# **Yukon:** Alaska's Largest Watershed – Dynamic Change and Connections over Time



## Geography

The vastness and complexity within the Yukon River watershed challenges the comprehension of the human mind. Beginning as trickles from Llewellynn glacier in British Columbia, the Yukon River runs north through the Yukon Territory and then east and southward through Alaska for a total of approximately 3200 km to its confluence with the Bering Sea. Two-thirds of the Yukon River watershed is within Alaska. All told the watershed spans 858,272 km2, which is larger than the State of Texas. By western convention the river is often considered three parts roughly corresponding to federal regional advisory council areas: Upper River, or the Eastern Interior area; Middle River, or the Western Interior area; and Lower River, or the Yukon-Kuskokwim Delta area (Moncrieff, 2007). For management, the region is separated into seven districts by the Alaska Department of Fish and Game

(http://www.legis.state.ak.us/basis/aac.asp#5.01.200), with the Coastal District and Districts 1-3 corresponding to the Lower Yukon, District 4 in the middle river, and Districts 5 and 6 corresponding to the Upper Yukon. The Yukon's expansive geography contributes to this region's varied relationships between people and salmon and the complex governance structures intended to manage those relationships. Larger than the state of Texas and the 3rd longest river in the United States, the massive size the Yukon region is hard for the human brain to comprehend. Though by numbers the

Yukon is dominated by chum salmon (average of 3.4 million per year between 2001-2015), the less abundant Chinook salmon (average 142,000 per year) are 'king'. Declines in Chinook salmon returns, like in the Kuskokwim, have had wide ranging effects throughout the region. To date, the Yukon River has not seen appreciable trends towards rebuilding of depressed Chinook salmon runs, however, close working relationships between residents of the river and state and federal fisheries management have helped assure the continued passage of individuals destined for the spawning grounds.

#### Early people and salmon systems

For at least 11,500 years, people living along the Yukon River have harvested the salmon from its waters (Halffman et al. 2015). Although the ways of life and cultures of the Yukon River differ along its vast length, the people have long shared a common reliance on wild foods of which salmon are a critical component. Yup'ik people first settled along the lower Yukon River. The river's abundant salmon, along with access to rich marine resources, allowed Yupiit to form sizeable summer villages along the coast and inland along the river. These villages were supported by salmon and their members would disperse after the salmon season to pursue other resources (Vanstone, 1984). Moving upriver into Interior Alaska, the landscape is dominated by a riverine ecology of seasonal fish resources and land mammals. Here, multiple and diverse Athabascan groups live along the Middle and Upper Yukon River to the contemporary border with Canada: Deg' Hitan, Holikachuk, Koyukon, Tanana, Gwich'in and Han (Krause, 1974). Unlike the large Yup'ik summer villages that arose, the Athabascan people typically lived in family-based bands with low human population numbers.

All five species of Pacific salmon spawn within the Yukon River drainage area, with Chinook and chum salmon being of the highest importance and abundance. The large size and high oil content of Chinook salmon make them the preferred species for human consumption, while the more abundant chum salmon are harvested in the greatest number. Chum salmon migrate up the Yukon River in two runs, distinguished by seasonal timing (summer and fall), spawning grounds, and genetics. The summer chum salmon spawn in streams of the lower and middle Yukon, while fall chum salmon spawn in streams of the Upper Yukon and Canada. With their lower oil content, chum salmon are often dried for human consumption, especially in the lower river, and have been heavily used to feed dog teams in the middle and upper regions. Because salmon flesh quality deteriorates as they near their spawning grounds, summer chum salmon are typically only fit for human consumption in the lower river. Additionally, the environmental conditions of the Middle and Upper Yukon are more conducive to

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processing fall chum salmon for human consumption and dog food while summer chum salmon is processed primarily for dog food (Brown and Godduhn, 2015).



Historically, salmon harvesting along the Yukon River was concentrated in fish camps. In these camps, fishers traditionally used dip nets, willow bark nets, and fish traps to catch salmon in the river's tributaries. Technological advancements in the early 1900s, including stronger net materials and fishwheels allowed salmon fishing in the main stem of the river (Loyens, 1966). The

highly efficient fishwheels predominantly catch the chum and coho salmon that travel in shallower water along the river's edge. Further, wheels provided the opportunity to harvest large quantities of salmon needed to feed the dog teams kept by most families to haul wood and water, provide transportation and protection, and trap during the winter. Chinook salmon, which tend to prefer deeper water, were more often targeted using drift dip nets and set nets (Moncrieff, C.F. & Riordan, A. 2017: Paul Beans (Nalqilria) from Mountain Village). The increased availability of outboard motors in the 1960s and 1970s allowed for the development of drift gillnetting as a means for targeting Chinook salmon in the lower and lower-middle Yukon River. In the braided channels of the upper Yukon River, set nets and fish wheels have remained the primary gear used to target Chinook salmon, which tend to swim closer to the shore in the narrower portion of the river (Brown and Godduhn, 2015). Due in part to the high use of set nets, fish camps continue to be used in the upper Yukon more so than along other portions of the river.

Throughout a century of rapid technological change, however, fish camps continued to be a locus for the transmission of the knowledge necessary to live off the land until the 1980s when their use began to decline. This is somewhat mitigated by the recent infusion of funding by Tribes and Tribal Organizations for culture camps to teach and revitalize fish camp culture, tradition, and knowledge for younger generations. More than just a place to catch and dry fish for a long winter, families work together at fish

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camp, passing on valuable cultural and social teachings about the fish, the land, and people's relationship with both.



Mason reaching for fish. Photo by Katie Kangas

Processing large quantities of salmon is labor intensive, often requiring the cooperation of multiple family members or groups. Building, setting, and repairing gear as well as cleaning, cutting, hanging, and smoking fish provide the opportunity for valuable cultural

lessons that reflect generations of local knowledge and connections to the land and fish. Even when commercial opportunities for selling fish, especially in the lower river, entered the scene in the early 1900s, the structure of fish camp provided the backbone for commercial labor.



Credit: Alaska State Library, Clarence Leroy Andrews Photo Collection (P45-0465)

### Changes in systems

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The value of Yukon River salmon has long attracted more than just local subsistence fishermen. The overlapping harvest of salmon for subsistence and commercial purposes is not new for the people of the Yukon River. Salmon has long been used as a tradable commodity, with the river itself serving as a conduit for trade and cultural exchange (de Laguna, 2000). Trade networks connected Yup'ik, Inupiaq, and Athabascan peoples throughout the region, with salmon being traded for a range of items including *laftak* (bearded seal skin), beaded crafts, caribou skins, and furs (Moncrieff, 2007). Fishermen sold bales of dried chum salmon in bulk to trading posts during the late-1700s to early-1900s to be sold as dog food for teams providing winter transportation to trappers, miners, and later postal service workers prior to the advent of accessible air travel and snow machines.

The commercial harvest of Yukon River salmon began in the early 1900s and the U.S. Department of Commerce began regulating a commercial fishery in the lower river around 1918. In an interview with Moncrieff and Riordan (2017), Raymond Waska (Iraluq), born in Nunapiggluugaq in 1941 and moving to Emmonak in the 1950s, recollects the productive commercial fishery of the lower Yukon that supported two canneries and a saltry. During that time, "As soon as the kings arrived around June 2, men fished in the areas near Quagcivik and downriver in Qessavik six days a week, resting on Sunday. After the commercial king season, families dispersed to fish camps (Riordan and Moncrieff, 2017:3)." From 1974 to 1996, the commercial sale of roe from subsistence-caught chum salmon was permitted in the the Middle Yukon area; fishermen stripped the roe for the commercial market and hung the carcasses for dog food, supporting the continuation of dog team use in the middle and upper areas of the Yukon River. During this time, a limited entry permit system was instituted to manage commercial fishing along the Yukon River and prevent overfishing.

At the same time, socioeconomic changes wrought by the growing demands of wage labor, advances in available technology--from gear types to means of transportation-and increasing regulation and cost of fishing contributed to changes in the structure of subsistence fishing, including a decline in the use of fish camps (Brown and Godduhn, 2015). The number of dog teams in Yukon River communities dropped dramatically, driven by reduced demand in combination with the reduced availability of chum salmon with fluctuating returns of salmon, especially in the 2000s, and rising costs (Wolfe & Scott, 2010). SA<u>SAP</u>

Despite these changes, salmon remains a cornerstone species for subsistence livelihoods along the Yukon River. Salmon are still at the center of exchange networks, especially as fewer people fish themselves (Moncrieff, 2007; Brown et al, 2017). The contemporary exchange of salmon takes different forms including sharing, barter, and customary trade, or the limited sale, of salmon (Moncrieff, 2007). Many Yukon River fishermen speak to the importance of sharing salmon with others:

"When the first fish come, we don't cut fish until everybody in Holy Cross eat[s] fish. So for the first week and a half we give everything away that we get because some people don't fish, they can't fish, either they don't have boat and motor or they are too old to be going fishing. You make sure everybody has fish." Angela Demientieff, Holy Cross, June 2004 (Moncrieff, 2007)

"I fish at my camp but when I have more fish than I need, I call around and give them to [family members] especially my sister and my brother-in-law. They fish but sometimes I catch more fish than them and when they catch more fish than I do they share with me. We do that especially with our relatives or our close friends. [I also give fish to family members who]...live along the coast and sometimes to our relatives and friends in Anchorage. Places like Hooper Bay, Chevak, Scammon [Bay] and further even up north like Stebbins. Places where they don't have the type of fish that we do." Denis Sheldon, Alakanuk, May 2004 (Moncrieff, 2007)

#### **Regional snapshot today**

#### Salmon and habitat

In the Yukon region, Chinook salmon have declined in length by approximately 10% in the past three decades, with some areas where fish have been observed (e.g. at the test fishing site near the mouth of the Yukon) have experienced declines in size of approximately 20%. This change in size is mostly due to the fact that individuals are returning from sea at a younger age (Link to R2 size change group). Given that fish grow with each additional year in the ocean, younger fish on average translates to smaller fish. While the factors underpinning these changes continue to remain elusive, the consequences of the changes in size are clear for local subsistence harvesters who end up with fewer meals in the freezer. It is important to note that these changes in size have occurred along with declines in abundance. However, the consequences of these changes for the viability of the salmon populations themselves and whether the declines in abundance are perpetuated by changes in body size or age of returning spawners is unclear. Although the human footprint in this huge region is comparably small compared to watersheds outside of Alaska, 865 km2 have been impacted by 391 mines, resulting

in the region having by far the most evidence of mining activity (Norton sound ranks 2nd in mining impacts to the land). The Yukon region is the most active with regards to forest fires, which are a natural part of the ecosystem and yet changes towards drier and earlier spring months may increase the frequency or severity of fires.



Area Burned per Watershed: Yukon



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Cumulative annual count of Yukon chinook escapement and harvest

#### Salmon and people

Today, there are over 40 villages along the Yukon River on the Alaskan side of the border. Not including the urban population of the Fairbanks North Star Borough, this amounts to approximately 10,000 residents in over 3,000 households. Regional differences have always characterized Yukon River salmon fisheries. Each region, indeed each community, maintain separate, though linked, histories that inform the evolution and current fishing profile there. Nonetheless, common themes emerge.

#### The Lower Yukon

The lower river is home to 10 primarily Yup'ik communities from Nunam Iqua at the south mouth and Kotlik at the north mouth to Russian Mission approximately 200 miles upriver. These communities have maintained their larger size compared to their more upriver Athabascan neighbors, ranging in size from approximately 100 to nearly 800 residents. In the lower river, where residents have access to marine mammals and a growing moose population, salmon account for approximately 30% of the total subsistence harvest. The strong historical presence of commercial fishing in the region

characterizes the overlapping relationship between commercial and subsistence fishing for most lower river villages today. Involvement in one fishery does not displace involvement in the other; for many families, commercial fishing provides the money and logistics for participating in subsistence activities.

"The commercial and subsistence linked together, they both help the families economically and, you know, the food put away for winter use. These can't be separated. If we commercial fish, we get money to buy gas and motor oil...you got to have an outboard motor and a boat. And also commercial fishing provided us with gasoline for use to go after different species of fish, for their family use, and different...types of berries..." (lower river resident quoted in Brown and Godduhn 2015:28).

Despite the cultural and commercial value of Chinook salmon, Lower river residents have always harvested more summer chum for subsistence than Chinook salmon. For example, in the 10 year average between 1998-2007 before the most recent decline in Chinook salmon runs, lower river communities harvested approximately 66,000 summer chum annually but only 23,000 Chinook salmon. Because of the demands of the commercial fishery, many families attempted to fish early for subsistence when the drying weather was ideal though putting away fish for the winter often required fishing for subsistence around the commercial periods as well.

"We do commercial fish at the same time as we subsistence fished. They are not separate. We have a family back home, in camp that we maintain. When there is a closure on the kings, we go back and subsistence. We subsist right away. We work hard in the summertime putting fish away." (lower river resident quoted in Brown and Godduhn 2015:29).

However, commercial fishing for lucrative Chinook salmon began declining in 2000 with declines in the runs. Because of continued declines, the harvest of Chinook salmon has been closed since 2008 and the commercial harvest of summer chum salmon has been restricted to protect the co-migrating Chinook salmon. These restrictions have had severe socioeconomic impacts in the lower Yukon where many villagers participating in both the commercial and subsistence harvest of salmon (Moncrieff, 2007).

"With fishing increasingly restricted, especially the commercial fishery which provided the money for gas and the other essentials of camp life, many families no longer go to fish camps. The teaching and learning that Evan (Pilot Point) described is declining along with the king salmon." (Riordan & Moncrieff, 2017)

#### The Middle Yukon

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The Middle Yukon River is a large, diverse stretch encompassing 13 villages including those along the tributaries of the Innoko and Koyukuk rivers. These village are mostly Athabascan and residents continue to hunt and fish their historical variety of subsistence resources including moose, caribou, migratory birds, salmon, nonsalmon fish, and furbearers as wella s gather a variety of plant resources. Spanning from Anvik at about river mile 317 to just below the village of Tanana at river mile 695, this stretch of the river is divided into 3 subdistricts to manage for more locally specific salmon run characteristics and patterns of subsistence use. Communities in the middle river are typically smaller than in the lower river, averaging about 350 residents. In this area, salmon account for approximately 40-50% of the total subsistence harvest primarily divided between Chinook salmon and fall chum harvests.

Commercial harvest of salmon, once practiced throughout the Yukon River, now primarily occurs in the lower portions of the river using drift gillnets. Though households all along the Yukon have retained commercial permits, Moncrieff explains:

"...having a commercial fishing permit does not ensure the ability to earn an income through commercial fishing. Fishers need an open commercial fishing period and the availability of a buyer in their region before they have the opportunity to commercial fish. With these variables to consider, the middle and upper river [have] much less opportunity for earned income through commercial fishing as compared to the lower river." (Moncrieff, 2007: p. 32)

Commercial fishing plays a minimal role in middle river fisheries; it has been characterized primarily by intermittent commercial opportunities for chum salmon and their roe.

As in other areas of the river, salmon fishing is integral to middle river communities, where the knowledge and skills to harvest and preserve salmon reflect generations of environmental and social observations and adaptability. River morphology and biological characteristics of salmon often play a role in how and which salmon species are harvested. For example, near the community of Nulato, salmon begin to bank-orient depending on their intended spawning grounds. Local fishermen observed that summer chum were more readily found along the northern bank, while Chinook salmon swim in the deeper, swifter channel of the south bank. Prior to the increased availability of drift gillnets around the 1970s, residents harvested larger quantities of summer chum and

fall chum. Since that time, however, Chinook salmon have been targeted and harvested in larger numbers. According to one Nulato resident, "...people used to catch king salmons, maybe my mom would get one or two good king salmons in the wheel. But they never used to put out net for king salmons until later [when] they started going drifting for them" (quoted in Brown and Godduhn, 2015).

Historically, fish camps were dotted up and down the middle river and extended families often maintained fish camps near each other in order to work together. The introduction of the more powerful outboard motors that provided the means to use drift gillnets also made it possible for fishermen to access these traditional fishing locations and bring their harvest back to their home villages for processing. In doing so, they could remain living at home close to jobs and services. So while many families no longer spend extended periods of time at camp during the summer, they still use their traditional family fishing locations to get their salmon.

#### The Upper Yukon

The Upper River is primarily composed of the upper Koyukon villages of Tanana, Rampart, and Stevens Villages and the Gwich'in traditional territories of the Yukon Flats, and the Han area around the village of Eagle at the border with Canada. Like the middle river communities, upper river communities are small, ranging from about 30 to nearly 600 residents, though most of the villages have less than 200 people and the overall population of the upper Yukon River is declining. Upper river residents hunt, fish, and gather a similar resource base to their middle river neighbors; salmon account for approximately 50-60% of their total annual subsistence harvests.There is little to no commercial fishing in this area.

As in the middle and lower areas of the river, cooperation and sharing characterize salmon fishing in the upper Yukon River. Fewer families appear to be fishing, relying on those who still fish to provide for the communities. However, although fewer fish camp sites are regularly used, ethnographic interviews from the area reveal extensive fishing networks consisting of multiple families that fish together and share their harvest (Brown and Godduhn, 2015). The braided channels of the Yukon River in the Yukon Flats has shaped the use of gear; fishwheels tend to be smaller and more moveable as fishermen use different spots to harvest the much lower abundances of fish this far upriver.

Sled dogs were and remain an important facet of Upper Yukon River communities, especially in Fort Yukon and Eagle. Keeping even small dog teams require a large quantity of chum salmon and other fish sources for food over a long winter. As summer chum and anxiety over their abundance.

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chum salmon do not distribute into the Upper River area, families in this region rely almost solely on Chinook salmon and fall chum. Residents reserve Chinook salmon for human consumption by practice and regulation, leaving only fall chum runs to feed dogs. Thee recent declines in Chinook salmon have heightened both the use of fall

Upper river fishermen also express concerns over their observations of declining sizes and abundance of Chinook salmon, especially as they are the only species of salmon they see until the fall run of chum salmon. These declines require much more effort over longer periods of time that fishermen do not always get because of restrictions. According to a resident of Eagle,

"...in the past where you go and your net's sunk, and it's just full of fish, and you start pulling fish out, and you get the net half picked, and it starts to float again you know, and obviously a pulse of fish just happened to wham your net...I don't ever go to my net and it's sunk full of fish; that's not happening ever again" (quoted in Brown and Godduhn, 2015:115).

Elders in this area connect the decline in salmon abundance and resulting diminished time that families spend on the river to a deteriorating relationship between the people and the fish and land. According to a resident of the community of Beaver, when a resource is not used or relied upon, it will disappear (Brown and Godduhn 2015).

Regardless of the regional differences in the fisheries between the lower, middle, and upper parts of the Yukon River, residents share many experiences in common. Every village has felt the severe impacts of declining Chinook salmon runs in their subsistence economies and the need to adapt to those circumstances to feed their families and communities. Increasing regulation, though necessary to protect a resource in peril, has created challenges for residents of the river while reminding them of earlier days when the regulatory structure was less complicated and fishermen worked with the environment and the animals to harvest.

"Fish were made before white men came around, and once they came we started to get regulated. In the past the only regulations we had is one Elder who told us, 'Take what you need for your family and don't waste.'" —Michael Hunt (Riordan & Moncrieff, 2017)

"When [fish] hit, they don't come through in a constant manner. They come in following things, including the wind. After the first run then some stop... So when fishers in Black River are catching a lot then we will also expect to—that's if we

walk away from the time given by [Alaska Department of] Fish & Game—or we'll overlook them or just be too late for them...And like he was saying, fish don't follow the schedules made by humans. Fish don't wait for us, whether they are passing by or have already gone by." -- Raymond Waska (Riordan & Moncrieff, 2017)

"Ray noted the negative impact of 'making noise' (arguing) over fish: 'I still think about the regulations set by Fish & Game. [Our Elders told us] not to make a noise about any fish. Our families are becoming more aware and angry about Fish & Game [regulations], talking about them, bashing and going against them, just like they are making a noise about it." (Riordan & Moncrieff, 2017)

Yukon River people are also united in their respect for the salmon and the role they play in their lives. These lessons are important to maintaining their identity and culture. Many residents echo an important traditional belief that animals, including king salmon, present themselves to be harvested. It is an act of respect and to not take those animals is to show disrespect causing them to go away and decline in number. Residents are concerned that regulations challenge these traditional beliefs (Riordan & Moncrieff, 2017).

"They say we humans have a spirit. Just as we have a spirit, they [Chinook] salmon] do also. Every single creature... It is said that if we don't take care of their homes and areas where they return, they won't be enthusiastic about it." --Nick Andrew (Apirtag) from Marshal (Riordan & Moncrieff, 2017)

Alaska Native, either alone or in combination



Southeast Fairbanks Census Area Yukon-Koyukuk Census Area

# 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.

#### Salmon and the economy

Since 1975, commercial salmon fisheries on the Yukon river have generated over \$380 million for harvesters making it the largest in Western Alaska and the ninth largest salmon region in the state (2017 inflation-adjusted dollars). Similar to other Western Alaska salmon fisheries, the smaller size compared to other salmon fisheries in the state and the higher year-by-year revenue variability translate into much lower permit prices for these fisheries. Historically, the volume of salmon caught by the commercial

fleet in most years has been smaller than the volume caught by subsistence fishing, underlining the importance of subsistence fishing in the region. Also, commercial fishing in this region also plays an important role in generating cash to support traditional subsistence activity, which is also shown by the large proportion of revenue retained within the region through local rural permit ownership (Figure below).

Historically, chinook, summer and fall chum, and increasingly coho are important target species for the commercial fishery in this region. All Alaska salmon fisheries including fisheries on the Yukon River were affected by low market prices in the early 2000s due

to the sustained and rapid growth of salmon aquaculture in the 1990s. Since then, market prices have recovered some through effective marketing of wild Alaska salmon products and other more complex world market forces.





#### Salmon and subsistence

#### State and Federal Regulatory Framework

The Yukon Management Area is geographically the largest in Alaska. Also, Yukon River drainage subsistence salmon harvests have been historically since statehood the largest in the state, accounting for about 26% of the total statewide subsistence salmon harvest over the period 1994 – 2015.

A portion of the Yukon Management Area is within the Fairbanks Nonsubsistence area as defined by the Alaska Joint Board (5 AAC 99.015(a)(4). The Board of Fisheries may not authorize subsistence fisheries within the nonsubsistence area, but a personal use salmon fishery is permitted in the Tanana River (Subdistrict 6 C). The Fairbanks Northstar Borough is nonrural under federal regulations. Residents of this nonrural area may not participate in federal subsistence fisheries.

Management of the subsistence salmon fisheries of the Yukon Management Area is complex:

Regulation and management of Yukon River drainage subsistence salmon fishing follows the Yukon River Drainage Subsistence Salmon Fishery Management Protocol, which provides a framework for coordinated subsistence fisheries management between ADF&G and the federal subsistence management programs in the Yukon River drainage. This protocol is applied through a Memorandum of Agreement between state and federal agencies which formalizes the working relationships between state and federal managers and fosters cooperation with federal regional advisory councils and fisheries interest groups. State managers are responsible for management of state subsistence, commercial, recreational, and personal use fisheries in all waters. Federal managers are responsible for management of subsistence fishing by gualified rural residents in applicable federal waters. The protocol also directs state and federal managers to solicit input from the Yukon River Drainage Fisheries Association (YRDFA), the Yukon River Coordinating Fisheries Committee (YRCFC), and other stakeholders during the decision-making process (Fall et al. 2018:60-61).

Although the regulatory authority for Yukon River subsistence salmon management is shared by the FSB and the BOF, Yukon River salmon fisheries are also managed in accordance with the Pacific Salmon Treaty between the United States and Canada. The Yukon River Panel, consisting of appointed members from both Alaska and Canada, meets twice a year to negotiate annual aspects of the treaty, such as S<u>ASAP</u>

escapement goals and border passage goals, and to approve funding of scientific research addressing salmon biology and use patterns (Fall et al. 2018:61).

Unique to the subsistence salmon management and harvest reporting systems of the Yukon Management Area, a distinction is made between "summer chum salmon" and "fall chum salmon." Summer chum traditionally have been harvested primarily for dog food while fall chum harvests are used for both human and dog food (see below).

For a summary of the complex regulatory history of the Yukon Area subsistence salmon fishery since the early 1990s, see Fall et al. 2018:61-64, Wolfe and Spaeder 2009, Wolfe and Scott 2010, and Moncrieff 2017, among other overviews. Since the mid-1990s, the abundance of Yukon River salmon stocks has fluctuated. Restrictions to subsistence fishing were implemented to protect king, summer chum, and fall chum runs. In 2001, subsistence fishing was managed based on what was termed a "windows schedule" of openings based on run strengths and timing. These vary annually. Restrictions on the mesh size for subsistence gill nets have also been implemented as a conservation measure. Under state regulations, legal gear in the subsistence fishery generally includes gillnets, beach seines, a hook and line attached to a rod or pole, handlines, or fish wheels but where each type of gear may be used varies. In addition, beginning in 2005, federal regulations allow drift gillnet fishing in subdistricts 4B and 4C by qualified rural residents. In 2015, primary gear used in the subsistence fishery included drift gillnets (48%), set gillnets (46%), and fish wheels (6%), similar to other recent years (Fall et al. 2018:66).

In most of the Yukon Management Area, permits are not required to participate in the subsistence salmon fishery. For these areas, ADF&G develops harvest assessments based on voluntary post-season household surveys. Additionally, ADF&G mails harvest calendars to known fishing households at the beginning of the season. These are mailed back to ADF&G or collected during post-season interviews. Permits are required for subsistence salmon fishing in the road connected portions of the Yukon Management Area, including the personal use fishery. For more details on the annual harvest assessment program for subsistence salmon in this area, see Fall et al. 2018:64-65.

In 1993, the BOF made a positive C&T use finding for all salmon in the Yukon Area. The ANS determination was established at 348,000–503,000 salmon for all species combined. In 2001, the BOF modified this finding, making species-specific ANS determinations for each of 4 species of salmon harvested in the Yukon Area, including separate ANS determinations for summer chum salmon and fall chum salmon. These were based upon estimated harvests for the period 1990-1999 (Brown and Jallen 2012).

In 2013, the BOF added an ANS for pink salmon but did not modify the other ANS ranges. These ANS ranges are (5 AAC 01.236(b)):

- King salmon: 45,500 66,704
- Summer chum salmon: 83,500 142,192
- Fall chum salmon: 89,500 167,900
- Coho salmon: 20,500 51,980
- Pink salmon 2,100 9,700

#### Subsistence Salmon Harvest Patterns

Since 1978, subsistence salmon harvests in the Yukon Management Area averaged 330,858 annually. However, estimated harvests dropped notably beginning in about 1990. For the period 1994 - 2016, the annual harvest was 244,458 salmon (compared to an average of 493,825 from 1978 through 1990), ranging from 152,300 in 2000 to 345,940 in 1995 (Figure 13-1). For the period 1994 – 2016, the largest portion of harvest was summer chum (39.5%), followed by fall chum (33.5%), chinook (17.1%), coho (8.5%), and pink (1.8%) (Figure 13-2).

Figure 13-3 shows trends in commercial and subsistence harvests of Chinook salmon in the Yukon River since 1994. Commercial harvests topped 100,000 fish in the mid-1990s, but there has been no directed commercial fishery for Yukon River Chinook since 2011. Subsistence harvests of Chinook have been below the minimum of the ANS range of 45,500 Chinook salmon since 2008 (Figure 13-4).

Wolfe and Scott (2010) (see also Howe and Martin 2009) discuss the consequences of reduced subsistence salmon harvests linked to weak salmon runs and restricted fisheries in five Yukon River case communities. These consequences includes increased fishing costs, decreased earnings from commercial salmon fisheries, fewer fish wheels, increased drifting for salmon, decreased fish camp use, increased difficulties obtaining subsistence foods, increased costs of dog food, and decreased use of sled dogs.

An ADF&G study (Brown and Godduhn 2015) investigated the socioeconomic effects of declining Chinook salmon runs in 5 Yukon River communities, with a focus on the 2009 season, when closures to the commercial fishery in the lower Yukon resulted in a disaster declaration by the US Secretary of Commerce. Findings were similar to those of Wolfe and Scott (2010). Primary socioeconomic effects included a decline in fish camp use, increased fuel costs, increased constraints on subsistence fishing from the

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need to engage in wage employment, changing fishing regulations, and shifts in gear types and harvests to feed dogs.

In addition to regulatory actions related to salmon abundance, two other factors that have historically affected levels of salmon harvests in the Yukon subsistence fishery are harvests for sale in a salmon roe fishery and harvests for feeding sled dogs. Until 1996, when the commercial market for chum salmon roe declined, subsistence harvests of summer chum salmon generally ranged between 115,000 and 142,000 fish in the 1990s, and regularly topped 200,000 in the 1980s. Participants in the commercial fishery harvested summer chum salmon for sale of the roe and kept most of the carcasses primarily for drying for dog food. These fish were counted as a subsistence harvest. Subsistence harvests of summer dropped after 1996 and then stabilized (Fall et al. 2018:66).

Traditionally, residents of Yukon Management Area communities harvested and preserved large numbers of salmon for feeding sled dogs. State and federal law recognize harvesting salmon to feed dogs as a subsistence use (Andersen 1992). The annual harvest assessment program for Yukon River subsistence salmon includes questions about harvests of salmon to feed to dogs. In 2015, for example, about 99 households harvested and fed whole salmon to their dogs; most households that owned dogs fed them fish scraps, not whole fish (Jallen, Decker, and Hamazaki 2017). Andersen and Scott (2010) estimated that between 1991 and 2008, the number of sled dogs and people involved in dog mushing in rural Yukon River communities declined by more than 50%. However, they found that salmon and other fish remained an important source of food for sled dogs.

Based upon the findings of the most recent comprehensive household harvest surveys, salmon make up approximately 40% of the subsistence harvests of wild resources in the communities of the Yukon Management Area outside the Fairbanks Nonsubsistence Area. Land mammals rank second (30% of total harvest as estimated in usable pounds) and nonsalmon fish rank third (18%) (Figure 13-5). Salmon make up about 43% of the noncommercial wild resource harvests by residents of the Fairbanks Nonsubsistence Area (which includes the Fairbanks Northstar Borough, Delta Junction and nearby communities, and Healy, Ferry, and Denali Park within the Denali Borough), second to land mammals at 48% (ADF&G 2017; see also Fall 2016). For the period 2007 – 2011, 50.6% of the harvest of salmon for home use by residents of the Fairbanks Nonsubsistence Area came from personal use fisheries, 31.1% from sport fisheries, and 17.3% from subsistence fisheries (Fall 2013:20). Most of this harvest takes place outside the Yukon Management Area, however. For example, in 2015, about 67% of Fairbanks residents' noncommercial, nonsport salmon harvest was taken

in the Copper River's Chitina Subdistrict personal use dip net fishery, and an additional 13% in the Copper River's Glennallen Subdistrict subsistence fishery (fish wheel and dip net). Yukon River subsistence and personal use fisheries provided about 10% of Fairbanks residents' noncommercial, nonsport salmon harvest in 2015, followed closely by upper Cook Inlet personal use fisheries at 9% (Figure 13-6).





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#### Salmon and governance

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As the largest drainage in Alaska, the Yukon River encompasses a complex mix of state, federal, and international jurisdictions. Subsistence uses are widespread, while commercial fisheries are regionally significant in the lower portions of the river. Recent challenges include equitably sharing the burden of conservation throughout the drainage as chum and Chinook salmon runs have faltered. State management is predominant in the Yukon River drainage, though federal subsistence management applies in 12 conservation units (such as National Wildlife Refuges, National Parks and Preserves) and 4 Wild and Scenic Rivers. To minimize confusion, state and federal managers coordinate under a memorandum of agreement in consultation with stakeholder groups, including the Yukon River Drainage Fisheries Association (YRDFA). The Pacific Salmon Treaty which provides for joint development with Canada of escapement goals and border fish passage objectives. Starting in the mid-1990s, protection of Chinook, and summer and fall chum runs resulted in restrictions on subsistence and commercial fisheries. Through the Yukon River Drainage Fisheries Association (YRDFA) and the more recently established Yukon River Inter Tribal Fisheries Commission, local residents have worked to restore salmon stocks with equitable burden sharing among the segments of the river. Between 2000-2018, the Yukon River salmon fisheries were declared a disaster on four occasions.

#### **Case Study**

# I am a Criminal: Criminalization of Indigenous Fishing Practices by Carrie Stevens and Jessica Black, Gwich'in



#### Introduction: Inequitable Salmon Stewardship

Alaska Native peoples experience well-being when out on the land: hunting, fishing, and gathering. This sense of well-being is amplified by core Alaska Native values of providing for family, sharing, and taking care of others. Alaska's salmon, namely the king salmon [chinook], are a foundation of Alaska Native cultures and ways of life. As expressed by Yupik Dr. Theresa John, Alaska Native peoples embody the animal which they harvest and take in. In this way, many Alaska Native people are Salmon People. This Indigenous way of life, often simplified to the term subsistence, is passed down generation to generation, year after year for thousands of years.

This way of life has been compromised; hundreds of years of colonization in Alaska, fueled by racism, has led to colonial laws and to the systematic

disenfranchisement of Alaska Native peoples from the land and resources on which they intimately depend for their physical, social, cultural, spiritual, and economic well-being. The Alaska State Constitution was written with one Alaska Native in the room, and failed to provide for the State's Indigenous peoples. The Alaska Native Claims Settlement Act stripped Alaska Natives of their aboriginal hunting and fishing rights with no compensation for these rights. The US Congress fell short with Alaska National Interest Lands Conservation Act (ANILCA), in which they attempted to address the wrongs against the State's Indigenous peoples. The State's refusal to enact ANILCA has led to ineffective, inaccessible dual management system in which Alaska Native voices are marginalized at best and silenced at worst. A further matrix of additional federal laws and international agreements further disenfranchise Alaska Natives in any equitable decision-making related to their salmon relatives and Indigenous fishing practices. Alaska Native peoples are left with no equity, with little voice, becoming criminals who are ticketed and fined when hunting, fishing, and sharing.

#### Fishing as Wellness: We are Salmon



Innumerable technical papers, reports, and empirical research have clearly established that the Indigenous hunting, fishing, gathering, and sharing way of life is central to Alaska Native peoples' well-being. This is recognized in the findings and declarations of Title VIII of the Alaska National Interest Lands Conservation Act. Elders in the Yukon Flats highlighted this special relationship in *Bridging Yesterday with Tomorrow*; the elders and traditional hunters/fishermen all expressed the daily of practicing the traditional way of life, of gathering and eating traditional foods, of respecting and caring for the environment and how it provided for them, their

well-being, and made them whole. Further community-based indigenous research clearly delineated "hunting, fishing, and gathering are essential elements of individual and community well-being for Gwich'in and Koyukon people" (Black, 2017).

Expression of this well-being has become increasingly difficult as the aforementioned laws and systemic disenfranchisement have impinged on Alaska Native peoples' ability to gather and steward the land in ways that their elders and ancestors taught them. In order to share Native foods, which are an important element of well-being and informal governance, one has to have access to first hunt, fish, and gather and also share in the management of these activities. So it is not enough to just have access to these important salmon relatives [and other game relatives], but one must also share an equitable role in the management of these resources or even better steward these resources on their own terms.

#### **Criminalization: Harassment and Shame**

US Fish and Wildlife data, Alaska Department of Fish and Game data, citation data, court data: if available, collected, and analyzed would all demonstrate the undeniable trend, Alaska Native peoples are being harassed and criminalized for practicing their Indigenous ways of life. Fishermen and fisherwomen, hunters alike, are ticketed and fined for feeding their families. Dozens and dozens of cases have flooded Alaska's courtrooms since the 1990's, representing only a small fraction of the citations and fines issued. In June 2012, 61 salmon fisher people were issued citations on the Kuskokwim alone, with their nets being seized or cut (Ikutanet al. 2013). Court records show only 25 appearing in district court. This story is not one limited to the Kuskokwim, it spans the salmon fisheries of the state. Criminalization is prevalent amongst traditional Indigenous fisher peoples of the Yukon River, along the Copper River, within the Bristol Bay, and throughout Southeast.

The stories of those affected are the greatest testament to the extent and impacts of criminalization, and the internalization of criminalization, to Alaska Native peoples. You can travel to any Tribal community in Alaska, and you will find a story of criminalization of traditional Indigenous hunting and fishing practices. The stories are of humiliation, anger, fear, desperation, shame, frustration, and devastation.

The highly publicized case of former State Senator and Tlingit fishermen Albert Kookesh demonstrates the inequity within the system. His criminalization for traditional fishing practices was front page news, telling a story of misuse and overharvest. He fought his citation over 7 years at great person cost, financially and socially. He found himself accosted and scorned publicly. However, his vindication and win, highlighting the administrative failures of Fish and Game, barely made third page news. (Albert Kookesh, personal communication). The stories of harassment, of feeling less than, of feeling bad, of feeling inadequate are pervasive. One of the most detrimental impacts of this criminalization is the Internalization of this criminalization.



"Now, I am being told I am wrong, my hunting and fishing are criminal. I don't know what I will do if I cannot eat my traditional foods. I am 65 years-old and have been eating my food all of my life... Several tickets have been issued to me and other hunters by the F&W or F&G. I have had to go to court more than once. I am not doing anything wrong. I am not committing a crime. I simply fish and hunt on the land that has always belonged to us all... for years we are being told by others not familiar with our ways, how and when we are supposed to trap, hunt and fish." Paul Herbert, Survival Denied

"It's like we're constantly being watched. We have to have all kinds of licenses, and you never know whether you're on federal or state lands. It makes us feel like criminals...It wasn't so bad long ago. But now there's so much regulation, so many

*rules. It's just making us look like we're bad people for wanting to continue living the way we were brought up."* Wilma Pitka, Survival Denied

"Us native hunters have been made to feel like criminals just to honor our traditional ways and feed our families. A couple, three times I felt harassed by state and federal officers. One time a State trooper came to my work, to question me about my hunting and fishing. He made me look as if I were a fugitive, the way he conducted himself and did his business running around crazily in search of me. It was foolish and embarrassing at my place of work." Walter Peter Jr. Survival Denied



Indigenous hunters and fisher peoples in various interviews shared how when they were out on the land they were aware every time a plane or helicopter flew overhead or a boat was coming down the river. They became anxious and paranoid. One young man, a Village Public Safety Officer for his community, shared a time when the anxiety got the better of him. He was out working on his fishwheel, he was doing nothing wrong within current regulations, however he was still anxious from the patterns of harassment in his community. He heard a plane, he became worried, he looked up and around, and he fell and twisted his ankle. This story illustrates the internalization of criminalization, it does not leave many active Indigenous fisher people, having a direct impact on their well-being.

#### The Path Forward: Creating Salmon Equity

Alaska Native well-being is tied to the ability to hunt, fish, gather and share. It connects Alaska Native people to the past and ensures the future is protected and cared for; this gives Alaska Native people a purpose, a reason to wake-up each day and live. Checking the smokehouse, traveling the trapline your grandfather trapped, feeding your sled dogs, harvesting a moose, sharing ones catch; all of these experiences are not quantifiable yet they are the only evidence that matters. These practices are imbedded in traditional governance systems that provide for Alaska Native peoples and offer solutions for all Alaska's people.

Criminalization of the Indigenous way of life has not only had far reaching cumulative negative impacts for Alaska Native peoples and their individual and collective well-being, but detrimental impacts to healthy, thriving salmon and waters. The spiritual relationship and covenant between salmon and people has been broken and healing needs to be restored. The only way the healing can begin is by providing for equity in salmon stewardship, management, and decision-making.

#### Creating Salmon Equity, Minimizing Criminalization:

**Recognition and practice of Alaska Native self-governance.** Allowing Alaska Native peoples to re-assume stewardship founded on Indigenous principles and spiritual relationship will reset the balance. This benefits all Alaskan's, sharing and taking care of others is a central principle of Alaska Native peoples' stewardship practices. Strengthening Alaska Native self-governance includes recognizing the work and the authority of the Yukon River and Kuskokwim River Intertribal Fish Commissions. The Commissions derive their authority from their member Tribal Governments, and their aim to ensure healthy salmon and populations for all peoples who rely on them for wellness. They strive to bring Alaska Native fisher peoples together with state and federal agency staff to co-create a sustainable path forward.

**Recognition and honoring racial equity in salmon management.** Truthful conversations regarding Alaska's salmon history will allow us to move forward as a more understanding and unified Alaska in caring for our salmon relatives. Our salmon relatives benefit the most when we come together, address our challenges as a State, and find our common ground to move forward. Numerous efforts are already being implemented on a statewide level, such as the work of First Alaskans Institute in their Alaska Native Dialogues on Racial Equity (ANDORE); the work of the Humanities Forum in the Salmon Fellows program; the work of UAF in Indigenizing Salmon Management and the Center for Salmon and Society; and the work of Salmon Connect.



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**Recognition, inclusion, and honoring Alaska Native peoples' voices and expertise in regulatory and management decision-making.** The complex, fragmented management system is largely inaccessible to Alaska Native peoples. The meetings are in urban centers, the language and process are complex, technical and untimely. The work of the Tanana Chiefs Conference Hunting and Fishing Taskforce is also an important step forward, as it has been successful in catalyzing different generations of Tribal leaders to not only learn the process of engaging in and changing fish and wildlife regulations and management, but inspires them to work towards an Indigenous Self-Governance framework. The work of the Tribal Management program is also a critical link, providing culturally relevant workshops for Tribal Citizens on engagement in the regulatory processes of Board of Fish, Board of Game, and Federal Subsistence Board. Largely Indigenous fishing people are fighting to sustain and protect their way of life, creating equity in salmon management and stewardship, provides the opportunity for Alaska Native peoples to share their wealth of knowledge, expertise, and spirituality.

This is for the benefit of the Salmon, the Salmon Peoples, and all Alaskans.

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