U.S. Senate Committee on Commerce, Science, and Transportation
Subcommittee on Oceans, Atmosphere, Fisheries and Coast Guard
"The State of Our Salmon: A Review of the Science and Data Informing the Management of Alaska's Salmon Fisheries."

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My name is Mary Peltola. I am the Executive Director of the Kuskokwim Inter-Tribal Fish Commission (KRITFC). I am originally from Kwethluk, Alaska, a small Yupik Alaska Native Village located on the Kuskokwim River. I have been fishing with my family on the Kuskokwim in our traditional ways for my entire life. Our fishing – when we fish, where we fish, how we fish – has always been informed and managed by our traditional knowledge. For thousands of years, our traditional knowledge protected our salmon stocks and helped ensure healthy runs and returns. However, despite an agreement with the U.S. Department of Interior (DOI) that provides our tribes with a role in the co-management of traditional subsistence fisheries on the Kuskokwim, our traditional knowledge is continually sidelined and minimized in favor of Western scientific models and data sources championed by Federal and State administrative structures and policy priorities. The failure to acknowledge and fully integrate our traditional knowledge undermines our tribes' efforts to protect our salmon stocks and preserve our traditional ways of life. I will first describe the KRITFC and how it utilizes traditional knowledge in its co-management of Chinook salmon stocks in the Kuskokwim River, and will then recommend how Congress can support and create additional legislative, administrative and funding opportunities for our tribes to fully co-manage important resources in Alaska. I will also recommend how Congress can recognize the value of traditional knowledge and its importance in improving resource management outcomes, including addressing salmon management in the face of climate change.

For about a decade now, our Kuskokwim Chinook salmon stocks have been crashing. The consequences are disastrous. We depend on Chinook salmon for our nutritional, spiritual, and cultural well-being. In May 2015, the KRITFC was formed as a consortium of all of the 33 federally-recognized Alaska Natives tribes located along the Kuskokwim River to address the crisis facing our Chinook salmon. This historical unity of the tribes was driven by our understanding, and insistence, that we must have at least a co-management role if our Chinook salmon stocks and our traditional ways of life were to survive in the face of drastically reduced Chinook returns. Each tribe appoints a Commissioner to the KRITFC which is authorized to make decisions on behalf of that Tribe. The Commissioners, in turn, select seven of their own members to serve on an Executive Council that is responsible for making larger governance and strategy determinations for the KRITFC. The KRITFC, and the Executive Council, strives to achieve consensus in all decisions. The KRITFC also selects four In-Season Managers from four different regions along the Kuskokwim River (Upper, Middle, Lower, and Lowest) who, together with Federal and State managers, participate in making important in-season decisions about fishing

openings and closures. In-Season Managers bring a wealth of traditional knowledge to a conversation otherwise dominated by Western scientific principles.

In February 2016, the KRITFC entered into a Memorandum of Understanding (MOU) with the U.S. Fish and Wildlife Service (FWS). The MOU was designed to enable the KRITFC, together with FWS, to cooperatively manage Kuskokwim River Chinook salmon stocks to ensure a stronger, more self-determined management structure, help address conservation issues so that the run could recover, and to avoid the burdensome administrative process. Working with FWS, the KRITFC has consistently and unanimously agreed to voluntary fishing restrictions to protect Kuskokwim River Chinook salmon stocks. The KRITFC also uses its collective traditional knowledge and expertise concerning the Kuskokwim River to develop culturally appropriate conservation management plans.

Since inception, the KRITFC has aspired to integrate traditional knowledge in the development of management plans for the Kuskokwim River, and to jointly implement these management plans with FWS and, when possible, the State of Alaska. It is also the KRITFC's goal that once a management plan is agreed to, and consistent with conservation, our tribes will be clearly empowered to implement and enforce that plan for their rural tribal members. Only when traditional knowledge is fully integrated into management of Chinook salmon stocks, and we are fully able to implement and enforce management plans throughout our tribes, will there be true co-management. Co-management of whaling through the Alaska Eskimo Whaling Commission is clear evidence that fully incorporating Alaska Natives and their knowledge into management of subsistence uses and resources is essential for conservation and to continue the traditional and cultural well-being of Alaska Natives.

However, the KRITFC's ability to achieve its goals for full co-management authority is frustrated under existing Federal and State subsistence management programs. Throughout its 702-mile long course, the Kuskokwim River runs through both Federal and State lands and is subject to the management jurisdictions of both entities. Under the Alaska National Interest in Lands Conservation Act (ANILCA), Federal managers are required to prioritize non-wasteful subsistence uses of fish and wildlife resources, such as Kuskokwim River Chinook salmon, by Alaska's rural residents, including KRITFC's rural tribal members. If conservation concerns require Federal managers to restrict people from hunting or fishing from a certain stock, they must consider a user's customary and direct dependence upon the resource as the mainstay of livelihood, the user's local residency, and the availability of alternative resources before any restrictions are put in place. ANILCA helps to ensure that the people who depend on a resource the most have the best opportunity to harvest that resource.

By contrast, State law prohibits prioritizing subsistence uses of fish and game resources for Alaska's rural residents. Instead, State managers must provide all Alaskans, regardless of whether they live in a rural village where food is costly and scarce or in an urban city where food is plentiful and relatively affordable, with equal access and opportunity to take fish and wildlife resources. Realistically, the State's "all-Alaskans" policy means is that a person who works and lives in Anchorage is provided with the same opportunity to fish for Kuskokwim River Chinook salmon

as an elder subsistence user living in Bethel who is unemployed and depends on the nutrition provided by Chinook salmon to make it through the winter without going hungry.

These conflicting management regimes create serious problems that restrict our tribes' subsistence opportunities and impede our ability to fully engage in our traditional subsistence ways of life and to be fully self-determined in our engagement. Despite these obvious conflicts, and despite the fact that Federal management is required to prioritize subsistence opportunities for rural residents, it is the FWS policy to defer to state management of the Kuskokwim River whenever possible. Unless FWS agrees that there is a conservation concern or a threat to subsistence uses, the agency stands aside while the State manages the Federal portion of the Kuskokwim River through State regulations governed by its diluted "all-Alaskans" policy and its bias towards commercial fisheries. This is routinely done over the KRITFC's objection, and to the obvious detriment of rural subsistence users. It is also contrary to the intent of the MOU that KRITFC entered into with the FWS.

Neither Federal nor State management regimes recognize our right as a matter of policy or law to manage our fish and wildlife resources. The fact that we do not reside within reservations is used as an excuse to sideline tribal co-management. And, because we do not have a direct role in either the Federal or State management systems, our traditional knowledge is sidelined and takes a backseat to the empirical data and assumptions informed by the Western science favored by Federal and State managers, despite the fact that we have successfully managed this river with our traditional knowledge for thousands of years.

Since before contact with Russian traders and missionaries, and certainly before statehood, we were stewards of this resource and successfully managed the harvest and conservation of our Kuskokwim River salmon stocks according to our traditional Yupik and Athabascan rules and values. These rules and values are not difficult to understand: provide for children, the sick, and the elderly first. Only catch what you can eat, and share what you cannot. Treat all resources with respect. Co-management is not true co-management without full acknowledgement and integration of our traditional knowledge into the management of our Chinook salmon.

While each KRITFC member tribe has a unique relationship with the Kuskokwim, we are all unified by the vitally important role salmon – in particular, Chinook salmon – plays in our nutritional, cultural, and spiritual well-being. We are further unified by our bounty of traditional knowledge and expertise about effectively managing and protect our Chinook salmon stocks in the face of diminishing returns and the unpredictable effects of climate change. Our traditional knowledge helps us understand who we are and how to act to ensure future success for our children and communities. Traditional knowledge guides our customs, ceremonies, cultural practices, and our individual behaviors to ensure that respect is shown to the land, water, and natural resources upon which our people depend.

While I personally do not think that Western science values traditional knowledge in the same way that it values empirical data, there is increasing interest in and attention being paid to traditional knowledge in the context of resource management. However, many people misunderstand traditional knowledge or are confused by what it means. Traditional knowledge is

holistic. The quality and behavior of one species can be used as an indicator of presence and abundance of a completely different species. What one thinks, what one says, and what one does, all has the potential to impact or influence another aspect of one's world. Wasting a resource or treating a resource disrespectfully incurs consequences for the individual, those around them, as well as the resource. In comparison, the western way of knowing is compartmentalized and specialized, some might say narrow. A western scientific observer may study a particular aspect of the world, like salmon run-timing and abundance, take notes, gather data, test hypotheses, confirm or formulate new theories, and develop a predicted salmon run forecast for the next season based on mathematic models.

Some academics understand traditional knowledge as "a living body of knowledge which pertains to explaining and understanding the universe and living and acting within it. It is acquired and utilized by indigenous communities and individuals in and through long-term sociocultural, spiritual and environmental engagement. TK is an integral part of the broader knowledge system of indigenous communities, is transmitted intergenerationally, is practically and widely applicable, and integrates personal experience with oral traditions. It provides perspectives applicable to an array of human and non-human phenomena. It is deeply rooted in history, time, and place, while also being rich, adaptable, and dynamic, all of which keep it relevant and useful in contemporary life. This knowledge is part of, and used in, everyday life, and is inextricably intertwined with peoples' identity, cosmology, values, and way of life. Tradition- and TK – does not change, nor does it equal only 'the past'; in fact, in inherently entails change."[1]

I understand traditional knowing as having a detailed and deep understanding of an ecosystem and using that understanding to help you make informed decisions about where and when to use that ecosystem's resources. For example, in 2014, my mom's younger brother taught me how to use a little set net to fish for red (sockeye) salmon. We went to the mouth of the Gweek River, a small tributary of the Kuskokwim River north of Bethel, where his grandparents had their fish camp. He knew exactly where to put the net to catch 95% sockeye (Reds) and avoid Chinook salmon. Many biologists and fisheries managers imagine that gill nets are indiscriminate killers of fish. But if you know where each species tends to swim, if they prefer sandbars, slower currents or deeper depths, gill nets can be a very targeted and discreet gear type. I know this from experience: I only caught one Chinook in the set net that summer.

My friend Charlie Wright, who lives on the Yukon River, told me that on his section of the Yukon, an indicator of the arrival of Chinook salmon is yellow butterflies. When he sees a yellow butterfly, he knows the Chinook salmon are there. He also said the abundance of yellow butterflies reflects the abundance of Chinook salmon. In 2017 when the Chinook salmon came back in real numbers, there were big swarms of butterflies again. These interconnections are inherent to indigenous knowledge systems and represent a very different way of viewing the relationship between human beings and the natural world compared western science.

Traditional knowledge should not need to be "proven" by Western scientific methods and ways of knowing before it is considered in making resource management decisions, but oftentimes,

[1] Raymond-Yakoubian, Julie, Brendon Raymond-Yakoubian and Catherine Moncrief. 2017. *The incorporation of traditional knowledge into Alaska federal fisheries management.* Marine Policy 78: 132-142.

our traditional knowledge is disregarded in favor of western scientific predictions and models. For example, in 2017, the KRITFC and FWS agreed on a conservative harvest of 40,000 Chinook salmon during pre-season negotiations and meetings. This harvest estimate was based upon the State's estimated Chinook returns – estimates based wholly on western science.

However, when the run actually started FWS and the KRITFC disagreed about its size and timing. Western science indicators used by UFWS suggested that the Chinook run was weak, whereas real-time traditional knowledge suggested that the Chinook run was strong but returning in ways – running deeper in the river, and returning later in the summer – for which western science could not account. At the end of the summer, the post-season escapement numbers confirmed that the traditional knowledge advanced by the Commission was correct, and there was a surplus of at least 10,000 Chinook salmon. While the conservation of these fish was important, those 10,000 fish represent lost subsistence opportunity and food security for hundreds of our tribal members. Had our traditional knowledge been fully acknowledged and recognized, we would not have lost important subsistence fishing opportunity.

There is a role for both Western science and traditional knowledge in the co-management of Kuskokwim River Chinook salmon stocks. The KRITFC strives to make all management decisions using the best available data. Oftentimes, that best available data is our traditional knowledge. Traditional knowledge fills informational gaps that can otherwise confound in-season management decisions. By integrating traditional knowledge into existing Western management regimes, the KRITFC hopes to pioneer a more complete, accurate, and holistic approach to fisheries management.

KRITFC's In-Season Managers all value the empirical data that is presented by our State and Federal managing partners in support of their management decisions. However, these tribal managers also recognize the value of traditional knowledge and are skilled at incorporating traditional knowledge into resource management decision-making in order to strengthen the end result. For example, upon receiving a mathematical forecast of the anticipated salmon return, our In-Season Managers will also use other traditional information before advising people on when and how long to fish. These additional considerations include observations about river water levels, snow depth of the previous season, height of grasses, when shoots of green grass emerge, numbers of migrating birds arriving and when they arrive, where people have been catching certain kinds of fish and which stock of fish are presently migrating, the nature of and direction of winds at the river mouth, when cotton flies, when there are storms in Kuskokwim Bay, river water temperatures, water clarity, amount of debris floating downriver, anticipated fishing interests, and fish-drying weather conditions, and the effect that these interconnected observations have on one another insofar as fisheries management is concerned.

There are a number of other ways in which the KRITFC uses traditional knowledge to improve management decisions and outcomes on the Kuskokwim River. A few years ago, the Bering Sea Fisherman's Association (BSFA) designed and began implementing a community harvest data monitoring program. This program trains people from local Kuskokwim communities to collect real-time harvest data from subsistence fishermen and women either as they fish, or immediately thereafter, to gauge the size, strength, and timing of Kuskokwim River Chinook

salmon runs. Recently, the KRITFC partnered with BSFA to help implement this program. The KRITFC then uses the information reported by BSFA's community monitors to inform its management decisions. The KRITFC firmly believes that the knowledge of our local fishermen and women is one of the best and most accurate sources of in-season information we have. Their individual experiences and observations of fishing conditions are a unique and essential source of traditional knowledge that we rely on heavily during the fishing season.

The KRITFC's use of information collected through the Bethel Test Fishery is another example of how the KRITFC blends empirical data with traditional knowledge to improve management outcomes. Every year, the State of Alaska's Bethel Test Fishery (BTF) helps to monitor the strength and timing of Kuskokwim River Chinook salmon run. The number of Chinook salmon that pass through the BTF each day during the season is used as an indication of the run's health, strength, and timing. As with the data provided by BSFA's harvest monitoring program, data collected by the BTF plays a critical role in the KRITFC's in-season management decisions.

Traditional knowledge is also essential in any study of climate change in the Kuskokwim River region and how climate change is affecting our natural resources. Traditional knowledge represents the most significant data set of systematic observations of our ecosystem. Though the KRITFC lacks the resources to conduct "formal" climate change studies demonstrating how climate change is affecting our subsistence resources, by the measure of the traditional knowledge used and recognized by our elders, it is evident that climate change is making it more challenging to predict weather, river conditions, and fish and wildlife behavior. Our tribal elders are observing changes in weather, temperature, river water levels, returning species, and other indicators of natural resource status, health, changes which all suggest that climate change and the coincident escalation of global temperatures is having a detrimental effect upon our subsistence resources – which, in turn, has a detrimental effect upon our physical, psychological, and spiritual well-being.

As this Subcommittee is aware, climate change has a broad range of impacts upon the lands, waters, and natural resources of Alaska. From milder, drier winters to warmer, wetter summers, these impacts change our physical landscape right before our eyes. These impacts also affect health and strength of the natural resources we depend on, as well as the lives and health of our tribal members. We need secure, dependable funding in order to build our capacity and commit to monitoring the effects of climate change. Additional congressional appropriation is one of the only ways to secure this necessary funding.

It is difficult to know the full extent to which climate change has affected the health and bounty of Kuskokwim River Chinook salmon stocks. But recent years of disastrously low Chinook salmon returns have deeply impacted our emotional, nutritional, economic, social, and spiritual well-being. We are no longer able to harvest enough Chinook salmon to meet our nutritional needs throughout Alaska's long and harsh winters. When our families can barely feed themselves, it then becomes additionally challenging for us to engage in our traditional practices of sharing and trading food resources with our friends and family who cannot otherwise provide for themselves. The Commission believes that the negative effects of climate change have contributed to, and even

created, an ongoing scarcity of essential resources, which in turn is causing an ongoing crisis in our tribal communities as we lose our food security and watch one another suffer.

My recommendation to the Subcommittee is simple: support and create additional legislative, administrative and funding opportunities for our tribes to fully co-manage important resources in Alaska. Recognize the value of traditional knowledge and its importance in improving resource management outcomes, including addressing salmon management in the face of climate change. The diluted form of tribal "cooperative management" that the State and FWS seek to foster may serve to protect their perceived roles as the "primary" management authorities. This failed model, however, will not serve either the salmon or subsistence users moving into the future. The only way to fully integrate traditional knowledge, and secure a partnership with the primary salmon harvesters on the Kuskokwim, is to establish, in law, a co-management structure that integrates the KRITFC as an equal with the State and FWS.