

Summary of Subsistence Harvests in the Yukon and Kuskokwim Management Areas

1. Introduction

This paper provides the North Pacific Fishery Management Council's (Council) Salmon Bycatch Committee (Committee) with a high-level overview of subsistence harvests of salmon with a primary focus on the Yukon and Kuskokwim Management Areas. The Salmon Bycatch Committee's [report](#) from its first meeting in November 2022 identifies nine non-prioritized information requests, and the Council supported staff work on eight of these requests to the extent possible. This paper responds to the Committee's information request for a better understanding of how conditions have changed since 2012, such as in-river restrictions.

Analysis of the stock composition of Chinook and chum salmon incidentally caught in the Bering Sea pollock fishery has shown that the stock structure is dominated by western Alaska stocks for Chinook (i.e., approximately 54% of Chinook salmon bycatch in 2020) and a lower proportion of western Alaska chum (i.e., approximately 9% of chum salmon bycatch in 2021).¹ These salmon stocks have historically been harvested at high levels for subsistence by people who live in western and interior Alaska. While the geographic scope and the impact of the Bering Sea pollock fishery's salmon bycatch is broader (i.e., includes stocks from Kotzebue, Norton Sound, etc.), staff time constraints were a limiting factor for this overview. The Yukon and Kuskokwim Management Areas were selected as a starting point for the Committee's discussion because both regions are experiencing a decline in multiple species of Pacific salmon which has negatively impacted subsistence harvests via restrictions and closures. Additionally, and as discussed below, the Yukon and Kuskokwim Management Areas have historically comprised the largest portions of overall subsistence salmon harvests which is largely attributed to Chinook and chum harvests.

Following this introduction, Section 2 provides a statewide overview of subsistence harvests of Chinook and chum salmon in 2019. This is the most recent year for which comprehensive data are available. Section 3 discusses the historical subsistence harvests of Chinook and chum salmon in the Yukon and Kuskokwim Management Areas and contextualizes those harvests in light of the Amounts Reasonably Necessary for Subsistence determined by the Board of Fisheries. Section 4 concludes with a high-level summary of potential, related social impacts of lower run abundance in these Management Areas.

2. Overview of Subsistence Harvests of Chinook and Chum Salmon

The estimated total subsistence harvest of salmon in Alaska in 2019, based on the Alaska Department of Fish & Game's Division of Subsistence annual harvest assessment programs, was 775,677 fish, which is a 10% decrease from 2018. The estimated statewide harvest by species was as follows: 303,314 sockeye salmon (39.1%), 233,610 chum salmon (30.1%), 114,594 Chinook salmon (14.8%), 75,281 coho salmon (9.7%), and 48,877 pink salmon (6.3%) (ADF&G 2022). To provide context for the 2019 subsistence harvests, Table 2-1 shows the historical Alaska subsistence salmon harvests from 1994-2019. An important caveat to this data is that, while the 2019 Annual Report is the most recent comprehensive overview of statewide subsistence harvests available, it does not reflect the more recent subsistence restrictions and closures in the Yukon and Kuskokwim Management Areas. For example, the Yukon Area

¹ The Council and the National Marine Fisheries Service have actively managed salmon bycatch in the Bering Sea for over 30 years. More information on the Council's salmon bycatch management programs can be found [here](#).

experienced total subsistence closures in 2021 and 2022 with partial closures in 2020 (i.e., some fishing for summer species with restrictions but not closures).

In 2019, fisheries in nine management areas accounted for 95.1% of the total estimated statewide subsistence salmon harvests. These were the Yukon Management Area (187,406 salmon; 24.2% of the statewide total); the Kuskokwim Management Area (166,821 salmon; 21.5%); the Bristol Bay Management Area (96,876 salmon; 12.5%); the Glennallen Subdistrict of the Prince William Sound Management Area (84,199 salmon; 10.9%); the Norton Sound-Port Clarence Area (69,913 salmon; 9%); the Kotzebue District (61,636; 7.9%); Southeast Region (including the Stikine River Federal fishery and other Federal permits) (49,632 salmon; 6.4%); the Kodiak Management Area (including Federal permits) (12,688 salmon; 1.6%) and the Arctic District (8,332 salmon, 1.1%) (ADF&G 2022).

The largest estimated subsistence harvests of Chinook salmon in 2019 occurred in the Yukon Management Area (48,623 salmon; 42.4% of the statewide harvest), followed by the Kuskokwim Management Area (44,542 salmon; 38.9%), Bristol Bay Management Area (11,488 salmon; 10%). In 2019, as in past recent years, four areas dominated the estimated subsistence chum salmon harvest: the Yukon Management Area (127,867 salmon; 54.7% of the statewide harvest), Kotzebue District (51,861 salmon; 22.2%), the Kuskokwim Management Area (35,521 salmon; 15.2%), and the Norton Sound-Port Clarence Area (8,719 salmon; 3.7%) (ADF&G 2022).

Table 2-1 Historical Alaska Subsistence Harvests, 1994-2019

Year	Households or permits		Estimated salmon harvest					Total
	Total	Surveyed or returned	Chinook	Sockeye	Coho	Chum	Pink	
1994	15,493	10,553	183,936	338,946	135,896	417,199	94,469	1,170,446
1995	15,596	10,328	180,805	291,539	120,048	499,992	54,908	1,147,292
1996	16,512	11,789	158,369	320,821	121,381	498,525	80,928	1,180,026
1997	17,668	12,863	176,703	376,397	98,883	347,808	41,543	1,041,335
1998	17,772	12,513	170,271	328,857	93,055	302,037	74,216	968,436
1999	17,290	12,763	155,088	358,866	89,627	338,351	32,402	974,334
2000	16,678	12,765	130,822	296,875	99,338	247,337	51,714	826,087
2001	18,693	13,061	161,632	340,411	98,517	240,581	42,435	883,576
2002	17,266	13,026	142,459	299,182	92,192	229,179	85,431	848,443
2003	18,131	13,211	164,555	324,539	106,488	238,582	66,794	900,958
2004	18,374	13,549	173,746	332,543	100,860	239,811	91,597	938,557
2005	16,256	11,013	153,431	323,218	97,993	257,200	76,071	907,912
2006	16,988	11,400	139,815	314,435	93,478	291,510	73,234	912,473
2007	17,068	10,374	154,974	319,885	78,704	273,802	33,513	860,877
2008	17,226	11,248	174,115	315,040	113,242	270,502	85,842	958,741
2009	16,989	11,607	141,302	296,104	86,363	213,835	38,038	775,642
2010	16,020	11,381	133,252	326,363	80,217	235,763	59,031	834,627
2011	17,181	12,155	128,657	341,388	77,180	257,032	35,646	839,903
2012	18,598	11,970	74,381	344,071	80,275	367,692	69,051	935,470
2013	18,676	13,190	83,729	347,834	81,295	360,920	29,963	903,741
2014	21,577	14,236	42,661	348,651	115,085	357,579	68,621	932,596
2015	21,501	13,847	61,567	351,339	95,756	315,973	48,512	860,809
2016	22,223	14,771	84,760	332,421	87,439	318,241	74,408	897,269
2017	21,876	14,044	82,198	308,421	92,359	325,446	54,506	862,930
2018	22,777	13,927	84,983	265,011	69,043	268,611	49,819	737,467
2019	22,889	14,490	114,594	303,314	75,281	233,610	48,877	775,677
5-year average (2014–2018)	21,991	14,165	71,234	321,169	91,936	317,170	59,173	858,214
10-year average (2009–2018)	19,742	13,113	91,749	326,160	86,501	302,109	52,760	858,045
Historical average (1994–2018)	18,177	12,463	133,528	325,726	96,189	308,540	60,508	923,998

Source ADF&G Division of Subsistence, ASFDB 2019 (ADF&G 2022).

Note Included in this table are all harvest estimates based upon annual harvest monitoring programs.

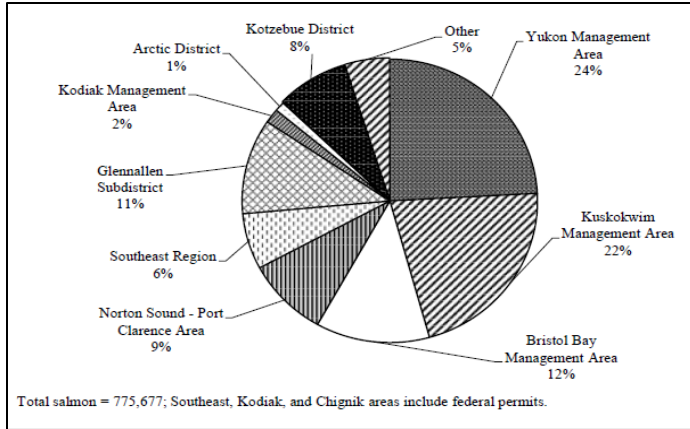


Figure 2-1 Alaska Subsistence Salmon Harvest by Area 2019

Source: ADF&G Division of Subsistence, ASFDB 2019 (ADF&G 2022)

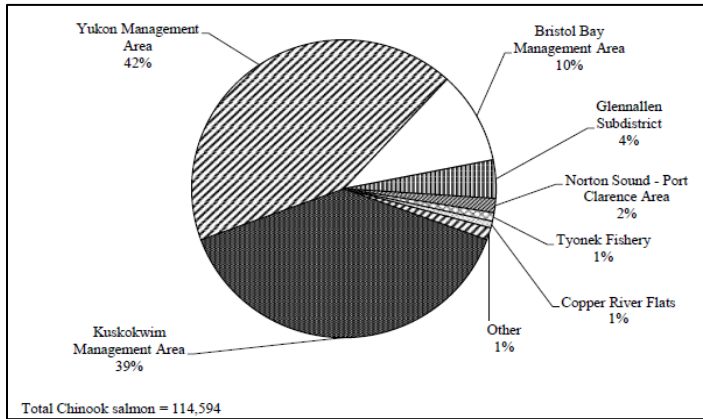


Figure 2-2 Subsistence Chinook Salmon Harvest by Area 2019

Source: ADF&G Division of Subsistence, ASFDB 2019 (ADF&G 2022)

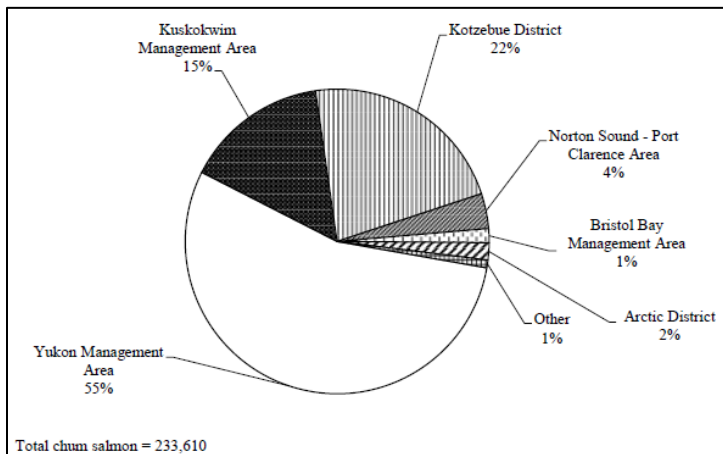


Figure 2-3 Subsistence Chum Salmon Harvest by Area 2019

Source: ADF&G Division of Subsistence, ASFDB 2019 (ADF&G 2022)

3. Amounts Necessary for Subsistence

One method for assessing the relative success of a particular subsistence fishery is to compare the annual estimated subsistence harvest for the Management Area to the historical harvest levels as well as the Amounts Reasonably Necessary for Subsistence (ANS). The Board of Fisheries and Board of Game use Customary and Traditional Use Worksheets to determine whether a stock or population has been customarily and traditionally used in an area. If the Board gives a positive finding that a resource is customarily and traditionally used, an ANS amount is established, and management decisions as well as harvest opportunities are made with that range in mind. The ANS amount is set keeping in mind the sustained yield principle, and the amounts do not include salmon harvested from personal use permits or salmon retained from commercial fisheries for personal use. The Board of Fisheries has made positive ANS findings for salmon throughout the Arctic-Yukon-Kuskokwim Region (see Table 3-1).

3.1 Yukon Management Area

In 1993, the Board of fisheries made a positive customary & traditional use finding for all salmon in the Yukon-Northern Area and determined that the ANS ranged between 348,000-503,000 salmon for all species combined (5 AAC 01.236). In 2001, the Board of Fisheries made species-specific ANS determinations for each of the four species of salmon harvested in the Yukon Area, including separate ANS determinations for summer and fall chum salmon.

The Yukon Area's ANS amount for Chinook salmon is 45,500-66,704 fish. Subsistence harvests of Chinook salmon across the Yukon area have been below the ANS amount in 16 out of 22 years (2001-2022, see Table 3-2). In the Yukon Area, Chinook salmon run sizes began to decline in 1998 with the most dramatic drop in run sizes beginning in 2007. Subsistence harvest of Chinook salmon along the U.S. portion of the Yukon River averaged 51,972 fish from 1992-2007. Since 2008, Chinook salmon fishing restrictions have been necessary for most years to meet escapement goals.² From 2008-2022, subsistence harvests of Chinook have averaged 25,569 fish. Chinook salmon run size began to rebound in 2016, and restrictions were relaxed. By 2019, subsistence harvests reached 48,379; this was the highest harvest since 2007. However, returns have since declined and there were drainage wide closures for Chinook and chum salmon in 2021 and 2022 in the summer and fall seasons. 2021 and 2022 were the lowest subsistence harvests of Chinook on record at 1,995 and 1,827 fish respectively (Figure 3-1 and Table 3-2).³

The Yukon Area's ANS amount for summer chum salmon is 83,500-142,192 fish. Subsistence harvests of summer chum salmon have been below the ANS range in 10 out of 22 years which is approximately 45% of the analyzed time period (2001-2022, see Table 3-2). Summer chum salmon provide the largest subsistence harvest of salmon in the Yukon Management Area (including the Coastal District), averaging 78,695 fish from 2001-2022. Subsistence fishermen in the lower Yukon River are the primary users for summer chum. While summer chum salmon are found as far upstream as the lower portion of District 5 and 6 (see Figure 3-5), fishermen in those districts typically do not target them due to their poor quality. Subsistence harvest levels of summer chum have been impacted by subsistence fishing restrictions due to their overlap in run timing with Chinook salmon. The 10-year annual average amount of subsistence harvests for summer chum salmon (including those harvests from the Coastal District) averaged 65,079

² Currently, the mainstem escapement goal for Chinook salmon across the U.S.-Canada border is 42,555 to 55,000 fish and the escapement range for fall chum is 70,000 to 104,000 (JTC 2021).

³ Subsistence fishing for Chinook and chum salmon was closed across the Yukon River drainage in 2021 and 2022 in the summer and fall seasons. The harvest totals include fish mortality caught in test fishery projects (Pilot Station sonar, Lower Yukon Test Fishery, etc.) and distributed to nearby communities. Some salmon may have been harvested early in the season prior to the start of closures on June 2, or late in the season after fall season management actions were rescinded, and under the ice. There was also a small number of salmon harvested incidentally in non-salmon gear as people along the river were fishing for sheefish, whitefish, and pike.

fish, but harvest restrictions were implemented in 2021 due to exceptionally low chum salmon returns, and only 1,266 and 6,724 fish were harvested for subsistence in 2021 and 2022 respectively (see Table 3-2).

The Yukon Area's ANS range for fall chum salmon is 89,500-167,900. Subsistence harvests for fall chum salmon have been below the ANS range in 17 out of 22 years, approximately 77% of the analyzed time period (2001-2022, see Table 3-2). Fall chum salmon provide the second largest subsistence harvest; an annual average 67,892 fish have been harvested for subsistence since 2001. Subsistence fishermen target fall chum throughout the Yukon River drainage, with most of the harvest occurring in the upper Yukon River and Tanana River late in the season. Fall chum harvest generally coincides with freezing weather, which allows some dog mushers to store fish for use as dog food (Ransbury et al., 2010). Subsistence fishing harvest levels increased in the mid-2010s due to low runs of Chinook salmon but have since decreased. In 2020 and 2021, the fall chum salmon subsistence harvests were minimal, coinciding with extremely poor salmon returns.

Table 3-1 Alaska Board of Fisheries findings pertaining to amounts reasonably necessary for subsistence

Fisheries Management Area	Year of ANS Finding	Chinook Salmon	Chum Salmon	Summer Chum Salmon	Fall Chum Salmon	Sockeye	Coho	Pink	All Salmon
Kotzebue District	None								
Norton Sound-Port Clarence Area	1998								96,000-160,000
Subdistrict 1 of Norton Sound District*	1999		3,430-5,716						
Yukon Area	2001	45,500-66,704		83,500-142,192	89,500-167,900		20,500-51,980	2,100-9,700	
Kuskokwim Area	2013								
Kuskokwim River		67,200-109,800	41,200-116,400			32,200-58,700	27,400-57,600	500-2,000	
Districts 4 and 5									6,900-17,000
Remainder of Area									12,500-14,400
Bristol Bay	2001								157,000-172,171
Kvichak River Drainage						55,000-65,000			
Alaska Peninsula	1998								34,000-56,000

Table 3-2 Amounts Necessary for Subsistence, Yukon Area, 2001-2022

	Chinook	Summer Chum	Fall Chum
ANS Range	45,500-66,704	83,500- 142,192	89,500-167,900
Year	Estimated number of subsistence salmon harvested		
2001	53,462	68,544	32,135
2002	42,117	79,066	17,908
2003	55,221	78,664	53,829
2004	55,102	74,532	61,895
2005	53,409	93,259	91,534
2006	48,593	115,093	83,987
2007	55,156	92,891	98,947
2008	45,186	86,514	89,357
2009	33,805	80,539	66,119
2010	44,559	88,373	68,645
2011	40,980	96,020	80,202
2012	30,415	126,992	99,309
2013	12,533	115,114	113,393
2014	3,286	86,900	92,529
2015	7,577	83,567	86,600
2016	21,612	87,902	84,617
2017	38,036	87,437	85,093
2018	31,812	76,926	64,494
2019	48,379	63,303	63,862
2020	21,531	41,655	55,696
2021	1,995	1,266	705
2022	1,827	6,724	2,778
Total harvest	746,593	1,731,281	1,493,634
Average harvest	33,936	78,695	67,892
10 yr av.	18,859	65,079	64,977
5 yr av.	21,109	37,975	37,507

*Bold indicates harvest is below ANS

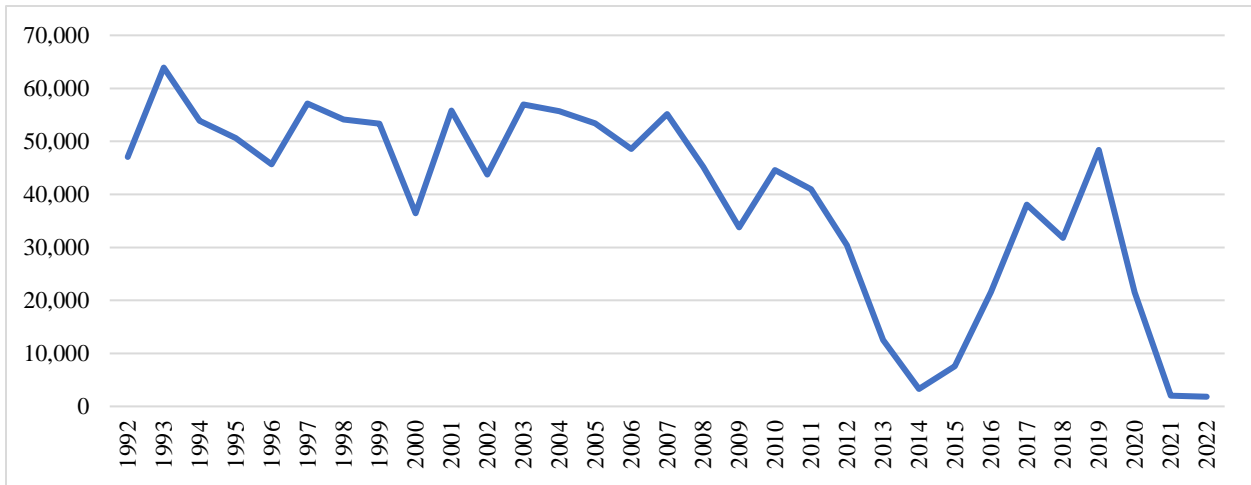


Figure 3-2 Yukon Area Chinook Subsistence Harvests, 1992-2022

Source: https://www.adfg.alaska.gov/index.cfm?adfg=commercialbyareayukon.subsistence_salmon_harvest

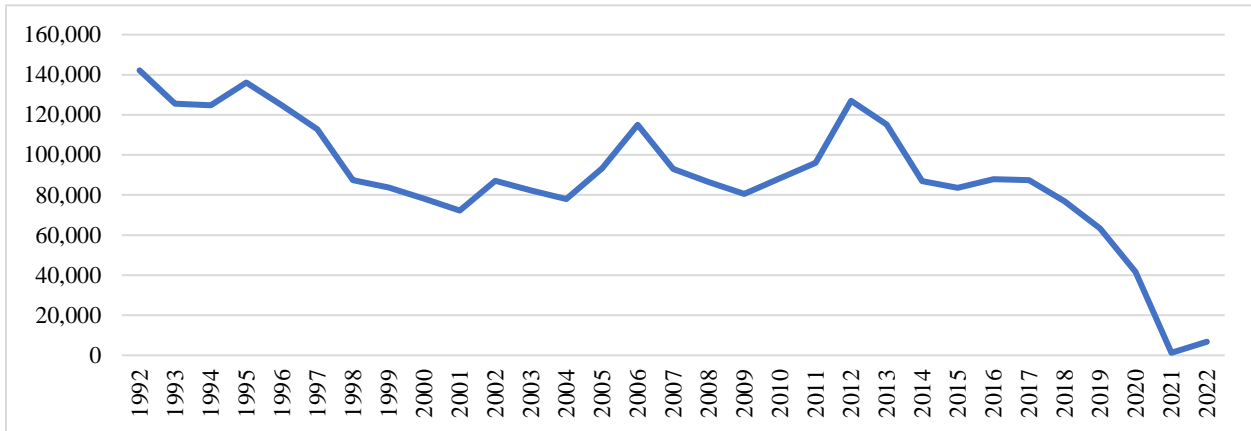


Figure 3-3 Yukon Area Summer Chum Harvests, 1992-2022

Source: https://www.adfg.alaska.gov/index.cfm?adfg=commercialbyareayukon.subsistence_salmon_harvest

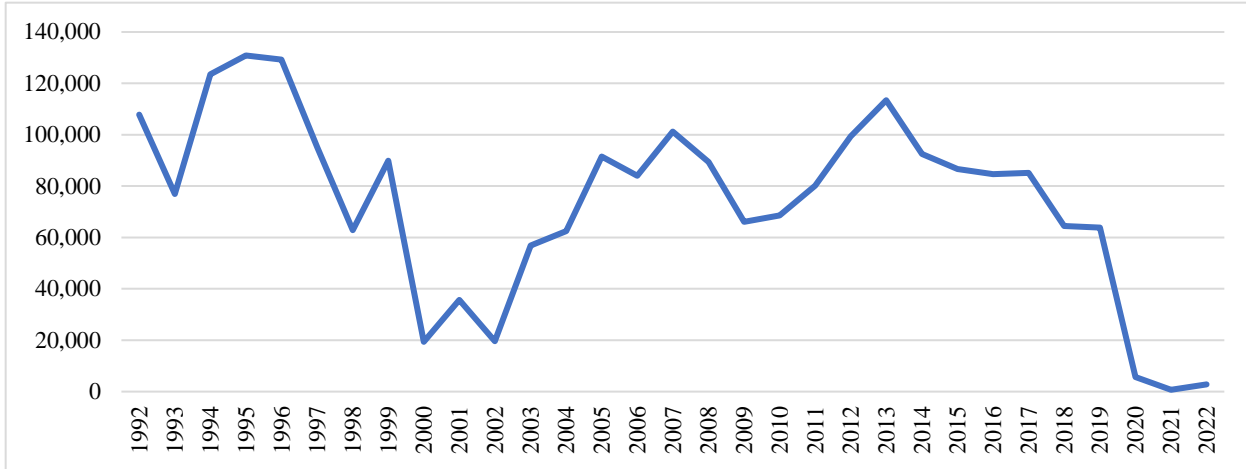


Figure 3-4 Yukon Area Fall Chum Subsistence Harvests, 1992-2022

Source: https://www.adfg.alaska.gov/index.cfm?adfg=commercialbyareayukon.subsistence_salmon_harvest

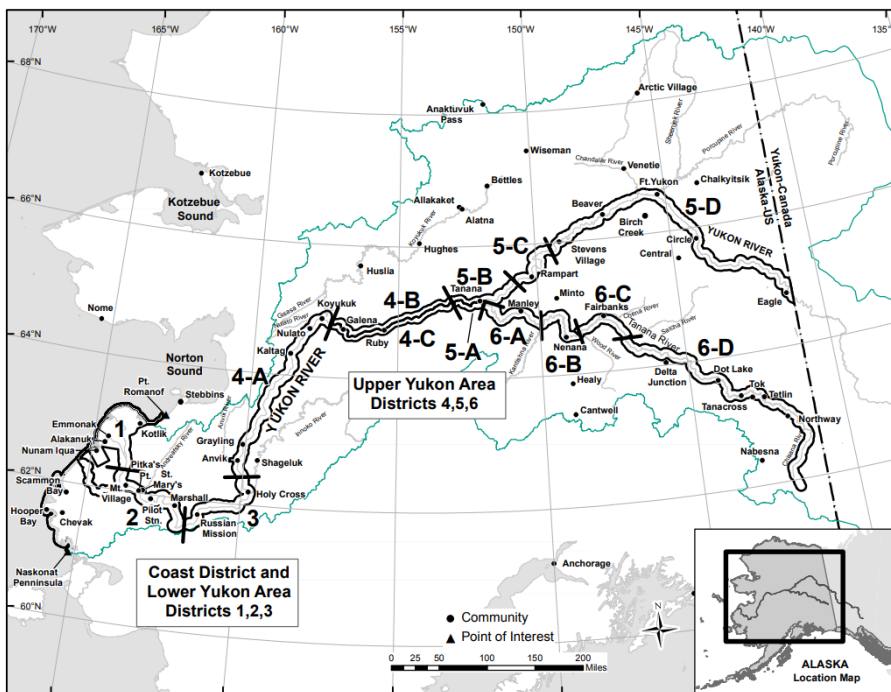


Figure 3-5 Yukon River Statistical Areas, All Districts

Source: https://www.adfg.alaska.gov/static/fishing/PDFs/commercial/yukon/yukon_main.pdf

3.2 Kuskokwim Management Area

In 1993, the Board of Fisheries made a positive finding for the customary and traditional use of all salmon in the entire Kuskokwim Management Area. In 2001, ADF&G recommended the Board amend 5 AAC 01.286 to include a finding of the ANS amount for the Kuskokwim Management Area using subsistence harvest data through 1999. During the 2013 Board meeting, the ANS ranges for the Area were revised.

The ANS amount for Chinook in the Kuskokwim Management Area is 67,200-109,800 fish. The subsistence harvests of Chinook salmon have fallen below the ANS range every year since 2013 (i.e., 2013-2021, see Table 3-4). From 1990 through 2010, the annual average subsistence harvest of Chinook salmon was 85,160 fish. Subsistence harvest of Chinook salmon in the Kuskokwim River averaged 85,160 fish from 1990-2010. Poor Chinook run sizes since 2010 have restricted subsistence harvests, and from 2011 through 2021, the annual average subsistence harvest of Chinook salmon was 30,079 fish; the most recent five-year average is 28,159 fish (2017-2021) (Smith and Gray 2022). Post-season household harvest surveys have not been completed and reported for the 2022 fishing season. However, preliminary data from the community-based harvest monitoring program operated by the KRITFC, Orutsamiut Native Council, and the Yukon Delta National Wildlife Refuge, estimates that residents of communities along the Kuskokwim River met approximately one-third of their average long-term Chinook salmon harvest needs in the 2022 season (KRITFC 2022).

The Kuskokwim River lacks a drainage-wide chum run and escapement estimates. Stock status is evaluated using harvest and tributary escapement data. The 2020 chum salmon run was well below average, and the 2021 chum salmon run was the lowest on record. Preliminary data for the 2022 season indicate the 2022 chum salmon run was the second lowest on record, slightly higher than the 2021 season. Chum salmon are an importance source of food security for communities along the Kuskokwim River, especially during years of poor Chinook salmon returns (Goddhun et al., 2020).

The ANS amount for chum salmon in the Kuskokwim Management Area is 41,200-116,400 fish. Since 2013, subsistence harvests of chum salmon in the Kuskokwim Management Area have fallen below the ANS amount in three years – 2019, 2020, and 2021. From 2001 through 2021, the annual average harvest of chum salmon was 54,083 fish, and the most recent five-year average is 33,924 fish (2017-2021). However, 9,621 chum salmon were harvested for subsistence which is the lowest subsistence harvest in the analyzed time period.

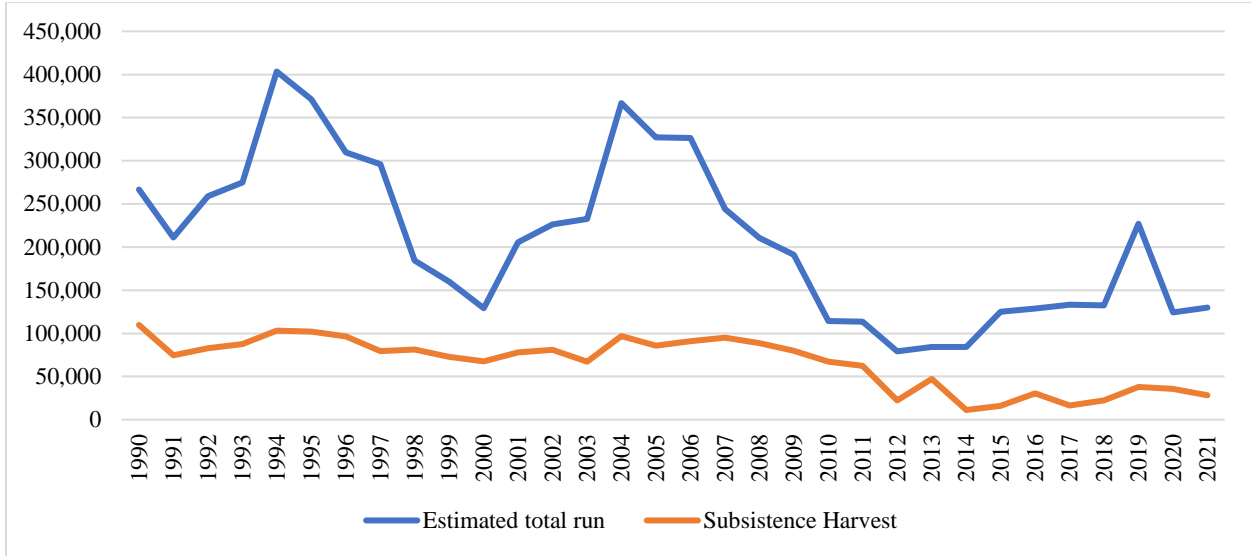


Figure 3-6 Estimated total Chinook run size compared to subsistence harvests on the Kuskokwim River from 2012 through 2021

Source: Kuskokwim Management Area Annual Report, 2021 (Smith & Gray 2022)

Table 3-3 Chum salmon utilization on the Kuskokwim River, 1990 through 2021

Year	Commercial	a	Harvest			Total
			Subsistence	Test	Sport	
1990	459,974	c	153,825	1,650	533	615,982
1991	431,802	c	87,237	1,014	378	520,431
1992	344,603	c	116,391	12,409	608	474,011
1993	43,337	c	59,797	8,365	359	111,858
1994	271,115	c	76,937	11,637	1,280	360,969
1995	605,918	c	70,977	16,241	226	693,362
1996	207,877	c	100,913	2,864	280	311,934
1997	17,026	c	37,366	790	86	55,268
1998	207,809	c	61,732	1,140	291	270,972
1999	23,006		44,242	363	180	67,791
2000	11,570		56,499	1,033	26	69,128
2001	1,272		56,005	19	112	57,408
2002	1,900		86,381	7	53	88,341
2003	2,764		41,167	0	53	43,984
2004	20,150	c	64,140	113	84	84,487
2005	69,139	c	58,555	96	500	128,290
2006	44,152	c	89,674	0	13	133,839
2007	10,783	c	73,560	53	391	84,787
2008	30,798	c	63,789	0	121	94,708
2009	76,956	c	44,324	0	285	121,565
2010	93,917	c	45,089	0	85	139,091
2011	118,316	c	54,316	0	83	172,715
2012	65,195	c	79,631	93	80	144,999
2013	52,236	c	53,627	0	31	105,894
2014	19,080	c	68,398	0	36	87,514
2015	507	c	42,612	0	102	43,221
2016		d	44,857	0	72	44,929
2017		d	52,589	0	29	52,618
2018		d	45,918	0	e	45,918
2019		d	34,571	0	e	34,571
2020		d	26,920	0	e	26,920
2021		d	9,621	0	e	9,621

a Not including personal use.

b Test fishery sales only, does not include donations.

c Districts 1 and 2.

d Confidential Information

e Information not available.

Source: Kuskokwim Management Area Annual Report, 2021 pg 33 (Smith & Gray 2022)

Table 3-4 Amounts Necessary for Subsistence, Kuskokwim Area, 2001-2021

	Chinook	Chum
ANS Range (updated in 2013)	67,200-109,800	41,200-116,400
Year	Estimated number of subsistence salmon harvested	
2001	78,009	56,005
2002	80,983	86,381
2003	67,228	41,167
2004	97,110	64,140
2005	85,097	58,555
2006	90,094	89,674
2007	96,139	73,560
2008	98,099	63,789
2009	78,225	44,324
2010	66,053	45,089
2011	62,368	54,316
2012	22,527	79,631
2013	47,113	53,627
2014	11,234	68,398
2015	16,124	42,612
2016	30,677	44,857
2017	16,380	52,589
2018	22,264	45,918
2019	37,940	34,571
2020	35,847	26,920
2021	28,365	9,621
Total harvest	1,167,876	1,135,744
Average harvest	55,613	54,083
10 yr av.	26,847	45,874
5 yr av.	28,159	33,924

*Bold indicates harvest is below ANS

4. Summary of the potential social impacts of lower run abundance

Chinook and chum run declines, and the resulting subsistence harvest restrictions and/or closures, impact rural communities across western Alaska, as well as Alaska Natives' subsistence way of life. Salmon are a staple resource for residents of most rural communities across western Alaska and have been the most reliable component for annual food supplies for thousands of years (Shaw 1998). The declines in Chinook and chum salmon abundance negatively impact people's ability to secure healthy, wild food sources and eat culturally preferred foods (Ikuta et al., 2013). Store bought food in rural communities is often less nutritious, expensive, and processed. Imported and purchased foods are not a sufficient replacement for salmon in terms of their nutritional and cultural value (Moncrieff 2017).

Restrictions on subsistence fishing also impact the social networks that are built around fishing. Family and friends will often pool their labor and resources to harvest and process subsistence foods cooperatively, and then share their harvests with others (Wolf & Spaeder 2009). Social relationships are a foundational part of subsistence economies throughout rural Alaska (Reedy Maschner 2009). The subsistence worldview is a "complex way of life with specific cultural mandates regarding the ways in

which the human being is to relate to other human relatives and the natural and spiritual worlds” (Kawagley 2006, 8). The subsistence worldview is holistic and based on relationships (i.e., among people, among people and the environment). When families work together to harvest fish, they are connected in that moment with each other and with salmon; “each shaping and being shaped by the others” (Trainor et al., 2021, 4).

However, the relationships and kinship systems of extended families working together to catch, process, and store salmon for their annual needs are changing (Goddhun et al., 2020). Fish camps are important places to harvest food and create memories that form one’s identity. For example, parents teach their children to share without expectation of anything being given in return by sending young children to deliver fish to Elders (Brown et al., 2017, 36). Sharing resources promotes culturally held values like generosity, taking care of those in need, and respect for knowledge and the skill it takes to properly preserve fish (Trainor et al., 2021). Put together, the acts of fishing and processing the fish allow people and communities to practice their culture and share it across generations, but people are fishing less today than in the past (Moncrieff 2017).

Changes (i.e., reductions) to subsistence fishing opportunities negatively impact the transmission of Traditional Knowledge (TK) and customs associated with fishing to younger generations that often happens during these activities. Subsistence practices and TK systems are inseparable because TK informs where, when, how, and why people practice subsistence activities that are central to sharing as well as food and water security. In turn, the continuation and applicability of TK systems for subsistence depends on ongoing opportunities for people and their communities to practice their traditions as part of their subsistence way of life.

Declines in salmon abundance have had widespread impacts across the Yukon and Kuskokwim Management Areas (along with other regions in the state), but not all communities or households feel those impacts equally. Some households may have more capacity to respond to changes in the fishery year-to-year or even within season as in-season management strategies change. For example, some households may be able to buy new gear when old gear types are banned or have more flexible schedules that allow them to fish when subsistence openings are announced with little notice. Without opportunities to harvest salmon for subsistence, some fishermen along the Kuskokwim River are targeting more non-salmon species such as Dolly Varden, rainbows, and grayling; these are less culturally preferred compared to Chinook salmon which are the most oil-rich species of salmon in Alaska (Goddhun et al., 2020). While these shifts in harvesting practices might meet some food security needs, not everyone can put more effort into getting fewer fish or shift their target species (e.g., the cost of new gear may be too expensive, households may not have a boat or other means of transport, the timing of the opening may conflict with work or school schedules, etc.) nor is it preferred.

The declines in Chinook and chum salmon abundance across western Alaska, but particularly the Yukon and Kuskokwim Rivers, have resulted in subsistence harvest restrictions and in some cases full season closures. The resulting impacts are far ranging and difficult to capture in a succinct yet meaningful way. Rural communities across western Alaska rely on salmon as a primary food source that is nutritionally dense (Simon et al., 2007). Salmon has also long been a cornerstone of subsistence economies through the sharing, barter, and customary trade of salmon (Brown et al., 2007; Moncrieff 2007; Trainor et al., 2021). Importantly, salmon as part of the subsistence way of life links the material (i.e., livelihoods), social (i.e., kinship connections at fish camp as well as sharing salmon), and spiritual (i.e., practicing cultural values and overall wellbeing) parts of life.

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