001, the commercial harvest of Chinook Salmon in District 4 ranged from 2,054 fish in 2013 to 25,465 fish in 2004 (**Table 3**). Since 2012, Chinook Salmon commercial harvest has been below the 10-year average of 9,981 fish, which does not include years when no commercial fishery occurred because of no commercial buyer (**Table 3**). The 10-year average of total commercial harvest of Chinook Salmon in District 4 (**Table 3, Appendix 5**) decreased approximately 56% from 1998–2007 to 2008–2021. The 2021 District 4 commercial harvest of Chinook Salmon in District 4 (**Table 3**) was ranked as the third lowest since 1968 when 8,879 fish were harvested (Smith and Gray 2022). The 2021 commercial harvest of Chinook Salmon is a 75% decrease from the 10-year average, 2008–2021 (**Table 3**). The low harvest of Chinook Salmon in 2021 may be attributed to a reduced commercial harvest effort given the delayed opening of the commercial fishery, or a reduction in fish available for harvest.

For Chum Salmon in District 4, commercial harvest has also varied over the past 20 years. Chum Salmon harvest occurred from lows of around 5,300 fish in 2021 to highs of approximately 106,600 fish in 2010 (**Table 1**). The 10-year average of total commercial harvest of Chum Salmon in District 4 increased approximately 58% from 1998–2007 to 2008–2021 (**Table 3, Appendix 5**). The 2021 District 4 commercial harvest of 5,310 Chum Salmon was the lowest harvest observed on record since 1967 when 8,087 fish were harvested (Smith and Gray 2022). The commercial harvest of 6,531 Chum Salmon in

2020, and 5,310 Chum Salmon in 2021 is a decrease of 87% and 91% from the 10-year average (**Table 3**).

Subsistence Harvest

Residents of Quinhagak harvest the majority of their salmon from both marine waters and freshwaters of the Kanektok River drainage. They harvest salmon using rod and reel or using other subsistence gear such as gillnets and by removing salmon from their commercial fishing catches (Ikuta et al. 2016). The estimated harvest of salmon has ranged from highs of 12,511 fish in 1990 and 12,393 fish in 2017 to a low of 5,795 fish in 2003 (**Table 4**). A mix of Chinook, Coho, Chum, and Sockeye salmon are harvested. The recent five-year 2016–2020 average harvest was estimated at about 4,800 Chinook, 1,100 Chum, 1,700 Coho, and 2,500 Sockeye salmon for a total of about 10,100 salmon. The estimated harvest in 2021 was about 2,700 Chinook, 800 Chum, 1,100 Coho, and 3,200 Sockeye salmon for a total of about 7,800 salmon. Based on a house-to-house survey of the harvest of all wild resources for home use that was conducted in Quinhagak for 2013, the majority of salmon in 2013 was taken with subsistence gear such as gillnets (**Figure 3**).

Table 4. The estimated harvest of salmon for subsistence 1990–2021 by the community of Quinhagak (source: McDevitt and Koster 2022).

Salmon Species	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Chinook	3,881	3,753	4,394	3,634	3,977	2,864	3,506	3,186	3,774	2,815	3,053
Chum	3,161	1,631	2,287	1,053	1,401	669	943	572	1,375	1,587	895
Coho	3,799	3,230	3,291	2,029	2,544	2,480	1,734	1,105	1,537	1,781	1,042
Sockeye	1,710	1,818	1,448	1,228	962	597	499	460	1,368	1,433	1,368
Total	12,551	10,432	11,420	7,944	8,884	6,610	6,682	5,323	8,054	7,616	6,358

Salmon Species	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2012
Chinook	3,177	2,649	2,563	4,563	3,505	5,163	4,686	3,125	3,312	2,793	2,588	2,396	2,396
Chum	808	2,011	559	1,383	994	2,754	2,249	1,794	1,557	1,347	1,255	2,001	2,001
Coho	1,719	1,133	1,868	1,435	1,558	1,315	1,550	1,869	1,824	1,599	1,369	1,380	1,380
Sockeye	1,054	909	805	1,375	1,745	3,128	1,755	2,097	1,960	1,719	1,582	2,015	2,015
Total	6,758	6,702	5,795	8,756	7,802	12,360	10,240	8,885	8,653	7,458	6,794	7,792	7,792

Salmon Species	2013	2014	2015	2016	2017	2018	2019	2020	2021	2016–2020 average	2011–2020 average
Chinook	3,143	3,723	3,082	4,822	5,217	3,592	5,690	4,757	2,728	2,793	2,588
Chum	1,958	1,959	691	848	1,592	1,575	721	829	842	1,347	1,255
Coho	1,087	2,240	2,238	2,014	1,734	1,486	1,791	1,395	1,105	1,599	1,369
Sockeye	2,158	2,939	1,065	1,691	3,850	2,622	2,537	2,000	3,170	1,719	1,582
Total	8,346	10,861	7,076	9,375	12,393	9,275	10,739	8,981	7,845	7,458	6,794

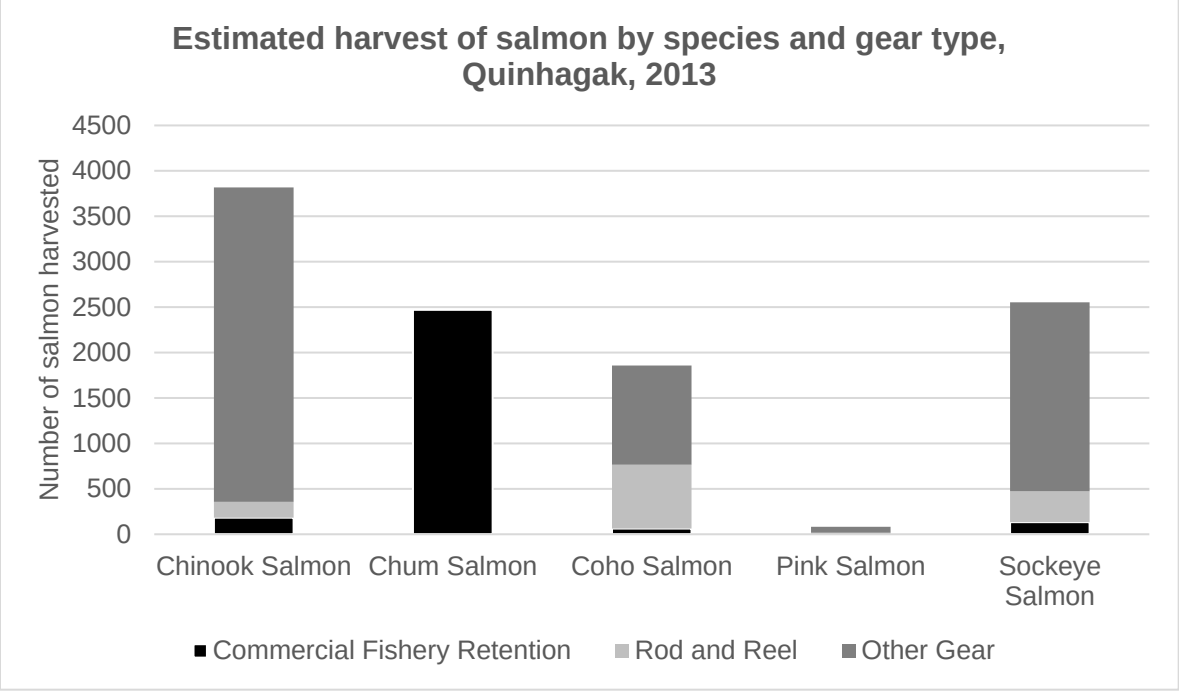

Figure 3. The estimated harvest of salmon by species and gear type in Quinhagak in 2013 based on house-to-house harvest surveys (source: Ikuta et al. 2013).

Sport Harvest

Kuskokwim Bay tributaries, primarily the Kanektok and Goodnews river drainages, contribute to most of the sport fishing effort in the Kuskokwim-Goodnews Management Area. Sport fishing is mostly conducted by nonresidents of Alaska who travel to the Kanektok River to target Rainbow Trout along with Chinook and Coho salmon. Chum Salmon may also be targeted, but to a lesser extent than Rainbow Trout and Chinook and Coho salmon. (Chythlook 2022). The U.S. Fish and Wildlife Service published a revised Comprehensive Conservation Plan for the Togiak National Wildlife Refuge (Refuge) in 2009 that includes a description of sport fisheries in the area and along the Kanektok River (USFWS 2009). This information is annotated, below, from the Comprehensive Conservation Plan.

There are a number of remote, exclusive fishing lodges in the region catering to catch-and-release anglers. Guests from these lodges are able to reach many sites by float plan and raft during their visits. Access to the Refuge today is primarily by plane, boat, or snowmachine. Most visitors fly from Anchorage to Dillingham or Bethel. From there, visitors hire an air taxi to either take them directly into the Refuge by landing on one of the rivers or lakes or to one of the smaller communities. Then, visitors can use a motorboat to go upriver into the Refuge. Other visitors who stay at lodges outside the Refuge are taken by float plane to these same rivers and lakes (USFWS 2009).

Fishing trips on the Refuge typically involve several nights of tent camping, although fly-in, day-use opportunities are available as well. Commercial support services, including guiding, outfitting, and air

taxis are well-established on the Refuge. The majority of recreational visitors rely on air taxis for access and about half rely on guides (USFWS 2009).

Recreational fishing use on the Refuge increased substantially during the 1980s, and along with that increase came concerns about litter, levels of motorboat use, loss of wilderness values, and other issues. The Public Use Management Plan (PUMP), completed in 1991, was developed to address these issues. The PUMP restricts the number of permits available for guided fishing operations and calls for regulating the timing of guided trip starts, party sizes, and camping in the most popular fishing areas. The PUMP does not restrict the amount of unguided use, but it does indicate that long-term management should be directed toward a 50/50 allocation of guided and unguided use. In most areas of the Refuge, unguided fishing has increased as a proportion of all fishing so that, in a typical year, it accounts for at least 50 percent of total use days (USFWS 2009).

Guided use, which is limited by permit availability and permit stipulations, has fluctuated around the same level since 1991. In contrast, unguided use, almost all related to fishing, has increased well over 100 percent from 1,170 use days in 1990 to 4,507 use days in 2007 (USFWS 2009).

Within the Togiak Wilderness, guided float operators are permitted to start at Kagati Lake, the source of the Kanektok River, every other day during the summer months. Guided float operations are awarded through a competitive prospectus bid system. The annual average is about 20 guided float starts for the peak season, June through August. Annual guided float use has averaged close to 800 clients use days from 1990 through 2007 on the Kanektok River. Guided motorized operations are also allowed within the Wilderness Area and average 542 client use days since 1990. There may be as many as 12 rafts and five or six guided motorboat groups on the river at a time (USFWS 2009).

Permits for guide camps below the Wilderness boundary on the Kanektok River are not managed by the Refuge. Rather they are obtained through private land holds or through Qanirtuuq Incorporated, the Native village corporation in the village of Quinhagak. According to Refuge staff, observations indicate use on lower river may have increased over time, but multiple access points and limited jurisdiction make it difficult to obtain accurate assessments of the level of use by refuge visitors (USFWS 2009).

Unguided fishing is not constrained by permit requirements and has fluctuated from an average of 1,300 use days during 1990–1994 to an average of 1,900 use days during 1995–1999 to an average of 1,760 use days during 2000–2007. These estimates were gathered from air taxi reports and represent use on both the upper (Wilderness) and lower (non-Wilderness) portions of the Kanektok River. Therefore, the estimates of unguided use cannot be directly compared to those of guided use, which represent upper (Wilderness) use days only (USFWS 2009).

Best available information indicates that in 2009, on average, 40 unguided trips begin from the put-in at Kagati Lake each summer. Unguided fishing now accounts for about 51% of recreational use along the Wilderness section of the Kanektok River. During peak fishing periods (Chinook and Coho salmon runs), there are typically 10–14 unguided recreational fishing groups along this 58-mile stretch of river at one time (USFWS 2009).

Most sport fishing effort in the Kanektok River drainage is catch-and-release. In catch and release fishing, anglers immediately release live fish back to the water where they are caught. The “catch” is the number

of fish caught, and the "harvest" is the number of fish retained, if any (**Table 5**). Sport fishing effort and harvest are estimated and reported using a mail survey. There was also a guide logbook program that operated 2006–2016 concentrating on guided clients and businesses. The number of salmon caught and the number harvested describes both guided and unguided fishing (Chythlook 2022).

For Chinook Salmon, estimated sport fishery catches in the Kanektok River drainage peaked at about 13,500 fish in 2019. From 2011 through 2020, catches ranged from 0 to 13,500 Chinook Salmon; there were no reported catches in 2020 because of the COVID-19 travel restrictions and precautions through most of the season (**Table 5**). In general, more fish are caught in the Kuskokwim Bay streams than the Kuskokwim River drainage streams because emergency order closures in the Kuskokwim River drainange have redirecting effort to areas where Chinook Salmon can be legally caught such as the Kanektok River drainage (Chythlook 2022).

For Chum Salmon, estimated sport fishery catches in the Kanektok River drainage peaked at about 21,500 fish in 2006; and from 2011 through 2020, catches ranged from 0 to 15,000 Chum Salmon, with the 2020 year being an anomaly reflecting the COVID-19 travel restrictions and precautions through most of the season (**Table 5**, Chythook 2022).

Participation in the sport fishery is estimated and measured in angler days (number of anglers/days fished). For all salmon species, estimated angler days peaked at about 9,500 angler days in 2015; and from 2011 through 2020, angler days ranged from 61 to 9,500. Again, 2020 was an anomaly because of the COVID-19 travel restrictions and precautions through most of the season (**Table 5**, Chythlook 2022).

Table 5. The estimated harvest and catch of salmon by species by the sport fishery in the Kanektok River drainage 2001–2021 (source: Chythlook 2022).

Year	Chinook Harvest	Chinook Catch	Chum Harvest	Chum Catch	Coho Harvest	Coho Catch	Sockeye Harvest	Sockeye Catch	Angler Days
2001	947	10,842	43	6,457	2,448	21,941	83	1,415	9,063
2002	779	3,815	446	10,779	1,784	10,922	73	1,423	5,885
2003	323	3,480	14	7,138	1,076	19,257	107	5,082	7,655
2004	228	2,758	33	4,715	1,362	23,845	112	1,330	6,364
2005	520	10,116	108	9,241	1,006	13,279	156	5,692	5,789
2006	754	7,292	145	21,528	1,742	12,282	5,231	1,450	7,861
2007	633	6,331	15	7,971	1,087	12,768	385	3,481	5,071
2008	78	2,490	48	9,232	1,541	18,086	654	6,776	8,024
2009	400	2,522	44	3,802	876	6,896	75	768	3,267
2010	552	2,619	150	10,298	1,280	7,192	404	4,872	5,307
2011	891	6,911	271	9,541	981	11,506	429	5,193	7,235
2012	591	4,322	127	11,397	2,533	16,998	146	2,262	7,790
2013	30	3,215	320	10,330	2,509	17,062	159	2,616	8,792
2014	0	633	110	7,935	1,956	10,022	220	3,795	6,456
2015	0	3,236	83	14,771	1,356	26,235	107	4,451	9,346
2016	17	3,002	466	6,943	3,234	30,689	451	2,776	8,707
2017	110	3,078	201	7,186	1,842	33,921	1,027	5,842	8,314
2018	64	5,537	226	14,790	1,355	13,393	1,077	8,360	7,846
2019	348	13,694	400	14,285	1,284	26,626	373	6,139	9,033
2020	0	0	0	0	0	23	8	41	61
2021	304	3,121	230	5,549	562	5,163	528	1,917	5,071

Year	Chinook Harvest	Chinook Catch	Chum Harvest	Chum Catch	Coho Harvest	Coho Catch	Sockeye Harvest	Sockeye Catch	Angler Days
Average 2016–2020	108	6,327	259	8,641	1,543	26,157	587	4,632	6,792
Average 2011–2020	205	4,848	233	9,718	1,705	20,717	400	4,148	7,358

Catch and Release Mortality

As noted in the Sport Harvest section, above, catch and release fishing is a very popular activity on the Kanektok River, particularly for Chinook Salmon (**Table 5**, Chythlook 2022). There is an accepted rate of unintended mortality associated with these non-harvest fisheries, and a number of studies have examined mortality rates of catch and release fisheries. These rates vary across studies due to factors such as species, life stage, water temperature, and gear type. A literature 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.

Specific to Alaska, Stuby (2002) reported an overall mortality rate of 15% for Coho Salmon using barbless, single-hook artificial lures in the Unalakleet River. Bendock and Alexandersdottir (1990) found Chinook Salmon mortality rates of 13% for males and 7% for females associated with the Kenai River catch and release fishery. The ADF&G Division of Sport Fish Regional Supervisor for the Southcentral Region, Tom Vania, stated at the January 2017 Federal Subsistence Board meeting that 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, but that the actual rate for the Kenai River Chinook Salmon fishery is anticipated to be lower as the fishery is restricted to single barbless hook and no bait (FSB 2017). Mortality estimates provided in the Kenai River annual management reports for the early-run Chinook Salmon sports fishery in the Kenai River 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).

Overall, some amount of mortality is a recognized consequence of catch and release fisheries, however no catch and release mortality monitoring occurs for Chinook or Chum salmon in the Kanektok River.

Current Events

Summary of Public Hearings

An in-person and teleconferenced public hearing was held on February 15, 2023, in Quinhagak, Alaska. Another teleconferenced public hearing was held on February 21, 2023. Sixteen individuals and organizations provided testimony during these public hearings.

Testifiers presented several reasons for supporting Fisheries Special Action FSA23-01. Most said that low numbers of Chinook and Chum salmon are entering the Kanektok River, and that local families who rely on these salmon cannot rely on the salmon anymore. One supporter said that the Native Village of Kwinhagak submitted a similar proposal to the Alaska Board of Fisheries to close the Kanektok River sport fishery targeting Chum Salmon from June 1 to June 30 for the same reasons, low run sizes. This testifier said Alaska Department of Fish and Game (ADF&G) is not counting the number of salmon in the river, and the estimates ADF&G reports are very low. Several testifiers said global warming affecting water temperatures, low water affecting spawning areas, increasing presence of beaver dams reducing spawning areas, decreasing food sources for Chum and Chinook salmon in deep water, increasing pressure of intercept fisheries, and new populations of Northern Pike in the river eating salmon fry are all negatively impacting salmon run sizes and reducing the size of Chinook Salmon observed in the fishing district by commercial and subsistence fishers. One testifier supported the special action request because of his overall concern for the conditions of the salmon stocks. He said, "We need to make sure that somebody is listening, to make sure that the salmon stocks in the river don't get depleted and that we remain a viable salmon river."

There were also testifiers who did not support the request. For the most part, these testifiers were concerned about declining Chinook Salmon run sizes in the Kanektok River but did not think the special action request would address the problem of declining Chinook Salmon run sizes in the Kanektok River. Some of these testifiers explained that sport fishing is mostly catch-and-release and few Chinook Salmon are harvested. Instead, the timing of net fisheries in the bay and intercept fisheries such as at False Pass must be reduced. An example offered was that during some years, few Chinook Salmon were observed in the river until nets in the bay were removed. Another of these testifiers said the State is not managing the commercial fishery appropriately because the commercial fishery is wide open, and the number of boats in the bay should be curtailed so that salmon can enter the river. In the past, the commercial fishery was opened every other day to give salmon a chance to enter the river and spawn. Increasing harvest pressure from people coming to the Quinhagak area as a result of commercial, sport, and subsistence fishing closures in the Kuskokwim River was cited as a problem. One testifier said the sport fishing industry provides local income in terms employment in camps, as mechanics and guides, as well as income to the village corporation for use of their lands alongside the river. This testifier said the timing of this special action request would not provide enough time for sport fishers to make alternative plans if the river was closed to sport fishing.

One testifier took exception to catch-and-release fishing, requesting sport fishers to keep the fish they catch or share them with people in Quinhagak.

A representative of ADF&G opposed the special action request stating it was lacking in biological rationale. Under current management, Amounts Reasonably Necessary of Subsistence (or ANS) were being met. Conservation measures were not necessary at this time, and when necessary, could be addressed through State management. A small commercial fishery has operated sporadically outside the mouth of the Kanektok River most recently in 2020 and 2021, the first since 2015. It did not operate in 2022 due to a lack of a fish processor. Aerial survey data for Chinook Salmon are available in 8 of the last 10 years with the sustainable escapement goal of 3,900 to 12,000 being met every year except 2013 and

2014. The aerial survey was not assessed in 2017 and 2022 due to inclement weather preventing surveys from being conducted. Sport fishing is mostly conducted by nonresidents of Alaska who travel to the Kanektok River to target Rainbow Trout along with Chinook and Coho salmon. Chum Salmon may also be targeted, but to a lesser extent that Rainbow Trout, Chinook and Coho salmon.

Summary of Tribal Consultation

Tribal consultation occurred in-person and by teleconference between representatives of the Native Village of Kwinhagak and representatives of the Federal Subsistence Board on February 16, 2023, at Quinhagak, Alaska. Public board member Rhonda Pitka, Fish and Wildlife Service board member Sarah Boario, Chris McKee representing the Bureau of Land Management board member, Greg Risdahl representing the Forest Service board member, and Kim Jochum representing the National Park Service board member attended the consultation by teleconference. The Kwinhagak Tribal Council president and five council members as well as other Kwinhagak Tribal members attended the consultation in-person and by teleconference.

Native Village of Kwinhagak representatives explained that the Native Village of Kwinhagak is not targeting sport fishermen but instead is considering all options. Council representatives explained that they had long conversations with the goal of identifying options for addressing salmon declines in the Kanektok River and finally had submitted two proposals to the Alaska Board of Fisheries to make changes to commercial, sport, and subsistence fisheries to be taken up at their meeting in January 2023. (The first was rejected, Proposal 94 to close sport fishing to nonresidents for Chum Salmon June 1 to July 15. The second, Proposal 173, requested (1) in the subsistence fishery in District 4, between June 1 and July 15, only one gillnet may be operated per boat, the aggregate length of a set gillnet or drift gillnet may not exceed 50 fathoms, and subsistence fishing for salmon will be closed on Sundays between June 1 and July 15; and (2) in the commercial fishery in District 4, between June 1 and July 15, only one gillnet may be operated per boat and commercial fishing for salmon will be closed on Sundays. This proposal was unintentionally omitted from the meeting agenda, and instead the Board of Fisheries will take it up at a special meeting slated for April 19, 2023).

On the Federal side, the call for proposals to change fishery regulations would not open until 2024, and after much consideration, the Native Village of Kwinhagak submitted this special action request, FSA23-01, the focus of this analysis.

Native Village of Kwinhagak representatives said there must be a better way to manage fisheries and focusing on reducing the number of people coming into the area to harvest salmon was a better way. While several forces might be affecting salmon numbers such as contaminate sources and erosion in the river and the False Pass commercial fishery intercepting salmon destined for other areas, a bigger issue was that the number of people coming to the area to harvest salmon was growing, and more Chinook Salmon were being harvested by the commercial fishery, when opened, than by the sport fishery. They said they are targeting Sockeye Salmon in the commercial fishery in an attempt to make more Chinook Salmon available to subsistence users even though Sockeye Salmon are less valuable than Chinook Salmon to the processors who buy them.

Additionally, Native Village of Kuinhagak representatives said ADF&G's knowledge of Chum Salmon populations in the area is unknown as there has been no information on annual Chum Salmon escapements or run sizes to the Kanektok River reported by ADF&G since 2015.

A Kwinhagak tribal elder shared that in his youth, while he was commercial fishing in western Bristol Bay, he and others chucked Pink Salmon, and now Pink Salmon were not returning in the numbers they once did. Now he said Chinook and Chum salmon are not returning and larger-sized Chinook Salmon are no longer seen, a consequence of not being treated rightly.

Effects of the Proposal

If this action request is adopted, the Board would close the Federal public waters of the Kanektok River drainage that are within and adjacent to the Togiak National Wildlife Refuge to the harvest of Chinook and Chum salmon from June 1 through June 30, 2023, and from June 1 through June 30, 2024, to everyone except Federally qualified subsistence users. The entire Kanektok River drainage is situated within and adjacent to the exterior boundaries of the Togiak National Wildlife Refuge Federal conservation unit and is Federal public waters. Federal subsistence fishing schedules, openings, closures, and fishing methods would be determined by the Federal fishery in-season manager who has Board delegated authority. If harvest opportunity is provided by the Federal fishery manager, only federally qualified subsistence users who are permanent rural residents of the the Kuskokwim Area would be allowed to harvest Chinook and Chum salmon in Federal public waters of the Kanektok River drainage. Alaska residents and non-residents would be unable to harvest Chinook and Chum salmon in State subsistence and sport fisheries in Federal public waters of the Kanektok River drainage that are within and adjacent to the Togiak National Wildlife Refuge, but would be able to harvest Kanektok and Arolik river Chinook and Chum salmon in marine waters of District 4.

If this special action request is rejected, the types of user groups able to harvest Chinook and Chum salmon in the Kanektok drainage will not change. Sport fishing effort may increase for Chinook Salmon between June 1 and June 30 on the Kanektok River, as it has in recent years, given anticipated closures within the Kuskokwim River drainage.

OSM CONCLUSION

Support Temporary Fisheries Special Action request FSA23-01 **with modification** to close the Federal public waters of the Kanektok drainage to only harvest of Chum Salmon by non federally qualified subsistence users June 1–June 30, 2023 and June 1–June 30, 2024. This modification does not include Chinook Salmon.

The modified regulation would read:

> **50 CFR 100.27(e)(4) Subsistence taking of fish—Kuskokwim Area**
>
> *(ii) For the Kuskokwim area, Federal subsistence fishing schedules, openings, closings, and fishing methods are the same as those issued for the subsistence taking of fish under Alaska Statutes (AS*

16.05060 [emergency orders]), except the use of gillnets with 6-inch or less mesh size is allowed before June 1 in the Kuskokwim River drainage, unless superseded by a Federal Special Action.

Federal public waters of the Kanektok River drainage are closed to the harvest of Chum salmon except by federally qualified subsistence users, effective June 1 through June 30, 2023, and from June 1 through June 30, 2024, unless reopened by the Federal in-season Manager. The Federal Fisheries in-season Manager will adjust Federal subsistence fishing schedules, openings, closures, and fishing methods as needed.

Justification

There is very little available data to assess the health of salmon populations in the Kanektok River drainage. Although aerial survey estimates of Kanektok River Chinook Salmon have been within the sustainable escapement goal range in 8 of the last 10 years, aerial survey data for assessing Chum Salmon escapement are scant (Smith and Gray 2022, Smith et al. 2022). Further, there are no Chum Salmon escapement goals to the Kanektok River. Given the lack of data on Chum Salmon escapement to the Kanektok River and concerns raised by local users, a conservation approach is warranted.

The data suggests a decline in the commercial harvest of Chinook and Chum salmon (**Table 3, Appendix 5**, Smith and Gray 2022). The decline may be attributed to a reduction in harvest effort or, a reduction in fish available for harvest. Chinook and Chum salmon commercial harvest estimates are available for only two of the past 6 years, 2020 and 2021(Smith and Gray 2022). Chinook Salmon commercial harvest 2012–2015 was below the 10-year average of 9,981 fish. and no commercial harvest took place in District 4 from 2016–2019, or in 2022, because there was no commercial buyer (Smith et al. 2022). The 2021 District 4 commercial harvest of Chinook Salmon was ranked as the third lowest since 1968 when 8,879 fish were harvested, a 75% decrease from the 10-year average (**Table 3**, Smith and Gray 2022). The 2021 commercial harvest of Chum Salmon was the lowest harvest observed on record since 1967. The commercial harvest of 6,531 Chum Salmon in 2020, and 5,310 Chum Salmon in 2021 is a decrease of 87% and 91% from the 10-year average (**Table 3**, Smith and Gray 2022). The declining trends observed with Kanektok River survey and escapement estimates of Chinook and Chum salmon suggest a reduction in fish as the cause for decline in commercial harvest.

Based on a below average 2023 preseason outlook for Chinook and Chum salmon in the Kuskokwim Bay Fishing District, the Alaska Department of Fish and Game does not anticipate any commercial gillnet openings in the Kuskokwim Bay Fishing District 4 and 5 in 2023 (**Appendix 1**, Donnellan and Munro 2023). Furthermore, citing concerns of very poor anticipated Chum Salmon returns, and to protect Chum Salmon in periods of low abundance and provide future sport fishing opportunities, the Alaska Department of Fish and Game closed sport fishing for Chum Salmon in the Kuskokwim – Goodnews Area until December 31, 2023 (**Appendix 2**).

The proponent is aware that some of the lowest Chinook and Chum salmon returns on record in western coastal Alaska have occurred recently; however, given available data, a similar determination could not be made for the Kanektok River. Further, it could not be determined that the returns are deemed healthy with the lack of data specific to the Kanektok River. Local users are highly attuned to conditions on the

river and have described their observations during public hearings for this special action request. Several described observing fewer Chinook and Chum salmon in the river, and the Chinook Salmon that are observed are the younger and smaller "jack" salmon. Yet, ADF&G reports indicate Chinook Salmon estimates of run-size and escapement appear healthy within the Kanektok River and have been within the SEG range in 8 of the last 10 years (**Table 1**, Smith and Gray 2022, Smith et al. 2022). This data shows sufficient Chinook Salmon escapement, and therefore it is not warranted to close Chinook Salmon sport fishing at this time. Without having recent and reliable Chum Salmon data to show if the runs are healthy or not, and with declining trends in Western Alaska, it is prudent to close sport fishery to targeting and retention of Chum Salmon from June 1–June 30, 2023 and 2024.

LITERATURE CITED

ADCCED (Alaska Department of Commerce, Community, and Economic Development). 2022. Community database online. https://dcra-cdo-dcced.opendata.arcgis.com/, retrieved January 7, 2023. Division of Community and Regional Affairs. Juneau, AK.

ADF&G. (Alaska Department of Fish and Game). 1960. Kanektok River Counting Tower, 1960. Alaska Department of Fish & Game, Division of Commercial Fisheries, Kuskokwim Escapement Report No. 1, Juneau.

ADF&G.1962. Kanektok River Counting Tower, 1962. Alaska Department of Fish & Game, Division of Commercial Fisheries, Kuskokwim Escapement Report No. 3. Juneau.

ADF&G. 2016. Preliminary Summary of Actions, Alaska Board of Fisheries, January 12–16, 2016, Arctic/Yukon/Kuskokwim Finfish, Fairbanks, AK. https://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.meetinginfo&date=01-12-2016&meeting=fairbanks

ADF&G. 2021. Advisory announcement Emergency Order 3-S-WB-01-21. June 30, 2021. Alaska Department of Fish and Game, Division of Commercial Fisheries. Anchorage, AK. http://www.adfg.alaska.gov/static/applications/dcfnewsrelease/1281320763.pdf

ADF&G. 2023a. Preliminary Summary of Actions, Alaska Board of Fisheries, January 14–18, 2023, Arctic/Yukon/Kuskokwim Finfish, Anchorage, AK. https://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.meetinginfo&date=01-14-2023&meeting=anchorage

ADF&G. 2023b. Board of Fisheries Meeting Information. Alaska Department of Fish and Game, Juneau, AK. http://www.adfg.alaska.gov/index.cfm?adfg=fisheriesboard.meetinginfo

Begich, R. N., J. A. Pawluk, J. L. Cope, and S. Simons. 2017. 2014-2015 Annual Management Report and 2016 sport fisheries overview for Northern Kenai Peninsula: fisheries under consideration by the Alaska Board of Fisheries, 2017. Alaska Department of Fish and Game, Fishery Management Report No. 17-06, Anchorage, Alaska.

Bendock, T. and M. Alexandersdottir. 1990. Hook and release mortality of Chinook Salmon in the Kenai River recreational fishery. Alaska Department of Fish and Game, Fishery Data Series No. 90-16, Anchorage, Alaska.

Burkey, Jr., C., M. Coffing, J. Estensen, R.L. Fisher, and D.B. Molyneaux. 2001. Annual Management Report for the Subsistence and Commercial Fisheries of the Kuskokwim Area, 2000. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report. Anchorage.

Carlson-Van Dort, M. 2023. Alaska Board of Fish. Board of Fisheries discussion on Proposal 94. January 18, 2023. Audio from Soniclear [0:31:38]. Accessed 2/20/23: https://www.adfg.alaska.gov/static/regulations/regprocess/fisheriesboard/swf/2022-2023/ayk2023/index.html?mediaBasePath=/Meeting%2001-18-23%20%28Jan-18-23%2011-03-19%20AM%29#

Chythlook, J. 2022. Fishery management report for sport fisheries in the Kuskokwim-Goodnews Management Area, 2021. Alaska Department of Fish and Game, Fishery Management Report No. 22-31, Anchorage, AK. 56 pages.

Clark, K. J., and J. C. Linderman Jr. 2009. Kanektok River salmon monitoring and assessment, 2007. Alaska Department of Fish and Game, Fishery Data Series No. 09-11, Anchorage.

Dickerson, B. R., C. L. Berry, and N. J. Smith. 2019. Salmon escapement monitoring in the Kuskokwim Area, 2018. Alaska Department of Fish and Game, Fishery Data Series No. 19-31, Anchorage.

Donnellan, S. J., and A. R. Munro, editors. 2023. Run forecasts and harvest projections for 2023 Alaska salmon fisheries and review of the 2022 season. Alaska Department of Fish and Game, Special Publication No. 23-10, Anchorage.

Dumond, D.E. 1987. Prehistoric human occupation in southwestern Alaska, a study of resource distribution and site location. University of Oregon Anthropological Papers. No. 36.

Estensen, J. L. and C. Diesinger. 2003. Kanektok River Weir 2002 Alaska Department of Fish and Game, Regional Information Report No. 3A03-21, Anchorage.

Estensen, J. L. and C. Diesinger. 2004. Kanektok River Weir 2003. Alaska Department of Fish and Game, Commercial Fisheries Division, Regional Information Report No. 3A04-07, Anchorage.

FSB. (Federal Subsistence Board). 2017. Transcripts of the Federal Subsistence Board proceedings. January 10–12, 2017. Office of Subsistence Management, USFWS. Anchorage, Alaska.

Fienup-Riordan, A. 1998. Yup'ik Elders in Museums: Fieldwork Turned on Its Head. Arctic Anthropology, 35(2), 49–58.

Fox, F., 1997. Kanektok River Salmon Escapement Monitoring Project, 1996. Native Village of Kwinhagak, Nahual Resources Department. Quinhagak, AK.

Giefer, J., and S. Graziano. 2022. Catalog of waters important for spawning, rearing, or migration of anadromous fishes – Western Region, effective June 15, 2022, Alaska Department of Fish and Game, Special Publication No. 22-06, Anchorage.

Groot, C., and L. Margolis, editors. 1991. Pacific Salmon Life Histories. Department of Fisheries and Oceans, Biological Sciences Branch, Canada. UBC Press, Vancouver, B.C.

Huttunen, D.C., 1984. 1984 Kanektok River Sonar Project Report, 1984. Alaska Department of Fish & Game, Division of Commercial Fisheries, AYK Region Kuskokwim Escapement Report No. 40. Anchorage.

Huttunen, D. C., 1988. Kanektok River Sonar Project, 1987. Alaska Department of Fish & Game, Division of Commercial Fisheries, Regional Information Report No. 3B88-04. Anchorage.

Ikuta, H., D.M. Runfola, J.J. Simon, and M.L. Kostick. 2016. Subsistence harvests in 6 communities on the Bering Sea, in the Kuskokwim River drainage, and on the Yukon River, 2013. ADF&G, Div. of Subsistence Tech. Paper No. 417. Fairbanks, AK.

Jones, E.L. III, S. Heinl, and K. Pahlke. 2007. Aerial counts. Pages 399–410 *in* D.H. Johnson, B.M. Shrier, J.S. O'Neal, J.A. Knutzen, X. Augerot, T.A. O'Neil, and T.N. Pearsons. Salmonid field protocol handbook: techniques for assessing status and trends in salmon and trout populations. American Fisheries Society, Bethesda, Maryland. 478 pages.

Jones, P.W. and J.C. Linderman Jr. 2006. Kanektok River salmon monitoring and assessment, 2005. Alaska Department of Fish and Game, Fishery Data Series No. 06-48, Anchorage.

Liller, Z. W., and J. W. Savereide. 2022. Escapement goal review for select Arctic–Yukon–Kuskokwim Region salmon stocks, 2023. Alaska Department of Fish and Game, Fishery Manuscript No. 22-08, Anchorage.

Linderman Jr., J.C. 2000. Report: 2000 Kanektok River Weir Project. The Native Village of Kwinhagak. Natural Resources Department. Quinhagak, AK.

Lindsay, R. B., R. K. Schroeder, and K. R. Kenaston. 2004. Hooking mortality by anatomical location and its use in estimating mortality of spring Chinook Salmon caught and released in a river sport fishery. North American Journal of Fisheries Management 24: 367–378.

Menard, J., and A. Caole. 1999. Kanektok River Counting Tower Cooperative Project, 1997. Alaska Department of Fish and Game, Commercial Fisheries Division, Regional Information Report No. 3A99-16. Anchorage.

McDevitt, C. and D. Koster. 2022. Subsistence fisheries harvest monitoring report, Kuskokwim Fisheries Management Area, 2021. ADF&G Division of Subsistence, Technical Paper No. 489. Fairbanks, AK.

Neilson, J.D. and G.H. Green. 1981. Enumeration of spawning salmon from spawner residence time and aerial counts. Transactions of the American Fisheries Society. 110:554–556.

Pawluk, J.A. and P.W. Jones. 2007. Kanektok River salmon monitoring and assessment, 2006. Alaska Department of Fish and Game, Regional Information Report No. 3A07-07, Anchorage.

Poetter, A.D., A. Tiernan, and C. Lipka. 2016. 2015 Kuskokwim area management report. Alaska Department of Fish and Game, Fishery Management Report No. 16-38, Anchorage.

Rearden, A. and A. Fienup-Riordan. 2013. Erinaput Unguvaniartut So our voices will live, Quinhagak history and oral traditions. Calista Elders Council, Anchorage, and the Alaska Native Language Center University of Alaska Fairbanks. 413 pages.

Schill, D. L, and R. L. Scarpella. 1997. Barbed hook restrictions in catch-and-release trout fisheries: a social issue. North American Journal of Fisheries Management 17: 873–881.

Schultz, K. and M. Williams, 1984. Kanektok River Sonar Enumeration Project, 1983. AYK Region, Alaska Department of Fish & Game, Division of Commercial Fisheries, Kuskokwim Escapement Report No. 37. Anchorage.

Smith, N., and B. P. Gray. 2022. 2021 Kuskokwim management area annual management report. Alaska Department of Fish and Game, Fishery Management Report No. 22-26, Anchorage.

Smith, N. J., R. Renick, and S. Larson. 2022. Kuskokwim River salmon stock status and Kuskokwim Area fisheries, 2022: A report to the Alaska Board of Fisheries, January 2023. Alaska Department of Fish and Game, Special Publication No. 22-19, Anchorage.

Stuby, L. 2002. An investigation of how catch-and-release mortality of Coho Salmon in the Unalakleet River varies with distance from Norton Sound. Alaska Department of Fish and Game, Fishery Data Series No. 02-26, Anchorage.

Taylor, D.V. and K.J. Clark. 2012. Kanektok River salmon monitoring and assessment, 2008. Alaska Department of Fish and Game, Fishery Data Series No. 10-09, Anchorage.

Taylor, D.V. and T.B. Elison. 2010. Kanektok River salmon monitoring and assessment, 2009. Alaska Department of Fish and Game, Fishery Data Series No. 10-57, Anchorage.

Taylor, D.V. and T.B. Elison. 2012a. Kanektok River salmon monitoring and assessment, 2010. Alaska Department of Fish and Game, Fishery Data Series No. 12-24, Anchorage.

Taylor, D.V. and T.B. Elison. 2012b. Kanektok River salmon monitoring and assessment, 2011. Alaska Department of Fish and Game, Fishery Data Series No. 12-64, Anchorage.

Taylor, D.V. 2014a. Kanektok River salmon monitoring and assessment, 2012. Alaska Department of Fish and Game, Fishery Data Series No. 14-10, Anchorage.

Taylor, D.V. 2014b. Kanektok River salmon monitoring and assessment, 2013. Alaska Department of Fish and Game, Fishery Data Series No. 14-51, Anchorage.

Taylor, M. J., and K. R. White. 1992. A meta-analysis of hooking mortality of nonanadromous trout. North American Journal of Fisheries Management 12: 760–767.

Tiernan, A., and A. Poetter. 2015. 2013 Kuskokwim area management report. Alaska Department of Fish and Game, Fishery Management Report No. 15-46, Anchorage.

Tiernan, A., C. Lipka, and N. Smith. 2018. Kuskokwim River salmon stock status and Kuskokwim Area Fisheries, 2019: A report to the Alaska Board of Fisheries. Anchorage: Alaska Department of Fish and Game Division of Sport Fish, Special Publication No. 18-19.

Tiernan, A. and B.P. Gray. 2020. 2018 Kuskokwim area management report. Alaska Department of Fish and Game, Fishery Management Report No. 20-23, Anchorage.

USFWS. 2009. Comprehensive Conservation Plan Togiak National Wildlife Refuge. Dillingham and Anchorage, AK. 439 pages.

Wolfe, R.J. 1987. Subsistence Fishing Along the Kanektok and Goodnews Rivers, Western Alaska. Report to the Alaska Board of Fisheries. Juneau, Alaska: Alaska Department of Fish and Game, Division of Subsistence.

Wolfe, R.J. 1988. “The fish are not to be played with”: Yup’ik views of sporting fishing and subsistence-recreation conflicts along the Togiak River. ADF&G. Div. of Subsistence, Special Publication No. SP1988-002. 25 pages.

Wolfe, R.J. 1989. Subsistence-recreational conflicts along the Togiak, Kanektok, and Goodnews Rivers: a summary. Alaska Department of Fish and Game, Division of Subsistence, Special Publication No. SP1989-001. Juneau, AK. 26 pages.

Zimmerman C. and L.M. Zabkar. 2007. Weirs. Pages 385-398 *in* D.H. Johnson, B.M. Shrier, J.S. O'Neal, J.A. Knutzen, X. Augerot, T.A. O'Neil, and T.N. Pearsons. Salmonid field protocol handbook: techniques for assessing status and trends in salmon and trout populations. American Fisheries Society, Bethesda, Maryland. 478 pages.

SUBSISTENCE REGIONAL ADVISORY COUNCIL RECOMMENDATION

Yukon-Kuskokwim Delta Subsistence Regional Advisory Council

Support FSA23-01. The Council acted on the special action request before the FSA23-01 final analysis was made available. The Council **supported** the closure to the harvest of Chinook and Chum salmon by non-federally qualified users, including catch and release fishing, during the month of June because of conservation concerns for these runs into the Kanektok River. The Council further noted subsistence fishing should not be restricted by the special action.

Western Interior Alaska Subsistence Regional Advisory Council

Support FSA23-01. The Council acted on this special action request before the FSA23-01 final analysis was made available. The Council **supported** the closure as written. The Council's justification was that closures to sport fish are warranted and needed when levels are below management objectives and there are high mortality rates associated with catch and release fishing.

INTERAGENCY STAFF COMMITTEE COMMENTS

The Interagency Staff Committee (ISC) has found the staff analysis to be a thorough and accurate evaluation of Fisheries Special Action Request FSA23-01. The Yukon-Kuskokwim Delta and Western Interior Alaska Subsistence Regional Advisory Councils both took up FSA23-01 and both Councils supported it. The ISC acknowledges the Councils expertise in regional subsistence issues and notes the Yukon-Kuskokwim Delta Council's discussion about potentially expanding the Native Village of Kwinhagak's request to include a closure to all species in addition to Chinook and Chum salmon. It was pointed out that even with a closure to Chinook and Chum salmon, sport fishing will still occur for non-salmon species of fish such as Rainbow Trout. However, there would not be time for the Tribal Council to consider this addition and the Yukon-Kuskokwim Delta Council did not further consider it.

It should also be noted that neither Council was presented an analysis, and therefore were not made aware of the Office of Subsistence Management (OSM) preliminary conclusion to support FSA23-01 with modification to close Federal public waters of the Kanektok River drainage to harvest of Chum Salmon only, except by Federally qualified subsistence users. For the Federal Subsistence Board (Board) to consider this modification, they would need to consider the Councils' recommendations concerning the taking of fish and wildlife as outlined in Section 805(c) of ANILCA and 50 CFR 100.18(a)(4). The Board may choose not to follow any recommendation that it determines is not supported by substantial evidence, violates recognized principles of fish and wildlife conservation, or would be detrimental to the satisfaction of subsistence needs.

There are pros and cons to the OSM modification. While the aerial survey data shows escapement for Chinook Salmon being met in the Kanektok River in 8 out of the last 10 years, there were an additional two years where the survey goal was not assessed in 2017 and 2022 due to inclement weather that prevented surveys from being conducted. While this information provides evidence of Chinook Salmon escapement goals being met, recently, aerial survey counts were near the lower bound of the goal range. There is a general lack of data for salmon monitoring in the Kanektok River drainage. Overall, Chinook and Chum salmon returns in the Arctic-Yukon-Kuskokwim region have been well below average and, given the lack of data showing healthy Chinook and Chum salmon returns, we cannot state with certainty that there is or is not a conservation concern.

Further information is worth considering. Kuskokwim Bay Advisory Announcement #1 from the Alaska Department of Fish and Game (ADF&G) announced that ADF&G does not anticipate any commercial gillnet openings in Kuskokwim Bay Fishing Districts 4 and 5 in 2023 based on the well below average preseason outlook for Chinook and Chum salmon. Additionally, ADF&G also issued an Emergency Order March 29, 2023, that closed the entire Kuskokwim–Goodnews Area to sport fishing for Chum salmon, effective 12:01 a.m. Wednesday, April 5, 2023. This closure prohibits all sport fishing for Chum salmon, including catch-and-release fishing and states that all Chum salmon caught incidentally while fishing for other species may not be removed from the water and must be released immediately.

Also of significance are the concerns and observations shared by Quinhagak residents. Following 2020, after a year of curtailed sportfishing due to pandemic restrictions, community members noticed the

number of dead fish on the gravel bars in 2021 and 2022 was noticeably higher than in 2020, which they believe stemmed from catch and release mortality. This local knowledge is important when considering the impacts of sport fisheries on Chinook and Chum salmon returns.

Finally, the Tribal Consultation with the Native Village of Kwinhagak was informative and led to a good discussion between the Tribe and Board members. The ISC encourages the Board to read the summary of the Tribal Consultation provided in the analysis to help inform their deliberations.

STATE OF ALASKA COMMENTS

THE STATE of ALASKA
GOVERNOR MICHAEL J. DUNLEAVY

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MEMORANDUM

TO:	Anthony Christianson, Chair Federal Subsistence Board	DATE:	March 31, 2023
		PHONE:	267-2190
FROM:	Ben Mulligan Deputy Commissioner	SUBJECT:	Fisheries Special Action 23-01

The Alaska Department of Fish and Game (ADF&G) has reviewed Fisheries Special Action (FSA) 23-01 and **OPPOSES** this proposed closure. FSA23-01 requests the Federal Subsistence Board (FSB) close those portions of the Kanektok River flowing through or adjacent to the exterior boundary of a federal conservation system unit to the harvest of Chinook and chum salmon except by federally qualified users (FQU) from June 1 through June 30 of 2023 and 2024.

The special action request and any justification ADF&G has seen to date is lacking the biological rationale regarding the need for the Federal Subsistence Board (FSB) to close the Kanektok River to non-federally qualified users (NFQU). Under the current State subsistence system, the amount reasonably necessary for subsistence (ANS) is being met and conservation measures are not being taken for either species. As directed by Congress in Section 802 of the Alaska National Interest Lands Conservation Act (ANILCA), subsistence uses of fish shall be the priority consumptive use "when it is necessary to restrict taking in order to assure the continued viability of a fish or wildlife population or the continuation of subsistence uses of such population." Section 815 of ANILCA authorizes federal restrictions on nonsubsistence uses on the public lands only if "necessary for the conservation of healthy populations of fish and wildlife" or if necessary to "continue subsistence uses."

Conservation measures, when needed for Chinook and chum salmon can be addressed under State management through its emergency order authority if necessary. The harvest of Chinook and chum salmon is relatively small, and no restrictions on the sport or subsistence fisheries has been required to maintain sustainability since at least 2000. Despite this, if the FSB chooses to enact this closure, ADF&G requests that they direct the Refuge Manager to provide a plan on how they will manage Chinook and chum salmon during the closure period, assess the status of those salmon during the closure, and what metrics they will use to measure its effectiveness.

Background

The Kanektok River flows 85 miles west from headwater lakes in the Ahklun Mountains into Kuskokwim Bay and supports all five Pacific salmon species found in Alaska. A small commercial fishery has operated sporadically outside of the mouth of the Kanektok River, most recently in 2020 and 2021 (the first since 2015); it did not operate in 2022 due to a lack of a fish processor.

A salmon enumeration weir was operated on the Kanektok River between 2001 and 2015 at river mile 45 from approximately June 25–August 15. Given the relatively short data series, no formal escapement goals for any species were developed for this weir. Comparison of escapement among years is problematic because a substantial number of Chinook, chum, and coho salmon spawn downstream of the weir site. Aerial survey escapement goals have been established for Chinook and sockeye salmon. Aerial survey data for Chinook salmon are available in 8 of the last 10 years, with the escapement goal (SEG: 3,900–12,000) being met every year except 2013 and 2014. The aerial survey goal was not assessed in 2017 and 2022 due to inclement weather preventing surveys from being conducted.

Subsistence harvest of Kuskokwim Bay stocks remain relatively small and stable. Since 2018, Chinook salmon have continued to make up the largest portion of subsistence harvest, followed by sockeye, coho, and chum salmon. Additionally, approximately 9,400 salmon of all species have been harvested on average annually since 2018, within the range of ANS (6,900–17,000 salmon in both District 4 and District 5, combined).

Sport fishing is mostly conducted by nonresidents who travel to the Kanektok River to target rainbow trout along with Chinook and coho salmon. Chum salmon may be targeted after these species depending on the success of those targeted species. Based on the most recent Statewide Harvest Survey (2016-2020), the estimated 5-year average harvest of Chinook salmon was 135 and chum salmon was 323. The catch average for Chinook salmon under the same time period was 6,327, and chum salmon was 10,801. This level of catch, particularly for chum salmon, is more likely reflective of their relative abundance when anglers are targeting other species. Some harvest of chum salmon may occur by Alaska residents because hook and line attached to a rod or pole is legal subsistence gear.

Commercial fishing did not occur in District 4 during 2016–2019 due to there being no commercial processor operating in the area. In 2020 and 2021, a single salmon processor operated within Kuskokwim Bay. Participation in the fishery was low and harvest of Chinook, coho, and chum salmon were all similar to or below the 10-year (2012–2021) average. Sockeye salmon harvest was above the 10-year average in both 2020 and 2021, with harvests of 78,462 fish in 2020 and 113,849 fish in 2021. In 2022, a processor did not return to the area and no commercial fishing occurred.

APPENDIX 1

Division of Commercial Fisheries
Sam Rabung, Director

Kuskokwim Area Office
P.O. Box 1467
Bethel, AK 99559

Alaska Department of Fish and Game
Doug Vincent-Lang, Commissioner

PO Box 115526
Juneau, AK 99811-5526
www.adfg.alaska.gov

Advisory Announcement
For Immediate Release: **March 29, 2023**
Time: 3:00 p.m.

CONTACT: Nick Smith
Kuskokwim Area Management Biologist
(907) 267-2379

Kuskokwim Bay Salmon Fishery Announcement #1

2023 Kuskokwim Bay Commercial Fishery Outlook

This is an announcement from the Alaska Department of Fish and Game (ADF&G) for commercial fishermen in Districts 4 and 5, Kuskokwim Bay.

ADF&G does not anticipate any commercial gillnet openings in Kuskokwim Bay Fishing Districts 4 and 5 in 2023.

Commercial fishing in Districts 4 and 5 is managed in accordance with the District 4 and 5 Salmon Management Plan (5AAC 07.370) and targets salmon bound for the Kanektok and Goodnews rivers. There were no commercial fisheries in District 4 and 5 from 2016 to 2019 and 2022 due to lack of a commercial buyer. In 2020 and 2021, a single salmon processor operated within Kuskokwim Bay. The commercial fishing season was delayed until late June in 2020 and early July 2021 to allow for Chinook salmon escapement in order to achieve escapement goals in light of continued low returns. With the exception of sockeye salmon, commercial harvest for all species in District 4 and 5 were well below average in 2020 and 2021 with chum salmon catch per unit effort (CPUE) and harvest being some of the lowest on record.

Kuskokwim Bay has no formal forecast for salmon returns. Broad expectations are developed based on parent-year escapements and recent year trends. The 2023 preseason outlook for Chinook and chum salmon in Kuskokwim Bay Fishing Districts 4 and 5 is for well below average runs. The sockeye salmon outlook is for an average to above average run. Kanektok River Chinook salmon escapement is evaluated through a peak aerial survey that has a sustainable escapement goal (SEG) with a range of 3,900–12,000 fish. Aerial survey data for Chinook salmon are available in 8 of the last 10 years with the escapement goal being met every year except 2013 and 2014. While the goal has been met recently, aerial survey counts were near the lower bound of the goal range. The department relies on subsistence reports from local residents and commercial catch statistics to approximate run strength for Kanektok River chum salmon. Chum salmon escapement has not been formally assessed since 2015 when the Kanektok River weir ceased operations. Commercial catch statistics and local observations have indicated that chum salmon run strength between 2020 and 2022 was poor. These observations are corroborated by the unprecedented extremely poor chum salmon returns to the Yukon and Kuskokwim Rivers.

ADF&G staff met with the processor and a small group of Quinhagak subsistence and commercial fishers by teleconference on March 8, 2023, to discuss, receive feedback, and answer questions related to this announcement.

For additional information concerning this advisory announcement:
Nick Smith (907) 267-2379

-end-

APPENDIX 2

SPORT FISHING

Emergency Order

ALASKA DEPARTMENT OF FISH & GAME

Under Authority of AS 16.05.060

Emergency Order No. 3-CS-V-02-23

Issued at: Fairbanks, Wednesday, March 29, 2023.

Effective Date: 12:01 a.m. Wednesday, April 5, 2023.

Expiration Date: 11:59 p.m. Sunday, December 31, 2023, unless superseded by subsequent emergency order.

EXPLANATION:

This emergency order closes the Kuskokwim-Goodnews Area to sport fishing for chum salmon from April 5 through December 31. All chum salmon caught incidentally in the Kuskokwim-Goodnews Area while fishing for other species may not be removed from the water and must be released immediately.

REGULATION:

The provisions of 5 AAC 71.010(b)(2) and (c)(3)(B) are superseded and (c)(11) is added by this emergency order. Under this emergency order, the following provisions are effective 12:01 a.m. Wednesday, April 5, through 11:59 p.m. Sunday, December 31, 2023:

5 AAC 71.010. Seasons and bag, possession, annual, and size limits for the Kuskokwim–Goodnews Area.

(b)(2) salmon, other than chum and king salmon: the bag and possession limit is five fish, with no size limit;

(c)(3) in the Aniak River drainage,

(B) the bag and possession limit for pink, sockeye and coho salmon is three fish, with no size limit; however, the aggregate daily bag and possession limit of salmon, other than chum and king salmon, may not exceed three salmon;

(c)(11) in the Kuskokwim-Goodnews Area, sport fishing for chum salmon is closed; chum salmon may not be taken or possessed; chum salmon must be released immediately; a person may not remove a chum salmon from the water before releasing the fish.

Douglas Vincent-Lang
Commissioner

By delegation to: _____
John Chythlook
Area Management Biologist

JUSTIFICATION:

In 2022, the chum salmon return to the Kuskokwim River drainage was extremely low and subsistence fishing opportunity for chum salmon was very restricted. The Bethel Test Fishery is the primary assessment tool for chum salmon and in 2022 the cumulative CPUE was 2,192, which was well below the 10-year average of 4,906. Anecdotal information from subsistence and sport fisheries on the Kanektok, Goodnews, and Arolik Rivers also indicated very poor returns. For 2023, indications are that chum salmon returns within the Kuskokwim – Goodnews Area will again be very poor. Therefore, closing sport fishing for chum salmon in the Kuskokwim – Goodnews Area is warranted.

PREVIOUS EMERGENCY ORDERS AFFECTED: Emergency Order 3-KS-V-01-23 issued March 29, 2023, closes the Kuskokwim River drainage (excluding Kuskokwim Bay drainages) to sport fishing for king salmon from April 5 through December 31. In addition, only one unbaited, single-hook, artificial lure may be used in the Kuskokwim–Goodnews Area.

DISTRIBUTION:

The distribution list for this emergency order is on file at the Region III Office of the Alaska Department of Fish and Game, Division of Sport Fish, 1300 College Road, Fairbanks, AK 99701, (907) 459-7207.

APPENDIX 3

Age and sex composition of Chinook Salmon from the District W-4 Commercial fishery, 2002–2013. Ages are reported using European notation. European notation is composed of 2 numerals separated by a decimal, the first numeral indicates the number of winters spent in freshwater and the second numeral indicates the number of winters spent in the ocean (Groot and Margolis 1991). Total age is equal to the sum of these two numbers plus 1 to account for the single winter winter of egg incubation in the gravel. (Source: Estensen and Diesinger 2003a, Estensen and Diesinger 2003b, Linderman 2005, Jones and Lindermann 2006, Pawluck and Jones 2007, Clark and Lindermann 2009, Taylor and Clark 2010, Taylor and Elison 2010, Taylor and Elison 2012a, Taylor and Elison 2012b, Taylor 2014a, Taylor 2014b).

Sex	Year	Age 1.1	%	Age 1.2	%	Age 2.2	%	Age 1.3	%	Age 1.4	%	Age 2.3	%	Age 1.5	%	Age 2.4	%	Total	%
M	2002	4	2.1	40	21.4	0	0	43	23	27	14.4	0	0	1	0.5	0	0	115	61.5
F	2002	0	0	0	0	0	0	5	2.7	55	29.4	0	0	12	6.4	0	0	72	38.5
M	2003	192	2.3	1,944	23.6	0	0	2,364	28.7	981	11.9	0	0	61	0.7	0	0	5,542	67.3
F	2003	0	0	0	0	0	0	2,907	35.3	3,022	36.7	0	0	166	2	0	0	2,689	32.7
M	2004	31	0.2	11,282	57.8	0	0	4,368	22.4	1,165	6	0	0	31	0.2	0	0	16,867	86.4
F	2004	0	0	111	0.6	0	0	560	2.9	1,869	9.6	0	0	111	0.6	0	0	2,661	13.6
M	2005	-	0.4	-	20.4	-	-	-	41	-	7.8	-	-	-	0	-	-	0	69.6
F	2005	-	0	-	0	-	-	-	13.8	-	16.3	-	-	-	0.2	-	-	0	30.4
M	2006	31	0.2	6,192	32.3	0	0	4,809	25.1	2,734	14.2	0	0	209	1.1	0	0	14,024	73.1
F	2006	0	0	128	0.6	0	0	1,113	5.8	3,679	19.2	0	0	240	1.2	0	0	5,160	26.9
M	2007	131	0.9	4,588	32.5	0	0	1,972	14	2,309	16.4	0	0	197	1.4	0	0	9,197	65.1
F	2007	0	0	53	0.4	0	0	731	5.2	3,935	27.9	0	0	177	1.3	27	0.2	4,923	34.9
M	2008	0	0	8	23.5	0	0	7	20.6	1	3	0	0	0	0	0	0	16	47.1
F	2008	0	0	1	3	0	0	6	17.6	10	29.4	0	0	0	0	0	0	18	52.9
M	2009	30	0.4	1,790	26.2	15	0.2	1,313	19.2	1,139	16.7	0	0	0	0	0	0	4,288	62.7
F	2009	0	0	0	0	0	0	277	4	2,247	32.8	0	0	15	0.2	15	0.2	2,553	37.3
M	2010	50	0.9	2,043	35.2	21	0.4	1,947	33.6	365	6.3	0	0	0	0	0	0	4,425	76.3
F	2010	0	0	0	0	0	0	602	10.4	741	12.8	0	0	31	0.5	0	0	1,374	23.7
M	2011	0	0	2,607	51.8	0	0	1,217	24.2	100	2	0	0	0	0	0	0	3,924	78
F	2011	0	0	374	7.4	0	0	186	3.7	648	12.9	0	0	0	0	0	0	1,108	22
M	2012	0	0	12	25	0	0	14	29.2	5	10.4	0	0	0	0	1	2.1	32	66.7
F	2012	0	0	1	2.1	0	0	4	8.3	11	22.9	0	0	0	0	0	0	16	33.3
M	2013	0	0	1,210	33.9	0	0	750	21	277	7.7	18	0.5	0	0	0	0	2,255	63.2
F	2013	0	0	46	1.3	0	0	168	4.7	1,071	30	0	0	28	0.8	0	0	1,314	36.8

Note: The number of fish in yearly summaries are the strata sums from each year of sampling. Percentages are derived from seasonal sums.

APPENDIX 4

Age and sex composition of Chum Salmon from the District W-4 Commercial fishery, 2002–2013. Ages are reported using European notation. European notation is composed of 2 numerals separated by a decimal, the first numeral indicates the number of winters spent in freshwater and the second numeral indicates the number of winters spent in the ocean (Groot and Margolis 1991). Total age is equal to the sum of these two numbers plus 1 to account for the single winter winter of egg incubation in the gravel (source: Estensen and Diesinger 2003a, Estensen and Diesinger 2003b, Linderman 2005, Jones and Lindermann 2006, Pawluck and Jones 2007, Clark and Lindermann 2009, Taylor and Clark 2010, Taylor and Elison 2010, Taylor and Elison 2012a, Taylor and Elison 2012b, Taylor 2014a, Taylor 2014b).

Sex	Year	Age 0.2	%	Age 0.3	%	Age 0.4	%	Age 0.5	%	Total	%
M	2002	654	2.2	6,308	21.5	3,143	10.7	523	1.8	10,629	36.2
F	2002	524	1.8	10,412	35.4	7,668	26.1	129	0.4	18,732	63.8
M	2003	148	1.0	11,571	42.0	1,635	6.0	0	0.0	13,354	48.0
F	2003	147	1.0	12,959	47.0	1,059	4.0	349	1.0	14,514	52.0
M	2004	933	3.6	5,731	22.2	7,556	29.3	159	0.6	14,379	55.7
F	2004	154	0.6	4,636	18.0	6,651	25.7	0	0.0	11,441	44.3
M	2005	-	0.6	-	55.7	-	7.0	-	0.3	-	63.5
F	2005	-	1.0	-	32.0	-	3.3	-	0.1	-	36.5
M	2006	806	2.1	8,512	21.8	9,901	25.3	165	0.4	19,384	49.5
F	2006	985	2.5	8,579	21.9	10,204	26.1	0	0.0	19,767	50.5
M	2007	0	0.0	38,531	52.3	13,730	18.6	607	0.8	52,868	63.5
F	2007	156	0.2	38,492	52.3	21,515	29.2	1,303	1.8	2,519	36.5
M	2008	286	0.5	8,898	16.5	19,396	34.0	1,503	2.7	30,802	52.7
F	2008	161	0.3	10,813	19.0	15,106	26.5	870	1.5	26,951	47.3
M	2009	249	0.5	21,743	42.1	10,558	20.5	563	1.1	33,114	64.1
F	2009	50	0.1	13,368	25.9	4,608	8.9	512	1.0	18,538	35.9
M	2010	91	0.1	18,863	30.1	10,827	17.3	561	0.9	30,342	48.5
F	2010	647	1.0	21,880	35.0	9,398	15.0	300	0.5	32,225	51.5
M	2011	44	0.1	10,904	21.4	13,208	25.9	329	0.6	24,485	48.1
F	2011	44	0.1	11,838	23.3	14,204	27.9	337	0.7	26,423	51.9
M	2012	0	0.0	7,624	31.5	4,524	18.7	494	2.0	12,643	52.3
F	2012	0	0.0	5,925	24.5	4,690	19.4	916	3.8	11,530	47.7
M	2013	0	0.0	6,315	14.7	16,551	38.5	750	1.7	23,616	54.9
F	2013	0	0.0	4,859	11.3	13,722	31.9	843	2.0	19,424	45.1

Note: The number of fish in yearly summaries are the strata sums from each year of sampling. Percentages are derived from seasonal sums.

APPENDIX 5

District 4 commercial salmon harvest, including personal use (source: Smith and Gray 2022).

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
1960	0	5,649	3,000	0	0	8,649
1961	4,328	2,308	46	90	18,864	25,636
1962	5,526	10,313	0	4,340	45,707	65,886
1963	6,555	0	0	0	0	6,555
1964	4,081	13,422	379	939	707	19,528
1965	2,976	1,886	0	0	4,242	9,104
1966	278	1,030	0	268	2,610	4,186
1967	0	652	1,926	0	8,087	10,665
1968	8,879	5,884	21,511	75,818	19,497	131,589
1969	16,802	3,784	15,077	953	38,206	74,822
1970	18,269	5,393	16,850	15,195	46,556	102,263
1971	4,185	3,118	2,982	13	30,208	40,506
1972	15,880	3,286	376	1,878	17,247	38,667
1973	14,993	2,783	16,515	277	19,680	54,248
1974	8,704	19,510	10,979	43,642	15,298	98,133
1975	3,928	8,584	10,742	486	35,233	58,973
1976	14,110	6,090	13,777	31,412	43,659	109,048
1977	19,090	5,519	9,028	202	43,707	77,546
1978	12,335	7,589	20,114	47,033	24,798	111,869
1979	11,144	18,828	47,525	295	25,995	103,787
1980	10,387	13,221	62,610	21,671	65,984	173,873
1981	24,524	17,292	47,551	160	53,334	142,861
1982	22,106	25,685	73,652	11,838	34,346	167,627
1983	46,385	10,263	32,442	168	23,090	112,348
1984	33,663	17,255	132,151	16,249	50,422	249,740
1985	30,401	7,876	29,992	28	20,418	88,715
1986	22,835	21,484	57,544	8,700	29,700	140,263
1987	26,022	6,489	50,070	66	8,557	91,204
1988	13,893	21,574	68,605	21,311	29,247	154,630
1989	20,820	20,582	44,607	273	39,395	125,677
1990	27,644	83,681	26,926	12,056	47,717	198,024
1991	9,480	53,657	42,571	115	54,493	160,316
1992	17,197	60,929	86,404	64,217	73,383	302,130
1993	15,784	80,878	55,817	7	40,924	193,410
1994	8,564	72,314	83,912	35,904	61,301	261,995
1995	38,584	68,194	66,203	186	81,462	254,629
1996	14,165	57,665	118,718[a]	20	81,505	272,073
1997	35,492	69,508	32,862	5	38,435	176,302
1998	23,158	41,382	80,183	2,217	45,097	192,037
1999	18,426	41,315	6,184	0	38,091	104,016
2000	21,229	68,557	30,529	3	30,553	150,871

Year	Chinook	Sockeye	Coho	Pink	Chum	Total
2001	12,775	33,807	18,531	0	17,209	82,322
2002	11,486	17,820	26,695	0	29,319	85,320
2003	14,444	33,941	49,833	0	27,868	126,086
2004	25,465	34,661	82,398	0	25,820	168,344
2005	24,195	68,801	51,708	19	13,529	158,252
2006	19,004	106,424	26,831	0	39,151	191,410
2007	19,575	109,517	34,710	0	62,232	226,034
2008	13,812	69,776	95,073	0	57,663	236,324
2009	13,920	112,153	48,115	0	91,158	265,346
2010	14,230	138,362	13,690	0	106,610	272,892
2011	15,387	38,543	30,457	0	104,959	189,346
2012	6,675	37,688	31,214	0	61,140	136,717
2013	2,054	26,393	21,126	0	58,079	107,652
2014	2,265	58,879	52,317	0	14,563	128,024
2015	7,547	30,269	76,285	0	16,051	130,152
2016[b]	b	b	b	b	b	b
2017[b]	b	b	b	b	b	b
2018[b]	b	b	b	b	b	b
2019[b]	b	b	b	b	b	b
2020	4,345	113,849	29,374	0	6,531	154,099
2021	2,468	78,462	13,012	29	5,310	99,281
Average 2007–2020	9,981	73,522	43,188	0	57,735	184,426

[a] No harvest information available
[b] No commercial fishery occurred