KING SALMON *on the* LOWER YUKON RIVER

Past and Present

SPONSORED BY

Yukon River Drainage Fisheries Association
Anchorage, Alaska

PARTICIPANTS

Nick Andrew, Sr., Marshall
Francis Charlie, Scammon Bay
Raymond Waska, Emmonak
Michael Hunt, Kotlik
Paul Beans, Mountain Village
Evan Polty, Pilot Station
Catherine Moncrieff, YRDFA
Alice Rearden
Mark John
Ann Riordan
Davina Carl
Rebecca Nayamin, Chevak

Text by Ann Riordan and Catherine Moncrieff
Translations by Rebecca Nayamin and Alice Rearden
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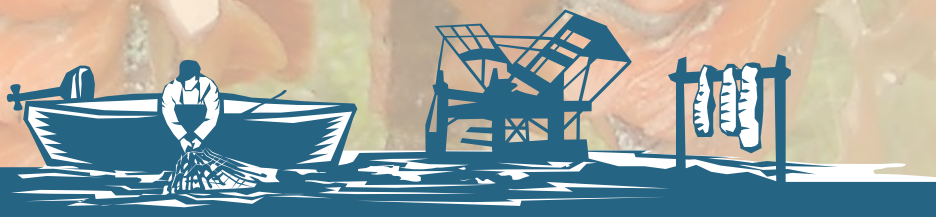

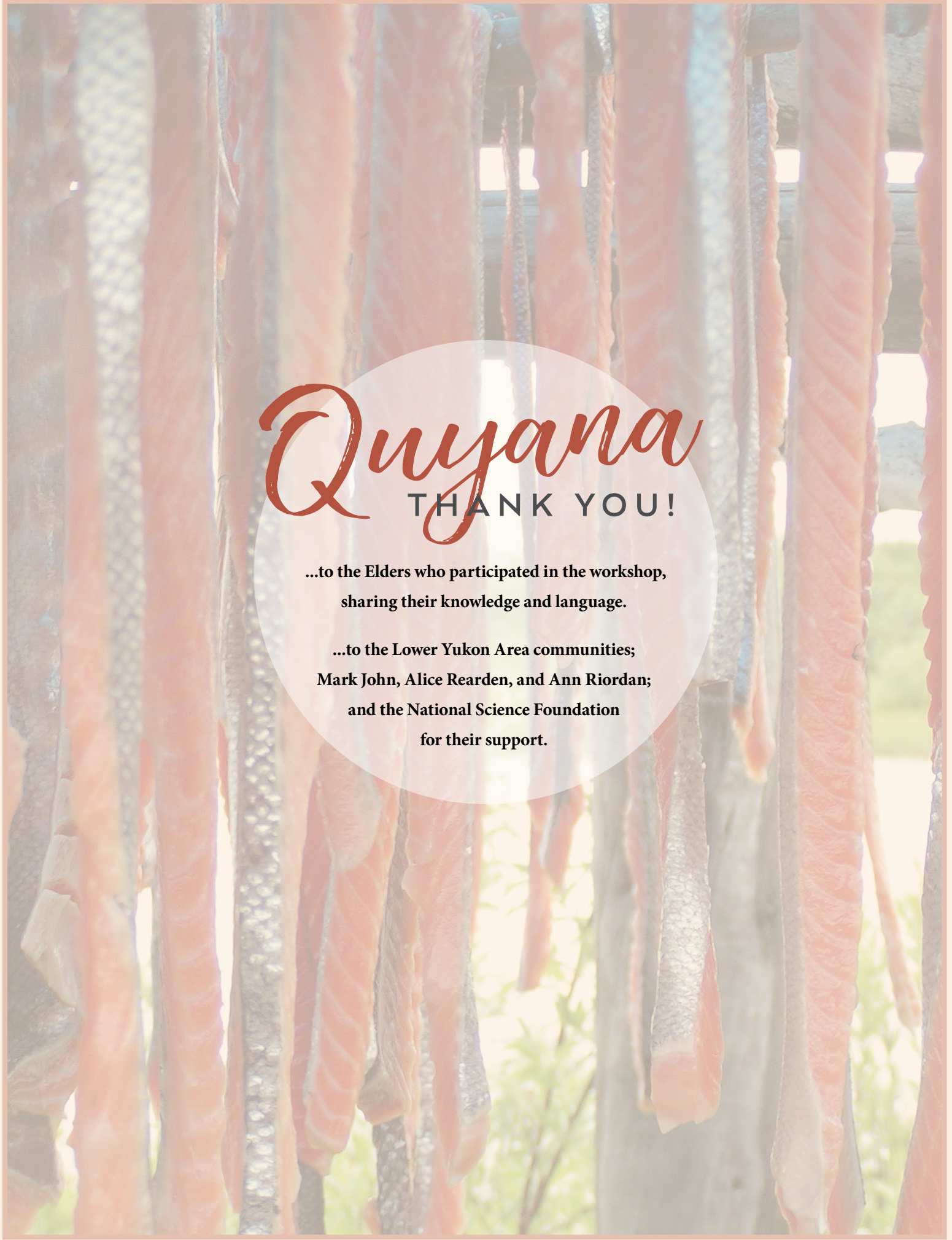

Quyana

THANK YOU!

...to the Elders who participated in the workshop, sharing their knowledge and language.

...to the Lower Yukon Area communities; Mark John, Alice Rearden, and Ann Riordan; and the National Science Foundation for their support.

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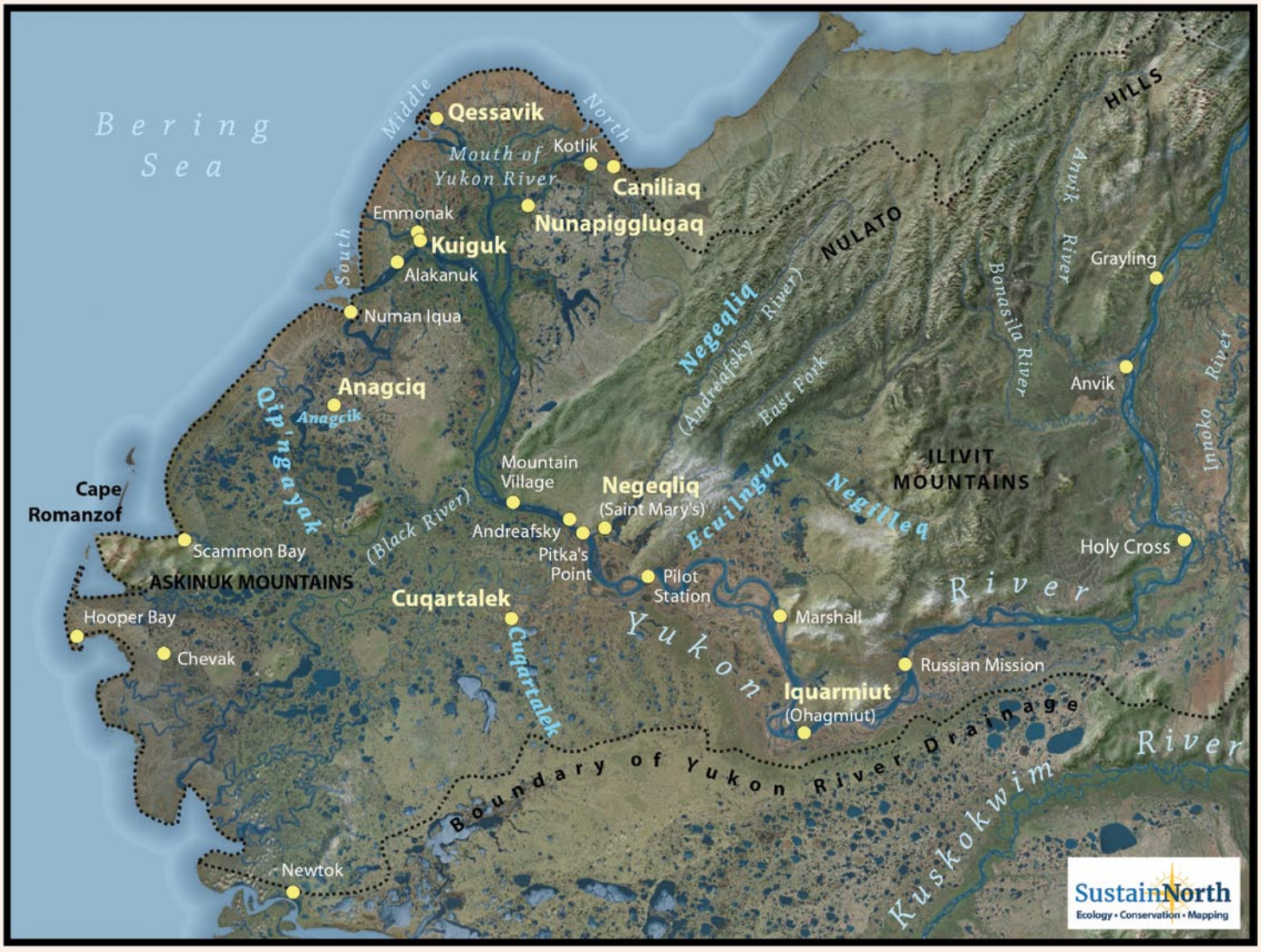

Lower Yukon River Area with places identified by Elders during 2017 king salmon workshop.

Introduction

In February 2017, six Yup'ik Elders from Yukon River and coastal communities gathered in Anchorage to share their knowledge and experience regarding one of the most important resources in their region—king salmon (Chinook salmon). The gathering was organized by Catherine Moncrieff on behalf of the Yukon River Drainage Fisheries Association (YRDFA). To host the gathering Catherine partnered with Mark John, Alice Rearden, Davina Carl, and Ann Riordan of Calista Education and Culture (CEC) and translator Rebecca Kelly, with funding provided by the National Science Foundation, Division of Arctic Social Science. The meeting was designed as a topic-specific gathering, following a format which CEC has developed over the last 20 years to investigate and document many aspects of traditional knowledge in southwest Alaska. The meeting was a true collaboration, combining Catherine's extensive experience with fishery issues along the Yukon River with CEC's experience working with Yup'ik Elders. Everyone involved—YRDFA and CEC staff as well as the Elders themselves—learned and shared a great deal during our two days together. We hope that this report can communicate lessons learned about the history and current condition of king salmon on the lower Yukon River.

Elders arrived in Anchorage on Tuesday, January 31, and our gathering took place over the next two days, February 1 and 2. Participants were nominated by the tribal councils of the lower Yukon and coastal areas, knowledgeable Elders, and CEC cultural director Mark John. They included Nick Andrew, Sr. from Marshall, Evan Polty from Pilot Station, Paul Beans from Mountain Village, Michael Hunt from Kotlik, Raymond Waska from Emmonak, and Francis Charlie from Scammon Bay. Nick Andrew, Ray Waska, and Francis Charlie stayed as guests of Ann Riordan in her Anchorage home, where the meetings took place. Paul Beans and Michael Hunt stayed at a nearby hotel. Evan Polty's flight was delayed until February 1, but he was able to join us for the second day and also stayed at the hotel.

Elders from the lower Yukon River at the 2017 Anchorage Workshop on King Salmon. Pictured: Back (L to R) - Raymond Waska, Paul Beans; Front (L to R) - Francis Charlie, Michael Hunt, Nick Andrew Sr.; Not pictured - Evan Polty.

At the beginning of our meeting Catherine explained our purpose—to document Yup'ik understandings of king salmon and to share that information both within their communities and with organizations and agencies involved in fisheries management. All agreed that this was important work, as king salmon have declined sharply over the last twenty years, with significant negative impacts on both the subsistence and commercial fisheries of the lower Yukon. Speaking in English, Michael Hunt noted that in the 1940s and 1950s when they were young, king salmon were large (averaging 50 pounds) and abundant, and no one came around to tell them "you can't do this, you can't do that."

> *There were plenty of fish that time when we were growing up and... in my community, we had an Elder that we respect tell us, "You take what you can for your family... Don't waste, take care of what you catch. Tomorrow will come again, and you'll have more fish then."... From there we can start working on why king salmon is no longer strong as when we were growing up. Let's start off from there.*

Lead CEC translator Alice Rearden led our discussion, which was primarily in Yup'ik, with simultaneous translation into English provided by Rebecca Kelly and Davina Carl. Alice noted at the beginning that we were interested in understanding all about salmon, not just the decline of king salmon. Yet this concern over the king decline dominated our discussion.

Though living in different villages today, all of the Elders knew one another and shared a common background. All had been born and raised in small winter settlements, moving routinely with their families to seasonal camps to harvest the fish and food they needed to survive. In the late 1950s and early 1960s, however, these winter settlements were abandoned when the Bureau of Education established schools at 56 central locations, making formal education mandatory throughout southwest Alaska. Also, limited export trade in furs and fish to meet local import needs had already developed by the early 1900s. This commercial activity was temporarily regulated out of existence after the failure of the salmon run in 1919. By the early 1930s, however, commercial salmon fishing reopened on the lower Yukon and has continued to coexist with and support subsistence harvesting activities until the closure of the commercial king harvest in 2007.

Elders introduced themselves from oldest to youngest. First to speak was Francis Charlie (Acqaq in Yup'ik) from Scammon Bay. Francis was born in 1941 in Anagciq, a winter settlement south of Nunam Iqua, then relocated to Nunam Iqua when he was a young man. Francis moved to Scammon Bay when he married and has lived there ever since. When he was growing up, Francis noted that there were few people but an abundance of fish: "There was never no fish." Francis described life at Anagciq along the Anagciq River:

> *There was no wilderness. Anyone who traveled in all the rivers, the ones that had fish, it was like he was going to the grocery store... and they'd travel vast distances when there used to be a lot of snow [and water]. And when on a beautiful day one could see smoke rising up from far away, the visible smoke from their chimneys would be the only indication [that other people were living nearby]. And my grandfather, even though he owned dogs, he'd only push a sled and travel.*

Nick Andrew (Apirtaq) from Marshall was our next speaker. Nick was born at Iquarmiut in 1933. When he was young, his family regularly moved between Iquarmiut in winter, spring camp south of the Yukon, and summer fish camp along the Yukon River. His family harvested sheefish immediately following breakup, boiling their stomach fat for oil, which they jarred for future use.[1] Nick further noted that the first run of kings was harvested and cut up right away so that they would dry well during June's good weather. Today's regulations prevent that, and fish are not always taken at the optimal time:

> *There are certain times during the year that food is good to eat. Those others [non-Natives] don't know that because it has never been a part of them...*
>
> *For those who have lived off the land since it was passed on by our ancestors, we gather foods when they are best to eat. But we had different varieties of food that we never got tired of eating and always ate off the land.*

Michael Hunt (Amiksuguin) from Kotlik spoke next. Michael was born in Caniliaq in 1943 and moved to Kotlik when a school was established there in the 1960s. Michael attended school at both Wrangell and Mount Edgecumbe, where he learned to speak English. A well-respected Elder and community leader, Michael noted that he would speak from experience. Growing up in Caniliaq, one of the Northern Commercial Company boats, *Agulleit* and *Roosevelt*, would pick up families in early June to work at George Butler's cannery at Kuiguk (established in 1940) for a month during the king salmon season.[2] In the 1950s, king salmon were abundant. NC Company provided the nets, and men fished six days a week, resting on Sundays. The fish were large, too, and people worked long hours. Michael said: "Each morning, the *Agulleit* and *Roosevelt* would take off to pick up fish from the fisherman, and they'd arrive with heavy loads of king salmon. They'd never stop and always had loads of fish back then... That was all we fished for, fishing in June and sometimes even into July."

After commercial fishing, the Hunt family headed home to their summer fish camp, where they dried chum salmon for winter use, as well as brining some king salmon. Michael fished commercially for kings starting around 1960 and also worked at the Nunam Iqua saltery (established by a man named Sheldon

in the mid-1940s): "Even though there weren't many fishermen at that time, they'd bring in so much king salmon. We worked on those for long hours... King salmon were plentiful in numbers and large in size... But the time [allowed for fishing] became less and less. We started fishing for five and a half days, and they'd never buy the chums."

Michael noted that Arnold Akers, who established another saltery along the Yukon's middle mouth in the mid-1940s, paid $1 to $1.50 per fish. By 1970, the canneries started buying fish by the pound and the salteries could no longer compete. Upriver at Mountain Village, George Shephard had a salmon cannery and Jack Emel established another cannery at Alakanuk in 1938. Michael recalled that 1979 was the year with the most king salmon, and that they have declined in numbers ever since:

> *[Once in 1979] as soon as I set my drift net the kings hit... and my net starts to sink. Right away I pull in the whole thing with all the fish in it. Since it was about to sink I'd drag it to shore, then remove the fish there. Not even three minutes there I caught 110 king salmon. That was the peak of the heaviest run that I've seen.*

Michael said that after that, king numbers declined and the fish became smaller. Around that time the canneries started buying chums for 5 cents a pound. Though the price was low, few people fished and the money was a help to those who did.

Our next speaker was Raymond Waska (Iraluq) who was born at Nunapiggluugaq in 1941, moving to Emmonak in the 1950s. Like Michael, he remembered the bustling commercial fishery along the lower Yukon, including both the Kuiguk and Alakanuk canneries, as well as the saltery at Nunam Iqua. 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. Ray noted that people hardly caught kings for personal use: "At that time they'd catch up to ten of them, and they'd brine them, make them into strips. Or they'd only salt the fish."

Paul Beans (Nalqilria) from Mountain Village spoke following Ray. He recalled going to spring camp at Qip'ngayak (Black River) in April, where his father hunted and fished with a kayak. Paul had his own kayak by age 12. When they heard the Yukon River ice break up in May, they portaged their boat and dogs back to their summer fish camp just downriver from Mountain Village. *Kiagtat* (king salmon) hit first around June 1 and were taken with cotton nets that easily deteriorated. Paul shared his recollections of fish camp.

> *Here when they hit, it wasn't chum salmon, only these king salmon. We'd filet them there, for our food... My grandfather and my two uncles had two different houses there. They would cut kings for our winter food. They didn't let us do the chums... We caught the kings using nets. When the kings hit they'd catch so much in the nets. The fish wheel didn't catch [many kings], but during the night it would catch two or three.*

Nick Andrew later confirmed that king salmon were not normally caught in fish wheels, as kings feared "the loud booming splash noise." King salmon also feared the noise made by belugas as well as barges: "When barges head upriver during king season, when a net is set it fills up fast. [The kings] rush up from the channel below, fleeing." Chum salmon, however, were taken in abundance. Paul continued:

> *A little farther upriver from Mountain Village they'd set the fish wheels. They had big containers for chums, all night that fish wheel would fill up. Those chums were given to the dogs because in those days they had no machines but would use only dogs for transportation. Whenever the church bell rang all the villages would howl so loudly.*

Paul recalled hearing about the time when king salmon didn't arrive on the Yukon—possibly 1919. People ate so much wild rhubarb that their mouths turned green: "At that time since the kings wouldn't arrive my grandfather portaged over to his spring camp, where he and my grandmother cut and fileted *qaurtut* [large

humpback whitefish]. It was there that they spent time gathering fish for winter."

Paul started commercial fishing around 1950 when he was young. He fished for one month after the June 1 king opening, selling fish to George Shepherd's cannery in Mountain Village, where mild cured salmon were packed in large barrels for shipment Outside. At that time, Henry Bogler also had a cannery at Pitka's Point, where he paid 50 cents per king salmon. Shephard raised the price to $1 a fish. A third cannery briefly operated at St. Marys, but closed within several years. Around 1950, the Mountain Village Fish Company, under the direction of Brother Al Perry from the St. Marys Mission, bought only king salmon.

Paul said that Paul Johnson from Mountain Village, who had fished in Bristol Bay, was among the first to driftnet in the Yukon around 1965. Before that time, men used set nets. Johnson fused two 20-fathom nets together, creating a 40-fathom net. This proved very effective, and soon other Mountain Village fishermen followed his example. Paul also described how the price paid for kings rose steadily, starting at $1 a pound to $3.50 a pound in the late 1970s, passing $5 a pound in the 1980s. The number of fisherman also steadily increased, with permits first issued in the 1970s. Paul noted that prices peaked in the early 1990s, then began to decline. At the same time fishermen began harvesting chum salmon for their roe. Kings were not accepted during the roe fishery and were thrown away, which Paul found disturbing.

Paul noted that his extended family, including three related households, needed 12 barrels of king salmon, stepped on to compress the contents, to supply their winter needs. When he was young, his family didn't eat chum salmon, which were for dogs. King salmon, however, were a daily staple: "We know that winters are long. Before we ate, our mothers would set out king [strips] with every meal."

Paul emphasized that all parts of the king salmon were used in the past. People would brine or dry the heads as well as the cartilage and roe. Salmon were also processed as *egamaarrluk* (half-dried fish boiled before eating). Paul declared: "Everything would be eaten except the guts." Francis said that some even hung the salty guts and *igyamcuut* (esophagus), which were delicious: "They dried these kings without leaving anything out. The only thing they threw away were their gills. At times they didn't even throw them away but would stick them on a piece of wood to dry and give them to dogs... But they would remove the blood line that was inside their bone. Everything else was dried." Francis said that king salmon heads were not fermented although people did ferment chum heads. He then jokingly recalled a friend who, whenever angry, would take a fermented head, aim it at him, and pretend to throw it.

Along with king salmon, Paul and his siblings harvested chums for 30 dogs: "The fish wheel basket would be lopsided all night... They'd cut up every fish and bring them to the storehouse... and would make bundles of 20 fish each." They also set large fish traps to catch burbot for additional dog food during winter, sometimes taking more than 100 fish in a single trap. Men set nets under the ice for sheefish and large humpbacked whitefish: "They still do this today after freeze-up... Hunting and gathering and fishing are ongoing... And beluga whale is still hunted, as well as seals."

Evan Polty (Utuan) from Pilot Station also shared details of his growing up. Evan was born in 1947 south of the Yukon at Cuqartalek. When he was young, his family headed north to the Yukon for king salmon fishing every year around June 10. In those days, Evan said, fish were plentiful and families quickly harvested what they needed for winter use. Evan recalled:

> *This event was our marker. As soon as the kings dried around the end of July, then everyone headed back to our old campsites before returning to Cuqartalek. That was how we lived for many years… Then not long after I was about six or seven years old, we moved from Cuqartalek to the Yukon because they built a school at Pilot Station.*

Evan further described his observations of fishing for king salmon at this time.

> *They called kings* kiagtat *[lit., "summer things"] in the north side area of the Yukon. And our parents would go to harvest with gusto just for kings. The net wasn't even set out for a long time. When we set them out for just a night, right away a fish rack would fill up, and we would fill them with between twenty and thirty cycles of cut, hanging kings. So thankfully we'd have food for the whole winter.*

Evan noted that not long after his family moved to Pilot Station, 7 hp motors started appearing, replacing the row boats, and people began to travel farther afield, to areas with strong currents, to go fishing. Commercial fishing also began to increase: "Not long after this cannery opened at the [St. Mary's] Mission and Bogler [at Pitka's Point] there used to be an abundance of fish. Sometimes their boats would be so full some would almost sink." Paul emphasized the important role king salmon played in village economies: "That used to be their main source of income. Back in the 1970s and 1980s when there were lots of fish, that's when they started using those aluminum boats with the large machines. From one opening they'd cover the cost of the boat."

Yup'ik Understandings of King Salmon

Our group spent considerable time explaining their understandings of king salmon. This included discussions about their spirit, their treatment required by humans, their path to the spawning grounds, their medicinal values, and the admonitions taught to them by their Elders. Nick began by saying: "They say we humans have a spirit. Just as we have a spirit, they 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." An animal's body requires careful treatment as well. Nick explained: "It's said that if you leave any meat on the bones, that its other body won't return. They go through pain, from that bit of meat that was left on the bone. When they try to return home to their nesting areas they go through a lot of pain."

Evan Polty with Nick Andrew Sr.

Salmon, they say, will disappear and become unavailable if not properly cared for. Francis further explained about proper treatment:

> *They say the reason for them disappearing, they didn't want [people] to put them where they would be stepped on. Because they might disappear [due to mistreatment], back in those days, they didn't have mops, but only wiped things up with feathers/furs from animals. And then after doing that [mopping the residue], if there was ash [from a fire pit or stove], they would cover the area with ashes. They say it was so that [the animals/fish] won't disappear and become unavailable.*

The Elders explained that fish also avoid the nets of those who do not take good care of them.

The Elders spoke about stories told to them about king salmon. Nick related a story told to him by a man from Huslia of King Salmon heading up the Yukon and meeting Blackfish along the way:

> *So it happened that this King Salmon was at the mouth of the Yukon, facing the mouth. And as he happened along he heard a voice, "I wonder now where you are heading to?" Here he looks and sees Blackfish right there next to him asking, "I wonder where it is you're heading to now?" Then King Salmon tells him right there, "Here I am, when I start entering the Yukon, I'll be swimming up to where there is no more to swim past, to where there*

is no more water." So it turns out that that is where they are heading to go spawn and die at the very origin [of the Yukon] where there are lots of rocks.

So then King Salmon asks Blackfish, "What about you, which way are you heading to?" That dear old Blackfish just looks at him and answers, "I'm not going way up there so far. I'm going to just stay here where it's not so far from the ocean." [laughter]

Subsistence foods are highly valued on the Yukon, especially king salmon. They are valued as food but also as medicine. Nick highlighted this when he noted that king salmon are like medicine:

Native foods do not cause sickness. They do not contain anything harmful… One who eats our Native foods will add one more day to his life. Some of our foods are medicinal.

We didn't have razors to scrape off mold, so we ate [dried fish] with mold. That was medicine. Nowadays our grandchildren throw them away, not knowing they have medicinal qualities.

Alice asked about rules against eating king salmon when one has a cut or surgical incision, and Nick affirmed that king salmon, silver salmon [chum salmon], and sheefish were all not proscribed when one had a wound that was healing.

Other practices related to king salmon were described by the Elders. Evan noted the rule against cooking land and water animals together:

They'd also tell us that when cooking any water animal, kings, large humpback whitefish, and the chums, to be mindful and never cook them with birds. It is said that the birds fly away with them [making them disappear or not return]... So whenever my mother cooked she'd always cook them separately, never cooking the kings with any land animals.

Evan also noted the admonition that pregnant women never cut king salmon with blemishes or her baby will have freckles:

They also used to say about the first arrivals, that any woman who is pregnant to be reminded before cutting and filleting fish to not ever cut any fish that has a round or dark blemish. It should be done by someone else. It will be evident when the baby is born... The baby will have lots of freckles...

Pregnant ones should not touch those fish with blemishes as the blemishes might enter into their wombs. Even today my wife keeps an eye on that while cutting and filleting. She takes them off the pile.

Evan also described the time his uncle saw a king salmon with a human face and what people said about it:

My uncle Anguyagpak... and another person, Angutengyaaraq, [told this story]. It was said that upriver on the other side of the Yukon, they took a net to catch kings as they were paddling. Then something appeared just downriver from there. As they were watching it appear, lo and behold, it had a face. My maternal uncle was about to shoot it. As it dove into the water that being had a king salmon's body. From then on they'd say that there would not be very much fish because of that…

My mother would tell me before I went out fishing, to leave those alone should I ever come across one. They say that they whistle and take people under the water with them. Those are things that people were warned about back then.

Evan labeled the being his uncle saw a mermaid, and Alice noted that it was reminiscent of the seal person, *qununiq*, said to have appeared to coastal hunters out on the sea ice.

Some time was spent talking about how to welcome or honor the king salmon and to celebrate the first

catch. Nick described how wormwood was placed in the fish's mouth as a welcome gift:

> *I used to see when they first caught fish they'd put wormwood into their mouths when they brought them up to shore.*
>
> *This was done so that they should want to come back again for more, because they were so well received by their hosts.*

Evan described how his mother welcomed the first-caught king salmon with a bit of food and oil:

> *That's what my mom also did when catching the first king salmon, putting in a piece of food, and then smearing it with a bit of Crisco, and honoring the Elders. Sharing it first. That's what they did to remember our past Elders. That's what they and my mom would say, that when they catch again that we would be remembered. They always made sure to remember every first catch by hosting them, or receiving them.*

We also briefly discussed plants used to freshen fish nets and make them more attractive to incoming fish. Nick explained:

> *If the net doesn't catch, use* teptukuyuq *[valerian, from* teptu-*, "to be odoriferous"] on them. After setting the net into the water then add that plant. The plant makes the net smell good right away. It's said that this plant is wanted by the fish. That [plant] grew on land. Just the way that our ancestors would gift a bit of food with wormwood, they'd do the same that way.*

Evan recalled additional admonishments surrounding king salmon fishing, such as the proscription not to allow muskrat fur to touch nets. They were instructed to watch the river for muskrats and move their nets to avoid them:

> *My mother's parents used to warn, to think foremost about the king nets, that they should never come close to a muskrat. They said that if any of its fur was to touch any part of the king net to wash it. That's what they'd warn us about.*

Nick Andrew Sr.

Nick agreed: "They say that causes us to not catch fish." The admonishments and practices discussed in this section were passed down by the Elders before these Elders and guided the communities in proper treatment of the animals.

Salmon Preparation

Our group possessed a wealth of knowledge on the care of salmon, as they had been catching, drying, storing, and eating these fish throughout their lives. Evan spoke at length, describing how he and his family prepare king salmon to this day. He describes the importance of being ready when the salmon arrive as they pass by for limited time only:

> *When I was a young man when I first had a partner, and we had kids all girls, then three boys. Then my father used to tell me, "These kings and salmon swim only during summer. So prepare for them and be very alert for them, it's not a lot, they will pass." So we'd prepare, me and my partner, and we would bring our growing children with us to our fish camp, their mother would show them by example while cutting kings.*

Evan then described how his wife cut kings into strips, soaked them in brine, then hangs them. Her daughters helped, and now that they are adults they don't let their mother fillet anymore: "So those children of ours were carefully instructed." Evan also took the boys to gather *uqvigpiit* (large willows) for the smokehouse. He describes the importance of fishing early in the season when the weather is good and taking care to dry the salmon carefully: "When they [the salmon] dry, they're not hard... But still they need to be watched over carefully, starting in June when they first arrive... In August when the [bad] weather arrives, they would have fog and storms. They were told that if they were going to be fishing, to start early and right away."

Like Nick, Evan and his family process and consume all parts of the salmon. He describes how they his wife taught their daughters to prepare the salmon in the smokehouse:

> *She pulls out their eyes and tells her daughters those are for making* sal'kuuyaq *[casserole]... Hang their tails along with them... They keep a close eye on their bellies... Those kings must be closely watched...*
>
> *If they are smoked too much and there are flames, their meat starts falling off. They put the new fish, the ones that come in later, high above [in the smokehouse] to smoke... They keep them away from sunlight, and bundle them up... Take care of the heads and tails for* egamaarrluk *[half-dried fish eaten after boiling]...*

Then Evan summarizes how they work together, putting the salmon away at the end of the summer once they are finished processing it to store it for the winter:

> *So that's how we work all summer, and we are all together... Then when they've dried, they are salted and sealed into plastic buckets with new seals... So it's about 200 [kings and chums] that my children cut and dry...*
>
> *The buckets mix kings and chums. Chums are put in first for the bottom, then kings [on top] so they [the oil] will seep into the chums... Then they go back and switch them and let it re-seep, and when they do that they're not so hard.*

Evan described, above, their method for storing the king and chum salmon, taking advantage of the oil of the king salmon and letting it mix with the less oily chum salmon.

Evan said that during summer 2016, they caught 20 kings during a 24-hour opening. He and his wife headed to camp, where they were "just teaching them everything." A key point Evan made was how his family spends the summer working together. Later he explicitly noted: "We teach them all about the Yup'ik ways of preserving and preparing." This inter-generational exchange was routine in the past but is much rarer today. 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 described is declining along with the king salmon.

Evan shared details on cooking salmon, noting that his mother cooked the rich kings with *allngiquat* (marsh marigolds): "Yes, those marsh marigolds grow when the king salmon start arriving." He explained that his family does not cut and fillet *uqurliit* (fall chums): "Our mom always warned us that they're not good to eat, for those who are sick. I suppose it's because they are too fat." King salmon, however, are boiled, and the oil that surfaces is put away in jars: "Then during the winter they use it to soften hard beaver skins, and it removes anything stuck on the skin."

Evan recommended putting this information about how the Yup'ik people use and harvest subsistence resources on paper for use in the schools to ensure that the children can learn it early and follow the traditions and admonishments of their culture.

The Order of Salmon Runs

The Elders talked extensively about the different kinds of king salmon that they have observed in their parts of the river, discussing the different names and characteristics of each group of king salmon. Nick observed: "Our counterparts [fishery managers] who keep an eye on us, the ones who watch over these fish, they only call [king salmon] one thing." Fishery managers refer to king salmon as Chinook salmon or *Oncorhynchus tshawytscha*. Our participants, however, have a more nuanced view of king salmon based on both run timing and their characteristics at specific locations along the river. Today's managers have learned a great deal from the Elders about variations within the king salmon run and do pay attention to these observation, especially early in the season. The following discussion highlights these variations identified by the Elders. Readers should note that dialectical differences account for some minor variations in the names for salmon and that the same term may be used for different fish in different communities. Although there was much agreement, the Elders also described different names and characteristics of the various king salmon groups observed which could be due their location along the river and changes the salmon go through as they migrate upriver.

Ray Waska identified five different runs of *taryaqviit* (king salmon): *aciartaat* (lit., "ones below"), *tarsaqvagpiit* (lit., "large *taryaqviit* [king salmon]"), *tungulrianeg nasqulget* (lit., "ones with black heads"), *allirkat* (called "white nose" in English because of their white fins), and *massret* (old salmon near spawning).

Michael Hunt (left) and Raymond Waska (right).

The first run of king salmon are known as *aciirturtet* (from *aciir-*, "to go through the area under something"), as they run under the ice, as well as the smelt, when heading upriver. Nick explained about these "under the ice king salmon",

> *They enter into rivers below the ice. They like to twist and turn hard. Those are very strong, the ones that are to go upriver.*
>
> *And their eggs are small. Since they won't spawn here, the ones that swim [under the ice] will only spawn at the origin of the Yukon."*

Nick also observed that kings with large egg sacs are heading to rivers closer to the mouth, such as Negeqliq (Andreafsky) and Ecuilnguq, where they will spawn.

Following the *aciirturtet* [under the ice king salmon] are the *tarsaqvagpiit* (lit., "large *taryaqviit* [king salmon]"). Francis noted that these first kings were too rich to dry:

> *Further toward us [south along the coast] in the area of Black River, the first arrivals do not dry. They are too rich in fat. But our ancestors took them to brine or to eat a bit, or they gave them to those who had no one to fish or hunt for them so that they could have a bit of food from those first kings...*
>
> *My wife and I have tried [to dry them]. They are too fat. The plants underneath the drying rack couldn't grow anymore because of the oil. We would wait for the second run [pulse of king salmon]. Those are much better and easier to dry.*

Michael said that king salmon get less fat as they swim upriver against the current. In his opinion, the best king strips are from Holy Cross, as they are not as rich and fatty as those made on the lower Yukon:

> *The first runs of kings when they're rich are for further upriver. The later ones are skinny once they come closer to the Andreafsky, Anvik, [the king salmon in] those places are not very rich. They're good, they catch a lot of those, less fat,*

> *easier to dry than these first ones. These first ones, when they take too long to dry the meat comes off from their skins. They're not as good to eat when that happens.*

Unlike Francis, Paul noted that he and his family prefer the first fat kings: "Kings that come first are always fat because they are heading up to Canada. In my village, we won't go without eating them. But the ones that come afterward, including the "white nose," taste different. But I always prefer the ones that go to Canada." Paul warned that one cannot eat too much, as they are very rich.

Following the first run of fatty kings are kings known as *tungulrianeg nasqulget* (lit., "ones with black heads") in Yup'ik and "black heads" in English. These fish are not as large as the earlier kings and are considered fighters. Ray explained that: "Black heads are so strong and lively. They also danced for the net in Pilot Station. It is said that those black heads were the first to travel to Canada... They are not big [for past standards], averaging about 30 to 40 pounds." He continued and reported that, "We don't see [them] anymore, the kings with black heads, those disappeared the most. There used to be a lot of them. They're not seen anymore. The ones with black heads. The ones that come after the white noses."

The next run of kings are *allirkat* (from alliit, "mitten palm") known in English as "white nose." Francis explained that this is because the tips of their pectoral fins are white. Ray stated that "white noses" are always the middle run. He said: "They come hand in hand with the 'black heads.' They are very abundant and usually average about 30 pounds." Nick, who knew them by a different name, added that they are always big and are the most abundant: "They are usually big and twist hard in the net... And their fins are white, we call them *aritvaaraleget* [lit., 'ones with *aritvaat* (mittens)'] in my village."

The last ones to enter the mouth of the Yukon are the *massret*, the older salmon near spawning. Ray noted that these were hardly taken in the past but today some are harvested because the fishery is restricted in the early part of the run to conserve the king salmon that go to Canada: "Right now they probably take [*massret-* the old salmon near spawning] early, since they're not commercial fishing anymore... They [fishery managers] told us to take those kings we caught, that we can make strips or fry them. They're not fat."

Although he gave no clear description except that "they come from the ocean,", Nick noted that kings that are bluish on the top of their backs are said to have come from the North, implying that they were not technically "Yukon kings" but had mistakenly entered the river. Ray also spoke about long, thin king salmon blown down from the north:

> *Some time ago the wind kept coming from the north around spring without stopping. So when summer arrived some would say, "These kings come from the north." The wind had brought them from there, from the Inupiat [from the north.] They were long and thin like torpedoes... Turns out Northerners are coming brought by the wind, making them pass through. But those of our kings that come in, the Yukon kings, enter depending on which way the wind blows. When they arrive to the fresh water, that is where their path is, their route.*

Finally, participants noted that the timing of king runs isn't always the same, partly because they live in different parts of the river and also because there is some run timing variation year to year. Paul described the run timing from his perspective in Mountain Village and stated:

> *Kings start [running past Mountain Village] during the first week of June, and the first ones pass by June 20. The other ones like "white nose" come later, but by July 15 all have passed Mountain Village.*
>
> *Some of those that aren't fat stay in Alaska farther upriver to spawn in different rivers, like Inoko, Anvik. That's where the later kings go.*

Our group also described salmon runs that followed the king salmon. Ray provided a useful summary:

"The first ones that arrive are *tarsaqviit* [kings], *kiagtat* [Yukon word for kings, lit., 'summer things']. Then *teggmaarrluut* [first chums]. Then *uqurliruat* [summer chums]. Then *uqurliit* [fall chums], the real fall chums, then *qakiiyat* [cohos]. So I became aware of how we take care of our fish. They never spoiled because they were taken good care of."

The first to follow the kings were the *teggmaarrluut* (chum or dog salmon, lit., "hard ones"), the first chum run without fat. Both Paul and Nick described how fish wheels were used in the past to harvest an abundance of chums for dog food. Evan noted that his family only started using fish wheels to harvest chums more recently when they relocated to the Yukon, and that both *qaurtut* and cohos were harvested for dog food at Cuqartalek.

Nick described checking his family's fish wheel and processing the catch:

> *My grandparents had fish wheels to catch chums...*
>
> *From my experience in one night…where there were strong currents at the bluff, in the morning my cousin and I were told to go get the catch. And here we'd catch 300 chums. The boat would get filled... I got so good at cutting and drying them. I'd make my knife real sharp. Sometimes I didn't have to take the head off, but just open them up, take their guts out, then make cuts between the flesh to dry evenly, then throw the guts into the drum, I'd do one fish in one minute.*
>
> *We'd hang and dry them for three days, then put them in the smokehouse. When they were dry, we'd place them in containers, place plywood above them to step on, put them in a hole and step on them to compact them, tie them up into bundles. The store would end up buying them at 13 cents a pound. Even so, it paid for other foods, since food was inexpensive. And gas was $1.50 for five gallons.*

Ray said that his family sometimes harvests the first run of chums as food:

> *When my wife and I used to fish and when we took those, two days of smoking them [would be enough]. We take them down while still rawish. Then they'll be soft in winter. But when they're smoked too much, [they are] like pipeline steel. Very hard. So since we've started taking* teggmaarrluut*, [chum salmon] we smoke them for a little bit... then store them away before they get too hard... That's why they call them* teggmaarrluut *(lit., "hard ones"), because they get so hard when drying. My wife and I learned how to take care of them... then store them away in buckets.*

Following the *teggmaarrluut* were two additional chum runs, as well as cohos, and pink salmon. Nick continued:

> *After* teggmaarrluut *would be what we call* uqurliruat *[summer chums, lit., "pretend* uqurliit *(fall chums)"].* Uqurliruat *are actually chums, but they are fatter. Then afterward are the* uqurliit *[fall chums]. Then* qakiiyat *[silvers].*
>
> *Spawned out salmon[?] are the last to arrive. They only start coming when the markings appear on the cohos and chums, those old things. They don't cut and dry them in my village, as they are like wood. They are very hard because they have no fat.*

Nick reiterated that red salmon were not taken around Marshall: "These *sayiit* [another term for red salmon or sockeye] were never taken traditionally on the Yukon. Now since last year, my darned people would bring me some. They're really good food." Ray quipped that fish collectors regard them as chums, and he does not enlighten them: "I never say nothing."

Nick distinguished between *uqurliit* [fall chum] and *uqurliruat* [summer chum]: "*Uqurliruat* are like *uqurliit*. But *uqurliit* are healthy looking fish. They're more pointy and bigger. But those *uqurliruat* are more slender but still pretty looking, delicious food but not

as big. Their tails are V-shaped. They don't swim for long." Ray noted that they pass Emmonak around July 10 for two days and then are gone, and Nick added they pass Marshall around July 28. Ray noted that *uqurliruat* are between the first run of chums and *uqurliit* in size, and that is why he calls them "summer chums."

Ray described how the different chum runs were processed at the mouth of the Yukon:

> *After working on those chums when they dry, just like [Nick] said, they turn them into bundles and save them for dog food or sell them to those in the commercial business.*
>
> *Then after they've passed, as the* uqurliit *[fall chums] arrive, they get some for their food. They hang dry them, first their skin and their lower part, between its skin and back bone. Since they're so fat we remove the whole spine from them, boneless, then hang them outside on a sunny day, letting them dry fast. Then after they dry, they bring them in to smoke. Or if it's wet weather, we quickly bring them into our smokehouse, lighting a fire in the inside of that [smokehouse]. Then after they dry, we make it smoke. They'd even make those fall chums into strips...*
>
> *Then next will be the cohos, and since those are fat they'd make them into strips. Then again, after filleting them not too thick, they work on its core, they call them* ekiaq *[lit., lining, layer between things].*

Michael also commented on *uqurliit* [fall chum]: "*Uqurliit* at the mouth of the Yukon are so fat and big. They don't make too many into strips, as they are so rich... In the past they dried these with their bones for *egamaarrluk* [half-dried fish boiled before eating]. The whole fish, no waste... And when going berry picking we'd have that [*egamaarrluk*] for food." Ray and his family still process at least 20 fall chums as *egamaarrluk*, but Michael said that few do that these days in his village.

Evan noted that his mother had warned them that *uqurliit* [fall chum] are not good for people who are ill: "So we don't cut them... It is said they go straight to our bodily ailments... because they are rich in fat... Today we cut kings, then after doing chums, when the *uqurliit* start coming in we leave fish camp and go home."

Ray also briefly described *uqurlillraat*, although which salmon he is describing remains unclear: "Those *uqurlillraat* [lit., 'ones that look like *uqurliit*'] have bluish backs, and they're more slender. The skin on the middle of its back is bluish. [In English] I call those 'razorback fish.'... They dry fast." Paul called them "blueback fish."

Ray talked briefly about *amaqaayiit* (pink salmon or humpies) which he rarely harvests: "We call them *cuqperet* on the lower Yukon, and 'seagull bait' [in English]. We do sometimes take them home and fry them. When there are a lot of them, they are in the way, those 'baseball fish.' Because we don't eat them, they are a nuisance in the fish nets." Evan explained that the nickname "baseball fish" is because when they throw them away, they throw them high in the air. Nick added detail on pink salmon habitat:

> Amaqaayiit *[pink salmon] swim to rivers and spawn where other salmon won't enter... Even if there is mud, they go to the south side of the Yukon where there are tributaries... Their numbers sometimes go down, and some summers they are so abundant... When we fished commercially, they were so annoying... Their teeth tend to snag [in the net]...*
>
> *The [tributary streams on the] south side of the Yukon are muddy. Blackfish are there where it is muddy. The chums and kings don't spawn there, they never mix. Even if they are small baby fish, they don't mix. They prefer clear water, and go for rivers with pebbles where there is gravel to lay their eggs. But pinks like to mingle and swim among whitefish, which are way inside muddy rivers...*
>
> *Pinks go in any river, but these summer fish [king salmon] go to specific places. They use their instincts.*

Natural Indicators of Salmon Arrival and Abundance

The Elders discussed ways in which they know when the salmon will arrive and how many salmon to expect. There are many natural indicators that they used prior to western style fisheries management including observations of the wind, the other animals such as bird, and the growth of the plants.

Prevailing wind direction in the winter is a major indicator—and perhaps determiner—of the path salmon take when entering the Yukon River. Francis stated succinctly that when the wind is blowing from the south, salmon will swim closer to shore when they arrive, while a north wind pushes their path farther down. Michael stated:

> *The universe takes care of everything; even when it's time for the fish to come in, the wind takes care of that. When the wind comes mostly from the north, the fish mostly come in from the south mouth of the Yukon. But when the wind mostly comes in from the south, that's when the kings and other fish enter the river from the north side of the mouth.*

Michael then explained why this is so: "A south wind blows fresh water away from shore, and fish enter through the north mouth. When a northwest wind blows, the fresh water is closer to the river, and the fish come into the south mouth of the Yukon. So the wind controls the fresh water." As fish follow fresh water, the wind also controls the fish.

A constant northwest wind in spring is also said to indicate an abundance of fish during summer. Paul explained: "They say that when there is wind coming from the northwest that many fish will enter the Yukon... Constant wind from the northwest usually causes that... when it turns into spring, like April, May. They'd say that there will be an abundance of fish." Paul qualified this observation: "But this by-catch in the ocean maybe has an effect."

Paul also noted the saying that calm weather means fewer fish: "This is what our Elders say: 'When it is calm and windless the fish don't want to come in.' Then when it starts to get a little windy or the tide comes in, they start entering." Alice added that this also happens on the Kuskokwim. Francis explained why this is so:

Raymond Waska.

> *[Fish] must see the debris, before the fish arrive to us they probably don't want to die. Today I see different types of fish during calm weather, including chums that turn upon approaching them.*
>
> *But when the surface [water] starts getting wavy, since things are starting to move and the net is harder for them to see, then it's easier to catch them in nets when it's windy. It doesn't matter whether it's the Yukon or the ocean.*

Ray agreed: "When it's calm the fish are very cautious, they can see." Commenting on both the wind and contemporary fishermen's inability to follow traditional indicators, Ray observed:

> *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.*

> *Sometimes we start [fishing] too late and only catch a little.*
>
> *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.*

Elders identified a number of other natural indicators related to salmon. Ray wisely commented that in the past observation of the natural world generally was their most important tool:

> *Most importantly during spring, our ancestors kept close watch whenever [salmon] entered the mouth of the Yukon. Then again there was Francis Lee [an Emmonak elder] who would always keep an eye on them. He instructed Yi'al'aq to closely observe how the birds arrived in the coming summer. If [birds] should first arrive from up north or from further down, that will be the way the kings will come in. So those are some of the many ways our ancestors used for determining or measuring, but we're not being attentive to the things they took care of.*
>
> *It turns out since long ago they kept watch. They had no cell phones or science, but they would strive to live. They'd use their own minds and observations as tools. It's evident that they observed diligently, always watching. They used the birds and other things for measurement, including the wind that determines the path of king salmon.*

Nick described how people observed land animals to predict seasonal changes and upcoming warm or cold weather:

> *When winter will come late, they know because of the animals. They say that those land animals are not ready [for winter]. They point to the coming cold or warmth. Using that to determine the timing by their observation they say, "It looks like spring is going to be late."*
>
> *It is known that all of these land animals prepare. Even if it's only the ptarmigan, what they call* kepnertuq *[?internal dye], when [ptarmigan] start changing color. Then there are times when their color takes longer to change. It's so easy to tell, even if one catches one and it hadn't reached March. And the Elders would knowingly say, "Spring is coming late." They always used those land animals as determiners for seasonal changes.*

Speaking about fish, Nick said that more ice during breakup indicated an abundance of fish: "Ice means that there will be large numbers [of salmon] in the Yukon. But when [the ice] keeps stopping and moving when it goes out during breakup, it mitigates the numbers."

Ray said that when birds come in late, kings will also come in late, while when birds come early, kings will follow suit: "Birds are also determiners during spring... When the [birds'] arrival is slow, coming toward their nesting areas, that means that fish coming in will be late, and they will not come in large numbers. When [birds] arrive quickly in large numbers then the kings are supposed to come in and won't make us wait long." Francis agreed: "When birds arrive slowly, the fish will also arrive slowly."

Paul noted how swallows and gulls swoop down for eggs when lots of fish are swimming upriver: "You see so many swallows when there's an abundance of kings or chums below. My older brothers and father also used to keep an eye on them, and my old man would say that there were lots of fish down below." Nick added: "I think they go for those eggs that hatched into little fish." Francis noted that the size of the salmon's roe can be used as an indicator of its destination: "If roes are smaller, that means they are going up far away. Even if it is fat, it has smaller roe. But if it's going closer, roe is big. It has already arrived at its spawning place. That is because it is their world."

Finally, Ray stated that *qapnet* (foam) on the water's surface is another indicator: "When there is a lot of foam in the river during spring they say that there might be a lot [of fish] down there, before it starts."

As shown in this discussion, keen observations of the environment informed the Elders as to what to expect from the salmon runs, the animals, and the environment in general. They were, and are, masters of observation, scientists for their people, and this knowledge guided them in preparation for each season.

The Decline of King Salmon, Traditional Beliefs and Practices

Yup'ik people recognize regular fluctuations between abundance and shortage in salmon cycles however, participants agreed that the recent declines of king salmon are more severe and long lasting than the regular fluctuations they observe. This section contains a list of the things that the Elders contribute to the decline of king salmon.

Francis noted that *aciirtuurtet* (the first run of king salmon) run in four-year cycles: "These come in abundance for two years, then decline in numbers the fourth year, then become abundant again." Evan extended this observation to fish generally:

> *Our Elders used to say that every four years the subsistence fish everywhere in this land are very abundant. Then they gradually decline within four years after that. They would say, "Now we are reaching the fourth year, there's not going to be much fish." They always knew that. Then it would cycle again to that next fourth year, and they knew that the time was coming for abundance. Those were our ancestors' time indicators. They told us about what was to come next.*

Evan declared that this is still true, especially for king salmon: "In my observation this is still the way they use the time cycle. In four years there is plenty, and then again within those four years they decline... They told everyone to observe the fish and especially the kings."

Along with regular variability in run sizes, all our participants have witnessed an unprecedented decline in the number and size of king salmon returning to the Yukon River. Michael noted that in the past, king salmon averaged between 30 and 40 pounds, but in the 1980s declined to between 17 and 20 pounds. Ray recalled John Redfox from Emmonak catching a 112 pound king in the late 1950s that was bigger than he was, but noted "I don't see that kind anymore." Ray also described the third run of kings, known locally as "black heads," noting, "I don't even see them anymore."

Do Not Make Noise Over Fish

Our group shared their views on factors contributing to this marked decline. 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." Francis agreed: "They'd say that we were the ones who were depleting [the fish]. We aren't depleting them... But [Elders] told us not to make too much fuss about it, that they could indeed get low in number or disappear altogether." Michael also emphasized the importance of not arguing over fish: "Those who work in the field should listen to [what we've been discussing] and take them into account... Let's not fight with those north [upstream] of us, I hear how they say we are to blame... None of that is good... If we start getting along with each other without negativity, then we'd thankfully be their friends."

Francis Charlie with Nick Andrew Sr.

Always Take Animals that Present Themselves

Ray discussed an important traditional belief that when animals that present themselves, including king salmon, are not taken, their numbers will decline. He is concerned that they are not able to follow this practice today due to current regulations: "And these rabbits, since they're hardly hunted anymore they're rarely seen. Just like how kings aren't taken anymore by many people, that must be why they're declining in numbers."

Always Dispose of Fish Waste On the Land

Nick dates the beginning of the decline of king salmon to fish processors grinding unused king salmon parts and dumping them into the river—something that was never done traditionally. Evan agreed: "It all started when they opened the cannery that the fishing got out of hand. Our Elders used to tell us to keep an eye over that. [Cannery workers] would dump their remains, bones and all, into the water after cutting and fileting them, and not on land like they were supposed to." Nick noted that the odor stays on the river bottom, even if the fish waste is covered with sand:

> *The prescriptions concerning living beings must be highly respected and followed; our Elders cautioned us about these kings and chums with emphasis. They warned us never to throw away even a bit of its remains in the water. This is not their burial area, the far mouth of the Yukon.*
>
> *Farther upriver fish die on rocks, and flies finish them off. We were instructed never to throw remains on low ground tundra or mudflats, but to dump them above high tide line... We were also told to age fish [in pits] where erosion will not reach them.*
>
> *The fish processors in the Yukon and the Kuskokwim that buy fish throw the ground remains into the water, thinking that's okay. That is definitely not right. They absolutely break the laws of our ancestors.*

Nick further remarked that although the cannery at Mountain Village closed years ago, the site is still smelly from the fish remains dumped in front of the old cannery site.

Ray also remarked on how today people throw fish heads and guts in the water near their camps, while in the past these parts were given to dogs: "There are times when one arrives at a camp, there's a strong odor." Nick reiterated that ground-up entrails should be put into a tank and emptied on land: "They should not dump the leftovers into the water but only on land, if they do that then they are following what our Yup'ik ancestors have always told us since the beginning of time. Before the arrival of white men they've always taken care of the fish in our rivers. Even though it seems insignificant, it is indeed something important."

Evan also told the story of how years ago a boat full of kings had broken down and burned at the mouth of the Yukon:

> *They said that while they were on fire some of the fish fell into the Yukon. All those kings. Then this old man from Pitka's Point said, "Someday the area downriver from us will not have very much fish but will start only having them farther up this way." So when we began fishing I watched for that... So coinciding with that time the kings started their decline.*

Chum salmon waste also need to be disposed of on land. Francis attributes the beginning of the chum decline to the 1990s when upriver fishermen removed the valuable fish roe and threw out the rest: "It was from that the destruction came." The negative impacts of throwing fish and fish waste in the river may have a physical effect, as Nick and Francis suggest. Such activity also signals disrespect, which from a Yup'ik point of view was even more significant. As Evan made clear, "We were always taught to take heed or the fish would diminish."

Negative Impacts of Off-shore Fishing

Just as throwing fish waste into the Yukon River is believed to negatively effect the king salmon fishery, throwing away kings caught as by-catch by ocean

trawlers is viewed as equally if not more destructive. Michael blamed the decline in king numbers on the "Madness Act" (Magnuson-Stevens Fishery Conservation and Management Act) which regulated trawlers fishing in the Bering Sea, allowing them to take thousands of kings as by-catch. Michael and others are quite critical of the huge numbers of kings that are wasted as by-catch, at the same time Yukon fishermen are increasingly restricted. Francis described attending a Bethel meeting during which a representative of the off-shore fishing industry told the group that 50,000 kings were being given to a food bank:

> *It was so obvious that they hadn't said the whole truth about how much they caught. That's all they shared, that they gave away 50,000 [fish] to the food bank... Turns out they threw away the rest because [if they had kept them] there would not have been room for the ones that they would sell. It's because they couldn't give all those away that they didn't tell us the whole truth.*

Ray was also disturbed by how many salmon trawlers harvest: "We must also keep an eye on these trawlers... It must be that people take some [salmon] over there in the islands near False Pass... [Salmon] make a big circle, following the wind. So as they travel along, must be that sometimes the Japanese or Russian trawlers take a lot of them." Michael agreed: "The reason [kings] decreased in numbers is that other countries take so many of them." Ray also noted that in 2007 Harry Wilde and other members of the Mountain Village Working Group had asked the North Pacific Management Council to declare a seven- year moratorium on kings taken by ocean trawlers: "Scientists say that the water and environment are changing, but we blame the trawlers for catching and wasting fish."

Impacts of Beavers

Elders believe that the increase in the beaver population along the lower Yukon is another factor leading to the decline in salmon numbers as well as other fish. Francis said that beavers block the fishes' paths to their spawning grounds. Nick noted:

> *These beavers cause hunger. They cause difficulty in catching fish. That's what's affecting our salmon, blocking their path to spawn. They can't reach their spawning destination. They are also blocking their spawning grounds upriver. And for us they're blocking the places where we go to trap blackfish. They're known as ones who cause hunger, they're ones that can really cause the disappearance of fish.*

In this quote, Nick was describing how the beavers build dams and block fish passage to their spawning grounds. In the past, beavers were trapped for their furs. This practice has declined today with the reduction in fur prices, allowing beaver populations to grow, and fishers have noticed the effect on salmon populations.

Nets Killing Fish

Elders also complain that the requirement that they use smaller nets unnecessarily kills salmon. Ray noted that chum salmon die right away if their gills bleed: "Those are what we are probably finishing off... when they get caught in set nets when their gills bleed slightly therefore dies right away…Or even with dip nets. What were they doing when they let them start dipnetting in the Yukon? And this wide Yukon has such strong currents, they try fishing with dip nets. Also when that dip net catches a king, its gill will bleed and it will not live anymore. Fox bait or probate [crow bait]."

Evan complained that when the king net mesh size went from 8.5 to 7.5 inches, fishermen only got the smaller female kings while the larger kings just bumped the net and got away:

> *After they shortened the [mesh size] we started catching a lot of the smaller first run [kings]. The 8.5 inch nets are for those first female kings… the ones that travel first. Nowadays during a king salmon opening, since they reduced the size down to 7.5 inches, they just catch little female kings while the bigger ones just bump into the nets, get caught for a bit, then snap off.*

Nick also noted how larger salmon are injured when they hit smaller nets and twist and turn and stated that if they could harvest the larger fish they would be able to harvest less fish: "Nine inch mesh nets would be better. One large fish is less than smaller fish. They won't have much to cut and dry, but will have more fish." Nick further explained: "Since they've made the mesh size smaller, that's helping to make the [numbers of fish spawning] less and less. Waiting for the high tide, the smaller ones are more numerous than the bigger ones, that helps toward killing off the ones that are to spawn." If, however, fishermen were allowed to use 9 inch mesh nets, they would catch fewer but larger fish, allowing more smaller fish to head upriver to spawn.

Negative Effects of Fish Hatcheries

Our group also spoke briefly about the negative effects of fish hatcheries, from the Yup'ik point of view. Francis commented: "They say fish don't continually change where they go. They like to return to the places where they grew up, where they were born in their own world." He added: "Our Elders told us never to mess around with fish. Now [fish] are starting to change since they've started growing [farming] them."

Evan also commented on fish being moved to new rivers, causing them to disappear.

> *My old man [Noel Polty] also used to tell me that these fish, including king salmon, go to rivers they usually go to. But they say that if they take them from the places where they were and bring them somewhere, they go elsewhere and start again. The [fish in the new location] are more abundant, and the ones here in the Yukon are less. That's what those people used to say.*
>
> *These days we've started to see people, after coming to the Yukon River and fishing, filling a number of boxes [coolers] and taking them elsewhere. They say those people* tengulluki *[lit., "fly away with them"].*

Dangerous Debris

Our group briefly discussed the impact of the Fukushima earthquake in Japan, and the resulting debris that has washed ashore in coastal lowlands at the mouth of the Yukon and around Cape Romanzoff to the south. Francis noted that some things sink and pollute the ocean, while others wash on shore: "Even Japanese beer bottles are brought inland by flooding, to the high ground area with uprooted stumps." Francis believes that this dangerous debris could be contributing to the decline of fish and other living things. He noted tomcod found with dark spots of varying sizes. Ray remarked optimistically that the destruction of Japanese fish farms during the earthquake may mean that the Japanese (who previously supported the lucrative chum roe market) will want to buy more Yukon fish.

Climate Change

Climate change was not discussed in detail during our gathering. Early during the meeting, Francis commented that the water and weather generally are not the same as in the past. Both are warming. Evan directly related warmer winters with less snow (and less melt water) to the decline in salmon abundance: "It used to be cold, 30 below, with lots of snow in March, and lots of fish around at that time. Now since the climate is not so cold, chums and kings are not as abundant." Kings, Evan noted, also come later:

> *When May had its new moon, that's when they had their most abundant first catch of the first run of kings. Then as June's new moon arrived that's really when kings here would be most abundant. So when there were lots of fish during this time, they didn't need to fish for long, they'd catch fish for food for themselves. Now the month that they usually arrive has been pushed much later.*

Evan also associated warming water temperatures with rotting fish:

> *It must be the water getting warmer and warmer that is the reason for this. We know that those* kiagtaat *[kings] and* qaurtut *[large*

Ann Riordan listens in from the kitchen as the Elders gather at the table with Davina Carl.

> *humpback whitefish] and* teggmaarrluut *[chums] and uqurliit [fall chums] were all strong. Now sometimes I catch a king, and some would already be rotting, and it had already been a while since their death. And their flesh would not be good.*

Nick commented that in the past, when it was colder and there was more snow, the abundant freshwater run-off cleaned out tributaries allowing salmon to smell fresh water:

> *We would head to our camps, 10 to 15 miles inland. Then we'd hear the thunderous noise, when the Yukon started breaking up, and in those times the ice would be 6 feet thick. Then as it broke, the tide would be high, the banks of the Yukon would be all water. Our ancestors used to be so thankful when that happened. They'd say, "Thank you so much." [The Yukon] was so filled.*
>
> *Then there were these things alongside the Yukon waters—sour water. The bad waters would be brown. It's said that [fresh water] clears and brings them out.*
>
> *They say these summer things, the two most important being the king and the chum, enter the Yukon wanting to smell fresh, clean, and saltless water. You see, all the fish that are inside the Yukon, when it hadn't been windy from the northwest during winter, the first freshwater runoff comes from the mountains and into the water under the ice. That is what the fish face in schools.*
>
> *Also up there [on the north side of the Yukon] there are mountains that have runoff. And so [water] would never stop flowing, even during winter. Whenever there had been constant northwest winds our Elders would set their traps near the mouths of runoffs along the Yukon... So all during the night those traps would fill up with ocean fish. It's because they want to swim toward that fresh water. Whenever there hasn't been constant northwest winds, the water in the Yukon inland gets brown.*

Nick observed that today with less snow and less water during breakup, currents aren't as strong and the Yukon cannot flush itself out as in years past. Speaking in English, he concluded: "That what they call global warming isn't going to help us much."

Problems in Fisheries Management

> *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

Along with discussing reasons for the decline in king salmon, our group also talked about problems from their perspective in fisheries management on the lower Yukon. First and foremost were problems they see with the placement of sonars on the lower Yukon and their perceived inability to accurately count fish. Ray noted that many kings pass uncounted, as "fish are not going to wait for the camera."

> *These biologists at Fish & Game, if they asked for help from our people then they'd do a bet-*

> *ter job of watching over [the fish]. They put too much emphasis on the sonar below, 12 hours on and 12 hours off... If a king is about to pass by, it's not going to wait for the camera. It's just going to swim right past.*

Group members recommended that the sonar be put in earlier. Michael noted that in summer 2016 the sonar at Pilot Station was not put in soon enough and many kings passed before they could be counted: "That's why they could fish at Eagle and Canada."

Evan, who lives in Pilot Station, does not believe that the sonar provides accurate counts. For over 30 years, the sonar has been in the same place just above Pilot Station. Evan's father, Noel Polty, told him that when they are moving upriver kings find deep sloughs during high tide, take short cuts, and are not counted. Nick agreed, noting that kings use lots of channels when going upriver and don't swim in schools in the middle of the river: "Fish travel through channels in the Yukon. They know their usual paths... Our counterparts see the Yukon and think that there are fish inside all the river... [Fish] instinctively use the paths that their ancestors have always used." Nick noted that some kings come in through Ecuilnguq (a river branching off the Yukon directly above Pilot Station) and then head upriver through Negilleq River. Seven miles above Marshall, however, the Yukon forms a single channel: "If counting starts there it will not miss its mark." Nick added that Fish & Game would get a more accurate count around Holy Cross, at Quuyacuuq (where the Yukon is not as wide), or near Anvik: "It's an uncomfortable situation that although we try to show them what we poor Yupiit know, they just use their own minds. Maybe they think that we're weaker... Here we and our ancestors were born and raised here... They don't regard us as important. Boy, do they not listen." This discussion shows the need for increase communication between the fishers and managers in the lower Yukon. The Elders are expressing their frustration that their detailed local knowledge is not being used in managing the salmon they rely on.

Paul agreed with Nick that setting up a sonar at Holy Cross or Anvik would provide a more accurate count: "The Pilot Station sonar doesn't work, especially with so much driftwood going downriver during high tide." Evan suggested a possible location south of St. Marys: "Downriver from Pilot Station, the midstream is 90 feet deep. Upriver is shallower, and even downriver from Boreal [Fish Processors near St. Marys is one large river. At Boreal there's a road, a trail for trucks. I've said this to them for over 30 years. None of their minds ever budge."

Along with problems in sonar placement, Elders complain that Fish & Game does not keep a careful eye on the sonar in place. Nick complained that the sonar is not monitored 24 hours a day and that the technicians only estimate how many fish have passed. Evan described how Fish & Game technicians went boat to boat counting fish once when the sonar was broken, estimating the numbers that were passing. Evan also complained that the fish counters stay in the church or in the village, using their computers. Evan remarked: "They do watch it, but when night comes, they probably are taking a nap." Ray continued: "Fish are not going to wait for them because they are sleeping. Fish don't wait when they hit the Yukon, when they are so determined." Ray noted that he tries to help the Fish & Game workers in Emmonak, but he is frustrated: "Is it that they're not watching it closely on purpose? Considering those upriver from us more highly?... Even though it really needs to be fixed they really root for the fish to reach the Indians in Canada."

Evan noted that salmon are swimming deeper than in the past, trying to avoid noisy outboard motors:

> *People said that the fish were moving further down whenever they heard something in the water. Turns out that was right. At that time the Yukon was deeper closer to shore in front of our village. [The salmon] started getting further from shore. Only then further upriver when it becomes shallow again the kings start appearing and are more abundant, somewhere around Ohagmiut [Iquarmiut], and from there they converge and head farther upriver.*

Evan watched the person who was supposed to count fish, telling him the sonar was not working properly:

"And here we see those large numbers of fish hitting upriver that hadn't been counted."

The Elders' frustration over the sonar showcases the need for more communication between fishers and fishery managers both to explain their fishery management methods and so fishery managers hear fishers' observations, concerns, and suggestions. For instance, the suggestions of potential new sonar sites may more accurately count salmon swimming up the Yukon River, but moving the sonar upriver to these areas would cause them to miss counting salmon destined for lower river tributaries. Ideally, local fishers and managers can work together to provide improved management of the Yukon River fisheries.

Alice asked about fish moving farther from shore to avoid loud motor noises, and Evan reiterated that fish swam closer to shore and nets were set closer to shore in the past. Because noise irritates them, today they move through the channel. Nick explained: "Before machines came around fish swam close to shore, avoiding strong Yukon currents."

Another reason given for inaccurate counts is that fish only come in during high tide for a set period of time. Michael explained:

> *Fish only come in during high tide, and when they hit they do not go past more than three days. When the first run hits they come in during high tide for three days. That's how those fish go upriver...*
>
> *When the fish hit the Yukon mouth, fishers usually catch a lot... When fish want to come in, sometimes the boat fills right away, as there are three days of strong runs... There is such an abundance the nets fall under... It is strenuous work because of the abundance of fish.*

Although fishing may be closed, Michael notes, "fish don't know and keep coming, as Fish & Game is not their boss."

Nick made valuable observations about the paths fish take, and the importance of understanding these paths to get accurate fish counts:

> *Even though there is lots of water in the Yukon, they don't just go any old way. Fish & Game would proclaim, "There are no fish!" And yet the king salmon would be plentiful as they go up through their own path. Fish & Game would erroneously think that the whole water was swimming everywhere with fish. There are areas in the water that fish avoid. They have their own paths that they have used from the very beginning. They'd wait for those that swim deep in the river, it's the king salmon that swim far below [deep].*

Ray noted that channels shift and fish move, changes Fish & Game needs to take into account:

> *The river channel doesn't stay in one place here at the mouth of the Yukon. Sometimes the channel moves.*
>
> *Also the Fish & Game people who are always testing are probably not seeing that the water level has receded in the Yukon...*
>
> *Also they set their test nets in calm water... And I know for a fact that they are always testing at that same spot downriver from my camp. They never change or move. And then here in this other calm spot where I fish I'm always catching.*

Along with complaints about the accuracy of sonar counts, many complained that the regulatory system favors the Canadians along the upper river. Michael remarked that the Canadians have been blaming fishermen at the mouth of the Yukon for depleting the king salmon. Yet in 2015, at the same time Yukon fishermen were not allowed to take kings, the Canadians were allowed to fish: "They were commercial fishing for kings[3], and my mind was unsettled. Why was it that we weren't gaining anything from what we caught after letting them go?" Michael was clearly unhappy, feeling that the US was only thinking of the Canadians.

Nick was equally disturbed that fishermen in the Canineq and Nelson Island areas are allowed to fish for kings headed toward the Yukon, while Yukon fishermen are restricted from doing so: "Let's make them no longer be allowed to fish like us." Michael suggested that we focus on the situation on the Yukon: "In my opinion, we should just worry about us from the Yukon... We don't know their ways, they are just like us trying to survive."

Nick also objected to restrictions placed on blackfish trapping: "Our watchers have made the blackfish trappers quit, thinking that they might catch baby salmon. The kings never ever mix with the blackfish, even though they are still babies they will not swim where there is mud."

Finally, some in our group strongly dislike the new dipnet fishery. Ray remarked with feeling: "Last year [2016] there were lots of kings, but they were only allowed to fish for the wary pink salmon, after so many had already passed. They let us commercial fish using dip nets. The Yukon is so big and wide, and here they let us use such dinky little things. [laughter] But even so, kings would catch in the dip nets. It was obvious that there were a lot of kings."

Conclusions

On our last day, we discussed how best to disseminate what Elders had shared and who should be the intended audience. Nick emphasized the importance of passing on Yup'ik understandings of king salmon as well as traditional knowledge generally to young people. Michael agreed:

> *I know my people back home in Kotlik [and] how to help them. It has a bigger impact when one helps their own people... We always bring up those things of old, and if they live and use them by their life example, our work here will be a gift to [the younger generation]... Our Yup'ik way of life is going more and more downhill... Let's not be idle... We got lots of time to talk to our young people.*

All agreed that the report should be shared with Fish & Game so that they might better understand Elders' concerns. Nick declared: "It will be excellent. It will open their eyes because it will educate them." Michael emphasized that the information be sent to tribal governments and be open to the public generally: "I'm really hoping for the best outcome for this project, [investigating] why the decline [in king salmon] and ideas for their resurgence... When these things are written down correctly and given to tribal governments or to anyone who wishes to see them, it should be public. And it also belongs to us, our people." Michael also made the excellent suggestion that before finalizing the report, participants have an opportunity to review it: "If I have questions, then we can make corrections on that before publicizing it." He concluded that Elders' participation is critical to effect change: "There's no such thing as 'we don't have time.' We all have time. We can do it. Our people are our own people."

Ann Fienup-Riordan and Evan Polty.

In closing, our group reflected on village life, past and present and the importance of continuing their culture. Paul said:

> *Evan and I are the same age... We grew up together... My grandfather, father, and mother taught the Yup'ik way of life... and I spoke in Yup'ik... Now I'm an adult and still use the Yup'ik ways.*
>
> *Now our young people are encouraged to get educated, to still use our Yup'ik ways but take in the Western way as well, to master both ways... We don't want to forget our past... In*

our school district today, although funding is low, they have culture camps... So they are learning, but the Western lifestyle seems to have a bigger weight...

Like they say, things circle. After so many years they come back... They're slowly going back to teaching [young people] our way of life and how to care for animals...

Francis added to Paul's comments by saying, "Now we dearly wish to pass [our knowledge] on to our younger generation. It can be compared to providing a bit of food to a dog that is tied, to keep it from starving. That is now how things seem to be."

Ray agreed that people today need to use both Yup'ik and Western ways: "We have to take in both." He used Alice as an example of someone translating what Elders are saying into English: "She is helping us... She knows Yup'ik and the grammar, so perhaps she and you [Mark John] went to college. It makes me feel proud." Mark added:

Our Elders were very learned... They were able to succeed as human beings, to live with each other without conflict, having respect and love... I encourage Elders to educate young people, to not keep quiet. Don't just say "try to live good." Show and illustrate how to be and do good with examples... If you are this way, showing respect for others, you will succeed in life.

Paul described how his children today know how to cut fish, but do not know how to cut king salmon: "My son and daughter are now teaching their children, and I'm so grateful. But they still haven't learned about kings, since they closed in 2007... But I'm really thankful that they've started eating dry fish in winter... and they've really taught my grandchildren a lot." He said that today his family uses 200 chums a year, with no kings allowed: "We wish they would open for them so that people can relearn how to cut and dry them... I don't think it's lost." Nick agrees that girls need to be taught the art of cutting kings: "These kings need to have a certain thickness and must be taken care of in a special way... When they are hung to dry some of the meat falls off, because they are so oily. They used to teach girls how to avoid that. Nowadays because fishing is always closed, they've started to lose that art."

Nick has hope for the future: "Now our young men are smarter, when they stand up against [Fish & Game] with their traditional Yup'ik knowledge." He told the story of how his son, Marshall tribal administrator Nick Andrew, Jr. told people not to answer enforcement officials but to send them to the tribal office: "There he answered them using our traditional Yup'ik ways... And their Fish & Game leader came with them on the last day. When he was leaving he said, 'I finally learned something.' And he left and never came back."

Finally, Ray shared a short history of his busy fish camp with many generations still working together:

My partner and I got married in August 1952. In one week, we went to our summer fish camp. So every year we'd go to fish camp. As time went on our children became many. We had eight kids. We'd bring them with us to camp and teach them how to run a fish camp. Our children learned, my wife always taught them. Then suddenly here they are adults, our children.

Now it's been two years since my wife was paralyzed. We don't go to camp anymore. So now our kids and grandkids go to the fish camp and take care of fish there. So now these are off our hands. Whenever two of our daughters go, they bring their nieces and nephews with them. There would be a lot of people along with their own relatives. And when they're down there the two elder ones set the net and bring fish. Maybe two or three of them would remove the heads, and cut them, and clean them, and then put together two [spines] and then clean the fish. Then there'd be three, even if they're girls, bringing up fish to the cutters. Then there'd be four or five of them cutting, filleting, and drying them. One time someone told me, "Man, you look like a

> *cannery!" [laughter] So now [my wife and I] are in no rush and have fish...*
>
> *These days they're taught even if they're small. And those who can't do much, six-year-olds, carry little buckets for the steam house, fill all the [water] buckets. Even if they want to go swimming, they can't go until they fill the buckets full and complete everything else.*

Listening to Ray, Alice pointed out that he and his family have now been harvesting together for 60 years. As noted above, although Ray's family is not unique, fewer families go to fish camp today than when they were young. What the future holds is hard to see, but our group was united in the view that the skills and knowledge surrounding fishing and fish camp activities have continuing value in today's world. They are hopeful that this report can play a small part in passing this knowledge on.

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1. See Fienup-Riordan and Rearden (2016:104-117) for a detailed biography of Nick Andrew.

2. See Fienup-Riordan and Rearden (2014:xxxv-xxxvi) for a brief history of commercial fishing on the lower Yukon.

3. See JTC (Joint Technical Committee of the Yukon River U.S./Canada Panel). 2016. Yukon River salmon 2015 season summary and 2016 season outlook. Alaska Department of Fish and Game, Division of Commercial Fisheries, Regional Information Report 3A16-01, Anchorage. There was no commercial fishery in Canada for king salmon in 2015 but Michael may be referring to the limited aboriginal fishery king salmon catch for ceremonial and cultural purposes of an estimate 1,000 fish.

Salmon Glossary

kiagtaq/kiagtat (Y) — king salmon, summer fish (lit., "summer things"); *taryaqvak/taryaqviit*

aciirtuurta/aciirturtet — first kings under the ice

tungulrianek nasqulget (Y) — "black heads," third run of king salmon

taryaqvayagaq — immature king/jack salmon

teggmaarrluk/teggmaarrluut (Y) — chum or dog salmon, first run without fat (lit., "hard ones"); *iqalluk/iqalluut* (K)

uqurlirnaq/uqurliruat — summer chums (lit., "pretend *uqurliit* [fall chums]), running between chums and fall chums

uqurliq/uqurliit — fall chums, ? "razor backs," "bluebacks"; *kangitneq/kangiqneret; aluyak/aluyiit* "Christmas fish"; *naraaniq/naraanit*

qakiiyaq/qakiiyat — silver salmon/cohos

sayak/sayiit — red salmon, sockeyes; *kavirlit* (Y); *caayuryak/caayuryat*

amaqaayak/amaqaayiit (K, Can) — pink salmon, humpies; *cuqpeq/cuqperet* (Y)

talayat — spawning salmon (LY)

meluk/meluut — fish eggs/roe; *imlauk/imlaut* (Y)

eriq/erit — milt

masseq/massret — old salmon near spawning

cin'at (Y) — salmon aged in a pit

qanrugtat — whole fish strung through the mouth to dry

qaurtuq/qaurtut (Y, Coast, NI) — large humpback whitefish

egamaarrluk — half-dried fish boiled before eating