

**PROPOSAL 155 - 5 AAC 57.120. General provisions for seasons, bag, possession, annual, and size limits, and methods and means for the Kenai River Drainage Area.** Expand the waters of the Kenai River closed to fishing for king salmon, as follows:

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

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

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

(A) may be taken only from January 1 - July 31, in the Kenai River from its mouth upstream to an ADF&G regulatory marker located **approximately one mile upstream from the mouth of the Lower Killey River [AT THE OUTLET OF SKILAK LAKE]**, with a bag and possession limit of one fish, as follows:

(i) from January 1 - June 30, from its mouth upstream to an ADF&G regulatory marker located at the outlet of Skilak Lake, and from July 1 - July 14, from an ADF&G regulatory marker located approximately 300 yards downstream from the mouth of the Slikok Creek upstream to an ADF&G regulatory marker located **approximately one mile upstream from the mouth of the Lower Killey River [AT THE OUTLET OF SKILAK LAKE]**, only king salmon that are less than 42 inches in length or 55 inches or greater in length may be retained;

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

(i) in the Kenai River upstream from an ADF&G regulatory marker located **approximately one mile upstream from the mouth of the Lower Killey River [AT THE OUTLET OF SKILAK LAKE]**, including Kenai Lake; and

**What is the issue you would like the board to address and why?** Chinook Salmon that arrive in the main-stem Kenai River between the Killey River sanctuary and Skilak Lake prior to July 31 are vulnerable to harvest in a given year whereas fish that arrive after July 31 are protected from harvest. If nothing is changed, different harvest opportunities and likely different harvest rates could affect the composition and run-timing for this aggregate of early-arriving main-stem spawners. Apparent shifts in spawn timing have already been reported by the Alaska Department of Fish and Game (Department; Reimer 2013). Non-random harvest on small, discrete spawning stocks imposes risks to population sustainability, and harvest selection can eventually lead to elimination of specific spawning groups (Olver et al. 1995).

Why: Chinook Salmon abundance in the Kenai River and throughout Alaska has been decreasing since around 2007. Some stocks are also exhibiting declining trends in size and age, including Kenai River Chinook Salmon that spawn on the Kenai National Wildlife Refuge (Kenai NWR), either in tributary streams (Funny River escapement analyzed by Boersma and Gates 2016) or the main-stem Kenai River (late-run commercial harvest analyzed by Lewis et al. 2015). Several mechanisms have been identified as potential drivers of these trends (e.g., size-selective harvest, competitive interactions, and changing environmental conditions), but the evidence is not conclusive for a specific cause (Lewis et al. 2015).

The main-stem Kenai River below Skilak Lake serves as an important spawning area for Chinook Salmon. In fact, river miles 46 and 47 on the Kenai NWR represent some of the highest densities of spawners in the entire watershed (Reimer 2013). Most of the main-stem spawners in this area are part of the late run that enter the Kenai River in July and August, but a small number are part of the early run that enter the Kenai River during May and June.

Although anecdotal information from local residents indicates this early-arriving group of main-stem spawners was likely at higher levels of abundance in previous years, recent work by the Department indicates only a small number of early-run fish currently spawn in this area (Reimer 2013). Between 2010 and 2013, the Department successfully radio-tagged and tracked early-run Chinook Salmon to spawning areas, but only a small proportion (about 2.5%) spawned in the main-stem Kenai River between the Kenai NWR boundary and Skilak Lake. Regardless of the uncertainties inherent in these data, one thing is clear -- only a small number of early-run main-stem spawners are found in the area. Any Chinook Salmon sport fishery in this stretch of river during July is in large part a terminal fishery for this group of main-stem spawners, and results in harvest pressure on other fish migrating through to other parts of the watershed where they are currently protected from harvest.

The Department (McKinley et al. 2002) reported that disproportionate harvest for early-run Chinook Salmon occurred in the past, mainly early in the season during years of restrictions to the fishery. Harvest rates were disproportionately higher in May and early June compared to later in June in years when the fishery was restricted to catch-and-release or trophy fishing (Figure 24 in McKinley et al. 2002). McKinley et al. (2002) recognized that disproportionate harvest of early-run Chinook Salmon in May or June could have biological impacts such as shifts in run-timing and thus recommended managing the inriver Chinook Salmon sport fishery to avoid disproportionately harvesting either early or late arriving fish.

A similar threat currently exists for Chinook Salmon that spawn in the main-stem Kenai River between the Killey River sanctuary and the outlet of Skilak Lake. Table 16 of Reimer (2013) presents information that indicates mainstem-spawning Chinook Salmon established site fidelity in the Moose River to Skilak Lake section as early as July 7 to July 9 in 2012 and 2013 and indicates some fish likely completed spawning and died prior to July 17. These fish represent the early-arriving portion of the run and would all be vulnerable to harvest in this stretch of river in most years, whereas the vast majority of main-stem spawners in this stretch of river arrive after July 31 and are protected from harvest. Different harvest opportunities and likely different harvest rates for the early-arriving group of fish could lead to changes in composition and shifts in run timing.

Although McKinley et al. (2002) found no observable trends or other evidence for shifts in run timing for early-run Chinook Salmon, data presented by Reimer (2013) indicates spawn timing for early-run main-stem spawners has shifted and appears to be about a month later than observations in 1990. As presented in Figure 9 of Reimer (2013), the median post-spawning mortality date for early-run main-stem spawners in 1990 was about July 19 whereas the median post-spawning mortality date for early-run main-stem spawners from 2010-2013 was about August 21. Spawn

timing for all main-stem spawners now appears to be similar regardless of when they enter the Kenai River and forms an overlapping continuum as noted by Reimer (2013).

The effect of this proposal will be to close approximately 4.5 miles of the main-stem Kenai River downstream of Skilak Lake to sport fishing for Chinook Salmon. This represents about 8% of the entire Kenai River downstream of Skilak Lake. This proposal will reduce the harvest of both early- and late-run Chinook Salmon by an unknown amount. There will be little change in regulatory complexity since our proposal simply extends the existing Chinook Salmon sport fishing closure for the Kenai River above Skilak Lake to an additional 4.5 miles of main-stem river below Skilak Lake.

Very few guided anglers target Chinook Salmon in this stretch of the river and very few fish are harvested. Therefore, very few anglers will likely be impacted by a closure to Chinook Salmon fishing in this stretch of river. Also, since this stretch of river has in essence been closed through in-season emergency orders since 2011, there should be no noticeable increases in use or crowding in any lower river fisheries. Since past fishery performance in regard to effort and harvest may have little or no relationship to future fishery performance (effort and harvest), managing this stretch of river to avoid differential harvest of even a small number of fish is appropriate, especially given the current small number of fish estimated to use this area during July.

Current resolution of genetic information does not allow for finer-scale management of Chinook Salmon that spawn in the main-stem Kenai River. However, given what we know about current abundance and observed declining trends in size and age, a cautionary approach to management is appropriate and prudent.

One of the principles of the Alaska Sustainable Salmon Policy is that “salmon escapement should be managed in a manner to maintain genetic and phenotypic characteristics of the stock by assuring appropriate geographic and temporal distribution of spawners as well as consideration of range, sex ratio, and other population attributes.” This principle is consistent with tenets of the U. S. Fish and Wildlife Service’s policy on Biological Integrity, Diversity, and Environmental Health (601 FW 3) which directs the Service to maintain biological integrity on national wildlife refuges, defined as “Biotic composition, structure, and functioning at genetic, organism, and community levels comparable with historic conditions...” Managing the main-stem Kenai River below Skilak Lake to avoid differential harvest of Chinook Salmon will address the needs of both policies and both agencies, and promotes conservation of the overall Kenai River Chinook Salmon stock complex. Maintaining life history diversity and biocomplexity is important not only for the long-term sustainability of the overall stock, but also for the overall sustainability of the fisheries that exploit the stock (Hilborn et al. 2003).

There are other spawning areas for Chinook Salmon in the main-stem Kenai River upstream of the Slikok Creek closure area that may also benefit from regulations that restrict harvest. For example, a large proportion of early-run main-stem spawning fish located above Slikok Creek after July 15 in 2010-2013 (range 29 to 71%) were in “unrestricted” areas of the river that are normally open to sport fishing (Appendix B5; Reimer 2013). Sport fishing regulations for Kenai River Chinook Salmon above Slikok Creek also become more liberal from July 15-July 31, allowing the use of bait and removal of a protective slot limit. At this time, we believe protections for these fish can

be better addressed through a different mechanism than a time and area closure. We have submitted a separate proposal to extend early-run regulations upstream of the Slikok Creek sanctuary area for the entire month of July to promote resource conservation while providing for fishery participation and opportunity.

References:

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**PROPOSED BY:** U. S. Fish and Wildlife Service, Alaska Region (HQ-F16-014)

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