

## Stock status summary for major Western Alaska chum salmon and Chinook salmon stocks

Chum salmon (*Oncorhynchus keta*) and Chinook salmon (*Oncorhynchus tshawytscha*) have historically been abundant throughout Western Alaska rivers (Figure 1). Western Alaska chum salmon occur from Bristol Bay north through Kotzebue Sound Management areas and include stocks from Bristol Bay, Kuskokwim, Yukon, Norton Sound, and Kotzebue Sound management areas. Major populations of Western Alaska Chinook salmon occur from the Nushagak River north to southeastern Norton Sound. Both Chinook salmon and chum salmon support regionally important commercial, sport and subsistence fisheries although chum salmon are typically not targeted in this region's sport fisheries. Chum salmon traditionally constitute the majority of subsistence salmon harvest in the Arctic-Yukon-Kuskokwim region and have supported the most northerly commercial salmon fishery in Kotzebue Sound. Chinook salmon are a critical component of the subsistence salmon harvest in the Arctic-Yukon-Kuskokwim region, because they tend to migrate earlier than other salmon species, when weather tends to be more conducive to traditional drying preservation methods, and because they tend to migrate farther upriver than many other salmon species. In more interior communities of the larger river systems, Chinook and chum salmon are the only salmon species available.

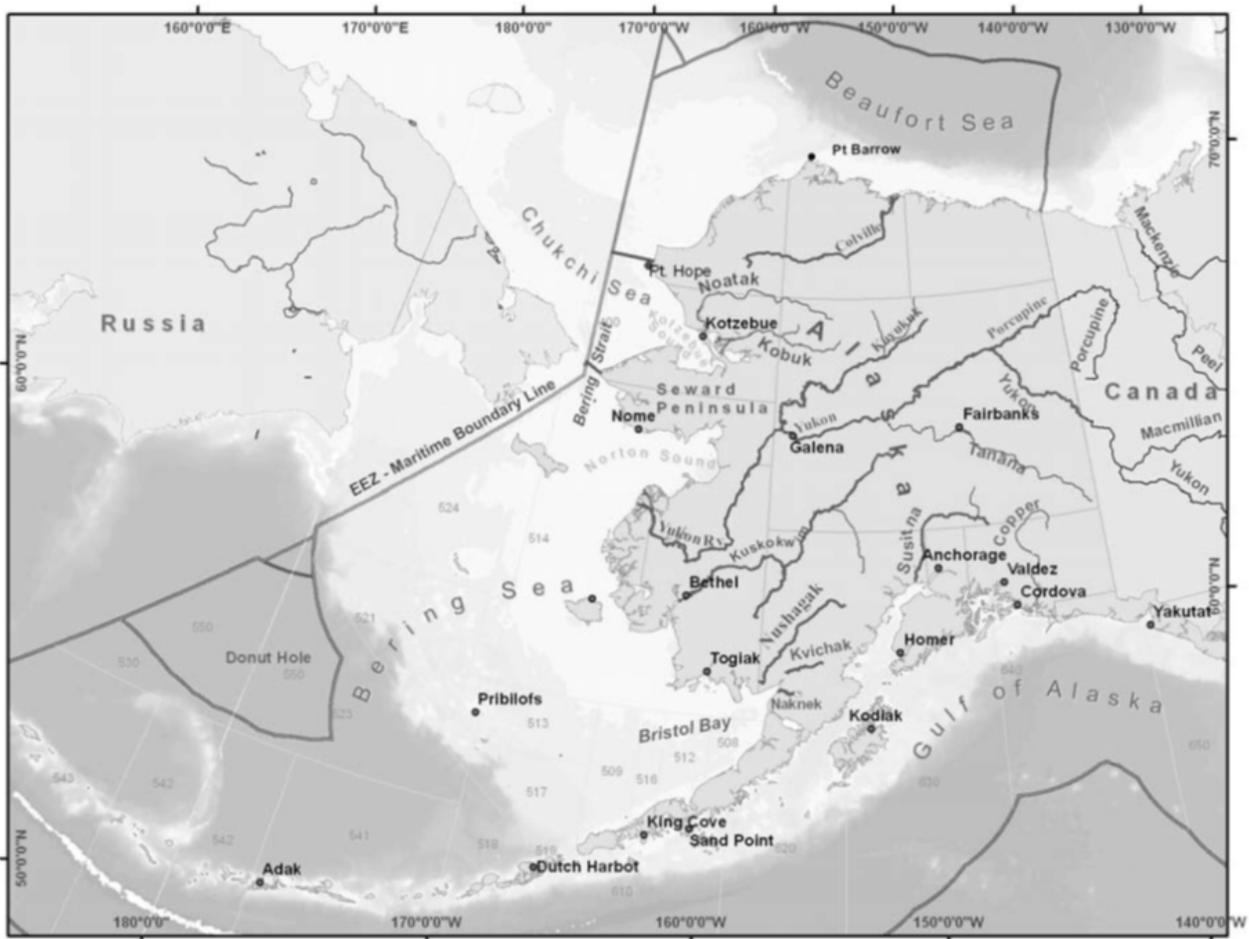


Figure 1. Map of the Bering Sea and major salmon producing rivers ([NPFMC 2012](#)).

## Western Alaska chum salmon

In 2020, Western Alaska chum salmon runs declined dramatically, with run sizes similar to those seen in the previous record poor run of 2000 (Figure 2). All Western Alaska areas had chum salmon run sizes below recent year averages and many were some of the lowest in the historical dataset (Table 1). Commercial chum salmon fisheries were limited for Yukon River summer chum salmon stocks when it became apparent that the run was much poorer than expected; the subsequent Yukon River fall chum salmon commercial fishery was closed. In the Kuskokwim River, there have not been any processors or registered buyers operating in the commercial salmon fishery since 2016 due to Chinook salmon conservation concerns and an accompanying lack of market interest. In the Kuskokwim Bay commercial sockeye salmon (*Oncorhynchus nerka*) fishery, incidental retention of chum salmon was allowed during the 2020 season. Sport fishing for chum salmon was open in all areas of Western Alaska except for Yukon River fall chum salmon. Subsistence chum salmon fisheries were open in all areas but limited in the Yukon River during both the summer and fall chum salmon runs, when runs failed to materialize.

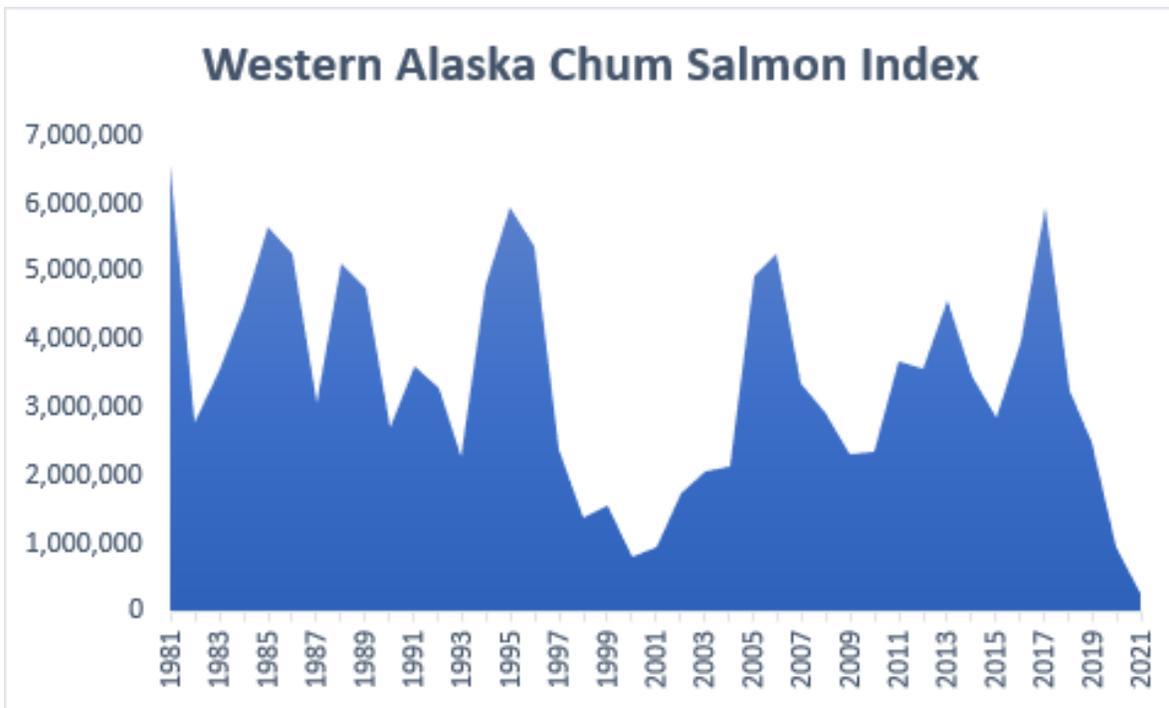


Figure 2. Chum salmon index abundance estimates for Western Alaska stocks.

The decline in Western Alaska chum salmon abundance was even more extreme in 2021 compared to 2020 across all areas (Table 2). An index of Western Alaska chum salmon abundance indicates the 2021 run size was roughly one-third as large as the previous record poor abundance seen in 2000, by far the poorest abundance ever documented (Figure 2). Of the 14 chum salmon escapement goals assessed in the Western Alaska region, only two, both in Norton Sound, were met. Chum salmon fishing was closed in multiple areas including fall and summer chum salmon for all user groups (commercial, sport, and subsistence) on the Yukon River; commercial chum salmon fishing in the Kuskokwim River and Bay areas; and sport chum salmon fishing on the Kuskokwim River.

Table 1. Summary of Western Alaska chum salmon stock status, 2020.

Stock	Abundance?	Escapement goals met? <sup>a</sup>	Subsistence Fishery?	Commercial Fishery?	Sport Fishery?
Nushagak River	Below average	0 of 1	Yes	Yes	Yes
Kuskokwim Bay	Below average	NS <sup>b</sup>	Yes	No	Yes
Kuskokwim River	Below average	1 of 1	Yes	Limited	Yes
Yukon River summer run	Below average	1 of 1	Limited	Limited	Yes
Yukon River fall run	Below average	1 of 4 <sup>c</sup>	Limited	No	No
Norton Sound	Below average	2 of 4	Yes	Limited	Yes
Kotzebue	Below average	NS <sup>b</sup>	Yes	Limited	Yes

<sup>a</sup> Includes performance for the subset of goals that were assessed. Some escapement goals were not assessed for various logistical reasons, including funding and weather.  
<sup>b</sup> No survey, escapement goal was not assessed.  
<sup>c</sup> Includes 2 U.S/Canada goals.

Table 2. Summary of Western Alaska chum salmon stock status, 2021.

Stock	Abundance?	Escapement goals met? <sup>a</sup>	Subsistence Fishery?	Commercial Fishery?	Sport Fishery?
Nushagak River	Below average	0 of 1	Yes	Yes	Yes
Kuskokwim Bay	Below average	NS <sup>b</sup>	Yes	No	Yes
Kuskokwim River	Below average	0 of 1	Limited	No	No
Yukon River summer run	Below average	0 of 3	No	No	No
Yukon River fall run	Below average	0 of 5 <sup>c</sup>	No	No	No
Norton Sound	Below average	2 of 4	Yes	Limited <sup>d</sup>	Yes
Kotzebue	Below average	NS <sup>b</sup>	Yes	Limited	Yes

<sup>a</sup> Includes performance for the subset of goals that were assessed. Some escapement goals were not assessed for various logistical reasons, including funding and weather.  
<sup>b</sup> No survey, escapement goal was not assessed.  
<sup>c</sup> Includes 2 U.S/Canada goals.  
<sup>d</sup> Closed in subdistrict 1.

In most of Western Alaska, 2020 and 2021 chum salmon runs were the lowest on record. In 2021, both Yukon River summer and fall chum salmon runs were the lowest in the time series, 1981-2021, with a combined fall and summer chum salmon run size under 250,000 fish (Figure 3).

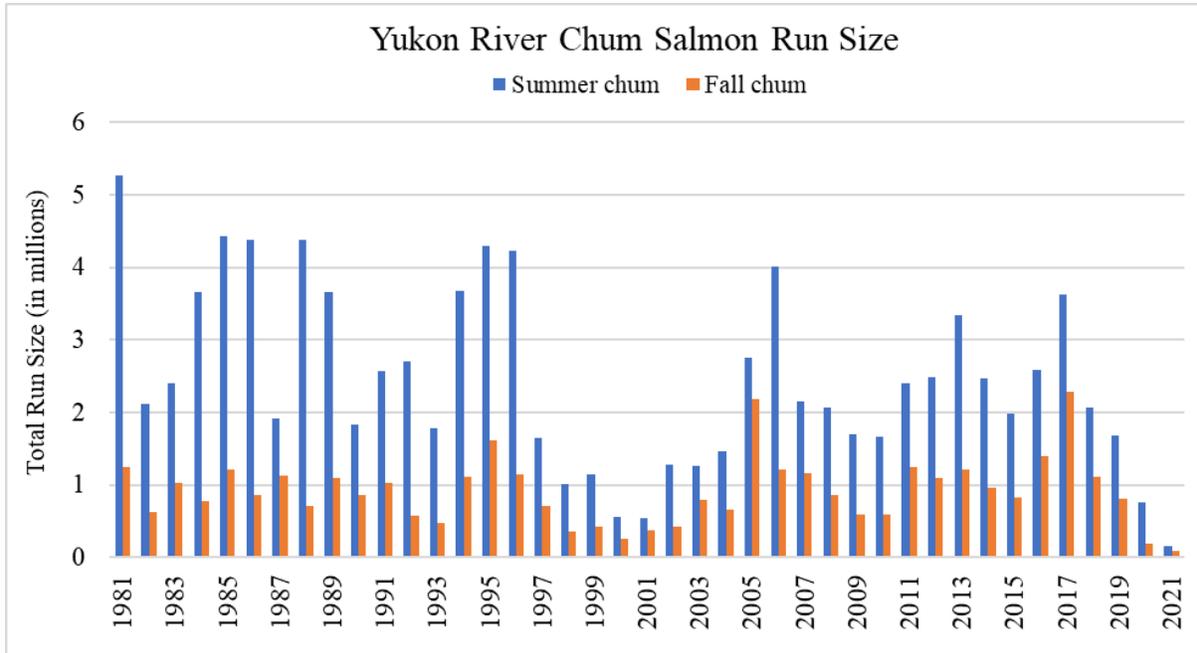


Figure 3. Yukon River chum salmon run size, 1981-2021. Source: Bayesian run reconstructions provided by ADF&G on April 26, 2022.

While total chum salmon run abundance estimates are not available in the Kuskokwim area, relative indices of abundance are available, including the Bethel Test Fishery in the lower river and the Kogrukluk River weir in the upper river. In 2021, the Bethel Test Fishery cumulative catch per unit effort (CPUE) and the Kogrukluk River weir chum salmon abundance estimates were the lowest in the time series (Figure 4).

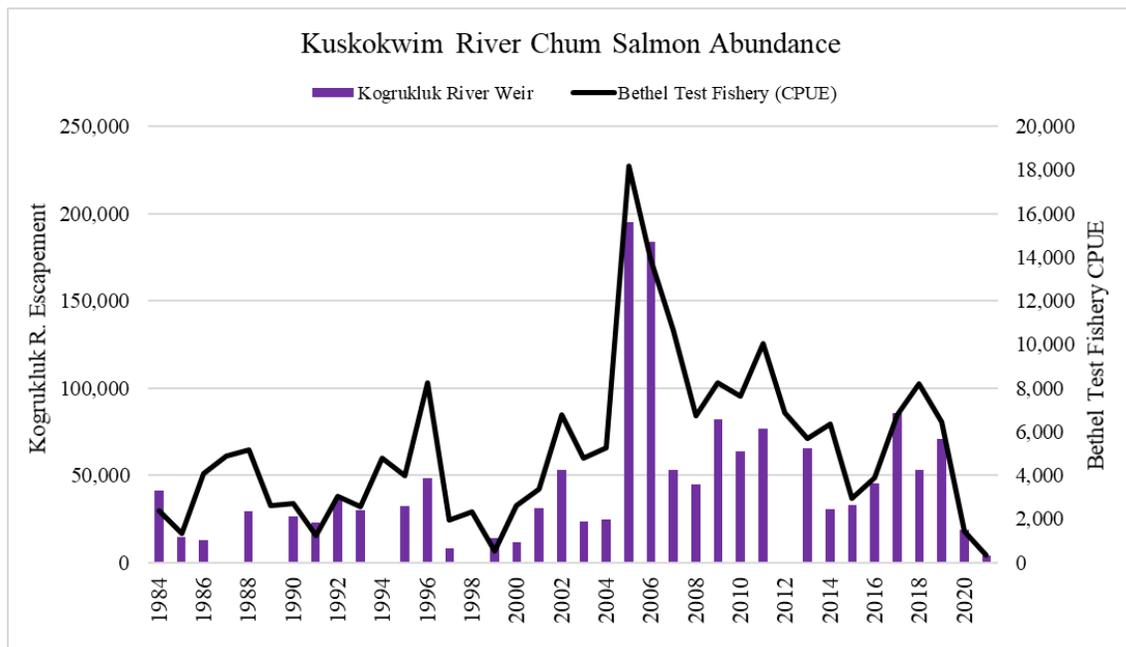


Figure 4. Kuskokwim River chum salmon. Kogrukluk River weir escapement and cumulative CPUE from the in-river Bethel test fishery, 1984-2021.

In the Norton Sound area, chum escapement goals were met in two of the four rivers in both 2020 and 2021. In 2020, escapement goals were met on the Eldorado River and the Nome River. In 2021, escapement goals were met on the Snake River and Eldorado River; no escapement estimate was made for the Nome River. While important chum salmon stocks exist throughout Norton Sound, the only total run size estimate is for Kwiniuk River chum salmon in northern Norton Sound. Unlike most Western Alaska chum salmon stocks, which have been abundant historically, northern Norton Sound chum salmon abundance has been variable with prolonged periods of poor productivity. Despite this different historical trend, the estimated 2021 Kwiniuk River chum salmon abundance was the poorest in the 1981-2021 time series (Figure 5).

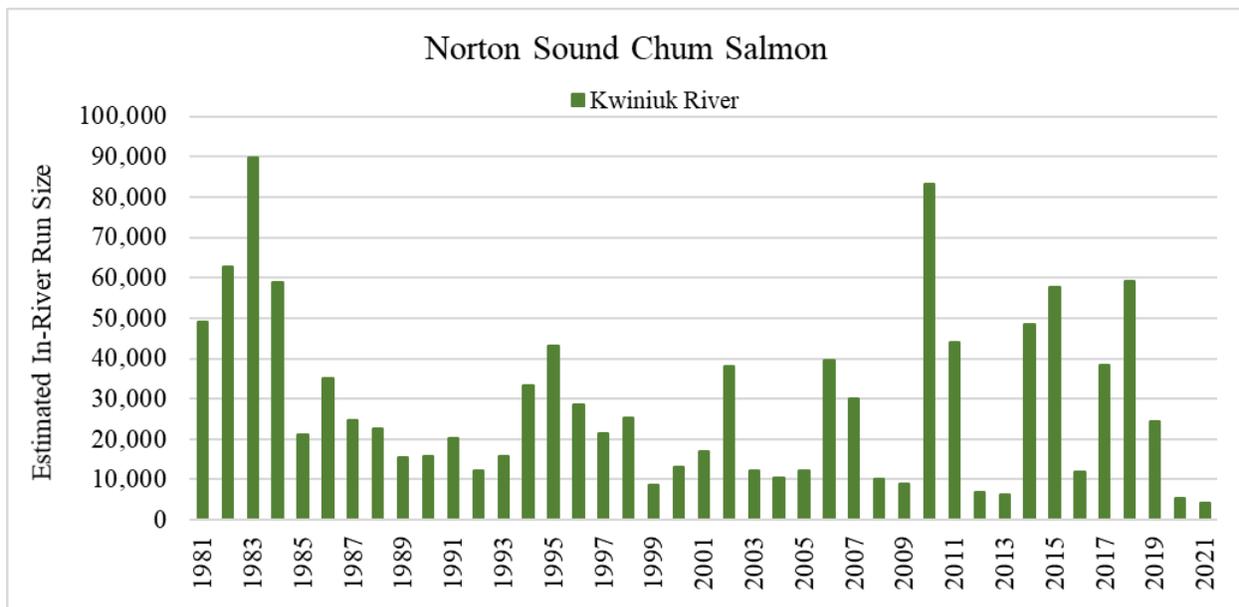


Figure 5. Estimated run size for the Kwiniuk River chum salmon in the Norton Sound area, 1981-2021.

### Western Alaska Chinook salmon

Western Alaska Chinook salmon runs have been chronically poor for over a decade (Figure 6). While this pattern has been observed elsewhere in Alaska, the magnitude of the decline has been particularly prominent in Western Alaska. Overall, Western Alaska Chinook salmon run sizes in 2020 and 2021 were the poorest observed over the past 40 years and unlike chum salmon, there was not a pronounced drop in run sizes from 2020 to 2021 (Figure 6). In 2020, commercial Chinook salmon fisheries were opened only in the Norton Sound area and no directed commercial Chinook salmon fisheries were allowed in 2021 (Tables 3 and 4). In both years, retention of Chinook salmon was allowed incidental to commercial fisheries targeting sockeye salmon in Bristol Bay and Kuskokwim Bay. Sport fishing for Chinook salmon was closed or restricted in all areas except Norton Sound in 2020 and Kuskokwim Bay in 2020 and 2021. Subsistence Chinook salmon fisheries were restricted in the Yukon River in 2020 and closed in 2021. Subsistence Chinook salmon fisheries were restricted in the Kuskokwim River both years. Despite complete closures or substantial restrictions to all Chinook salmon harvest, too few salmon returned to Western Alaska in 2021 to meet escapement goals in all areas except Kuskokwim River and Kuskokwim Bay (Table 4). This is a continuation of the poor productivity pattern previously reported for these stocks (NPFMC 2015), though 2020 and 2021 have been exceptionally poor even within this longer-term trend.

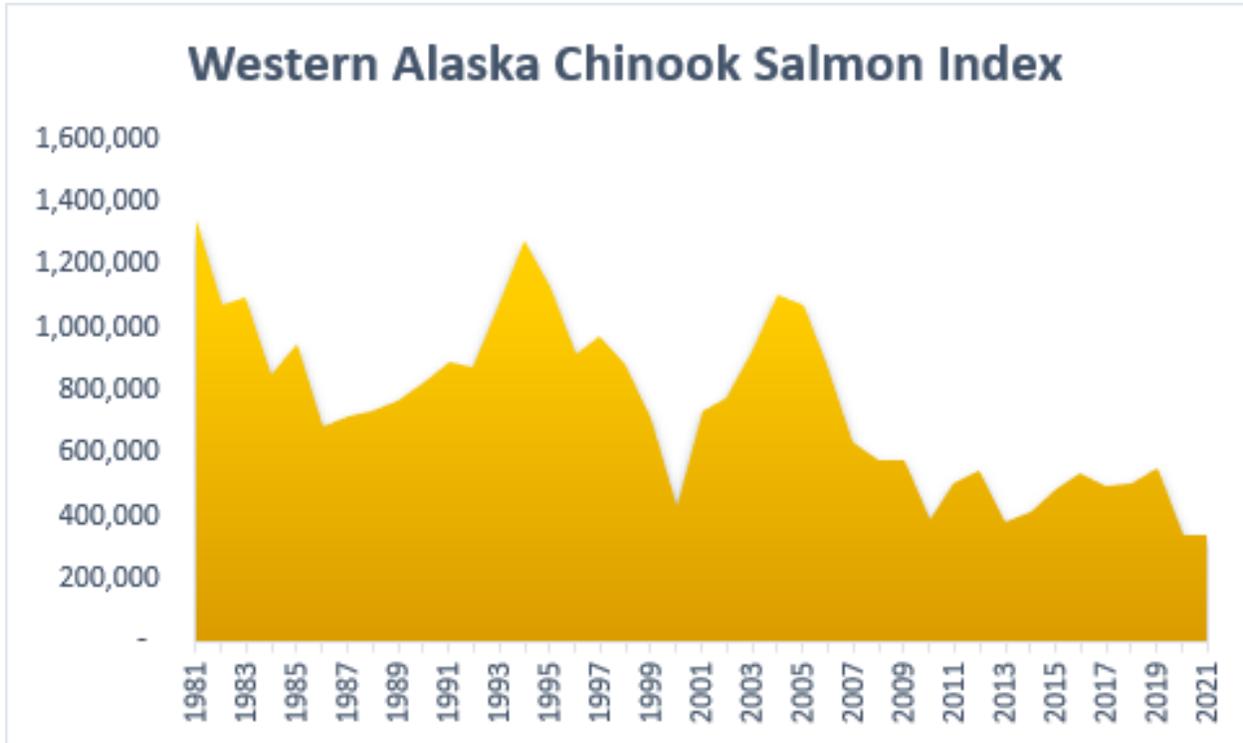


Figure 6. Chinook salmon index abundance estimates for Western Alaska stocks.

Table 3. Summary of Western Alaska Chinook salmon stock status, 2020.

Stock	Total run size?	Escapement goals met? <sup>a</sup>	Subsistence Fishery?	Commercial Fishery?	Sport Fishery?
Nushagak River	Below average	0 of 1	Yes	No directed Chinook Fishery	Limited
Kuskokwim Bay	Below average	2 of 2	Yes	No directed Chinook Fishery	Yes
Kuskokwim River	Below average	6 of 8	Limited	No	No
Yukon River	Below average	0 of 4 <sup>b</sup>	Limited	No	No
Norton Sound	Below average	1 of 2	Yes	No directed Chinook Fishery	Yes

<sup>a</sup> Includes performance for the subset of goals that were assessed. Some escapement goals were not assessed for various logistical reasons, including funding and weather.

<sup>b</sup> Includes 1 U.S./Canada goals.

Table 4. Summary of Western Alaska Chinook salmon stock status, 2021.

Stock	Total run size?	Escapement goals met? <sup>a</sup>	Subsistence Fishery?	Commercial Fishery?	Sport Fishery?
Nushagak River	Below average	0 of 1	Yes	No directed Chinook Fishery	Limited
Kuskokwim Bay	Below average	2 of 2	Yes	No directed Chinook Fishery	Yes
Kuskokwim River	Below average	3 of 3	Limited	No	No
Yukon River	Below average	0 of 4 <sup>b</sup>	No	No	No
Norton Sound	Below average	0 of 2	Yes	No directed Chinook Fishery	No

<sup>a</sup> Includes performance for the subset of goals that were assessed. Some escapement goals were not assessed for various logistical reasons, including funding and weather.

<sup>b</sup> Includes 1 U.S./Canada goals.