

University of Washington
Bevan Series on Sustainable Fisheries
What is Sustainability & Can it be Achieved?



The Use & Application of Traditional Knowledge to Sustainable Fisheries



Alaska Native Science
Commission
www.nativescience.org

SURFACE CULTURE

FOLK CULTURE

- fine arts •
- storytelling • drumming
- subsistence • dancing •
- games • cooking • dress

- weather forecasting • animal behavior •
- navigation skills • observation skills • pattern recognition •
- seasonal changes/cycles • edible plants / medical knowledge •
- star knowledge / constellations • language / terminology/concepts •
- counting / measurement / estimation • clothing design/insulation • tools/
- technology • building design/materials • transportation • genealogy •
- waste disposal • fire/heating/cooking • hunting / fishing / trapping • weapons •

AND MUCH, MUCH MORE . . .

DEEP CULTURE

WHAT IS TRADITIONAL KNOWLEDGE?

- It is practical common sense based on teachings and experiences passed on from generation to generation.
- It is knowing the country. It covers knowledge of the environment - snow, ice, weather, resources - and the relationships between things.
- It is holistic. It cannot be compartmentalized and cannot be separated from the people who hold it. It is rooted in the spiritual health, culture, and language of the people. It is a way of life.

TK - Continued

- Traditional knowledge is an authority system. It sets out the rules governing the use of resources - respect an obligation to share. It is dynamic, cumulative, and stable. It is truth.
- Traditional knowledge is a way of life -wisdom is using traditional knowledge in good ways. It is using the heart and the head together. It comes from the spirit in order to survive.
- It gives credibility to the people.

Challenges to the Use and Application of Traditional Knowledge and Wisdom

- The scientific community, as well as federal and state resource managers and policy makers address the issue of use and access of traditional knowledge and wisdom, for the most part, on a case-by-case basis rather than from long term, methodical, and strategic processes.
- Alaska Natives may serve as advisors, but rarely act as research partners or significant collaborators except to provide information in western scientific frameworks; most approaches have been on a case-by-case basis, depending on the interest and commitment of the individual researcher.

Challenges (cont.)

- There are no policy-level directives or consistent financial support for use and application of traditional knowledge and wisdom, or for researchers to engage in cross-cultural awareness and communication orientation programs.
- Little is understood about how to communicate and exchange information between scientists and the Alaska Native Elders (the keepers of traditional wisdom and knowledge).
- Scientists and researchers have little or no grounding in cross-cultural communications or awareness protocols.

Challenges (cont.)

- Scientists are unable to determine if the information they receive from Alaska Native observations is local, regional, or ecosystem-wide in scope and therefore discount the information they receive or label the information “anecdotal”.
- Alaska Natives, generally speaking, are skeptical of scientific motivations and thus may not cooperate, or cooperate minimally. Many believe either that the research is too limited in scope, or the data will be used to justify development in areas Alaska Natives want to protect for subsistence purposes.

Challenges (cont.)

- Alaska Native observations of wildlife and environment may be taken into account when making research and management decisions; however, quantitative western scientific research systems are not equipped, without innovative approaches, to validate these qualitative ways of knowing. In addition, state and federal laws mandate the use of “best available science” in making management and policy decisions, effectively marginalizing the Alaska Native ways of knowing.
- Changes in government administrations have constantly shifted institutional commitment to appropriate use and access of traditional knowledge and wisdom for stewardship and research.

Fishing vs. Fisheries Management



“Subsistence is a very divisive issue in the State of Alaska and it’s not the correct word to use in dealing with the resources out in rural Alaska. When they’re talking about subsistence, sometimes other people call it our livelihood – it is not a livelihood – it is our way of life. Subsistence is not even our word – it has no meaning. We need to use words that have meaning and come from us.” (***Ole Lake, Hooper Bay***)

Example -Traditional Native Knowledge and Wisdom from the Koyukuk

- Documentation of TNK&W on climate change indicators have been successful within the Koyukuk drainage, and are in our Tribal Archive
- Our Native Elders and western scientists have met and concluded that climate change is a fact in the Arctic
- We realize that we can and have to adapt quickly to this change by using short-term and long-term strategies
- The State and Federal governments are likely to be far behind our current efforts at adaptation
- What can we do to enhance current adaptation efforts
- What is the best way include everyone in our decisions
- Most rural village populations in Alaska are getting smaller, except for communities like Huslia
- With the knowledge we have now, how do we prepare and educate the next generation for climate change

Using workshops and a tribal archive to document climate change on the Koyukuk at Huslia

- Winter ice is much thinner now
- Snowfall extremes are common
- Consistently warmer temperatures all year
- Severe wildfire intensity
- Animals and fish, and their behavior are changing
- Declining permafrost
- Prolonged drought
- Riverbank erosion has increased
- Lakes drying out
- Grasses growing more, and plant distribution changes constantly
- Flooding events have changed
- Weather is no longer predictable
- Prophecies of change were supported



Adaptations - Finding alternative subsistence use sites

- Many lakes don't flood annually anymore, so we look for new subsistence sites that our Native Elders suggest where there may be fish along the river, or where animals may be during the seasonal hunting times. A few of the old sites still work.



We select dogs that are practical with warmer temperatures



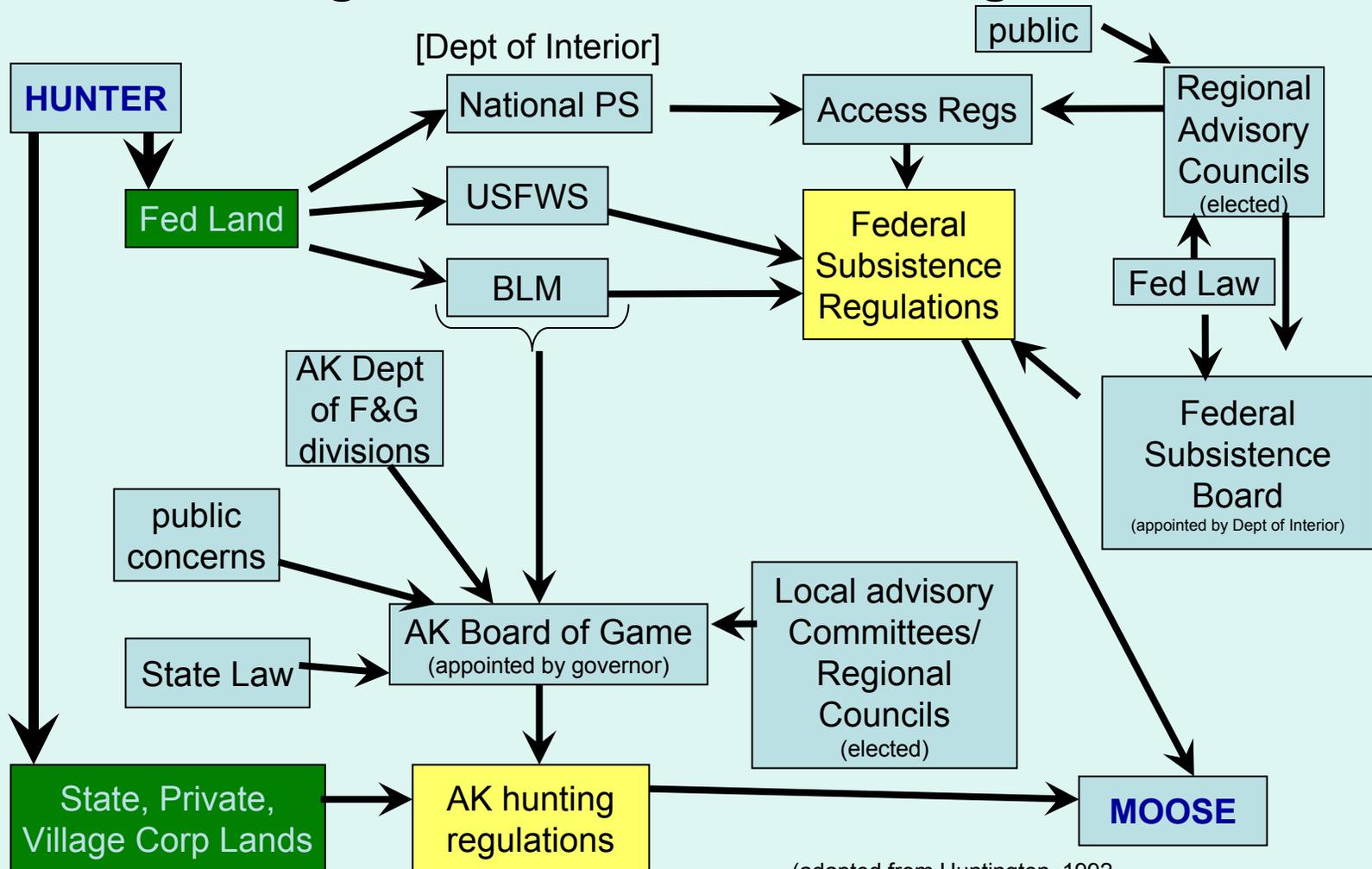
- Traditionally our dogs were used as pack or sled dogs and for surviving at remote traplines in severe winter conditions. But now thin haired hounds bred for racing are the preferred breed.

How do we maintain our access to cultural subsistence resources

- We have to work closely with all land managers and make our cultural needs known. This ensures that subsistence hunting and fishing regulations work for us.



Land Management and moose hunting in Alaska



(adapted from Huntington, 1992
by Annette Watson with Huslia
Tribe, 2004)

What can happen even when we adapt to climate change



- Many climate change impacts are related to weather, such as thin ice and hunters falling through. Fire itself has changed and become much more severe as the climate has changed.

An example: Wildfires and our response in Huslia

- This 60 acre wildfire occurred on May 29, 2005 and was within two miles of Huslia. It started from a contained landfill where there was a new wildfire fuel reduction project, that we started in 2004 to prevent this type of event from happening.



We worked with the DOI USFWS and BLM and reduced wildfire fuel load around the Huslia landfill



- At the landfill the fuel reduction crew had created a 100 foot buffer zone all around the landfill the week before. But the extreme spring heat created very dry Caribou Moss that was like kindling. The cut brush piles stacked around the area were also fire fuel.

Day of the Huslia wildfire



- It was beginning to be a typical day, and the weather was very hot as is common now. The wind conditions were moderate and variable. When I went to the landfill earlier that day, it was just as hot there.



The day after the fire



- This area hasn't been burned for over seventy years, and the Native Elders said it never burned as severely as this. Only by acting quickly on our own, did we prevent further spread of this wildfire to our community.

Erosion is steady now and rivers are growing wide



- As the Koyukuk rises and floods with spring snow melt, there is immediate and continuing erosion because of the lack of any permafrost. Also, the erosion is much worse now because snowmelt in Interior Alaska happens so quickly because of very warm spring temperatures.

We can also use TNK&W



- When we are under stress we often rely on our Native Elders Wisdom, and use what is known to work for the moment. In this case roped trees and brush slow the river current and eddies.

Subsistence along the Koyukuk

- Our subsistence efforts along the Koyukuk were always spiritually based, and we humbly accept the fish and wildlife the Creator provides. To practice that way of life now is difficult at best, and requires a very proactive approach to deal with all fish and wildlife managers.



Our subsistence efforts at fishing are difficult because of joint State and Federal Management, and climate change impacts.



- Many years our salmon runs are not healthy, due to climate change, and our subsistence fishing periods are reduced. This can make it really hard to get enough fish for the coming winter months. The fish also are not always healthy and some are sick from heat stress.

We may have to make new fishing regulations that work for us in fall

- The long warm fall weather now with a lot of rainfall, has all but eliminated our ability to normally fish with nets under the ice in late-fall and early-winter. An option is dip-netting for Coho salmon if we need to.



Government responses to climate changes are very slow

- Current erosion control efforts have not met the needs of Huslia. This old erosion control project failed the first year after it was built. We have to work with our legislature to find solutions to these types of long-term problems.



Climate change impacts vary



- Flooding events were common and associated with river ice breakup in the past. Now the floods are sparse and come in late spring. We have to adapt our subsistence activities to match what nature provides.

Alaska Native Perspectives – Recent Observations

- a) an increasing number of salmon have parasites, and that some salmon flesh appears abnormal in consistency and color
- b) more salmon are appearing with abrasions on their skin, possibly due to lowered water levels in rivers
- c) halibut are disappearing around the Pribilof Islands, perhaps migrating to waters further north
- d) beaver are moving further north in Bering Sea connected rivers such that for the first time beaver are appearing inside the Arctic Circle
- e) sea ice is thinning, appearing later in the winter season, and withdrawing earlier than previously known; and
- f) there was a dramatic increase in the abundance of jellyfish, with the numbers now rapidly decreasing.

While observations collected by Alaskan Natives span many aspects of the ecosystem, few of these observations make their way into scientific literature.

Native Ways of Knowing Contribute to Understanding the Ecosystem

Qualitative understanding of:

- 1) How cultures are sustained in extreme climates
- 2) How/when/where to access subsistence foods
- 3) Daily and seasonal weather patterns
- 4) Sustainable food harvesting techniques and strategies
- 5) Wildlife biology and behavior patterns
- 6) How to adapt to climatic changes
- 7) Complex natural interrelationships
- 8) Abnormal natural phenomena in the context of long time periods
- 9) Qualitative historical knowledge and information of the natural world

Benefits and Products

- We may be able to determine if observations of anomalies or changes in any parameter are local, regional, or may be ecosystem-wide in scope.
- We may be able to identify emergent trends at their outset.
- We may assist in developing hypotheses for declining marine species. Alaska Native observers may provide information that lead to development of new, additional research parameters that would not have been added otherwise, or would have been added later than would have been possible without the observer system.
- Local communities will be active participants and partners in research, ensuring more support for efforts of the scientists and enhancing opportunities for future partnerships.

Benefits

- Usable data will be gathered that may provide some degree of ground-truthing to scientific data gathering.
- Student observers will increase their observation skills, contact with local Elders, and become more engaged in science that is immediately relevant to their communities.
- Properly constructed processes and protocols could be replicated in other areas until observer coverage includes many Arctic indigenous communities.
- Engaged Native organizations will become more active participants in scientific conferences and workshops thus increasing the likelihood that Natives will want and seek partnerships, collaboration, and scientific research funding.

Fish = Life

