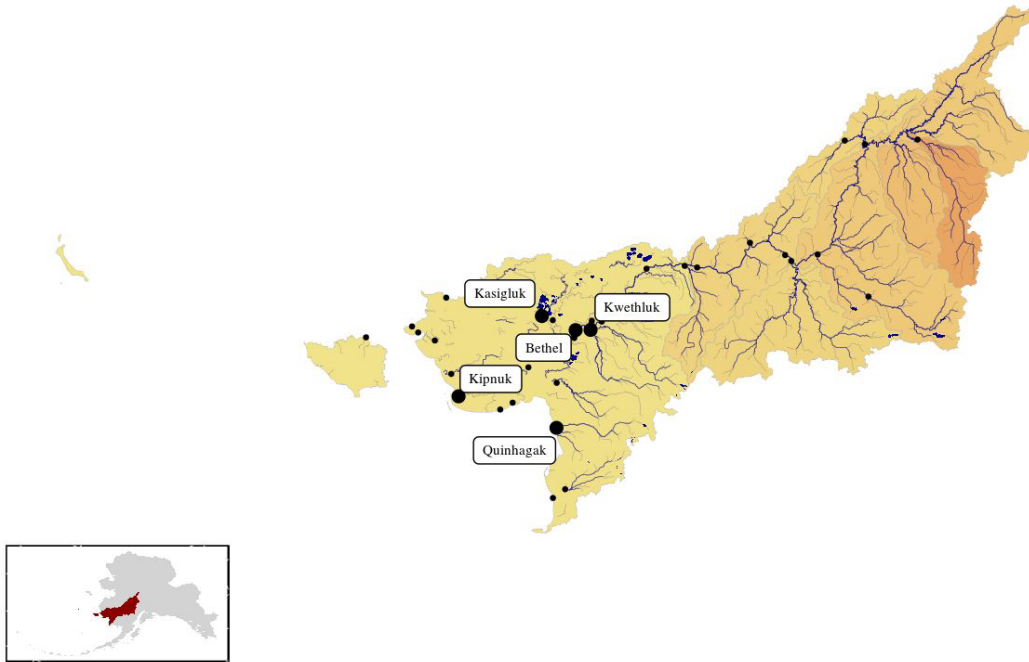


Kuskokwim: Decline, Rise of Alternative Management, and Rebuilding



Geographical setting

The Kuskokwim River in Southwest Alaska is 702 miles long and is one of the longest free flowing rivers in the U.S. The Kuskokwim region is the 4th largest across Alaska, comparable in size (154,168 km²) to the State of Georgia, draining one of the great rivers of the world; the Kuskokwim River. The river has important geographic as well as social and cultural roles. It serves as a central drainage system for the Alaska Range, serving as the second largest drainage in Alaska, and empties into the Bering Sea. Thus it is a glacially fed river. Overall the river is expansive and calm, making it not only good for river travel in the summer, but in the winter it also serves as a transportation highway out of Bethel for several villages. The majority of lands surrounding these rivers fall within the Yukon Delta National Wildlife Refuge or the Togiak National Wildlife Refuges, as well as many rural communities.

Early people and salmon systems

People of the Norton culture, who inhabited coastal areas from 3,000 years BP to 1,200 years BP, gave rise to the cultures that would eventually come to be collectively known

as the Central Yup'ik people (Shaw 1998). They used stone tools and developed clay containers and nets for fishing. Ancient residents of the Central Yup'ik region followed the seasonal round of subsistence by returning to more or less permanent winter settlements and dispersing seasonally to spring and summer/fall camps for harvest of marine mammals and fish/caribou, respectively (Shaw 1998). The increase in use of nets to catch salmon is suggested to be the reason why the Norton Tradition people in the region grew significantly in number 2,400 years ago. As populations grew in size and proximity, previously distinct traditions began to intermix and form new, more homogenous traditions.

The upstream neighbors of the coastal Yup'ik peoples have for centuries been the Upper Kuskokwim Athabascans, who refer to themselves as *Dina'ena* (the people) or *Dichinanek' Hwt'ana* (the timber river people). Autonomous group of migratory bands (~ 30 people in size) that speak an Athabascan language similar to but distinct from Koyukon, Holikachuk, Tanana, and Tanaina (Dena'ina).

Changes in systems

Russian contact brought disease, religion, and the beginning of the mixed cash-subsistence economy to the Yukon-Kuskokwim Delta. Redoubts, or trading posts, were built for trade of goods like furs, tobacco, manufactured goods, and dried fish. With the exception of limited use of rifles, subsistence hunting and fishing occurred in much the same fashion as it had for hundreds of years prior to Russian contact. What changed with the arrival of Russian explorers was the movement and social organization of the villages and “nations” in the region; epidemics in the late 1800s had the same profoundly negative effects on the Central Yup'ik nations of the lower Kuskokwim region as they did in Iñupiaq territory to the north. Upriver Athabascan villages, which were smaller in number and in population, were generally more isolated but still succumbed to disease and starvation (Krech, 1978).

With the transfer of Alaska from Russia to the United States in 1867 came arguably greater political and social change in western Alaska. The influenza pandemic of the early 1900s, or *quserpak* (“big cough” in Yup'ik), was the deadliest in human history. The outbreak had particularly devastating effects on indigenous populations in Alaska, because they had little or no immunity at the time of infection. Though the loss of human life was immense, the legacy of the guilt and shame experienced by the survivors of the epidemic has caused severe harm to the social, spiritual, and cultural wellbeing of Yup'ik and other indigenous Alaskans (Napoleon, 1991; Pullar, 1992). Cultural revitalization movements, including recognition of both the “old ways” and

contemporary, self-defined ways of being Yup'ik, aim to strengthen wellbeing in indigenous communities through sustaining language, history, and living off the land (Napoleon, 1991).

The early 1900s marked the earliest commercial sales of salmon in the region, and continued growth of the commercial fisheries in the mixed cash-subsistence economies of the Yukon-Kuskokwim region (Poetter et al., 2016). Subsistence continued through this period to be critically important, but began to adapt to modern technologies. During this time, before the widespread availability of outboard motors, people moved to fish camps and other seasonal sites using kayaks and oar boats (La Vine et al., 2007). Families returned to fishing sites in June to harvest Chinook salmon, and stayed through August to harvest (in order) sockeye, chum, then coho and pink salmon. Women braided grasses to make salmon-carrying backpacks and fashioned clothing out of salmon skins (La Vine et al., 2007). From the 1910s to 1930, people hunted with bows, arrows, and spears, participated in reindeer herding, kept sled dog teams, migrated to seasonal camps, and participated to a limited extent in the fur trade. The period 1930-1954 saw the increased use of rifles and outboard motors, while reindeer herds disappeared, cannery work increased among locals, and permanent, year-round communities were established.

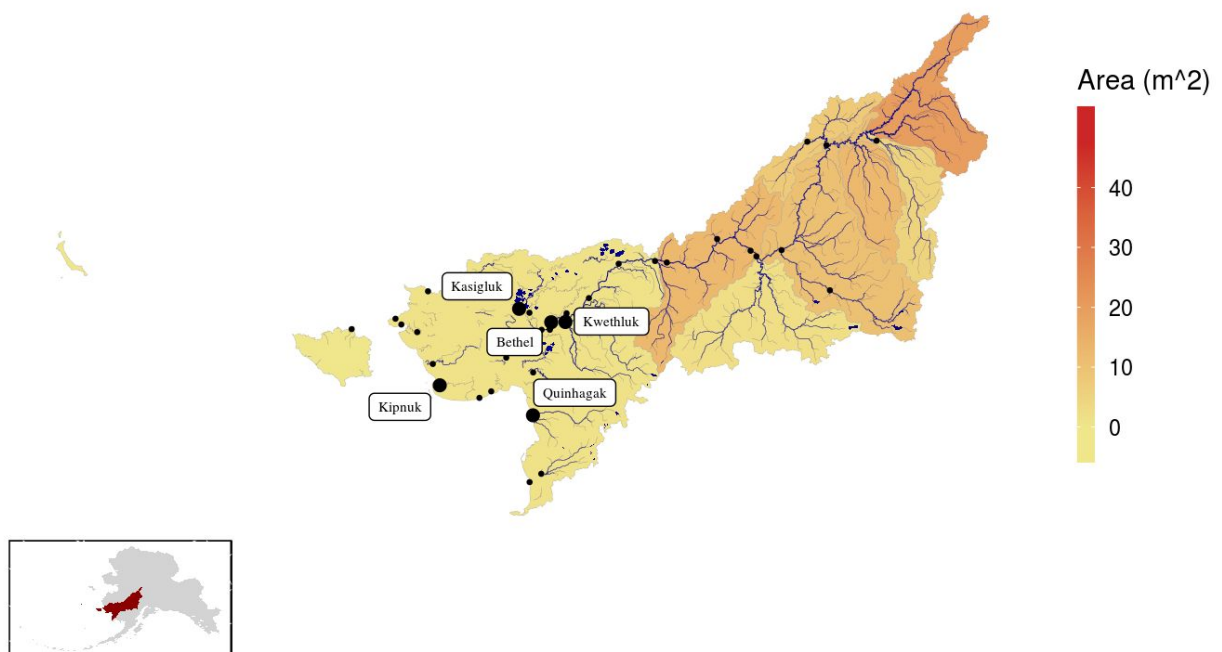
The post-war economic boom of the 1950s and movement toward statehood brought new goods, store-bought foods, and services to rural Alaska. Snowmachines began to be used in the lower Kuskokwim River in the late 1950s and 1960s, and although outboard motors were still relatively uncommon, they were growing in affordability and availability (La Vine et al., 2007). The 1970s began with the legal battle for Native land rights and the historic Alaska Native Claims Settlement Act. The Act established the Calista Corporation, which represents shareholders from the Kuskokwim drainage and the lower Yukon River. Since the 1980s, relationships between salmon and people have been characterized by multiple periods of extremely low salmon abundance, and by the struggle for subsistence fishing rights within state and federal fishery management paradigms. Federal and state subsistence management systems overlap downstream of Aniak, where the Kuskokwim River flows through the Yukon Delta National Wildlife Refuge. Except for subsistence fishery closures relating to resource abundance or commercial fishery openings, salmon may be taken for subsistence purposes without a permit, with several gear types, and with no annual limits. Federal regulations match those of the state, except when superseded by a Federal Special Action (Ikuta et al., 2016). The Kuskokwim River Working Group, established in 1988 by the Board of Fisheries, was a response to the requests of local stakeholders to actively participate in the in-season and long-term management of the fisheries (Francisco et al., 1989).

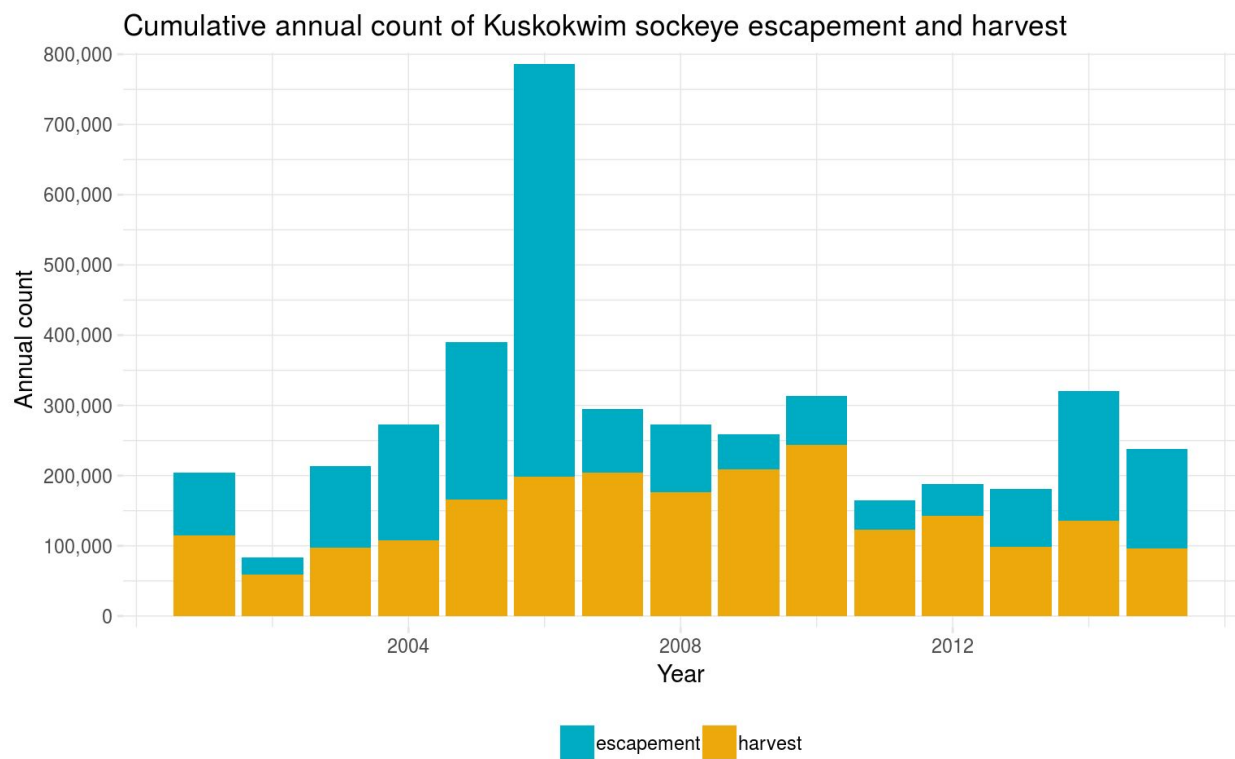
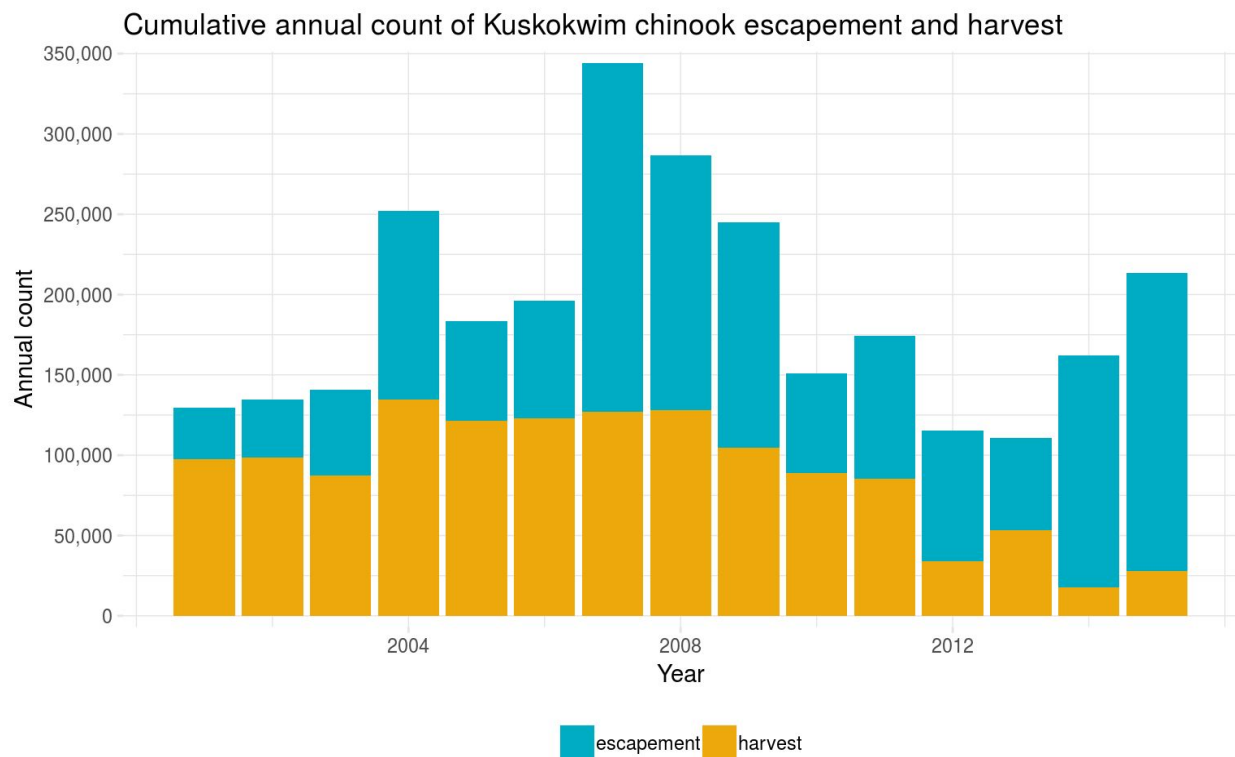
Regional snapshot today

Salmon and habitat

The decline of total abundance of Chinook salmon- the most culturally important species of the region- was the catalyst that accelerated the rise of new management frameworks and partnerships. Through reduced harvest by local users, the Chinook salmon resource has begun to rebuild. Greatly reduced harvest has helped increase the number of potential spawning individuals (i.e., escapement). The stability (and in some cases rise) of other species such as sockeye salmon have, at least in part, mitigated the loss of Chinook salmon but is not a perfect replacement. The salmon-producing habitat of the Kuskokwim is diverse and productive, with nearly 17,000 km of documented streams and rivers that contain at least one species of salmon. Almost 12,000 km of streams and rivers are known to contain Chinook salmon. Compared to the neighboring Bristol Bay region, the Kuskokwim receives 123 cm *less* precipitation and is categorized by more burned area by forest fires than other regions (the Yukon excepted).

Area Burned per Watershed: Kuskokwim



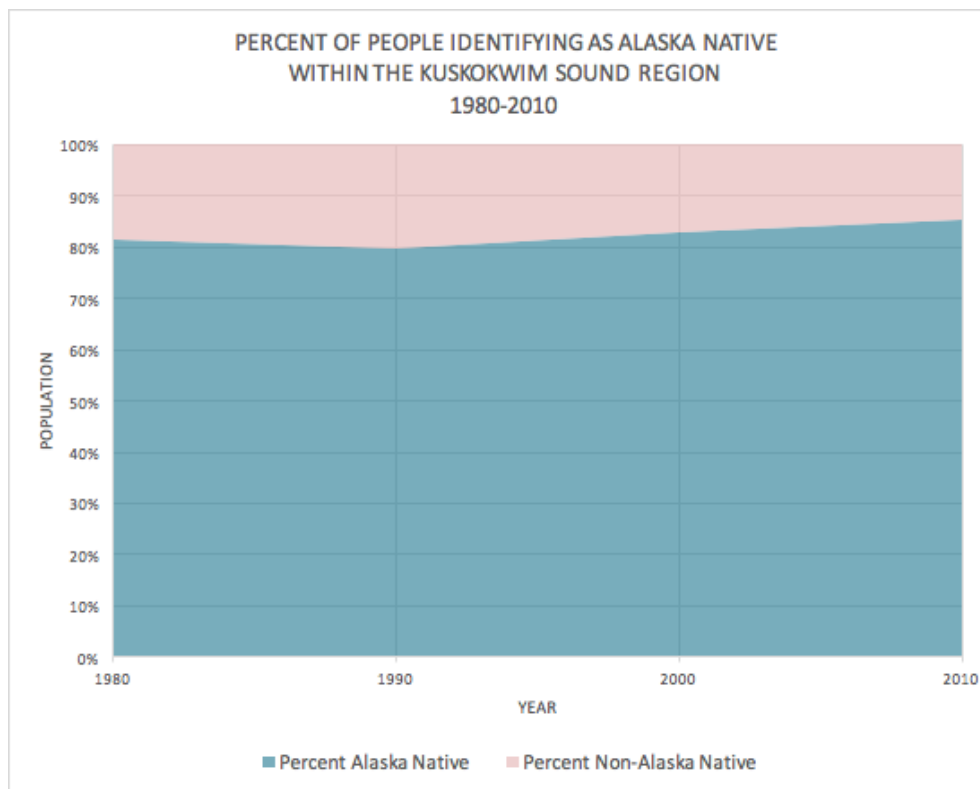
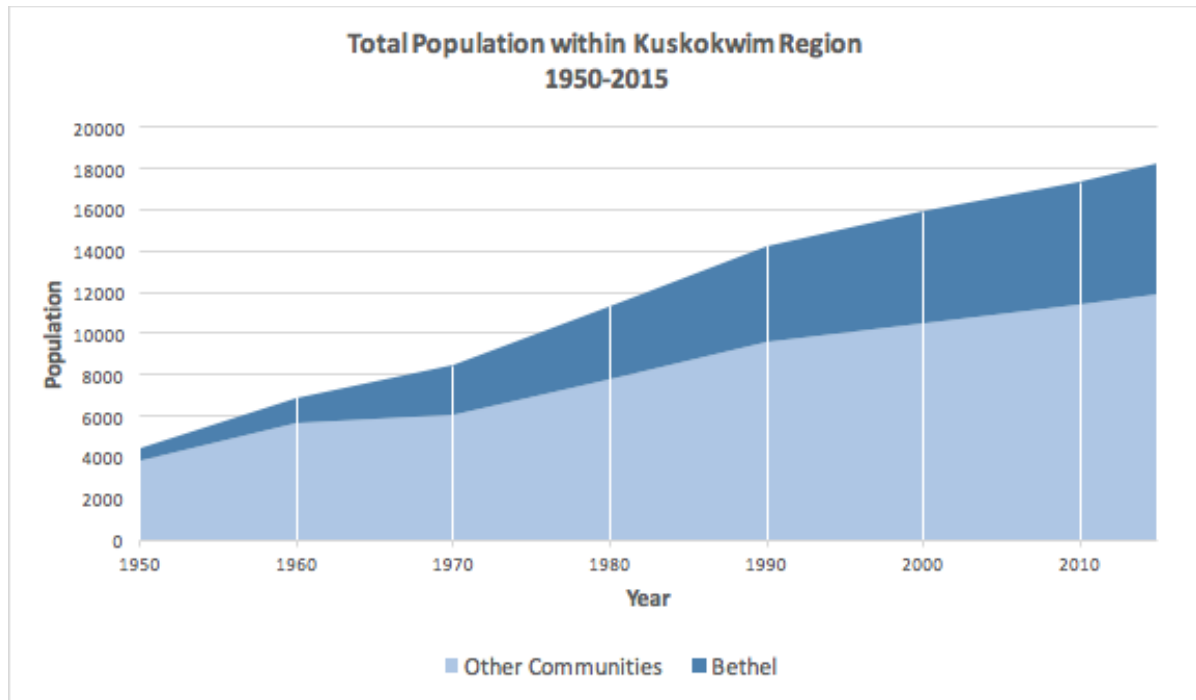


Salmon and people

The recent history of the commercial and subsistence fisheries on the Kuskokwim has been for the most part bleak. A string of poor Chinook salmon returns in the 1990s caused fishery closures and restrictions on harvest for both commercial and subsistence fishermen (Poetter et al., 2016). Again in the late 2000s, Chinook returns were and continue to be poor, spurring disaster declarations in 2011 and 2012, and even tighter restrictions on mesh size and more frequent fishery closures to avoid interception of Chinook salmon. In 2014, 11,234 Chinook were harvested by subsistence users, which is roughly 17% of the recent ten-year average of 65,092 fish. The Kuskokwim and its tributaries have grown in popularity among sport fishermen targeting grayling, rainbow trout, Arctic char, Dolly Varden, salmon, and sheefish (ADF&G Fish Resource Monitor). However, as the number of outside sport fishermen coming into the Kuskokwim Bay area has increased in recent decades, so too has concern about their effect on local fish populations and fish habitats (La Vine et al., 2007).

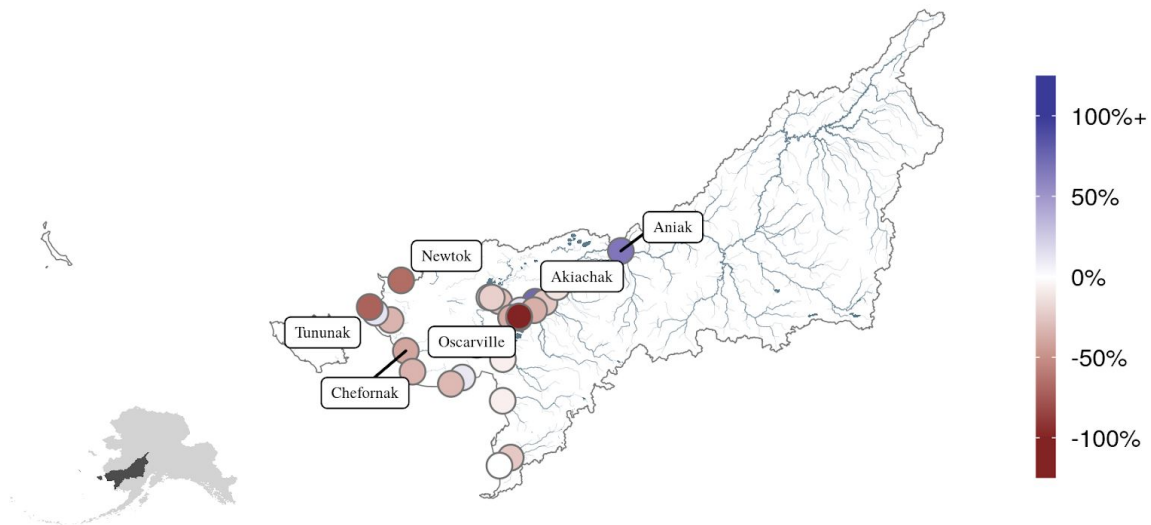


Photo: Culture camp with Elders and youth. By Mike Williams.



Census questionnaires in 2000 and 2010 allowed reporting of Alaska Native in combination with other ethnicities, whereas 1980 and 1990 did not allow for this option. The data presented here for 2000 and 2010 represents all people identifying as Alaska Native, either alone or in combination.

Percent Change from Number of Initially Issued Commercial Permits to Number of Permits in 2016



Percent change from number of initially issued (ranging from 1975-1982) permanent commercial salmon permits held by Alaska residents to number of permits in 2016 by community. Alaska Department of Fish and Game, Commercial Fisheries Entry Commission. 2017. Commercial Fisheries Entry Commission (CFEC) Public Permit Holders by Community of Residence 1975-2016. Knowledge Network for Biocomplexity. doi:10.5063/F1H70D1X.



Photo: courtesy of Marty Hintz.

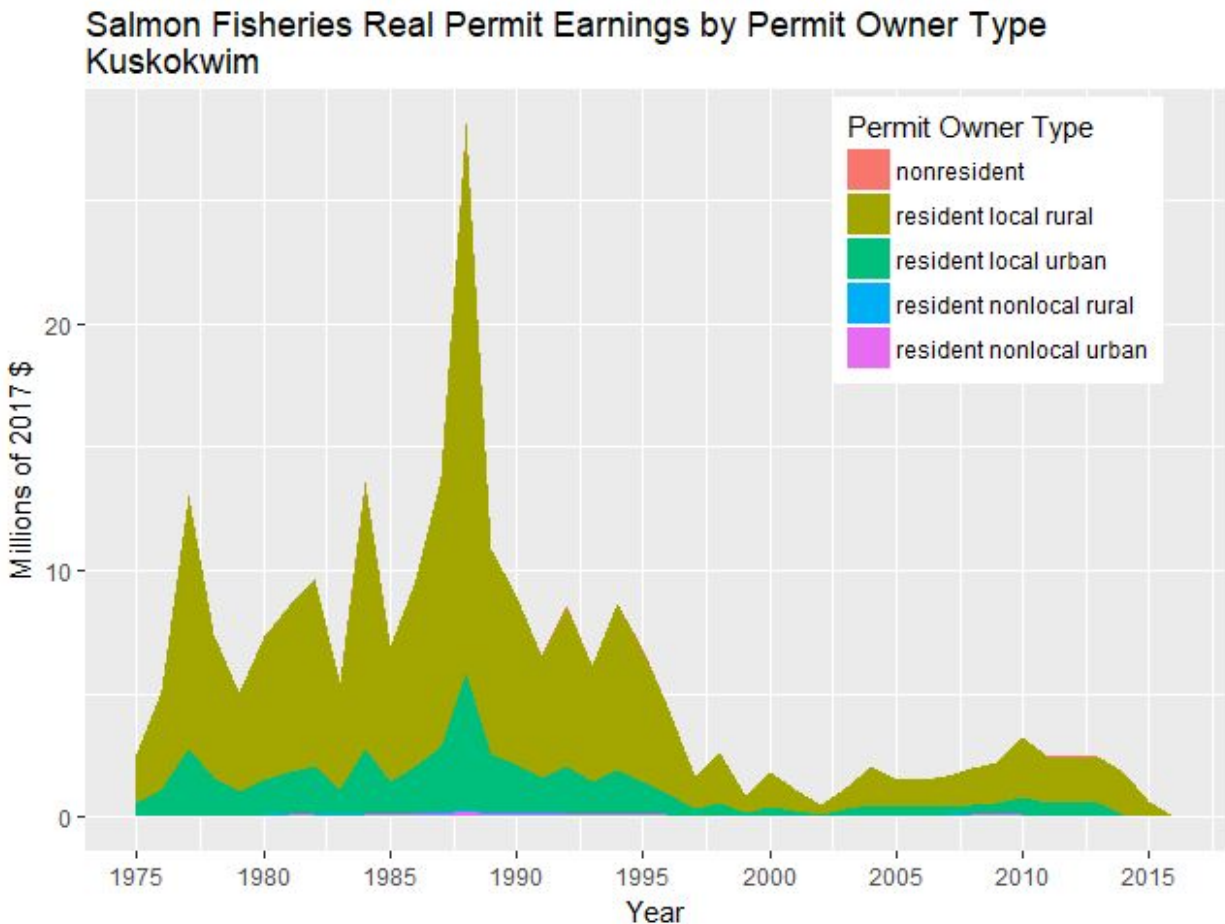


Photo: Hintz family at fish camp near Bethel. Courtesy of Marty Hintz.

Salmon and economy

Commercial salmon fisheries in the Kuskokwim have historically generated over \$230 million in revenue to harvesters since 1975 (2017 inflation-adjusted dollars). The Kuskokwim commercial salmon fishery primarily relies on chum salmon returns and is comparatively small in value and volume compared to other commercial salmon fisheries in the state. However, the fishery is important for generating cash income supporting local culture, traditional activities, and particularly subsistence fishing. Most of the revenue generated by commercial fisheries stays in the region as it is largely retained by local rural permit holders (Figure x).

Challenges for commercial fishing viability in this region are associated with limited and uncertain local processing capacity and relatively high variability in year-by-year harvest revenue. The region is currently without a large-scale salmon processor despite recent improvements in the chum salmon market associated with effective marketing of wild Alaska salmon products and other world market forces.



Salmon and subsistence

State and Federal Regulatory Framework

Since subsistence harvest monitoring programs began, subsistence salmon harvests in the Kuskokwim Management Area have historically ranked second only to those of the Yukon River. From 1994 through 2015, Kuskokwim Area harvests averaged 24% of the Alaska total, compared to 26% for the Yukon Area, and 14% for Bristol Bay (which ranked third among subsistence fisheries).

In 1993, the Alaska Board of Fisheries (BOF) made positive findings for customary and traditional (C&T) uses of all salmon species in the entire Kuskokwim Management Area. The initial Amount Necessary for Subsistence (ANS) finding established a single range of 192,000 -242,000 “salmon.” In 2001, the board revised the ANS to establish

separate ranges for species and subareas. The ANS was again modified in 2013 based on updated subsistence harvest estimates (Fall et al., 2018, p. 85). The ANS ranges are (5 AAC 01.286(b)):

- 67,200 – 109,800 king salmon in the Kuskokwim River drainage
- 41,200 – 116,400 chum salmon in the Kuskokwim River drainage
- 32,200 – 58,700 sockeye salmon in the Kuskokwim River drainage
- 27,400 – 57,600 coho salmon in the Kuskokwim River drainage
- 500 – 2,000 pink salmon in the Kuskokwim River drainage
- 6,900 – 17,000 salmon in districts 4 and 5 combined
- 12,500 – 14,400 salmon in the remainder of the Kuskokwim Area

Regulatory authority for Kuskokwim River subsistence salmon management is shared by the Federal Subsistence Board (FSB) and the BOF. ADF&G is responsible for implementing the Kuskokwim River Salmon Management Plan (5 AAC 07.365). Within the management area, federal regulations apply on waters within or adjacent to the Yukon Delta National Wildlife Refuge, Togiak National Wildlife Refuge, Lake Clark National Park and Preserve, and Denali National Park and Preserve. General domain lands managed by the Bureau of Land Management are open to fishing under federal regulations only on non-navigable waters. The portion of the Kuskokwim River drainage downstream from the Aniak River to Kuskokwim Bay is within the boundaries of the Yukon Delta National Wildlife Refuge.

Until 2001, there were few regulatory restrictions on subsistence salmon fishing in the Kuskokwim Area. Subsistence fishing closures were scheduled around commercial fishing periods prior to 2001. After 2001, following declines in Chinook and chum salmon returns beginning in 1997, the BOF adopted a “rebuilding plan” (now called the “management plan”), also adopted by the FSB, that allowed implementing a subsistence fishing schedule in June and July as announced by emergency orders to achieve escapement goals (Simon et al. 1997:6).

As of 2018, state regulations allow subsistence salmon fishing with gillnets, beach seines, a hook and line attached to a rod or pole, hand line, or fish wheel. Spears may be used in the Holitna, Kanektok, and Arolik river drainages and the drainage of Goodnews Bay. Generally, there are no closed seasons except as specified in the management plan or otherwise ordered for conservation purposes. If closures are necessary, they are implemented by emergency orders or federal special actions. State and federal regulations establish no bag or possession limits, except some limited state restrictions for rod and reel fishing. Up until 2018, there were no permit or reporting

requirements in regulations. However, in recent years in response to poor Chinook salmon returns, by special federal action, federally qualified subsistence fishers have been able to obtain special permits to harvest limited amounts of salmon in designated periods. These included “social and cultural harvest permits” issued to communities in 2014 and community harvest permits in 2015 (Fall et al. 2018:87). Beginning in 2018, state permits will be available for taking up to 10 king salmon in waters upstream of the refuge boundary if ADF&G determines that restrictions are necessary for conservation purposes (5 AAC 01.280).

In 1988, the BOF formed the Kuskokwim River Salmon Management Working Group in response to requests from stakeholders in the Kuskokwim Area who were seeking a more active role in salmon management. Members of the workgroup include local subsistence and commercial fishers, processors, sport fishery representatives, as well as ADF&G staff.

Subsistence Salmon Harvest Patterns

ADF&G develops annual estimates of subsistence salmon harvests in the Kuskokwim Management Area through voluntary post-season harvest surveys that are administered in most management area communities. Since 1999, the Orutsararmiut Native Council has been a partner in this program, conducting the surveys in Bethel. For a description of this program, see Fall 2018:88-90. For a history of subsistence regulations and the harvest monitoring program for the Kuskokwim Area through 2004, see Simon et al. 2007.

Participation in the post-season harvest surveys is voluntary, and several communities of the north Kuskokwim Bay and further north generally do not participate; funding constraints also limit outreach to these communities. A separate project estimated subsistence salmon harvests in seven of these communities for 2011 (Cheforak, Kipnuk, Mekoryuk, Newtok, Nightmute, Toksook Bay, and Tununak). Estimated harvests totaled 16,593 salmon and were composed of 44% chum, 27% sockeye, 17% coho, 8% chinook, 4% chum, and <1% unknown salmon (Wolfe, Stockdale, and Scott 2012).

From 1989 through 2016, subsistence harvests in the Kuskokwim Management Area averaged 238,993 salmon. Total harvests have been below this average since 2009, largely due to lower king salmon harvests. After a record low harvest of 140,431 salmon in 2015, harvests rebounded to 180,836 salmon in 2016, although they remained below the long term average (Figure 9-1). Accounting for most of the change

was an almost doubling of the king salmon harvest from 19,417 in 2015 to 36,268 in 2016, although harvests of all species were higher in 2016 than 2015.

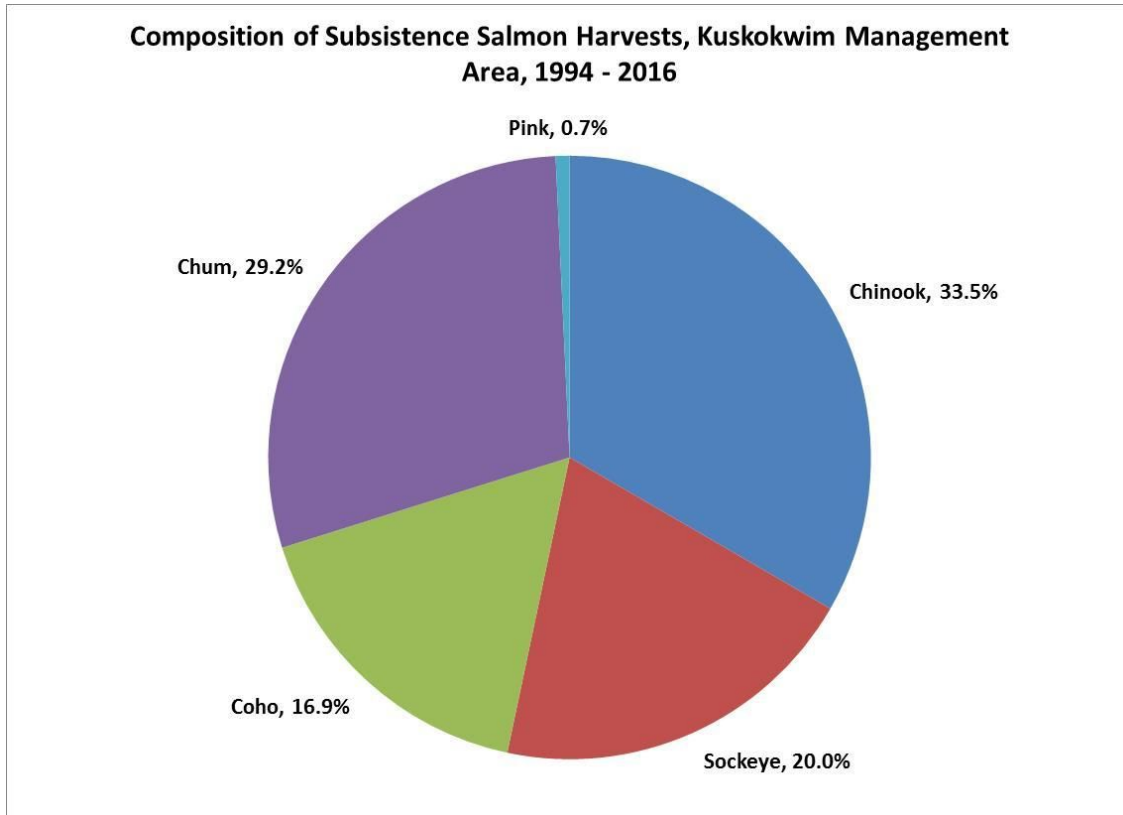
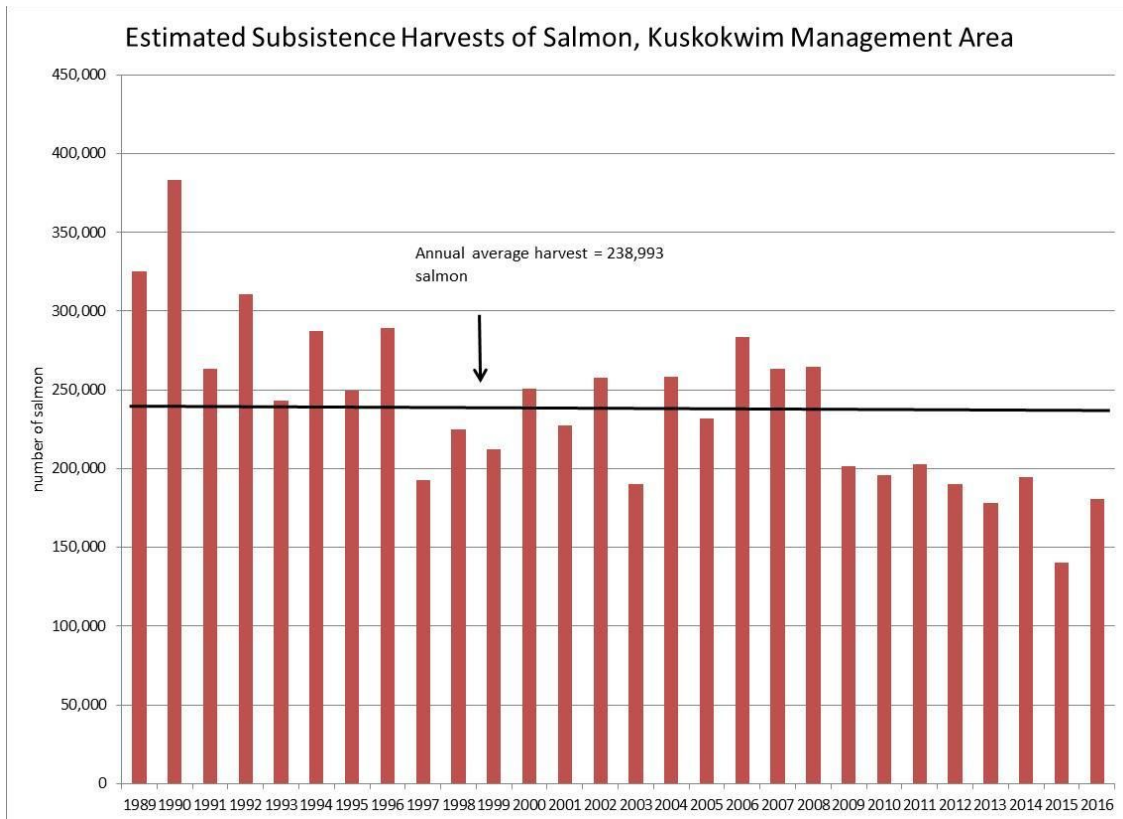
For the period 1994 through 2016, the subsistence salmon harvests in the entire Kuskokwim Area were composed of 33% king salmon, 29% chum salmon, 20% sockeye salmon, 17% coho salmon, and 1% pink salmon (Figure 9-2).

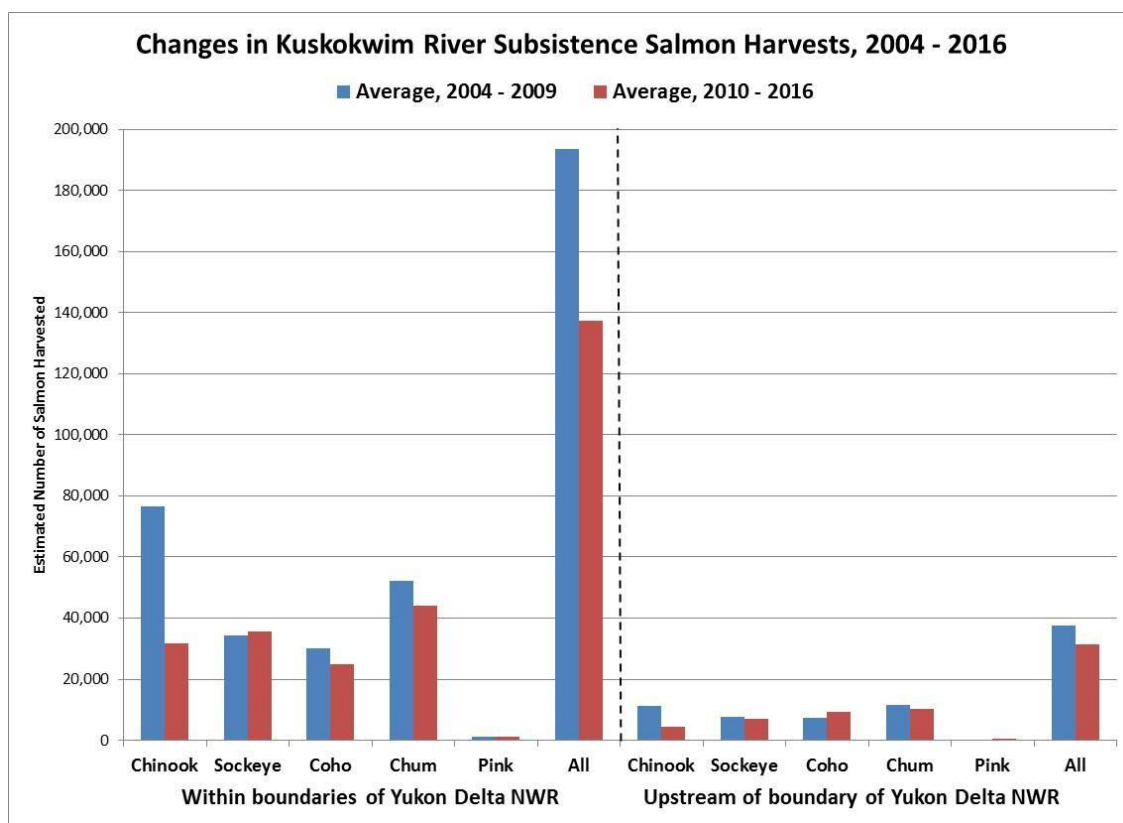
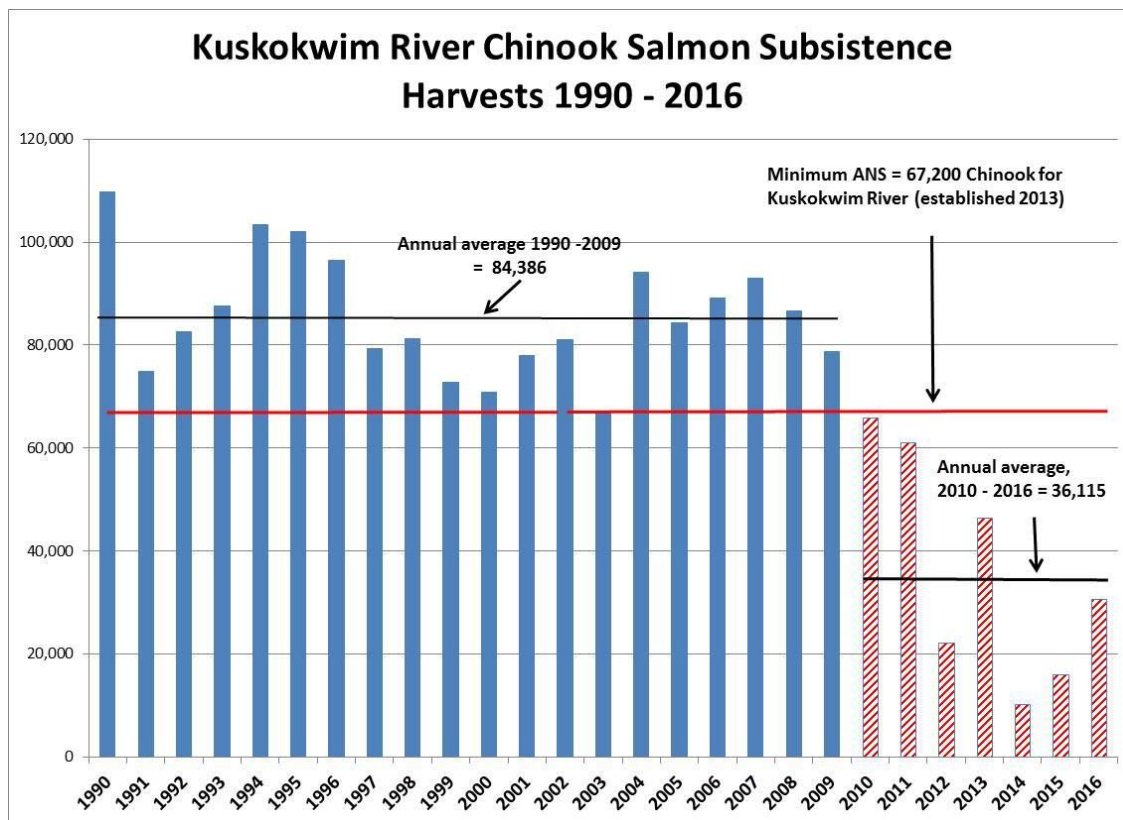
Estimated subsistence harvests of Chinook salmon within the Kuskokwim River have been below the ANS of 67,200 Chinook salmon since 2010 (Figure 9-3). For the period 1990 through 2009, Kuskokwim River chinook harvests averaged 84,386 fish. The average for 2010 through 2016 was 36,115 king salmon.

Figure 9-4 illustrates changes in estimated subsistence salmon harvests in the Kuskokwim River, comparing the annual average harvest for 2004 – 2009 (years in which the minimum ANS for chinook salmon was achieved) and 2010 – 2016 (years in which the minimum ANS for chinook was not achieved). The figure also shows changes based on locations within the boundaries of the Yukon Delta NWR (subject to regulatory actions by the FSB) and those upstream of the boundary (Aniak and above), subject only to BOF/ADF&G regulatory actions. For the period 2004-2009, harvests within the NWR boundaries accounted for 84% of the total salmon harvest and 87% of the Chinook harvest. These changed to 81% and 88%, respectively, for the period 2010 – 2016. Annual average harvests of salmon within the refuge boundaries dropped from 193,731 salmon for 2004 – 2009 to 137,367 salmon for 2010 – 2016 (a decline of 29%), while average Chinook harvests dropped from 76,461 salmon to 31,783 salmon (a decline of 58%). In the waters above the refuge boundary, average annual salmon harvests dropped from 37,590 fish to 31,329 fish (a decline of 17%), while average Chinook harvests dropped from 11,229 salmon to 4,332 salmon (a decline of 61%).

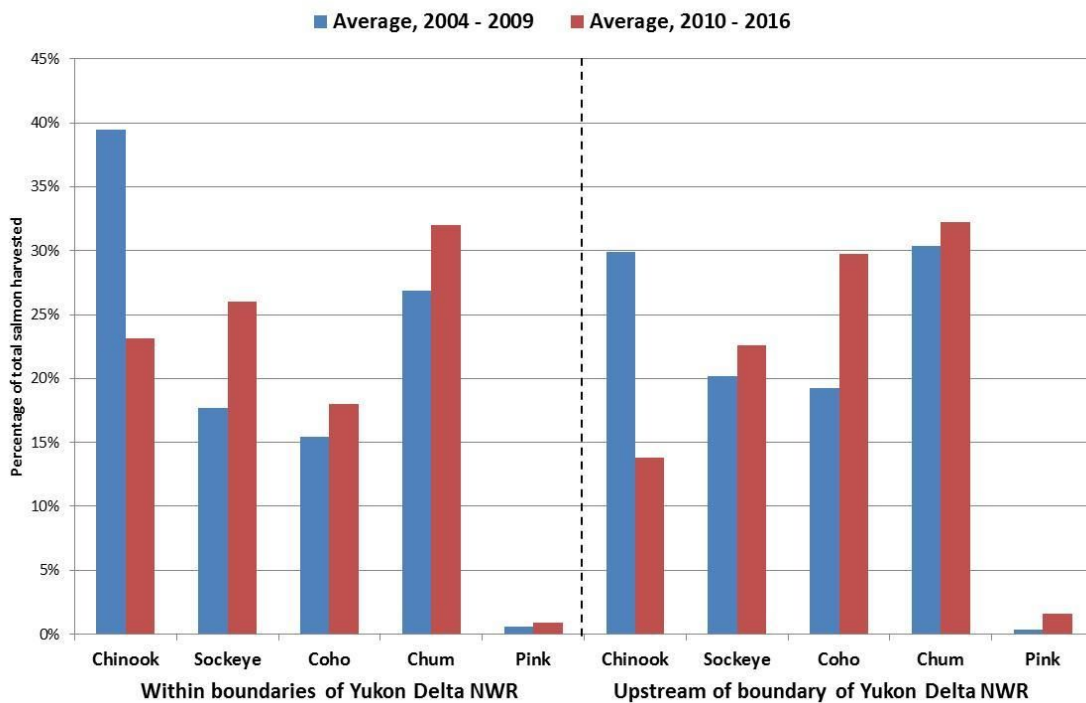
Figure 9-5 illustrates changes in the composition of the subsistence salmon harvests in the Kuskokwim River based on location of fishing. For the period 2004 – 2009, chinook made up about 39% of the total subsistence salmon harvest within the NWR boundaries, but dropped to about 23% for the period 2010 – 2016. Chinook harvests in the Kuskokwim River drainage above the refuge boundary made up 30% of the total subsistence salmon harvest in 2004 – 2009, and dropped to 14% in the period 2010 – 2016.

Based upon the most recent comprehensive household harvest surveys conducted by ADF&G, salmon provide 45% of the total subsistence harvest as estimated in usable pounds in Kuskokwim Area communities, followed by nonsalmon fish (22%) and land mammals (18%) (Figure 9-6).

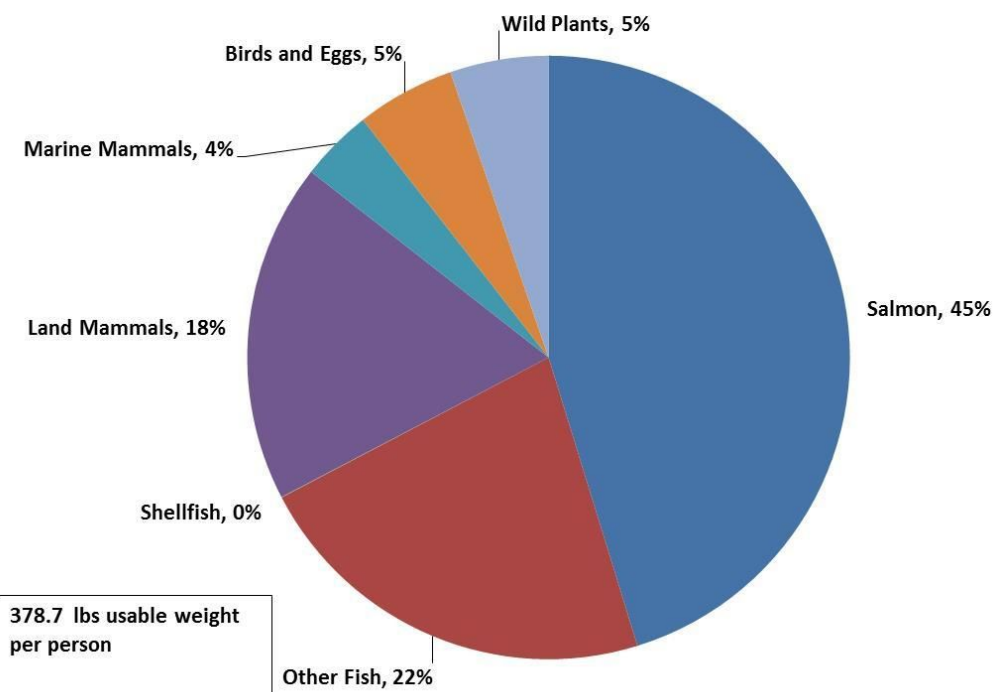




Changes in Composition of Subsistence Salmon Harvests, Kuskokwim River, 2004 - 2016



Composition of Wild Resource Harvests, Communities of the Kuskokwim Management Area



Salmon and governance

The dynamics of governance in the Kuskokwim Region arise from deep-rooted Yup'ik beliefs and traditions, severe conservation challenges for Chinook salmon, and emergence of a tribal collaborative management commission. Governance authorities and jurisdictions have evolved rapidly, with a growing presence of state and federal managers from the 1980s. Yup'ik residents asserted the validity of their traditions for resource use and called for co-management programs to provide a “voice at the table” and better respect for their traditions. The Kuskokwim River Salmon Management Working Group, state Advisory Committees, and federal subsistence Regional Advisory Councils reflect this dynamic. The extension of federal subsistence fisheries management in the early 1990s added institutional complexity. When Chinook stocks collapsed after 2010, severe restrictions on harvest were implemented, testing the effectiveness of the co-management bodies. In 2012 a number of residents fished for Chinook salmon for subsistence during a closed period and were met with a substantial law enforcement effort. In the subsequent legal challenges, the court found that Yup'ik subsistence fishing is a religious-based activity, but that the state's conservation responsibilities were paramount, and citations and fines were upheld. Seeking alternatives for more consequential roles in governance, tribes then worked with federal managers to create a new collaborative institution, the Kuskokwim River Inter-Tribal Fisheries Commission. Tribes have demonstrated administrative capacity in implementing community fishing permits in 2015 and 2016, and in consultation on Chinook management measures since 2016. The proposed Donlin Gold project and a recently concluded Environment Impact Statement remain controversial due to risks to salmon habitat. Between 2000-2018, there were four fisheries disaster declarations for Kuskokwim River salmon fisheries.

Case Study

by Taylor Brelsford

The Kuskokwim Chinook Salmon Crisis and the Emergence of the Kuskokwim River Inter-Tribal Fisheries Commission

The emergence of the Kuskokwim River Inter Tribal Fisheries Commission represents a significant new avenue for tribal involvement in Alaska fisheries management. This case study examines the context, the crisis, the aftermath, and the subsequent institutional emergence. The context of the Chinook salmon crisis and responses on the Kuskokwim River is founded in the strong traditional values and beliefs among the Yup'ik people of the region, notably in respect for the natural world, humility, and generosity with subsistence foods. As western management increased in the 1980s, Yup'ik residents asserted their right to have a voice in management, resulting in several early co-management initiatives. The Kuskokwim Salmon Management Working Group (Working Group) was established in 1988 as a forum in which managers and users shared observations about run strength and harvest opportunities.

The rise of federal subsistence fisheries management in the 1999 created new institutional complexity. While ADFG is the predominate fisheries manager on the river, 94% of the regional population resides in 20 villages within the Yukon Delta National Wildlife Refuge and a proportional share of total salmon subsistence harvests occurs in these federal waters.

The Chinook run crisis on the Kuskokwim River starting in 2010 prompted severe restrictions on subsistence harvests and a crisis of legitimacy in the long-standing consultation processes. Total escapement in 2010 and 2013 was below the lower bound of the ADFG escapement goal. Chinook salmon were an especially valued food source, so a sharp drop in subsistence harvests and proposed restrictions led to strained discussions in the Working Group. To address the weak run, managers proposed “rolling closures” during the periods when the Chinook made a higher proportion of the salmon run. With reservations, the Working Group generally agreed to these sacrifices to restore the run. However, in June 2012, ADFG proposed a five-day extension to a seven-day closure for a total of 12 consecutive days. The Working Group did not agree with this strategy, requesting instead a small fishing window before the extended closure. The Working Group emphasized the hardship this would cause.

On June 20, 2012 fishermen from Tuntutuliak to Tuluksak began fishing in violation of the closure. Two villages had issued statements encouraging traditional Alaska Native

fishing despite the closure. Law enforcement personnel from the Alaska State Troopers and the U.S. Fish and Wildlife Service issued 61 citations and seized 21 nets and 1,100 pounds of salmon. In all, the weak run and the restrictions resulted in a major collapse in the subsistence harvest in 2012. Families obtained just 25% of the long-term average annual harvest of Chinook salmon.

In the legal aftermath, a few fishermen pled guilty in return for reduced fines, but most went to trial in the Bethel District Court in fall 2012 and spring 2013. The Yup'ik fishermen argued that their fishing was a religious-based activity, based on their traditional beliefs regarding respectful behavior toward *Ellam Yua*, the spirit of the universe. The state argued that the severity of the Chinook run decline justified the restrictive measures. Importantly, the judge ruled that the fishing was a religious-based activity, but that the state's "compelling interest" in protecting the Chinook run overrode the religious practice.

The fishermen were found guilty and fines were imposed, generally for \$500 with half suspended and probation for one year. The seized nets were returned. Thirteen of the fishermen mounted an appeal, joined by the Association of Village Council Presidents, the Alaska Federation of Natives, and the Alaska Civil Liberties Union. In its decision in March 2015, the Alaska Court of Appeals applied the standards of the *Frank* funeral potlatch decision and upheld the trial court decision. The fishermen declined a further appeal.

The political mobilization and pressure for new institutions mounted in the months following the arrest of elders and seizure of fish. AFN devoted a portion of the October 2012 convention to discussion of these events. At the federal level, AFN and AVCP used their Washington contacts to urge a new approach from the Department of the Interior. At the AFN convention in 2014, DOI Deputy Secretary Michael Connor announced plans to develop a federal Kuskokwim Demonstration Project to better engage tribes. Inspired by the Northwest Indian Fisheries Commission, in May 2015 33 tribes of the Kuskokwim River met and established the Kuskokwim River Inter Tribal Fisheries Commission (Commission). Their constitution identified the membership, the Chairman role, and the Executive Committee, including balanced representation from all segments of the river.

In May 2016, following two years of intensive negotiations, a Memorandum of Understanding was signed between the U.S. Fish and Wildlife Service and the Commission. It provides for regular consultation with the federal In-season Manager and consideration of the knowledge of the Commission members and the agency

managers concurrently. The parties agreed to negotiation in good faith, seeking consensus on run forecasts, subsistence levels, and in-season regulations. In event that consensus not reached, MOU outlines recourse to revisit issue including further discussion, using the Yup'ik consensus building approach of the *qasgiq*, and elevating issues to the USFWS Regional Director if necessary.

In subsequent years, the Commission and the In-Season manager have consulted intensively, as the Federal Subsistence Board authorized federal management within the Refuge waters. Tribes played an important role in implementing a community permit system for fishing in 2015 and 2016. The Commission continues to build capacity and technical expertise to help rebuild Kuskokwim River salmon stocks and provide for the needs of the villagers who depend on salmon for their sustenance.



*Long line of witnesses waiting to sign the MOU.
Credit: Charles Enoch KYUK*

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