

## Native Science/Sense Making

### Introduction

Singular ways of thinking and viewing the world in western society is becoming the norm with the trend towards a global monoculture at a time when environmental problems are becoming ever more daunting. This global monoculture is manifested in singular ways of thinking, dressing, mathematics, science, agriculture, economic systems, institutionalized exclusionary systems, and educational processes. If nature teaches anything, it is that diversity is the foundation for survival. Indeed, diversity of cultures, gender, and ways of knowing is as important to wise stewardship as biologic and genetic diversity if the human species is to survive and thrive in the next millennium.

For thousands of years indigenous peoples have exercised wise stewardship and passed along their knowledge and wisdom to each new generation. This “science for living” involves a 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, 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, and 9) qualitative historical knowledge and information of the natural world. No other peoples in the world, and no science, can replicate what indigenous peoples know and understand about their immediate environments, flora, fauna, and habitat. This traditional knowledge and wisdom is a highly sophisticated holistic science that evolved through methodical cultural processes of: transfer of knowledge and wisdom through hundreds of generations, learning and applying a holistic way of knowing, collective information sharing, and guidance from Elders.

### The Benefits of Use and Access of Traditional Ways of Knowing and Sense Making

Indigenous leaders maintain that there are numerous benefits that can be derived from partnerships and information exchanges between researchers, managers, and indigenous peoples for the purposes of better stewardship and improved research. The leaders point to some examples of what indigenous ways of knowing can do to assist in research and management of fish, wildlife, habitat, and environment, including:

*It may be able to provide qualitative information that can be extremely useful to scientists attempting to place their research in the context of time and space. **Scientists and researchers often bemoan the fact that they have no baseline data from a particular time, or in a particular place, or about a particular specie. Contextual information allows the researcher to know, for example: the trend of a wildlife population (over time) that the researcher is studying, or the general environmental conditions and how they have changed over time, etc. Researchers would be able to determine long-term trends from reliable information over the long term.***

Information provided by Elders can provide important indications of the conditions of wildlife health and population levels in previous years, or provide stories passed along from previous generations that give such indications. Likewise, Elders can provide information on weather and climatic conditions in the areas where they lived, hunted, and

fished. Elders can also talk about how conditions of environment and wildlife have changed over the years. This qualitative information can provide a historical context (spanning several generations) for trend and other data gathered by researchers in fixed time periods.

What is lacking in terms of qualitative access by scientists and researchers to Elder knowledge and wisdom is a carefully thought out process. Most researchers approach the access of Traditional Knowledge and Wisdom on an ad hoc basis by individual scientists; that is, there is no formalized and systematic process for working with native Elders or others in native cultures. As a result, it is a “hit and miss” proposition for serious researchers because accessing this information depends on the abilities and experience of the individual researcher. Most researchers are not even given cultural orientations prior to attempting to solicit information from native peoples, and there is no formalized set of protocols they can use when working in a rural community.

***It can provide an early warning system of emergent biological or environmental trends and “anomalies” in local, regional, or ecosystem-wide geographical areas.*** There are many examples of how natives provided the first observations of significant changes in wildlife populations and environmental conditions:

The first reports of potential ecosystem-wide decline trends of wildlife in the Bering Sea came from the Pribilof Aleuts beginning in 1977. Pribilof Aleuts noted adult birds with breast bones “caved in”, seabird chicks falling off of cliff ledges and dying in large numbers, sea lions eating seal pups in greater frequency than ever noted in living memory, and northern fur seal pelts so thin as to be opaque when the fat was fleshed off of them. Given that these animals were surface and depth feeders, nearshore and distant foragers, it was evident that this was an ecosystem-wide phenomenon. And the fact that these observations were made every year for several years indicated a trend in progress. It was also evident that the anomalous behavior of wildlife indicated food stress. It was not until 1990 that scientists from the different disciplines produced a formal report that pointed to food stress as the probable cause for decline of many Bering Sea wildlife.

Similarly, the first reports of thinning ice and changes in sea ice drift patterns came from the Inupiat and Yupik peoples in the late 1980’s and early 1990’s. Scientists have only recently published data indicating the thinning of sea ice, perhaps related to global warming. These are only a few of countless examples.

***It can indicate the possible causes for biological changes, anomalous behavior of wildlife, and/or wildlife declines.*** The first reports of strange sea lion behavior came from Aleuts and Yupiks between 1995 and 1999. Aleuts from the village of False Pass noted over 300 sea lions in the bay adjacent to the village. They indicated that this was unusual as far as they were concerned. It indicates that, given the time of year they were present, that they may be intercepting salmon. Similarly, Aleut sea lion hunters report that sea lions are traveling in larger groups than was normal over the past thirty years. Normally, sea lions were seen traveling in groups averaging in size from 3 to 15

individuals, and now it is not unusual to see them traveling in groups of 30 to as high as 60 individuals. It has led natives to speculate that this change in behavior is food related.

Pribilof Aleut Elders indicate that the taste and color of seal meat has changed enough for them to notice, and the seal tastes “fishier” than normal. This has led Aleuts to believe that seals may have shifted their diet of pollock, squid, sand lance, and capelin to predominantly salmon.

These kinds of changes in wildlife can only be reported by people who live in the area and interact with the animals on a regular basis

***It can provide scientists with new, timely, and more accurate hypotheses to pursue in their search for causes for wildlife declines, saving time, money, effort and undue delay in action.*** Sometimes the research question on any given environmental issue is wrong and years of research may be discarded as a result, causing loss of valuable time and money that could have been better used if the hypothesis was more on target in the first place. For example, the National Marine Fisheries Service spent tens of thousands of dollars and several years to test the hypotheses that high seas driftnet entanglements were the primary cause for the decline of northern fur seals. As it turned out, high seas driftnets were a contributor to the fur seal decline, but it alone could not account for the decline rate of the seals. And so, the hypothesis was changed and research began focusing elsewhere. Aleuts knew food stress was involved because of all their observations of seals and other species mentioned earlier in this article

In conclusion, traditional ways of knowing and sense making can have significant impact on many aspects of research; however, for this to become a reality, systematic processes for use and access of this information is required and is addressed in the research objectives outlined below.

### **Research Objectives**

It is proposed that critically thought-out research projects be conducted on such areas as, for example: a) what constitutes Native Science and Sense Making, b) the value of traditional ways of knowing and sense-making to modern day research and management of fish, wildlife, habitat, and environment, c) the internal and external environments affecting the viability of traditional ways of knowing and sense making, as well as their sociological and cultural implications, d) documentation and analyses of the institutional challenges and opportunities for use and application of traditional ways of knowing and sense making and, e) research on issues of cross-cultural *communication protocols and issues, dispute resolution, information exchange protocols and issues, appropriate use of information, community relations issues, institutional and professional barriers, and cross-cultural awareness issues.* Where appropriate, demonstration programs, pilot projects, workshops, internships, and think tanks will be developed to address the research areas outlined in this section.