

# TRADITIONAL ENVIRONMENTAL KNOWLEDGE IN FEDERAL NATURAL RESOURCE MANAGEMENT AGENCIES

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# INTRODUCTION TO TRADITIONAL ENVIRONMENTAL KNOWLEDGE IN FEDERAL NATURAL RESOURCE MANAGEMENT AGENCIES

By Jennifer Sepez

The study of traditional environmental knowledge (TEK, also expressed as traditional *ecological* knowledge) in applied settings is an important and growing field for environmental anthropologists who seek to put the methods and findings of anthropology to work in public and environmental policy contexts. The incredible depth and insight of indigenous environmental knowledge is well known in anthropological circles, and for better or worse, has been captured in the public consciousness. A combination of public pressure, internal counsel, political realities and genuine scientific inquisitiveness has worked to create a growing interest in TEK research on the part of many natural resource agencies, providing fertile ground for this work.

As exciting as this may be to those of us who work in the field, such a growth in visibility is not without problems. There are still basic research challenges such as explicitly defining what should and should not be included as TEK, and finding rigorous methods and efficacious reporting formats. Moreover, the institutional context of research by government agencies with their vested management authority compels examination of the underlying power dynamics. Some of the articles in this issue struggle with this, implicitly or explicitly, in examining the tension between pressures to collect TEK and imperatives to consult with indigenous resource users and co-manage the resources in question, and the interplay (or, often, lack thereof) between research outcomes and actual resource management decisions. In many cases, just documenting or highlighting an issue or a perspective within an agency context is a major accomplishment. But

it is also legitimate for researchers, indigenous resource users, and the public to ask if that is enough.

This special issue of *Practicing Anthropology* explores the emerging role of TEK in United States natural resource management agencies by presenting a collection of articles on TEK projects and programs which have a direct bearing on the management practices of federal agencies. Though none of the agencies are officially represented, most of the articles have been contributed by participants who are either on staff at agencies and working on TEK issues in some capacity, or are involved in TEK research that is funded by a federal agency with specific relevance to federal issues. The articles cover topics pertinent to the US Environmental Protection Agency, National Park Service, US Fish and Wildlife Service and US Forest Service, National Oceanic and Atmospheric Administration/National Marine Fisheries Service, Bureau of Land Management and the Office of Subsistence Management (a multi-agency group), as well as specific tribes and other groups, from Maine to Alaska. However, the collection is in no way intended to be a comprehensive look at federal programs. The agencies mentioned have additional programs, and other federal resource management agencies, for example the US Minerals Management Service, have also been involved in TEK research and are not discussed here. Nor are the state agencies covered, most notably the Alaska Department of Fish and Game, which may have more long term experience on this topic than any other domestic management authority. The real long term experience, of course, lies in indigenous communities, although even tribal agencies can be aided by TEK research (see Mitchell article, this issue).



Jennifer Sepez with Jaspa

## Organization of the Issue

This special issue on TEK research and federal agencies has its roots in a session I organized at the 26<sup>th</sup> Annual Conference of the Society of Ethnobiology, held at the University of Washington in 2003. With help from Linda Storm at EPA, the session brought together representatives of Federal and Tribal natural resource agencies to present on TEK projects within their organizations. About half the articles in this issue originated in that session and were sharpened by the discussions following. With additional articles from contributors such as Eugene Hunn, current President of the Society of Ethnobiology, and Preston Hardison, indigenous intellectual property specialist (and prolific bibliographer to the Eanth-1 listserv), the issue is rounded out to a

broader examination of TEK in relation to federal and tribal natural resource management agencies.

In addition to representing a variety of agencies and regions, the articles in this special issue consist of several different types. We begin with two articles that describe specific TEK research projects that are directly applicable to a particular management issue. We then move onto a series of three articles that describe program level approaches to TEK within agencies, representing attempts to incorporate TEK research not into a particular management issue, but at a broader level of agency thinking and planning. We then consider a pair of articles that describe specific agency projects which collect and disseminate TEK, and assess the ways in which these projects achieve their goals. We conclude with what could be considered two cautionary tales, indicating the ways in which agencies must proceed carefully in order to maintain ethical relationships and produce quality results.

In the first article, Eugene Hunn *et al.* describe their research on Huna Tlingit gull egg harvests in Glacier Bay National Park, a study conducted at the request of both the Park and the Tribe. Gull egg harvesting has been effectively banned in the Park since 1950, although there has been intermittent illicit participation since then, and there were many elders who had strong memories of harvest practices. The research uncovered an indigenous conservation strategy employed by the majority of Huna harvest participants. Cultural rules which govern the taking of eggs interact with knowledge of the reproductive biology of the dominant local gull species such that gulls whose incomplete clutches have been harvested could be expected to lay eggs to replace those that had been taken. The implications for sustainability have fueled cooperation between the Park and the Tribe, although the obstacles to cooperative management remain formidable.

Todd Mitchell of the Swinomish Indian Tribal Community in Washington State describes efforts to incorporate Swinomish cultural values into the

process of wetlands valuation. Identification and ranking of wetlands for regulatory purposes usually includes an assessment of wetland functions and values, but ecological functions have been far easier to assess and include

purposes. Blending TEK and scientific resource management, the new system will change the former approach to wetlands functions valuations and yield a more appropriate method for Swinomish resource management.

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than culturally specific information about uses and values. The Tribe initiated a Cultural Assessment Project with EPA funding to gather information from elders and traditionalists on the uses and values of wetlands and wetland vegetation. The information is being used to develop a uniquely Swinomish system for ranking wetlands which will be able to account for items such as presence of medicinal plants, food plants, ceremonial plants, and past or present use of the area for spiritual or ceremonial

Moving into the programmatic articles, Polly Wheeler and Amy Craver describe a multi-agency federal research program for subsistence fisheries. Under the Federal Subsistence Management Program, jointly run by five federal agencies (US Forest Service, Bureau of Indian Affairs, US Fish and Wildlife Service, National Park Service, and Bureau of Land Management), research funding for projects on fisheries TEK in Alaska is available on an ongoing basis. Having evaluated the results of

more than 50 TEK projects since 2000, Wheeler and Craver use this article to examine the efficacy of different methods for documenting TEK, and for organizing, analyzing, and presenting research results with the specific purpose of providing information for federal resource management. Using four brief case studies, they conclude that two things are most important for success: a long-term, close relationship between the researcher and the study community that provides credibility and focus, and rigorous documentation at every stage of the project such that the process is replicable. They also suggest that expertise in and utilization of the full ethnographic "tool kit" produces information that is most useful to resource managers.

Patricia Cirone of the EPA describes that agency's unique experience with the EPA-Tribal Science Council, a national council that facilitates communication between EPA and the Tribes over science issues, particularly tribal scientific priorities, and EPA's science agenda. In addition to identifying data quality, confidentiality, and subsistence as top issues, the Council embarked on an effort to introduce Traditional Tribal Lifeways into EPA's perspective. The short term goal was to change the exposure assumptions in EPA risk assessment models to incorporate tribal practices and perspectives. The long term goal was to challenge EPA to think holistically in terms of health and well-being rather than in terms of risk. The agency has acknowledged the need to understand cultural and other social factors in its risk assessment practices, and is beginning to make assessment procedures more transparent, change planning and problem formulation practices, and work with tribal people on site-specific assessments.

The efforts of the US Fish and Wildlife Service's Medicinal Plant Working Group to facilitate sustainable use and conservation of medicinal plants native to the US is the subject of Trish Flaster's article. An impressive combination of agency personnel, industry representatives, academics, and non-profit groups and others have worked together for the benefit of plants

and people. The Ethnobotany Committee is working with tribal elders to identify and preserve culturally significant plants in situ, so that they may be available to future generations. The Conservation Committee has worked in cooperation with the US Forest Service and the Garden Clubs of America to monitor several wild plant species that were the subject of international trade. For these plants, knowledge of medicinal uses by commercial interests has not been matched by knowledge of native plant ecology by resource managers, and some species are thought to be critically imperiled. The groups' efforts have put wild medicinal plants on the radar screen of land managers and have provided data for initiating appropriate management measures.

The next two articles both describe the compilation of databases by NOAA Fisheries, though with different goals and in different regions. The first, a description of the Local Fisheries Knowledge Project by Jennifer Isé and Susan Abbott-Jamieson, portrays an education and outreach project that collects cultural, environmental, and historical knowledge in fishing communities by having high school students interview community members. The resulting database of interviews is not the primary goal of the project, but is a by-product created along the way. The pilot project in Maine has been very successful in connecting communities, schools, and families in ways related to fishing, increasing local interest in marine science careers, and introducing new perceptions of NOAA fisheries. The project has also increased awareness of local environmental knowledge within the agency, which has been criticized for not paying attention to the knowledge of fishermen. The database of interviews will be available to the public online, and will expand nationally as the project moves to other fishing communities around the country.

The NOAA Fisheries Alaska Native TEK Database had a different goal in mind. As described by Heather Lazrus and Jennifer Sepez, the database was created as a response to public comments which criticized a programmatic

supplemental environmental impact statement (PSEIS) for failing to adequately discuss Alaska Native TEK. Compiling quotes and paraphrases from existing literature, films, and NOAA Fisheries interviews, the database was designed as a project which could be completed with very limited resources in time to assist staff scientists as a searchable tool for the redrafting of the PSEIS. Lazrus and Sepez assess the database project for its contributions and its failings, based on interviews with the intended users at the agency. The assessment provides systematic feedback from the natural scientists and policy makers that should be useful to others in the process of designing TEK projects that will be most useful to management, including such issues as highlighted phenomena, temporal depth and historical perspective, geographic scope, expert authority, and differing paradigms. The authors also recognize and problematize the acontextual, "pluck it out and plug it in" approach to TEK that underlies the database.

Stacie McIntosh of the Bureau of Land Management discusses the creation of another agency document—a land use plan in the National Petroleum Reserve—which also attempted to respond to public comments suggesting incorporation of traditional ecological knowledge. McIntosh criticizes these efforts for failing to distinguish between local knowledge- individual ideas born of the user experience, and traditional knowledge- shared ideas of the community embedded in a cultural context. She argues how conflation of these different epistemic tracks can ultimately threaten the ability of agencies to identify, incorporate and apply TEK appropriately.

Finally, in an extended commentary by Preston Hardison of the Indigenous Biodiversity Information Network and the Tulalip Tribes, a tribal perspective on the potential pitfalls of TEK research is put forward. Framing the subject in terms of indigenous realities and international agreements such as the Convention on Biological Diversity and the World Intellectual Property Organization, Hardison examines issues such as government-to-government

relations between the US and tribes, rules of disclosure for tribal proprietary information, and the spiritual contexts of knowledge and knowledge-sharing, with the specific context of federal agency research in mind. He proposes a set of core principles that can be taken as guidelines for proceeding with research that recognizes fundamental legal and ethical responsibilities to the bearers of TEK.

### Themes and Challenges

The articles brought together in this issue raise many interesting themes that reflect on the particular pressures of government work in relation to TEK—responding to public comment, understanding and incorporating public testimony, deadlines, documentation, excessive acronym usage (EAU), competing stake holders, skeptical resource managers, institutions dominated by natural scientists, and concern for the public trust.

We also see a number of basic issues arise repeatedly in the articles. Resources—how can we do a lot with a little, in a short time? This is a question for any researcher, government or not, but can be particularly acute if statutory or other deadlines are involved or if the project is being supported only by a local office or other small unit. Quality and acceptance—this is a great concern in many of the projects. High quality research should be the goal of any study, but government projects will often have to face an extremely skeptical audience from within the agency from early on. These projects are often conducted with methods familiar to our discipline, but presented to a much wider audience. This should be seen as a challenge, not an obstacle, and there are many ideas in these pages for improving project design to meet the likely concerns of managers and scientists. Implications—if the project is successful, will management be affected? Even the clearest, most robust results do not necessarily translate into action. And finally, the issue of genuine incorporation—whether the knowledge has been treated as an object to be collected, or a

perspective whose integration demands both representation and context.

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valuable to anyone working in or around government and hoping to advance the place of indigenous knowledge in management. Anthropologists are enthusiastic, but there is reasonable caution from both agency scientists and indigenous groups. The lessons we hear from multiple places have the widest bearing: Choose your TEK experts carefully. Not all indigenous persons are bearers of TEK, nor can communities be expected to display perfect consensus. Consider the difference between traditional knowledge and local knowledge in relation to project goals. Document all research methods very carefully so that the components are transparent and replicable, especially to natural scientists. Work in cooperation with local representatives, and in the spirit of accepted principles. Keep the context of TEK available and integrated as much as possible in reports. Facts or individual observations in isolation are of limited use and potential harm. Understand the biology of the resources as well as the cultural context. And finally, just researching and presenting the knowledge does not mean that it will be applied. Cooperative structures and representative bodies are usually necessary for meaningful incorporation.

As the application of TEK is increasing in popularity and visibility, evidenced by repeated public comments to the government clamoring for work on this subject, agencies are responding to the call from without and from

within by attempting a greater volume and wider variety of TEK research than ever before. The specifics of these projects differ, as do goals, resources, and

organizational culture. But most share the characteristic of working deep in the trenches between science and policy, with extraordinary potential for real effects on management.

*Disclaimer: The opinions expressed in this article and in this issue are my own or those of the authors named, and do not necessarily reflect the opinion of the National Marine Fisheries Service/NOAA Fisheries.*

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# HUNA TLINGIT GULL EGG HARVESTS IN GLACIER BAY NATIONAL PARK

*By Eugene S. Hunn,  
Darryll R. Johnson,  
Priscilla N. Russell,  
and Thomas F. Thornton*

## Indigenous Conservationists?

There is a vigorous debate in academic and management circles with regard to the question of whether indigenous peoples characteristically “conserve” their local natural resources (Smith and Wishnie 2000; Hunn et al. 2003). Behind this question lurks another, “Who is indigenous?” Proponents of indigenous conservation argue that indigenous communities are more deeply attached to their homelands than are other “stake holders” in the locality, such as recent settlers and their descendants, and transient resource users such as international timber harvest companies, commercial and sport fishermen, hunters, or tourists. The indigenous conservation argument asserts that roots in the local landscape many generations deep are likely to motivate a strong interest in maintaining existing landscapes and patterns of habitat diversity supportive of indigenous ways of life, particularly the subsistence practices that largely define such lifeways. In addition, it is argued that multigenerational attachments to place make possible the development of time-tested knowledge and understanding of plants and animals, water and soil, and the interconnections among these natural elements and the human societies that depend on them for livelihood and that such knowledge and understanding is prerequisite to careful management of local resources for long-term sustainability.

Opponents and skeptics of these indigenous conservationist arguments question whether “indigenous communities” are in fact so stable, whether instead human history involves a succession

of environmental crises and violent population shifts more like modern human history. They further question whether humans are by nature capable of sacrificing short-term selfish gains in the interests of a collective concern to protect long-term sustainable relationships between the community and its natural environment.

## Conflicting Resource Management Perspectives

Our Huna gull egg harvest study was not designed to provide a scientific test of these competing hypotheses, but rather serendipitously contributes a relevant case study that we believe clarifies this contentious issue. We embarked upon this study at the joint request of the Glacier Bay National Park administration and the Hoonah Indian Association.<sup>1</sup> The Huna leaders specified the gull egg harvest issue as of the highest priority, and the Park agreed to fund the study as a first step in a joint effort to improve the historically strained relationship between the two parties (cf. Catton 1993). The central problem was different for each stake holder. For the Hunas, the issue was, “Why can’t we harvest gull eggs in our traditional homeland, when our traditional practice has ensured a sustainable harvest for centuries and has caused not appreciable harm to the bird populations in Glacier Bay?” For the Park administration the issue was, “How can we allow a seemingly destructive harvest in the pristine ecosystem of Glacier Bay, which we are legally bound to manage as a wilderness park and natural scientific laboratory?” Our team was brought in to document the historical and contemporary nature and significance of gull egg harvests by Huna people. We briefly summarize those findings below and then suggest something of their potential significance (cf., Hunn et al. 2004).



*Eugene S. Hunn*

First, our review of the archaeological, linguistic, and historical evidence strongly supports the view that the Huna Tlingit people are the direct cultural descendents (if not also the genealogical descendents) of Native communities in continuous occupation of the Icy Straits and Glacier Bay region for 6,000 to 10,000 years. Though their lives have changed radically within the past 200 years since first Euroamerican contact, their identity as a people remains profoundly bound to their traditional homeland and the physical and spiritual sustenance it continues to provide. This persistent and successful occupation through periods of dramatic climate shifts and in the face of Euroamerican colonization is proof that they had in fact achieved long-term stability or balance between their subsistence needs and the capacity of the local environment to sustain their population.

The extant ethnographic record demonstrates furthermore that the local

community has inherited an extensive body of Traditional Environmental Knowledge (TEK)—detailed, empirically and experientially grounded knowledge of local plants, animals, and places—that informs their occupation and use of the local landscape and its natural resources. The present study has been able to demonstrate further a specific linkage between local knowledge of gull breeding biology and behavior and a resource harvest practice based in that knowledge that may represent an instance of indigenous conservation.

#### *The Indigenous Conservation Strategy*

Our Huna Tlingit consultants describe the traditional seasonal harvest of glaucous-winged gull eggs as of particular cultural significance as marking a key transition in their annual cycle of travels and harvests, when with the full flush of summer resource abundance, families left the winter villages to travel throughout their country from harvest to harvest. Seagull eggs were available for harvest for but a few weeks around the first of June. This was the occasion for family outings to the gull colonies, most notably those on the Marble Islands in Glacier Bay, where the sheltered waters and accessible nests allowed even young children to participate and in the process to learn the basics of Tlingit resource harvest etiquette. As community members describe:

Gathering eggs in Glacier Bay was something especially the family looked forward to. It was like Easter. Family and cousins gathered up there and we collected eggs, and it was a joyous occasion....

Dad took us up there to gather eggs, and before we went to get the eggs while we're on our way up on the boat, they would instruct us about how many eggs to take, to respect it and not try to play with it.

...because the gull knows more about it than you do, so you always left the nest alone. You did not disturb it. You just took

the eggs and stepped around it. Children were also taught to only take what was needed or what they could use.

Our most striking finding was that nearly all knowledgeable Huna—we interviewed 45 Huna residents with some knowledge of the traditional practice of gull egg harvests, everyone willing and able to respond to our questions—referred to traditional rules governing these harvests, and that a substantial majority (24 of 39 consultants, 62% of those specifying a rule) agreed that they had been taught to carefully note the number of eggs in each nest and to harvest the eggs only if one or two had been laid but to leave the nest undisturbed if there were three eggs present.

when you see it, you look at the eggs. Some of them have one egg. That's good. If it's got three to four eggs, you leave it alone.

There was some variation evident as to the precise rule, with one alternative—offered by 28% of those who detailed a harvest strategy—stressing the need to leave one egg in the nest.

[We were] instructed...that we are not even to touch nests that have three eggs in it. Nests that have two, you can take one.

If there was just two eggs, leave one. Even if there was one, we were told not to touch 'em.

“ Our most striking finding was that nearly all knowledgeable Huna...referred to traditional rules governing these harvests, and that a substantial majority...agreed that they had been taught to carefully note the number of eggs in each nest and to harvest the eggs only if one or two had been laid but to leave the nest undisturbed if there were three eggs present. ”

What I was taught, if there was one or two eggs in there, that was good to take, you take them. If there was three or more in there, you know, they're already starting to form so the party I was with said don't touch them.

...[W]hen you'd go up there to Marble Island, you walk around and look for [a nest], and then

One respondent described a more radical strategy involving destroying the eggs in full nests, then returning later to harvest fresh eggs laid to replace those that had been destroyed. However, several elderly consultants vigorously denied that such a practice was ever sanctioned.

Initially we did not appreciate the significance of these cultural rules, but on further investigation learned

that the glaucous-winged gull (*Larus glaucescens*), the primary target of these harvests, is an "indeterminate nester," that is, females are "programmed" to lay a clutch of a particular size— in this case, the modal clutch size is three eggs—laying a single egg approximately every second day, continuing to lay until the target clutch size is achieved (Verbeek 1993). When a full clutch is present in the nest, the female begins to incubate and her hormonal system shuts off egg production. However, if eggs are removed from the nest before the clutch is complete, she will continue to lay eggs. Experiments with closely related species have demonstrated that as many as 16 eggs may be laid by a single female before she gives up, with an average of 8.59 per female subjected to this experimental manipulation.

In short, it seemed that the Huna community had devised a traditional resource management system, transmitted from generation to generation by explicit instruction of the young during the harvest itself and enforced by public opinion that was very likely designed to sustain a culturally significant harvest of a potentially vulnerable natural resource. Furthermore, this resource management strategy was informed by careful empirical observation of gull breeding habits.

#### *Significance of Indigenous Conservation*

Let us consider the likely significance of these findings for the management of natural resources within Glacier Bay National Park. Pertinent questions include: Is the traditional Huna Tlingit gull harvest strategy sustainable, and thus an example of indigenous conservation? If so, does this justify recognizing their right to manage these harvests within Glacier Bay National Park and Preserve?

Let us also consider a range of objections to such a conclusion. Firstly, the most skeptical might suggest that the Huna people we interviewed got together beforehand and invented a "tradition" that never existed in order that we might "discover" it. However, we reject this argument out of hand as it would require that someone at Huna anticipate

a subtle and complex ethnobiological argument and be highly knowledgeable of the ornithological literature on gull breeding behavior. This seems patently absurd.

Other skeptics might emphasize the fact that not everyone we interviewed agreed on the details (and the "devil is in the details"). We recognize the fact that not everyone reported "the rule" in a form consistent with the sustainability hypothesis. However, the two primary alternatives, the "one or two but not three" strategy and its minor variants and the "leave one egg behind" strategy, espoused in one form or another by the great majority of respondents, are each consistent with a "conservative" if not "conservationist" strategy, i.e., one that counsels restraint in the egg harvest and that is likely to minimize the impact of the harvest on the nesting success at the colony. Furthermore, it is our observation that the eldest Huna respondents, who had harvested consistently prior to the Park's effective ban ca. 1950, were consistent in their identification of the dominant strategy, whereas those who had harvested only intermittently before or after 1950 or who had learned of the harvest strategy at second hand were more likely to cite subordinate strategies, an indication that subsequent to the 1950s the traditional rules were perhaps imperfectly recalled.

A more subtle counter-argument notes that the motive for sparing nests with full clutches might be the desire for fresh eggs, as opposed to those with developing embryos. While it is true that several consultants made this concern explicit, others noted that elderly people actually considered eggs with developing embryos to be a special culinary treat. In any case, to note that a person may have complex and multiple motives is not inconsistent with considering the strategy as effectively conserving the resource, since it would seem to involve less effort to simply discard the developed eggs after the fact rather than to carefully avoid harvesting them, if avoiding such eggs were the sole motive for the practice.

After a preliminary review of our findings by Glacier Park staff, the Park

contracted with a biology student, Stephani Zador, to conduct a detailed study of the Marble Island glaucous-winged gull colonies in Glacier Bay, with particular attention to the potential impact a traditional harvest regime might have on the long-term health of the colony. Zador's research (2001) raised a number of questions with regard to the long-term sustainability of the traditional Huna Tlingit practice. Firstly, it is obvious that the size and distribution of glaucous-winged gull nesting colonies in the Glacier Bay region is highly dynamic, regardless of the intensity of indigenous harvests. Several colonies noted as of significance to the Huna historically no longer support nesting gulls, while new colonies have been established far up Glacier Bay in areas more recently freed from the retreating glaciers. Within the past thirty years the large North Marble Island colony has been largely abandoned (down from 500 pairs in 1973 to just a 25 in 2000). Since there has been no sanctioned Huna harvests during this time (and illegal harvests have been quite limited, as far as we can judge), it is clear that other forces are at work. The most notable is the evolution of the habitat through vegetational succession subsequent to glacial retreat (Lawrence 1958). On many islands dense willow thickets and subsequently spruce woodland has grown up, displacing the patchwork of grasses and sedges favored by glaucous-winged gulls for nesting. Only where the substrate is of particularly durable rock, and where such surfaces are not too steep, will conditions optimal for nesting by glaucous-winged gulls persist. South Marble Island, the preferred harvesting site for Huna Tlingits, appears to be the last stronghold for this gull in lower Glacier Bay and the long-term prospects for this colony are uncertain.

A second dynamic factor is predation by bald eagles. According to Zador, eagle predation is now the most significant contributing factor in the destruction of eggs and chicks at the Marble Island colonies. This reflects the dramatic bald eagle population recovery across North America since DDT was outlawed. How

might one judge the long-term sustainability of an indigenous harvest of gull eggs given that there is no way to define a stable baseline population in the face of rapid habitat change and dynamic non-human predator populations?

Finally, Zador notes that while the traditional harvest strategy might be conservative, it might nevertheless negatively impact gull nesting success by introducing additional stresses on breeding females through colony disturbance and the energetic demands of producing extra eggs. On the other hand, there is some limited evidence that human predation that is limited to the early phases of the nesting cycle—as in the present case—might actually enhance nesting success, at least as measured by the average number of fledglings per nest (Vermeer et al. 1991).

#### *Policy implications*

Evidence to assess the impact of a given harvest practice over the long haul is rarely available. Thus, if subsistence egg harvests by Huna in Glacier Bay were to be legalized, there would remain considerable uncertainty with respect to the sustainability and appropriate scale of such harvests. The reader may appreciate that the Glacier Bay National Park administration is in a difficult position, on the one hand charged to protect for all Americans Glacier Bay as a premier “wilderness” park (despite the obvious fact that the Tlingit Indians have lived there for thousands of years), while recognizing that Huna Tlingit people have a legitimate interest in managing resources that constitute the material and symbolic foundation of their families and community, but recognizing also that the biological and socioeconomic contexts of subsistence practice have changed dramatically since the Park was established.

Park staff has worked with the Huna community since the completion of our study to help arrange the harvest of gull eggs at a small colony outside of the Park at Middle Pass Rock in Icy Straits, which has allowed elders and young people from the community to experience this traditional subsistence practice without fear of arrest for the first time in decades. However, the

Middle Pass Rock colony is subject to stronger currents and wave action than is the case at the Marble Islands and thus is not safe for younger children. It is also noteworthy that the Park administration has funded research to monitor the status of the accessible gull colonies in Glacier Bay, which provides

indigenous people be considered conservationists?—are in order. If by “conservationist” we mean persons who first of all are determined to preserve biodiversity without regard for the human consequences, then the Huna Tlingit are not “conservationists.” Of course, such a strict definition rules out all but

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“  
 ...we believe that the wider public would be intrigued and impressed, as we were, to learn the details of Huna traditional environmental knowledge of Glacier Bay’s ecological communities...  
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essential evidence to complement what the Huna elders have provided. If the legal obstacles to the resumption of Huna Tlingit harvests in Glacier Bay can be resolved—and the obstacles are formidable, perhaps requiring an act of Congress to grant an exception for egg harvests—the administrative details of a truly cooperative management effort will still need to be hammered out, in the face of stiff opposition by those committed to the notion of parks as “wilderness,” on the one hand, and by indigenous activists who reject as illegitimate any federal presence in their traditional homeland.

Whatever the final outcome, we are heartened that our modest contribution—documenting the sophistication of Huna Tlingit traditional environmental knowledge and the role that knowledge has played in Huna traditional resource management—may demonstrate that the Huna people are willing and able to be equal partners with the professional scientists and administrators of Glacier Bay National Park in the defense of this prized landscape.

### **Conclusion**

A few concluding observations with regard to our opening question—Should

the most radical proponents of “Earth First!” However, if by “conservationist” we include persons who recognize that their actions may harm the earth’s resources on which their lives and the lives of their children depend and who act to minimize their “footprint,” in the interest of leaving that homeland intact for their grandchildren, then the Huna Tlingit, at least with respect to their gull egg harvest practices, may be judged conservationists.

Finally, what role does TEK play in this judgment as to the inclination of Huna Tlingit people to “conserve” local natural resources of subsistence value? And what role should TEK play in negotiating a truly cooperative management process that engages Park staff and Huna people in a common enterprise, the protection of Glacier Bay for future generations. We believe that the Hunas’ intricate knowledge of gull nesting behavior provided the necessary empirical foundation for their conservative harvest strategy, a strategy motivated by their recognition that the gulls’ must be allowed to raise their young year-by-year if they are to survive and continue to nest at their traditional colonies. We would argue that the resumption of Huna subsistence harvests in Glacier Bay would restore an important

element of the Glacier Bay ecosystem that existed before the Park's creation, but recognize the necessity for careful collaborative monitoring of the scale and impact of any future harvests. Such future harvests would require negotiating a contract between the Huna people and the National Park Service that recognizes their joint interest in preserving for the foreseeable future the health of the glaucous-winged gull nesting population in Glacier Bay. Whether future Huna harvests should be bound by traditional Huna harvest restraints would be an issue for negotiation, as would procedures for monitoring and enforcing the agreement. Finally, we believe that the wider public would be intrigued and impressed, as we were, to learn the details of Huna traditional environmental knowledge of Glacier Bay's ecological communities and would appreciate the deep feelings Huna people hold for their Glacier Bay homeland.

### Endnote

<sup>1</sup>Note that we use "Hoonah" to refer to the town and "Huna" to refer to the tribal community.

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# NATIVE USES OF WETLANDS AND NATURAL RESOURCES PLANNING: THE SWINOMISH INDIAN TRIBAL COMMUNITY'S WETLANDS CULTURAL ASSESSMENT

By *Todd Mitchell*

## Introduction

Wetlands are defined based upon the presence of three essential characteristics: hydrophytic vegetation; hydric soils; and wetland hydrology. Wetland inventory and wetland habitat assessments are conducted in areas where wetlands need to be identified and ranked for regulatory protection measures. Typically the following methods are used: 1) identify wetlands through existing resources and produce a preliminary wetland inventory, 2) field verify wetlands, 3) assess wetland functions and values, and 4) develop watershed ranking. In order to evaluate and assess the relative importance or level to which a wetland performs a specific function, a functional assessment of the field-verified wetlands is conducted. Detailed scientific knowledge of wetland functions, sometimes known as functions and values, is often limited, so that evaluations of the functions of individual wetlands are qualitative and largely dependent upon professional judgment. Wetland functional valuations are still an evolving science. Therefore, better methods for valuations are being researched but until such methods are in general use by the scientific research community, the current and possibly inaccurate methods are in use.

In addition to the drawback of the subjectivity and broad based scientific approaches to wetland functions and valuation, cultural and socio-economic factors cannot be adequately addressed for wetlands important to tribes since cultural practices, as well as flora and fauna, vary regionally. Given this varia-



*Todd Mitchell*

tion, cultural factors must be tailored in these assessments for each individual tribe to garner accurate functional values. In the absence of this individual tailoring, culturally important values may not be correctly integrated into wetland ranking and hence resource management and policy.

The Swinomish Indian Tribal Community's Wetlands Cultural Assessment Project was initiated to develop an understanding of Swinomish cultural values of wetland systems. The Tribe found there was a need to determine Swinomish wetland cultural values since standard wetland inventory and functional assessment methods could not adequately identify wetland functions or uses related to Tribal cultural values. Staff identified that significant cultural functions were not adequately captured in the assessment of the wetland systems. The cultural assessment considerations were absent from the functional rating values and hence proposed regulatory and management policy would not adequately protect

the wetlands in regards to Swinomish cultural values.

The Swinomish Indian Tribal Community's Wetlands Cultural Assessment Project was developed to produce a cultural resource assessment module that could be incorporated into the wetland assessment. In developing this module, local Native knowledge would be gathered about the traditional uses of native wetland vegetation and wildlife. With this traditional environmental knowledge incorporated into wetland assessments, we hope to reassess and revalue the wetlands on the Swinomish Reservation to better protect and preserve these wetlands for both cultural uses and ecological functionality.

## Background

In 1999, the Swinomish Planning Office contracted a wetland specialist to conduct a wetland inventory of the Swinomish Reservation that included a wetland functional value assessment. All existing and potential wetlands were

identified from the National Wetlands Inventory, soil survey, existing delineations and maps, topographic survey, and aerial photographic interpretation. These wetlands were assigned preliminary U.S. Fish and Wildlife (Cowardin et al. 1979) and hydrogeomorphic method (Brinson 1993) classifications. All wetlands identified during the inventory meet the definition of a wetland consistent with the U.S. Army Corp of Engineers 1987 Wetlands Delineation Manual. Thirty-six of the identified wetlands were then field-verified and evaluated using a methodology developed by the U.S.A.C.E. (Reppert et al. 1979) and modified by Cooke (1996).

The following wetland functions and values were assessed: (1 flood and storm water control; 2 base flow and ground water support; 3 erosion and shoreline protection; 4 water quality improvement; 5 natural biological support; 6 overall habitat functions; 7 specific habitat functions; and 8 cultural and socioeconomic characteristics. Each category contains a series of questions that are scored 1 through 3 (or low, medium, and high). This semi-quantitative method assigns points based upon indicators of low, moderate, and high levels of functions. Points are totaled at the end of each section and divided by the total available points. The final score is represented as a percentage that can then be compared with other wetland scores throughout the Reservation.

The cultural-socio-economic section in this standard approach is made up of seven questions: educational opportunities; aesthetic value; commercial fisheries, agriculture, renewable resources; historical or archeological resources; passive and active recreational opportunities; land ownership; and nearness to adjacent open space. The cultural-socio-economic section does not take into account Tribal values such as historical, spiritual, ceremonial, subsistence, medicinal, or traditional values. With these missing values in mind, the Swinomish Planning Office was able to apply for and receive funding for a U.S. Environmental Protection Agency (EPA) Wetlands Development Program Grant in 2000. The objectives of the Cultural

Assessment Project were: development of a functional value assessment for wetlands based on Swinomish cultural values, development of habitat data for all wetlands based on extensive plant and wildlife research in selected wetlands, and regulatory guidance that incorporates the cultural based functional values into wetland protection regulations and management policies adopted by the Tribe. The program strategy was broken into three phases, one for each objective:

- Phase One: Establish interview methodology and interview community elders and traditionalists to garner the expression of cultural values and obtain community information on the traditional uses of native wetland vegetation,
- Phase Two: Research information on native wildlife and habitat requirements that are associated with the wetland systems and develop a GIS map of culturally derived habitat zones as determined by the research and cross-referenced with existing wetland map and databases, and
- Phase Three: Incorporate findings into the assessment and regulatory guidance policy for Tribal wetland protection.

## Methods

### *Phase One*

The first phase of Swinomish wetland culture data development was started with a brainstorming session with two Tribal members and Tribal government employees, our Cultural Resources Liaison and Tribal Enrollment Officer, since they are well acquainted with the community and Tribal members. Our goal was to talk about Tribal members who could be hired to conduct the interviews and research as well as knowledgeable Tribal elders who should be interviewed. The Swinomish Tribal membership is about 1000 people total, with 1/3 of those living on or near the Reservation, and less than 50 of those being possible knowledgeable elders.

We decided that the hiring of an older Tribal member paired with a younger

Tribal member to conduct the interviews would be the best way to reach the community. The older interviewer was chosen to be someone well known in the community and familiar with the elders and community members as well as having traditionalist parents and grandparents. It was hoped that the older interviewer would be able to set up interviews with community members in their homes. The younger interviewer was chosen because he was already working in the Swinomish Planning Office as a Water Quality technician and willing to work on this project. Successful gathering of Swinomish cultural knowledge can be limited by sending an anthropologist because the community traditionally is leery or suspicious of giving away too much cultural knowledge to an outside "expert." The trade off to choosing Tribal members as interviewers was getting more open dialogue and information but in limited scope due to the interviewers' lack of training.

The interviewers were not able to start interviews on the project until December 2001 due to conflicts with the spring and summer fishing seasons, but during this time wetland plant information was compiled from existing documents and testimony and presentation materials for the interviews were prepared. Our next task was to establish interview methods. The basic guidelines were to conduct interviews at a time and place convenient for the elders; interview the elders and gather uses of plants whether medicinal, ceremonial, or spiritual; tape record the information for later transcription; and summarize the findings. The interviewers were able to conduct ten interviews within a one-month period but they found it difficult to schedule the interviews since the winter is the season for traditional Smokehouse (spiritual) activities. As one Swinomish elder, Neah Martin, stated, "I'm busier now that I'm older than I ever was as a kid."

The original interviewers found that there were not many "oldtimers" who still knew about traditional plant uses. Many of the people they contacted for possible interviews said, "You should have done this work 10, 20 years ago

when my (older relatives) were still alive. They knew all about the plants and I don't, I'm too young (or didn't listen and learn these things when I was younger)." To continue the work, we hired a non-Tribal member native-plant specialist to conduct follow up and/or additional interviews, compile a list of traditional plants from the interviews and literature review, produce a report on the traditional plant use, and start collecting Swinomish wetland plants for production of an herbarium of pressed plants. The herbarium was started to use as a teaching tool for later use or as presentation materials for future interviews. Working part-time from June 2002 to March 2003, this specialist was able to complete a Traditional Uses of Wetland Plants report.

#### *Phase Two*

The second phase is habitat profiling of the Swinomish wetland systems. For this work, we hired a botanist to conduct a detailed botanical survey of eight targeted wetlands on the Reservation. Each wetland chosen for the survey was a different type of wetland as classified by the wetland inventory. The survey included percent cover of plants, inventory of all plants present, whether a plant was culturally significant (based on the Traditional Uses report), and a plant's wetland status or habitat. Surveys were conducted from May to June 2003, including completion of the Wetlands Botanical Survey report, and collection of all but a few plants from the plant inventory list. Development of a finished habitat profile is ongoing. In further work in this area, we hope to apply the knowledge gained of the diversity and abundance of culturally significant plants found the targeted wetland types and habitats to all wetlands of these specific types and habitats in order to map and identify wetlands or habitat zones that have actual or potential culturally significant plants for use in future assessment or protection.

#### *Phase Three*

The third phase is to develop a cultural assessment module that incorporates the cultural functional values and

regulatory guidance. As part of separate but related work on a wetland protection ordinance, we were able to include policy language that indicated wetlands within the Reservation were to be ranked based on the Swinomish wetland ranking system. Recommendations for producing a Swinomish ranking system included consulting a wetlands specialist to determine what current methods are standard practices for assessing functional values and produce integrated culturally sensitive elements to assess the cultural component of wetland function. Alternatively, a stand-alone cultural values module could be incorporated into current ranking systems. Such a module would provide a quick way for us to re-evaluate wetland rankings by inserting the new cultural module into the 1999 wetland inventory functional assessment and re-scoring the wetland inventory functional value. This ranking could become the interim ranking until the new Swinomish wetland ranking system is established and implemented. For newly assessed wetlands, the old methods could apply with the addition of our cultural component.

In developing this cultural module, we would incorporate several ranking criteria into data forms and/or procedural checklists. These ranking criteria could include: number of plants that are used for medicinal purposes; number of plants used for food and the obtainment of food; past or present place of traditional harvesting; presence of known or potential archeological or historic sites; number of plants with past or present spiritual or ceremonial utilization; past or present spiritual or ceremonial utilization; number of native plants; and percent of wetland located on Tribal or Trust Land.

In using or creating this cultural ranking module, we are aware of the sensitive nature of the cultural information. Several options have been suggested to protect this information during the assessment and regulatory review processes. Tribal staff, rather than outside consultants, would perform the cultural ranking component of an overall wetland ranking, in a sense adding the cultural score to an existing or

newly ranked wetland score. Another option would be to inform and educate the Swinomish Cultural Committee about wetland rankings and have the Committee rank the wetland. The Swinomish Cultural Committee deals with cultural issues of the Tribe and is made up of several members of the Swinomish Senate (the eleven-member elected governing body of the Tribe) and other Tribal members of distinguished cultural knowledge. If this is the preferred method, the Committee's involvement could take on varied levels of involvement ranging from full involvement (the Committee given all the pertinent ranking criteria information about a particular wetland and using the cultural module worksheet to add points to the overall score) to minimal involvement (the Committee could simply determine a wetland should be overall ranked high, medium or low and the appropriate number of points added to the score).

### Discussion

Several of the project design considerations used in conducting this study were particularly effective in accomplishing project goals to date. The most effective interviewers were the Tribal members, and having an older interviewer (40's) paired with a younger interviewer (20's) worked well in this case. The interviewers, while not practicing traditionalists in the medicinal sense, did have either first or secondhand knowledge of plants that might have been used by their parents or grandparents. While not familiar with standard anthropological practices, the Tribal members were able to access a wide range of knowledgeable elders. Since the Swinomish Tribal membership is small and the relevant pool of potential interviewees was limited, the interviewers were able to determine appropriate people to interview either based on personal knowledge of the individuals or from information gathered talking to Tribal employees or family members. With their knowledge of the Tribal membership, they were able to interview several elders living off the Reservation.

The knowledge that is still retained by Swinomish elders is less primary practicing traditionalism but secondary. Many elder interviewees were chosen because their parents or grandparents were practicing traditionalists or medicine men. Dobe Tom, an Upper Skagit Tribal elder said, "I never paid no attention to those things I never thought important. My grandmother used to say, listen you might have to use [plant medicine] sometime. As a little boy... I lived with my grandmother. That is how come I know little a bit [about plants]." Given the interviewees' ages, even this information is becoming less and less accessible.

The interviewers began to elicit information and in many cases were able to just let the interviewees talk and reminisce with occasional prompting. Two interviews included two or more people and in both cases seemed to be a better method than individual interviews. In the 'group' interviews, all the interviewees played off each other, remembering or contributing more information than individual interviews may have. The seasonal timing of interviews also seemed particularly effective. Winter is the smokehouse season when most people are near home most of the time. Usually during the summer, people are gone to the regional powwows for indeterminate periods.

There were some aspects of the project that were not as efficient or effective as hoped. The interviewers found that the tape recorder setup was a bit intrusive given the large size of the tabletop, high quality microphone initially used. For the later interviews, we were able to switch to a lapel-type microphone that seemed to work better. Our interviewers, while approving of gathering and preserving this knowledge, were not committed to sticking it out and getting the interview portion of the project completely finished. Simplicistically, the new traditionalism is related to maintaining the Smokehouse spirituality and fishing culture, and in many instances conflicts with modern work ethic or lunchbox mentality. While this traditionalism made them very effective interviewers, without

personal commitment to the goals of the project it ultimately inhibited the process.

The major problem with the whole interview process was the loss of firsthand knowledge and a reliance on anecdotal information. In Swinomish, the influence of western culture is well over 150 years old and even second-hand information is becoming scarce as less traditional knowledge is passed from generation to generation and what is passed on is not being practiced. But even though most elder's sentiments were this work was too late in coming, Swinomish elder Ivan Willup said, "Things like what you guys are doing are a good thing...keeping [the culture] active...piece it all together and you'll have something." If you are interested in gathering this type of information, start now!

### Conclusions

This project was created because the standard approach to wetland function valuations failed to address critical cultural issues related to wetlands. With continued work, we hope to develop a Swinomish-specific method for inventorying and assessing wetlands, ultimately leading to culturally sensitive and resource-protecting regulations. With our limited cultural sources, we continue to research archival testimony and interviews and hope to start another round of interviews focusing on younger Tribal members and their memory of traditional practices by their parents, grandparents and relatives. This project continues to be ongoing and we will incorporate new information into the cultural module as needed. We are fortunate that, as the Tribal government and regulatory authority, we are able to incorporate cultural values within our policies. While planning, as a municipal practice, is a very "western" activity, the Tribe is able to use and learn these practices in an adaptive regulatory strategy while maintaining its cultural heritage. We are also able to maintain a respect for these cultural practices and protect the information as the sources and knowledgeable elders deem appropriate, since

ultimately, we are accountable to our constituents, the people we interviewed, our families, and the Tribal community.

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# OFFICE OF SUBSISTENCE MANAGEMENT AND ISSUES AND CHALLENGES OF INTEGRATING TEK INTO SUBSISTENCE FISHERIES MANAGEMENT

*By Polly Wheeler  
and Amy Craver*

## Introduction

The intent of this article is to introduce a relatively new federal program funding social science research on fisheries in Alaska. We discuss some of the challenges of this developing applied social science program, specifically focusing on some of the issues raised by research involving the collection and analysis of traditional ecological knowledge (TEK) and its application to fisheries management in Alaska. We highlight several projects funded through the program, and close with some observations on elements of successful projects.

## Background

As a result of an impasse between the state and federal governments over-management of subsistence, the federal government assumed management authority for subsistence hunting, trapping, and fishing (on non-navigable waters) on federal conservation units in Alaska in 1990; management authority was expanded to include fisheries on all federally managed public lands and waters in 1999 (for further information see Buklis, 2002; Cultural Survival, Winter 1998). The federal program introduced a huge level of complexity to subsistence management, with the involvement of five federal agencies (USDA Forest Service, and four Department of Interior agencies: Bureau of Indian Affairs, Fish and Wildlife Service, National Park Service and Bureau of Land Management), the Federal Subsistence Board (comprised of the Alaska heads of the five agencies) and



*Polly Wheeler (right) and Amy Craver*

10 Regional Advisory Councils<sup>1</sup>. These five federal agencies have a patchwork of jurisdiction across the state, with responsibility for management of subsistence on about 60% of the lands in the state.<sup>2</sup>

The Fisheries Resource Monitoring Program (Monitoring Program) was initiated in 2000, in response to federal assumption of management authority for subsistence fisheries. Housed within the federal Office of Subsistence Management (OSM), the Monitoring Program is a unique, multidisciplinary, multi-million dollar fisheries research program authorized by Section 812 of ANILCA (Alaska National Interest Lands Conservation Act).<sup>3</sup> The purpose of the Monitoring Program is to fund projects that provide information for federal subsistence fisheries management. On an annual basis, monies are divided up by region and type (1/3 to projects focusing on Harvest

Monitoring and Traditional Ecological Knowledge [HM-TEK], 2/3 to Stock Status and Trends [SST] projects). Projects funded under the HM-TEK data type include standard subsistence harvest assessment projects, which provide information on community harvest estimates (and often information on demographics, economics, as well as resource use and sharing information), as well as projects focusing on the collection and analysis of TEK. SST projects include conventional biological projects (i.e., counting towers, weirs, and age-sex-length sampling), as well as innovative projects utilizing radio-telemetry, genetics, and other technologies.

Project proposals are initially reviewed by staff anthropologists and biologists, and ultimately by a Technical Review Committee comprised of disciplinary experts who are also representatives of different state and federal

agencies. Proposals are evaluated for technical merit, strategic priority, direct application to or association with a federal subsistence fishery, the importance of information for federal fisheries management, capacity building<sup>4</sup> efforts, and past performance of investigators. To date, 167 projects (some one year in duration, most multiyear) have been funded statewide. While most of the projects have state or federal agency staff as an investigator, about 1/3 to 1/2 of all of the projects have staff from tribal or rural organizations serving as co-investigators.

A unique aspect of the Monitoring Program is its specific focus on projects involving the collection and analysis of TEK. In designing the program, architects clearly understood the utility of TEK for providing information about customary and traditional patterns of harvest and use of subsistence species. Perhaps more importantly, however, they recognized that TEK can provide rich context for understanding harvest survey information, as well as detailed qualitative information useful for interpreting biological and environmental phenomena. In recognizing the value of TEK for fisheries management, the design of the program implicitly addressed fundamental questions often raised with regard to TEK, namely, is it an appropriate focus for research and should it be used in management? The answer is clearly yes, but the larger questions of how best to conduct TEK research and how best to incorporate research findings into management remain. Thus, the very uniqueness of the program design has also been one of its greatest challenges.

Perhaps not surprisingly, the fisheries management arena in Alaska has historically been rooted in the natural sciences. Management agencies have generally focused on hiring biologists to research the status, trends, and life history characteristics of different fish species. And while there is recognition that people use the resource, the emphasis of most research has been on biology. Management agencies have sometimes recognized that there is value in understanding the patterns of use by people dependent on the resource, but it has not

been until fairly recently that they have shown interest in the knowledge held by people dependent on the resources. And while there may be interest, the greatest challenge continues to be how to best utilize this information. Thus, while most natural resource managers acknowledge that people have valuable information based on their long term dependence, use, and observation of natural resources, how to incorporate this information into management remains a challenge.

### Issues and Challenges

With its clear structural guidelines, the Monitoring Program provides a unique opportunity to address some of the underlying issues regarding application of TEK. As with any new program, however, opportunities also present challenges, and we address some of the larger ones herein. While one of the greatest challenges for the Monitoring Program is in incorporating TEK into fisheries management (as discussed above) consideration of this raises several related methodological and analytical issues. Specifically, two key issues in terms of application of TEK include: 1) methods for documenting TEK; and 2) approaches for summarizing, analyzing and presenting TEK.

#### *Methods for Documenting TEK*

An ongoing concern with regard to documenting TEK (that is, beyond should it be done) is how to best collect information in the context of its application to fisheries management. Because TEK is typically some combination of worldview and technical knowledge, employing a variety of data collection methods helps to better understand and address the interrelated, component parts that comprise the complex whole. Towards this end, investigators funded through the Monitoring Program have generally focused on four different means of collecting TEK: interviews, mapping, place names, and taxonomies.

Most investigators utilize the standard ethnographic approach of key informant interviews with local experts, recognizing that because their

knowledge is based on lifetimes of firsthand observation and on knowledge passed down from previous generations, these individuals often possess a wealth of insights into the habits, seasonal movements, and availability of various fish species. A key methodological issue directly affecting how or if the information will be used in management is how investigators select and/or characterize their key informants. Systematic identification of a sample of experts or highly knowledgeable participants is vital to the success of TEK projects. While there is a tendency among some investigators to want to protect the identity of local experts, this can be counterproductive, as fisheries managers (among others) are often interested in what qualifies someone as an expert, and specifically, how or why were they selected to be interviewed. While this is typically tied to an individual's long term residence in a place or her particular skill as a fisherperson, regardless of what qualifies a person as an expert, researchers should include a description of the selection process, as the source of qualitative information is a means to evaluate its utility.

Because interviews alone cannot capture all aspects of TEK, investigators are encouraged to utilize other approaches to documenting TEK. Specifically, maps and drawings can be used as prompts and as a means of eliciting information, as well as for providing further explanation. In addition to maps, place names can provide another important means of understanding how people understand their natural environment, as they convey important information about peoples' understanding of their physical environment. Finally, taxonomies can provide insights into how people structure information.

#### *Approaches to Organizing and Presenting TEK*

A continuing challenge for investigators funded through the Monitoring Program is what to do with the information once it is collected, specifically the organization, analysis, and presentation of TEK. Approaches typically fall into

two general camps. Some investigators include minimal introductory comments followed by lengthy interview transcripts, so as to allow the speaker to present the information in his or her own voice. Others provide rich context for analysis and understanding, typically by summarizing information by topic and/or drawing on biological information for comparison purposes. Given the focus of the Monitoring Program on the application of information to fisheries management, we have found the latter approach to be most useful.

Several investigators have developed databases as an alternative means for organizing and presenting TEK. In these instances, the goal of the database is generally to convert existing TEK narrative text data into a retrievable, usable format computer accessible CD-ROM (using specially designed software). Entries are typically worded by general categories dealing with topic area, species and geographic area. The strength of the database approach is that narratives are searchable; however, a downside is that the data lacks contextual nuances, and it is in its raw form and not summarized. Although the underlying goal of the database approach is to make interviews with local residents readily available to agency staff, the study community, and the public, we have found that they are not generally widely used. It may be that databases are most useful as a means to an end, rather than an end in and of itself. That is, databases can provide a useful repository for information, and if well designed, can provide a wealth of information for additional analysis. However, the lack of direct application to fisheries management is a significant disadvantage within the context of the Monitoring Program.

### Case Studies

The previous discussion highlighted some of the issues and challenges of collecting and applying TEK to fisheries management. The four case studies below provide several specific examples of successful projects with clear application to fisheries management.

#### *TEK and Harvest Assessment of Non-salmon on the Koyukuk River*

A collaborative effort between the Alaska Department of Fish and Game (ADF&G), Tanana Chiefs Conference, Inc. (the regional nonprofit organization representing 43 Interior Tribes), and a private researcher, the goal of this two year project was to collect TEK on and assess the harvest of non-salmon species utilized by residents of the seven Koyukuk River communities. Using a two-pronged approach, both TEK and harvest information was collected on all non-salmon species utilized by Koyukuk River residents. Non-salmon species have long been important to local subsistence economies in Interior Alaska, due in large part to their year-round availability, but use of and local understanding these fish in the Koyukuk area is not well understood by western scientists. The Koyukuk River is complex with different species available in the upper and lower reaches, different fishing patterns, and different gear types used. This study aimed to fully document these uses and differences. Researchers conducted a census survey, collecting household level harvest, use, and sharing information by species for over 240 households (96% of total households in region). In addition, researchers tapped into the rich body of local knowledge through interviews with 29 residents of the region, most of them elders and all of them known for their expertise in fish and fishing in their region. Interviews with these local experts provided information on topics such as when and where whitefish are ripe with eggs; what month burbot livers swell with oil; when blackfish congregate at lake ice openings; and how and when whitefish move through local streams, sloughs, and lake systems. These practical insights can help biologists learn more about aspects of spawning biology, fat metabolism and the seasonal movement of fish, particularly for species about which they know very little. Through collection of taxonomies, researchers found that in many cases the people of the Koyukuk drainage had a different, more detailed organization of fish species than western



photo by Polly Wheeler

#### *Salmon Hanging at a Yukon River Fish Camp*

science. As an example, respondents offered three Koyukon terms for a Alaskan blackfish; one general term applicable to all blackfish- *oonyhey*- and two terms that pertain to blackfish of a particular size, condition, or time of year. The term *toonoon* was used to refer to those blackfish in late winter that become bloated and filled with water, and *k'edzeel baan* is the term used for the largest blackfish that reach eight to ten inches in size. These terms demonstrate to a rich Native taxonomy for a fish that western science knows by a single name.

#### *North Slope (Anaktuvuk Pass) Subsistence Fish Harvest Assessment*

A collaborative effort between ADF&G, the North Slope Borough and the City of Anaktuvuk Pass, the goal of this two year project was to assess the harvest of a variety of non-salmon species utilized by the Nunamiut Eskimos of Anaktuvuk Pass, and to produce a basic ethnography of Nunamiut fishing that provides a deeper temporal perspective than what is captured in harvest assessment (but which provides important context for understanding that information). The harvest assessment component

of this project gathered information on household harvest and use, fishing locations, productivity, effort, gear types, and participation rates. Key informant interviews focused on descriptive Nunamiut natural history information on key fish species. In addition, investigators also collected place names in an effort to understand how Nunamiut understand their natural environment. Through this work they found that Nunamiut place names fall into three general categories: one which includes memorializing a person or an event to a particular area, secondly a description of a physical or geographic landmark, and finally those place names which are linked to environmental conditions and provide information about an area's resource base. An example of the latter category is *Paiaug*, a section of the upper Anaktuvuk River where Dolly Varden fish can be found year round in open water (Spearman 2004). This information is not only interesting from an ethnographic perspective, it can provide valuable context for understanding species distribution and environmental changes over time.

*Traditional Clan Subsistence Territories of Dry Bay and Traditional Tlingit Knowledge of Salmon Management and Ecology of Dry Bay, Alsek River Area*

This project was a collaborative effort between a Tlingit anthropologist and a National Park Service anthropologist. Drawing on ethnohistorical and ethnographic methods, this project compares traditional Tlingit knowledge of salmon management to the contemporary management styles of the Tlingit people. The goal of this project is to describe traditional tribal territories through interviews with house, clan, and tribal elders who are active resource users to delineate the clan territories and reconstruct the role of clan affiliation in traditional determinations of resource allocation and management. Key informant interviews with Tribal elders focused on collecting firsthand information on traditional fishing sites in the Yakutat area. Elders discussed locations of clan fish camps as well as the timing of the arrival of salmon to streams and

lakes within specific tribal territories. The information collected in the key informant interviews was then used to contribute to the development of an annotated GIS map intended to further document the historical and contemporary territories throughout the Alsek River Area (Dry Bay). Key informant interviews and annotated maps supplement each other and are used to provide a holistic perspective for evaluating the future management as salmon abundance and harvest pressure change over time.

One of the more promising approaches in the applied research realm is in projects that incorporate both western science and traditional knowledge. The Monitoring Program recently funded one such project, entitled *A Radio Telemetry and Traditional Ecological Knowledge Study of the Seasonal Migrations and Important Habitats of Humpback and Broad Whitefish in the Kanuti National Wildlife Refuge*. This project proposes a unique and synthetic approach to understanding whitefish ecology by blending western science and TEK. Part of the study consists of a radio telemetry study looking at whitefish in the Kanuti National Wildlife Refuge. Radio transmitters will be implanted in 30 humpback and 30 broad whitefish in Kanuti River in 2004. The fish will then be tracked by air and boat for 13 months, identifying feeding, over-wintering and spawning habitats. The process will be repeated on the South Fork of the Koyukuk River in 2005. This information will then be compared with TEK on whitefish ecology, focusing on life history/biological information including habitat preferences, spawning & rearing areas, and seasonal movements of fish). Using both approaches, investigators will then develop a synthetic model of whitefish ecology. This is a vitally important resource in many parts of Alaska, and a species about which little is known.

### Conclusion

After funding and administering well over 50 projects dealing in some way

with TEK, we have some observations about the characteristics of the investigators and projects that appear to best address the parameters of our program. As noted, the Monitoring Program has a specific focus, namely to provide information for federal subsistence fisheries management. As such, funded projects have a clear mandate, and we have identified several key characteristics of successful projects.

First and foremost, investigators that generally have the greatest success in bridging the gap between TEK and western science tend to have long-term relationships with the people and community with whom they are working, they often can speak and/or write the language, and they actively participate in the activities they are writing about. This latter point is important for two reasons. First, it provides researchers with credibility both at the local level and also when working with their biologist counterparts in the management realm. Second, when researchers have first hand experience with and know a lot about their topic, they know what questions to ask, and as important, how to integrate and organize different kinds of information in a management context. Additionally, having sound relationships with other researchers and managers can help to focus research questions, particularly if there are critical research or management issues.

Another critical element for successful TEK projects is documenting TEK in a rigorous manner. This includes systematically identifying experts and demonstrating or qualifying their knowledge of a particular place or skill. Clearly, managers and the general public can recognize expertise; documentation of such expertise by researchers helps to situate and substantiate the information collected. Rigor in methods of collection is also essential; regardless of which method(s) one uses, being able to replicate the process is, in part, what makes research scientific (Johnson 1990). In general, the most successful researchers are the ones that have been trained in and use traditional ethnographic field methods, with associated generation of detailed field notes and

documentation of information. As a related idea, researchers that employ a variety of data collection methods, including standard ethnographic interviewing, participant observation, spatial mapping, and native taxonomies and place names to document descriptions of trends in harvests and use patterns, fish populations, and fish ecology (among others), generally collect and provide the most useful information for use in management. Practically speaking, utilizing the complete ethnographic "tool kit" leads to more holistic and applicable information.

Ultimately, the goal of the Monitoring Program is to provide fisheries managers with the best information available to ensure opportunities for continued subsistence use of fisheries resources for future generations. This goal is achieved in large part when investigators work to incorporate TEK into research and management. In so doing, local people are active and informed participants in the research and management process and their knowledge is a valuable contribution to management.

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- <sup>1</sup>For the purposes of federal subsistence management, Alaska is divided into ten geographic regions, each of which has a Regional Advisory Council (Council). Councils are comprised of 10- 13 local residents representing sport, commercial, and subsistence hunting and fishing interests. In addition to providing a public forum for addressing subsistence issues, Councils review policies and management plans, and provide recommendations and important information to the Federal Subsistence Board.
- <sup>2</sup>The federal government's management authority for subsistence is limited to uses by federally qualified users on federal public lands. The state has management authority for subsistence, commercial and sport uses on all state lands, and commercial and sport uses on federal lands.
- <sup>3</sup>Section 812 of ANILCA specifically reads: "...The Secretary, in cooperation with the State and other appropriate Federal agencies, shall undertake research on fish and wildlife and subsistence uses on the public lands, seek data from, consult with and make use of, the special knowledge of local residents engaged in subsistence uses; and make
- the results of such research available to the State, the local and regional councils established by the Secretary or State pursuant to §805, and other appropriate persons and organizations."
- <sup>4</sup>For the purposes of the Monitoring Program, capacity building is defined as increasing the ability of Tribes, rural organizations and non-profit organizations to participate meaningfully in federal subsistence fisheries management and research. This is implemented in part through requiring that investigators funded through the Monitoring Program work with local and native organizations for project identification, administration, and operation.
- Disclaimer: Views expressed by the author do not necessarily represent the views of the U.S. Fish and Wildlife Service or the federal government.*
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# THE INTEGRATION OF TRIBAL TRADITIONAL LIFEWAYS INTO EPA'S DECISION MAKING

By Patricia Cirone

On November 6, 2000, the President of the United States of America issued Executive Order 13175 requiring consultation and coordination with Indian Tribal governments in the "development of Federal policies that have tribal implications, to strengthen the United States government-to-government relationships with Indian tribes, and to reduce the imposition of unfunded mandates upon Indian tribes." Within the U.S. Environmental Protection Agency (EPA) consultation has taken many forms. One way of fostering a strong working relationship between tribes and EPA has been through EPA-Tribal Councils.

The EPA-Tribal Science Council was formed in 2000 under the auspices of EPA's Office of Research and Development to provide a structure for tribal involvement in EPA's science efforts. The Council, made up of representatives from tribes across the nation and EPA, is intended to serve as a vehicle through which EPA may gain an understanding of scientific issues that are of highest priority to tribes at a national level. The Council also offers tribes an opportunity to influence EPA's scientific agenda by raising these priority issues to an EPA-wide group.

At the initial gathering, tribal members of the EPA-Tribal Science Council described their view of Tribal Traditional Lifeways and western science. James Ransome of the St. Regis Mohawk Tribe illustrated the Haudenosaunee (Iroquois Confederacy) concept of the parallel processes of gathering scientific evidence and sharing traditional knowledge with the metaphor of steering a ship and paddling a canoe. The ship represents western science and the canoe represents Tribal Traditional Lifeways, each traveling on the same path, but in different vessels. The ship cannot steer the canoe; the canoe cannot steer

the ship. EPA's Tribal Science Council can act as a meeting place where these two groups can share information that may contribute to environmental protection for all peoples with neither culture relinquishing its identity.

When discussing this effort to bring western scientists and tribal people together, tribal members of the EPA-Tribal Science Council raised concerns that are echoed across Indian Country. Tribal Traditional Lifeways are passed down orally, from person to person, generation to generation, whereas western science relies on the written word. Native Americans believe that scientific analyses are done in a metaphorical "black box" with little or no tribal input, and many western scientists perceive that tribal people do not want to share their Tribal Traditional Lifeways with outsiders. Given this background, the EPA-Tribal Science Council members engaged with the hope that their work would open the door to a broader view of environmental protection across the cultural landscape.

## Critical Issues for the EPA-Tribal Science Council

The tribal members of the EPA-Tribal Science Council identified three critical areas that they wanted the Council to investigate: 1) data quality, 2) preserving data confidentiality, and 3) subsistence. Data quality is a practical issue of how to best inform the tribes of EPA's requirements for data quality. EPA has data quality system requirements and guidelines that are available to the public (<http://www.epa.gov/quality/internal.html>).

The second critical area, confidentiality of data, is one that consistently troubles tribes. When tribes provide EPA access to tribal activities and Tribal Traditional Lifeways they ask, "What will you do with this information, if I give it to you? You will put it into your



Patricia Cirone

proverbial "black box" of risk assessment and issue a proclamation regarding our health that you will share with the public." As former EPA administrator William Ruckelshaus, stated in a talk he gave to the National Academy of Sciences in June 1983, "Science and law are [thus] partners at EPA, but uneasy partners." It is always a struggle to reconcile the legal evidentiary requirements, the public right to know as defined in the Freedom of Information Act, and tribal peoples' concerns about releasing information. This is a matter of legal and public policy that is now being resolved on a case-by-case basis. The collection and use of scientific data and Tribal Traditional Lifeways needs to be open and transparent, as well as protective of tribal intellectual property rights.

The third critical area that was identified by the EPA-Tribal Science Council is subsistence. Subsistence has a number of different definitions depending on one's culture, experience, fields of study, or general lifestyle. In many ways the word "subsistence" is inadequate to express the wide range of issues related to cultural practices and the concerns tribes have brought to EPA.

The EPA-Tribal Science Council defined subsistence as:

Subsistence is about relationships between people and their surrounding environment, a way of living. Subsistence involves an intrinsic spiritual connection to the earth, and includes an understanding that the earth's resources will provide everything necessary for human survival. People who subsist from the earth's basic resources remain connected to those resources, living within the circle of life. Subsistence is about living in a way that will ensure the integrity of the earth's resources for the beneficial use of generations to come. (USEPA, 2002a)

Tribal Traditional Lifeways include spiritual, emotional, physical, and mental connections to the environment; connections which are based on intrinsic, immeasurable values. In this same holistic manner, these tribes also see the protection of sacred lands is part of subsistence.

As part of their deliberation regarding selection of subsistence as a priority, the EPA-Tribal Science Council identified environmental resource contamination as "the most critical tribal science issue at this time." From local contaminated sites to regional and global contaminant deposition, tribal people with a subsistence lifestyle are disproportionately impacted by resource contamination. Tribal subsistence consumption rates are typically many times higher than those of the general population, making the direct impact of resource contamination a much more immediate concern.

### **Tribal Knowledge and EPA's Risk Assessment Paradigm**

The tribes recognize that EPA defines exposure to environmental contaminants through its risk assessment paradigm. Therefore, the EPA-Tribal Science Council members decided that one of the ways to introduce Tribal Traditional



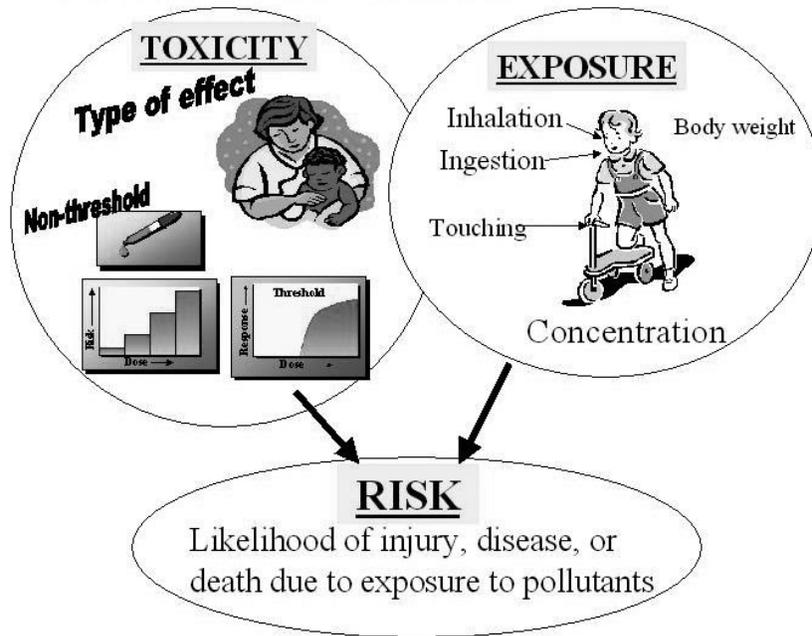
*Members of Tribal Science Council*

Lifeways into EPA culture was through the risk assessment process. EPA uses risk assessment as the organizing framework for the scientific analysis of the potential for harmful impacts to human health and the environment as a result of exposure to contaminants or other environmental stressors. Risk assessment is one of the factors used by EPA to establish clean-up levels at hazardous waste sites, water quality and air quality criteria, fish advisories, and bans or restricted uses for pesticides and other toxic chemicals.

Tribal people are concerned that the current EPA risk assessment methodology does not afford a complete accounting of tribal culture, values, and/or lifeways. The short-term goal of EPA's Tribal Science Council is to incorporate Tribal Traditional Lifeways into the exposure assumptions used in the existing EPA risk assessment model. The long-term goal is to seek a path where EPA decision-making shifts from assessing risk to preserving a healthy people and environment. Tribal people do not accept a separation of the human and ecological condition when they characterize risk; therefore Tribal Traditional Lifeways encompasses the land, water, people, and animals as whole

rather than separate parts. EPA initiated a series of workshops, seminars, and projects that involve the tribes in a dialogue about the integration of Tribal Traditional Lifeways into EPA risk assessment and decision-making. Through this dialogue as well as published papers, tribal people have described how Tribal Traditional Lifeways are now included in tribal decisions. They have also provided recommendations on how to adjust EPA's risk assessment practices to account for Tribal Traditional Lifeways.

Currently, Tribal Traditional Lifeways are included by tribes in evaluations of environmental problems in a variety of ways. Tribes may include unique tribal cultural activities such as native basketry, the importance of salmon and other fishes, native plant medicine, consumption of large amounts of fish and game, and sweat lodges as exposures for estimating potential risk to people or to communities (Harris and Harper, 1997). These types of tribal specific activities may be included in EPA risk assessments. However, there is no assurance that they will be included nor is there consistency in how they may be applied at different sites across the country.



### *Human Health Risk Assessment*

## A Health and Well-Being Paradigm

Some of the native speakers and writers have described situations where their goal was to include all those factors that contribute to the health and well-being of people and communities in addition to the usual exposure pathways that are considered in EPA risk assessments (Arquette et al., 2002; Harris and Harper, 2000; Lickers, 2003; Wolfley 1998). These factors range from the material elements of creation to the spiritual. This goal is most difficult to achieve within the confines of the current EPA risk assessment paradigm. Western science does not have all of the necessary tools to address these factors. It may be difficult for western scientists or environmental regulators to appreciate that tribal people may choose to preserve Tribal Traditional Lifeways. Sometimes this evidence is obscure or not obvious to western scientists or people of other cultures. The practice of Tribal Traditional Lifeways may be limited by the influence of western ideas and practices. Tribal people may not eat traditional foods because they are no

longer present (such as the buffalo), they believe that the foods are contaminated, or they no longer have access to traditional resources because of real estate development or other man-made structures, (dams, shopping malls, industrial complexes). These uncertainties limit the ability of western scientists to transform what is not understood into a scientific framework for decision-making.

The EPA-Tribal Science Council proposed a process for introducing the concept of health and well-being or Tribal Traditional Lifeways into EPA's risk assessments (USEPA, 2002b). This process is based on work begun by EPA's American Indian Environmental Office. The health and well-being process begins with "telling the story." The story should focus on cultural relationships that define health and well-being for Indigenous People. After telling the story, the process moves to "validating the story." This is done by going back to the tribes who told the story to make sure what they said was recorded and/or translated correctly. Then the story is analyzed. This analysis could involve EPA or may be done by tribal people, but

the difficulty remains in moving these stories into a process of assessing risk or achieving health and well-being. At the present time, the Tribal Health and Well-Being paradigm is continuing to evolve through discussions among tribal people. During this interim, EPA is working with its program councils and offices (American Indian Environmental Office, Tribal Pesticide Program Council, Superfund Working Group of the National Tribal Environmental Council, etc.) to incorporate, in some fashion, Tribal Traditional Lifeways into EPA's risk assessments.

## Criticism of EPA's Risk Assessment Practices

There has been criticism against EPA's risk assessment practices for not being inclusive of all people. In 2002, The National Environmental Justice Advisory Council, a federal advisory committee to EPA, provided advice to EPA on how to protect the health and safety of people consuming or using fish, aquatic plants, and wildlife (NEJAC, 2002). In its report titled "National Environmental Justice Advisory Council, Fish Consumption and Environmental Justice" the Council recommended that EPA protect "communities of color, low income communities, tribes, and other indigenous peoples" by accounting for the "cultural, traditional, religious, historical, economic, and legal contexts in which these affected groups consume and use aquatic and terrestrial resources" (NEJAC, 2002). The Council also recognized the special government-to-government relationship that tribes have with EPA as well as the potential for higher risks for tribal people due to their "dependence on subsistence fishing, hunting, and gathering" (NEJAC, 2002).

In early 2003, a U.S. Office of Management and Budget, Federal Register Notice asked for comments on federal agencies' regulations (Feb 3, 2003; 68 FR 5492-5527). Many of the comments that were directed toward EPA related to the agency's risk assessment practices. EPA staff developed a report to explain to the general public the principles that underlie the current EPA risk assess-

ment practices (USEPA, 2004). Most of the concerns about EPA's risk assessment practices are related to the uncertainty in the risk estimates. Uncertainty in risk assessments may be due to the lack of knowledge and/or variability in environmental data. In light of these uncertainties, EPA scientists and managers try to ensure that risks are not underestimated for infants, children, pregnant women, the elderly, or other populations that are identified as more likely to be at greater risk than the general population. In their report, EPA staff acknowledged the need to better understand the importance of cultural, economic, and ethnic activities on risk assessment practices. Tribal people, because of their long-held dietary traditions such as high consumption of fish and other aquatic life, may be at a greater risk.

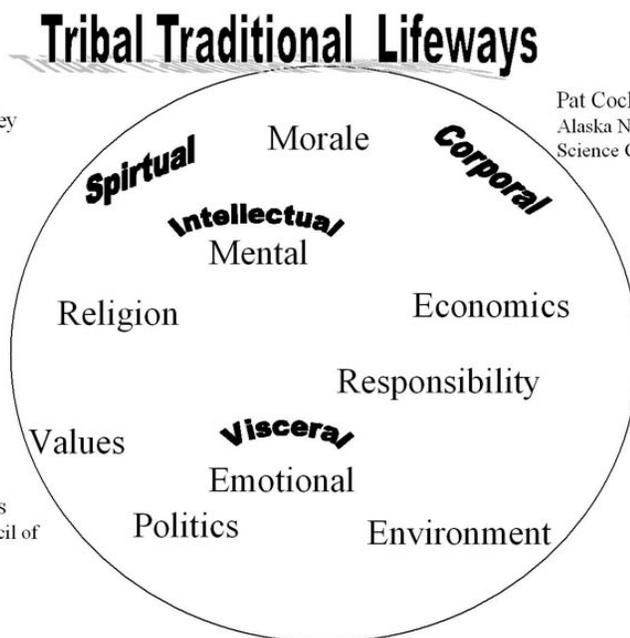
### Adjustment of EPA's Risk Assessment Paradigm

EPA has initiated a number of activities that should address some of the concerns raised by tribes with respect to risk assessment practices. EPA made a commitment to make its risk assessments "clear, transparent, and reasonable" (USEPA 1995). EPA has begun to eliminate the perception of risk assessment as a "black box" in this effort to achieve transparency. While identifying all assumptions and uncertainties may not resolve the issue of being inclusive of all people's traditions, it does at least illuminate the elements of the process for anyone who is interested in the "what, why, and where" of risk assessments that are produced by EPA.

EPA incorporated a planning and problem formulation phase into its 1998 Ecological Risk Assessment Guidelines (USEPA 1998) to foster a more thoughtful exchange between interested people, managers, and scientists. Planning and problem formulation were added to the risk assessment process to involve all people in the assumptions, policies, and scientific methods incorporated into risk assessment. EPA completed a Framework for Cumulative Risk Assessment in 2003 (USEPA, 2003). In this framework, EPA recommends that

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Shoban Tribe

Henry Lickers  
Mohawk Council of  
Akwesasne



Pat Cochran  
Alaska Native  
Science Commission

*Tribal Traditional Lifeways*

agency scientists integrate all aspects of a person's lifestyle that may contribute to the risk to their health.

EPA is also working with the international community to integrate ecological and human health risk assessments. In February 2003, EPA collaborated with the World Health Organization's International Programme on Chemical Safety, The European Commission, and the Organization for Economic Cooperation and Development to "foster integration of assessment approaches used to evaluate human health and ecological risks" (Suter, 2003). Thus EPA and a number of international groups are working to overcome the "legislative, educational, and disciplinary barriers to integration" (Suter, 2003). This international effort should help to move government agencies to a holistic view of environmental protection for all peoples.

### EPA Risk Assessment Projects with Tribes

In addition to changing national policies with respect to risk assessment practices, EPA staff is committed to working with tribal people on site-specific

risk assessments. One example of a site-specific assessment is the study of the cultural usages of native fish species in the Columbia River Basin (Cirone et al., 2002). This study was a cooperative effort by EPA with the Columbia River Intertribal Fish Commission, Warm Springs Tribe, Yakama Nation, Confederated Tribes of Umatilla Indian Reservation, and Nez Perce Tribe. The results of the study confirmed that because these tribes eat more fish than the typical US citizen, they may be at a greater risk of diseases related to the toxic chemical residues found in these fish. This case study illustrates a very real problem with risk assessments involving contaminated food that is a substantial portion of someone's diet. While there are potential health effects related to consuming contaminated fish, there are also benefits of eating fish that are rich in high quality proteins and compounds that prevent disease such as *omega* fatty acids. This issue presents a conundrum for tribes that rely on subsistence diets of native foods- foods that may pose a hazard to their health because of pollution. This argues for the need to preserve a healthy lifestyle by



*Yakama Tribe Fishing*

eliminating the source of pollutants in our environment.

In conclusion, EPA is working with tribes on a national and local level to develop 1) a better understanding of Tribal Traditional Lifeways, 2) a framework for including Tribal Traditional Lifeways into EPA decision-making, 3) information on Tribal Traditional Lifeways for application to specific environmental problems throughout the country, and 4) a pathway to preserving traditional lifeways that is clear and transparent for the tribes as well as respectful of tribal cultures.

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*Disclaimer: The opinions, findings, and conclusions reflect those of the authors and not necessarily the views of the USEPA.*

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# COMMUNITY CONSERVATION: A WORK IN PROGRESS

By *Trish Flaster*

Noted anthropologist Margaret Mead once said, "Never doubt that a small group of thoughtful committed people can change the world. Indeed, it's the only thing that ever has." Her statement sums up the philosophy of the U.S. Fish and Wildlife Service Medicinal Plant Working Group. This is the story of that group. It is the story of the evolution of an idea and the determination required to make it real. It is a story of community involvement and of people who care enough about plants to develop strategies to help ensure their future survival. This is the history of the Medicinal Plant Working Group (MPWG) under the guidance and leadership of the United States Fish and Wildlife Service (USFWS). It includes how it evolved, the projects to date, field data collected, and the community of people who have made it successful.

Today the role of MPWG is to forge partnerships with industry, government, academia, tribes and environmental organizations to facilitate sustainable use and conservation of medicinal plants. While our focus is on medicinals native to the United States, our membership includes international players, reflecting the fact that medicinal plants face similar challenges on a global scale. The Medicinal Plant Working Group is part of the (PCA), a consortium of ten US federal agencies and more than 190 non-federal agencies working collectively on issues associated with native plant extinction and native habitat restoration. PCA also serves as the North American Plant Specialist Group of the IUCN Species Survival Commission. The current chairperson of the MPWG is Patricia DeAngelis, Botanist, Division of Scientific Authority, U.S. Fish & Wildlife Service.

In 1999, through the creative thinking of Julie Lyke and Mary Maruca of the USFWS, a MPWG to facilitate sustainable use and conservation of

medicinal plants was proposed. They contacted plant conservation people working in various disciplines. The first meeting consisted of thirty people representing industry and pharmaceutical companies, herbalists, ethnobotanists, farmers, and federal government agencies including United States Department of Agriculture, Department of Defense, U.S. Forest Service, USFWS, Environmental Protection Agency, National Park Service U.S. Agency for International Development, Bureau of Land Management, Smithsonian, and the National Museum of the American Indian. Also present were various academic institutions including Native American colleges, and non-government organizations American Herbal Products Association, United Plant Savers (UPS), American Botanical Council, Rural Action, The Nature Conservancy, NatureServe, Native Plant Societies, Wild Flower Societies, and WWF. Several participants assigned themselves to 5 committees for future action Conservation, Sustainability, Public Information, Financial and Ethnobotany.

The primary focus of the Medicinal Plant Working Group is facilitating action on behalf of medicinal plants native to the United States that are of particular conservation concern. It aims to balance the biological and commercial needs of medicinal plants, so as to promote sustainable utilization and long-term conservation of native species. The working group facilitates information sharing among federal, state, and private organizations. Underway are projects to help:

- generate and share information regarding species of medicinal and economic importance and conservation concern;
- promote appropriate conservation measures for native medicinal plants;
- promote sustainable production of native medicinal plants;



*Trish Flaster*

- increase participation in native medicinal plant conservation; and
- encourage active participation by Tribes and other holders of traditional native medicinal plant knowledge.

(For more information, please see: [www.nps.gov/plants/medicinal](http://www.nps.gov/plants/medicinal), or contact the author for detailed charts.)

The basic goals of the MPWG demonstrate how critical community involvement can be to plant conservation goals. In the beginning we had no idea of how to proceed, but as we discussed by phone, in committees, we designed specific basic goals to demonstrate how concerned citizens, including Native Americans, come together on the issues associated with conserving medicinal plants within their communities. Volunteers from plant societies such as the Garden Clubs of America and from tribes now work with scientists who serve as team leaders to establish protocol and collect data. Eventually, once trends and definitive patterns become evident, such data will be used to help regulators make decisions to prevent over-harvesting and abuse of wild populations of medicinal plants. Two committees propelled themselves into action with this as an inherent goal: the Ethnobotany Committee and the Conservation Committee. What follows is the organizing premise and goals of the first of these two committees.

## Ethnobotany Committee

Ethnobotany is multi-disciplinary. To discover the practical potential of native plants not only requires knowledge of plants, but an understanding and sensitivity to the dynamics of how cultures work. By observing the intimate and harmonious relationship of indigenous cultures to their environment, their accumulated knowledge of the biodynamics of the natural world, and their traditions of stewardship that sustain fragile ecological balance, scientists, ethnobotanists, and others can gain insight into the management of land reserves, plant communities, and the biodiversity they sustain, in order to help maintain a balanced ecosystem for future generations. The committee outlined the following objectives:

- Encourage active participation by tribes and other holders of traditional ecological knowledge pertaining to native medicinal plants
- Conserve indigenous plants and plant communities used in traditional medicine, ceremony, ethnobotany, and the natural products industry.
- Preserve indigenous and immigrant knowledge, culture and biodiversity through education aimed at retaining, reinforcing and revitalizing this knowledge of plants. "Indigenous" pertains to the knowledge of the First Nations, as well as to the knowledge of rural U.S.-adopted cultures (e.g. African Americans, Appalachians, Asian and other cultures now living in the U.S.)
- Support community sovereignty through the Convention on Biological Diversity.
- Establish medicinal plant centers dedicated to conserving the plants, providing information about their uses, and ensuring a sustainable supply for future extraction, in partnership with the communities.
- Collaborate with the other efforts under the Medicinal Plant Working Group to incorporate traditional ecological knowledge within studies that focus on sustaining medicinal plants in the wild and in cultivation.

- Establish an ethnobotanical/ethnomedicinal seed clearinghouse and exchange, working with traditional elders and communities.

Several priority actions identified by the committee were to establish an elder link: this involves inviting elders to participate and set direction for actions develop a list of contacts; establish regional centers as loci for farming and education as ties into plant communities; contact Tribal colleges, Indian health services and youth organizations; encourage regional ethnoconference sponsorship that would bring together tribal and non-tribal knowledge on the subject of medicinals; and contact coordinators of scheduled meetings in 2000-2001 (e.g. Conference of the Americas, Environmental Issues Forum, Society for Economic Botany, Building Bridges II).

The first goal of the Ethnobotany Committee was the establishment of a link with Native American elders to guide the MPWG's plant conservation efforts. A method was devised to objectively choose Elders. The committee established the following criteria for the selection process: 1) a person who was recognized by their tribe to be knowledgeable and concerned about medicinal plants, 2) a person who lived on reservation or within the Tribal community, and 3) a person who had access to communication (phone or email).

The committee also chose to select representatives from the 4 directions. This resulted in representatives from 9 tribes: Mohawk, Accohanock, Hitchiti, Cherokee, Yurok/Karuk, Catabwa, Canoncito, Navajo, Kumeyaay, Appalachian Cherokee.

After several meetings these elders formed their vision: *To preserve and protect plants of cultural significance to tribes in their natural habitats and ecosystems for the future, so that these plants may be available to future generations carrying out traditional practices.* To realize this vision the elders chose the following steps as actions to accomplish:

- List culturally sensitive plants significant to tribes
- Establish Plant inventories and training for Accohanock and Appalachian Cherokee tribes
- Serve as consultants on an industry symposium to be held annually by USFWS/MPWG
- Outreach to the National Congress of the American Indian

Leon Secatero, a Canoncito Navajo, leads the committee. The committee has met regularly under his guidance and attended the two annual USFWS/MPWG meetings where they expressed their views on conservation and how native people view their environment. The committee is currently working on a document providing guidance on traditional conservation practices as these relate to beginning of a new 500 year cycle anticipated by many tribal calendars.

## Conservation Committee

As a new committee of volunteers, the Conservation Committee challenged itself to find the best way to initiate a conservation program. The group recognized that there was a paucity of data on wild medicinals and sustainable harvesting. The committee did not have funds for field work, though it featured a number of concerned individuals who were already committed to take on a full-time issue. What the committee needed was a work force and funds to conduct field activities. At this important juncture, the MPWG became connected with Jane Henley, Chair of Partners for Plants, (PfP), of the Garden Club of America, (GCA) and then the chair of organization's Legislation Committee. Her knowledge of GCA members and principles as well as her passion for plants led to an active role for GCA.

In 1999, to further explore the possibilities, MPWG held a meeting in Asheville, North Carolina, ghuided by Julie Lyke and Mary Maruca with Gary Kauffman, U.S. Forest Service, Nora Murdoch, then of USFs, Jane Henley and Marion Hill, GCA, Alice Zawadzki, Wild Flower Preservation Society, Mark Widrlechner, USDA-Agriculture

Research Service and the Conservation Committee, Trish Flaster-Botanicals Liaisons, LLC Conservation and Ethnobotany Chair, Ed Fletcher- Sustainability Chair, and a few other local interested people.

The agreement of the Forest Service as well as the Garden Clubs of America was critical to the field work concept that was evolving in the MPWG. Initially, the already heavy workload of Forest Service employees made this community-based partnership less than desirable. But after many long discussions Gary Kauffman agreed to conduct field monitoring of selected medicinal plants on Forest Service lands in North Carolina. Gary has many responsibilities, but he has been a valiant leader and without him nothing would have been initiated.

The committee determined the plants on which to focus by using the following criteria:

1. Plant species in international trade and in heavy use
2. Plant species collected from the wild
3. Plant species with no data on their populations and their conservation
4. Plant species that were not extensively cultivated

We made a list that consisted of *Actaea* species (cohosh), *Ulmus rubra* (slippery elm), *Euphrasia officinalis* (eyebright), *Echinacea* species (coneflower), and others, cross-checking and modifying our list based on the concerns other organizations such as United Plant Savers had about wild plants in trade. To date the Conservative Committee has focused on *Actaea racemosa*, *Sanguinaria canadensis* and *Ligusticum porteri* for their sustainability field research. The following is a review of the plant's ecology, use, and the specific protocol for species.

#### *Actaea*

*Actaea* was first highlighted when the use of hormone therapy came under scrutiny. There were various articles demonstrating the health risks of using hormone therapy and evidence showing that maybe it was not valuable

for women in later years to protect them against osteoporosis or to support heart health. The demand for black cohosh, therefore, increased 511% in 1997 (Breevort 1998). Almost all black cohosh supplied for the herbal market is collected from wild populations, however, there are no demographic assessments of black cohosh and sustainable harvest levels are unknown. In 2000, an amount estimated between 300,000 and 500,000 pounds (dry) was wild-collected (NatureServe 2001) so there was an obvious need to monitor the wild populations and find sustainable levels. Black cohosh is used exclusively in parts of Europe and Australia. It is used in more than 29 Canadian drug products, with the supply coming mostly from the Blue Ridge Mountains in the Appalachian chain (Small & Catling 1999).

Little is known of the autoecology of *Actaea racemosa*: Black cohosh is a herbaceous perennial, commonly found in species rich habitats identified as "coves" and is thought to be locally abundant in the Appalachians. Black cohosh is found in deciduous forests in 27 eastern states and 2 provinces in Canada, and is currently ranked as secure throughout its range (Natural Heritage Network 2000). However, increases in wild collection could result in over harvest and threaten the viability of the species. An example of over harvest of black cohosh has occurred in the state of Illinois, which has resulted in ranking populations in the state as critically imperiled (Natural Heritage Network 2000).

From 2000-2004 Garden Club of America volunteers coming from Georgia, Tennessee, New Orleans, Virginia and of course, North Carolina, joined USFS botanist, Gary Kauffman, local grower and industry specialist on wild collections Ed Fletcher, various researchers from local universities, and independent researchers. Through discussions with USFS botanist Wayne Owen, and other scientists, a protocol to monitor 10X10m plots. was established. Several coves in which *Actaea* populations are dense were identified, transects were laid, and annually plants

are counted, measured, and complete differential harvest treatments of the mature plants randomly are annually and biannually dug. Quantitative analysis is ongoing and will be available within the next year or two as trends become evident.

What is most curious as a result of this project is realizing that *Actaea racemosa*, black and *Actaea podocarpa*, yellow cohosh grow together. The roots of *A. podocarpa* are distinctively yellow (left in photo), hence the common name yellow cohosh. The roots lose their color as they are dried and turn black making them difficult to differentiate from the . Although, there is no direct information regarding the harvest of yellow cohosh (*A. podocarpa*) from wild populations, it seems to be facing incidental collection and subsequent decline due to its resemblance to the widely collected *Actaea racemosa* (NatureServe 2001). Because of the sympatric nature of these two species, both were included in study.

The inclusion of incorrect species can compromise a product if the biological activity differs from that of the black cohosh. It is assumed the traditional knowledge of use is based on black cohosh. To tease this information out, chemical baselines are being established by the Naturals Product Research team at the University of Mississippi to determine if there are differences and if differentiation is highlighted due to harvesting pressures.

#### *Sanguinaria*

The *Sanguinaria canadensis*, or bloodroot, has been used during the mid 90's as a dental antiplaque agent. Recently there has been more interest in its antibiotic properties. Bloodroot is currently being harvested as cattle feed supplement (antibiotic) to prevent scours. It is principally being exported to Germany, where the industry is projecting annual harvest totals exceeding 25 metric tons. Bloodroot occurs in similar habitat, mesic deciduous hardwood forest, to black and yellow cohosh throughout its very broad range. Like black cohosh, the species has been found to be an excellent indicator for



*Bloodroot*

ginseng (*Panax quinquefolius*) since it also occurs in greater numbers in calcium rich habitats. Bloodroot is most conspicuous in the early spring when its bright white petals emerge, even before the leaves. While the undulate orbiculate leaves are also distinctive, they are not as conspicuous since they are typically overshadowed by numerous other taller herbs. As with the 2 cohosh species, the desirable medicinal portion of the plant is the narrow finger-like rhizomes. These rhizomes have a distinctive orange-red color, exuding a red latex when cut. Like many other mixed mesophytic forest herbs *Sanguinaria canadensis* occurs across a large portion of the eastern United States. Bloodroot has a distribution broader than black cohosh with occurrences in 5 Canadian provinces and thirty-eight states (Natureserve Explorer 2003). The range extends from Nova Scotia west to Manitoba and Minnesota, south to northern Florida and eastern Texas. The species is currently ranked as demonstrably secure (G5) throughout their ranges (Natureserve Explorer 2003).

While bloodroot is not threatened at this time, there is scant demographic information on the abundance and distribution of this species and sustainable harvest levels are unknown. During the last 25 years abundance data on the distribution of species across numerous forested communities forest has been gathered both on public and private lands within the southern Appalachians. The preliminary data suggest indicate

that bloodroot is neither as dense as black cohosh. Only 5 of the 191 sampled plots had greater than 2% bloodroot cover. Harvest levels of 25 metric tons or greater could rapidly deplete its numbers throughout the southern Appalachians as well as across significant portions of its range.

#### *Ligusticum*

*Ligusticum porteri*, or osha, is also a rhizomatous plant found in higher elevation in the Rocky Mountains. It is had been used traditionally by the Zuni and Mexican people for upper respiratory ailments, and as a talisman often worn around the neck. The plant is not cultivated and grows in a limited range. The same protocol as the Actaea project was implemented with the additions or taking x,y coordinates of the mature plants dug and tagging the site of the dug plant for tracking of regrowth. GCA volunteers, Denver Botanical Garden staff, local scientists and conservation minded people join local native people to work this project.

### Conclusions

We are retrieving meaningful data and are expanding sites into Virginia. There remains concern about erroneous data. To resolve that, we continue to increase training for volunteers, and the number of trained team leaders, as well as closely monitor the changes indicated by the data. However, more substantial benefits than the retrieval of data have come about as a result of this project.

Many types of people and organizations that do not necessarily communicate regularly are all now related by the common focus on sustainable plant harvests to sustain our lands. The Elder committee is interested in our success as they need to inventory their tribal lands. The GCA, the only organization that lobbies Washington to protect plants, is now aware of wild harvesting of medicinals and their traditional use. Finally, the industry active members of these sites are advising trade organizations to implement guidelines based on our findings. USFWS will also be incorporating our work to make informed

decisions when plant populations are compromised.

Finally, working with volunteers is incredible. To quote Gary Kauffman after our most recent field work: "There are many indirect benefits we learn from the project with volunteers that supercede the data collection. We see volunteers learning about scientific projects, volunteers having ownership of a project on public land, volunteers learning about impacts to medicinal plants on public lands, GCA communication among different clubs. As a USFS employee, I also learn about any concerns the volunteers have regarding current Forest policy." Yes, we will have field data to give the natural products industry and federal agencies, but we also have many more stakeholders taking care of our lands and encouraging their friends and elected officials to do the same. This is perhaps the most important contribution of community-based conservation

So in offering a medium to collect data and assisting in constructing better policies many forms of knowledge have come together. Traditional use and ecological knowledge from native people, policy information from government agencies, ecological knowledge from USFS and Public Gardens, market use trends from industry experts and community activity from GCA. Together this knowledge will make for better policies and communication between disparate groups.

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# STUDENTS GATHER LOCAL FISHERIES KNOWLEDGE AS PART OF A NOAA FISHERIES EDUCATION AND OUTREACH PROJECT

By Jennifer Isé  
and Susan Abbott-Jamieson

## Introduction

The Local Fisheries Knowledge Project is an education and outreach project developed by the National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NOAA Fisheries) to document and preserve the cultural, environmental, and historical knowledge of fishing communities. Participants interview community members involved in marine fishing and other marine-dependent professions. Currently, it is geared towards students at the high school and university levels. It is place-based, implemented locally by educational institutions and community groups with Agency support.

The project developed from an appreciation of the complex issues facing NOAA Fisheries. First, NOAA Fisheries and NOAA, its parent agency, want the public to learn how the marine ecosystem affects people—from its effects on climate to the economic opportunities it provides and the food it supplies to the world. Second, the Agency wants to cultivate interest in marine science and management, since it's predicted that 50% of the Agency's workforce will retire within a decade. Third, relations between the Agency and those impacted by fisheries regulations are sometimes strained. Fishermen<sup>1</sup> often complain that NOAA Fisheries does not listen to what they know and observe about the fisheries and local marine environments in which they work or recreate. Fisheries scientists often dismiss fishermen's knowledge because they perceive it as anecdotal and it is not collected with quantitative methods and presented in data formats with which they are

familiar. Fishermen's knowledge is also highly localized whereas fisheries science models are constructed to characterize regions. When regulations are created based on scientific assessments that conflict with fishermen's observations, some become angry and distrust the Agency. Therefore, the Agency is interested in how local ecological knowledge (LEK) research might address the differences in knowledge possessed by scientists and fishermen.

As this is an education and outreach project rather than a research effort, its scope is broader than LEK documentation alone. It includes a variety of marine-related topics so that the project can be adapted to a variety of classes and a variety of individual and community interests. Therefore, the term *local fisheries knowledge* (LFK) was adopted. For this project, LFK is defined as:

local or traditional knowledge of, or relating to, all aspects of marine fisheries including but not limited to ecology, technology, business, culture, art, attitudes and perceptions, and management and regulations.

The term evolved from the traditional and local ecological knowledge (TEK/LEK) research areas. LEK is similar to TEK in that it is tied to place (e.g., specific hunting or fishing grounds) and is knowledge acquired through experience and observation. It can be acquired over a single lifetime or over many generations. LEK differs from TEK in that it does not require an ancient or even a multi-generational accumulation of knowledge, it does not require that the population be indigenous, and it does not require embedding in a broader shared culture. In other words, an individual can accumulate LEK over the



Jennifer Isé (left) and  
Susan Abbott-Jamieson

course of one lifetime interacting with a local environment.

For instance, in one lifetime of fishing during the 1900s, a fisherman would have witnessed the effects of dramatic changes in fishing including commercial extinction of some species, damage to marine habitats, and advances in fishing technology. The first-hand accounts of elder fishermen can be used to inform fisheries scientists and managers about historic conditions and contribute to characterizing population baselines and trends and to design restoration projects. They can also contribute to documenting the history and culture of fishing communities. Therefore, the authors adopted the term 'local' rather than 'traditional' because, at least initially, project participants would be gathering local knowledge, that is, from non-Native fishermen. In the future, it would also like to involve Native communities.

## Overview of the LFK Project

Unlike typical marine education programs that focus on marine science, the LFK Project focuses on human dimensions of the marine environment by having students explore their individual and community connections with it. Marine

fishing and other locally relevant marine issues become the context to learn about a variety of subjects, including history, science, language arts, business, and art. Students conduct interviews to gather LFK and archive the transcripts in a publicly accessible web-based database, which was developed for the project. Interviews are classified using one or more of approximately 200 topic and subtopic keywords in the database. Local educators develop a place-based curriculum to implement the project and ensure its relevancy to students' lives and local communities. Students, teachers, and participating community members determine topics of interviews, selection of interview participants, and interview questions without involvement from NOAA Fisheries.

The goals of the LFK Project are to:

- Create or increase students' awareness and understanding of the marine environment by exploring their social, cultural, economic, and ecological connections to it.
- Promote learning and careers in marine science, management, and policy.
- Provide rigorous and relevant learning opportunities that connect students to issues in their communities and equip them with the skills necessary for work and continued education.
- Document and preserve local fisheries knowledge.

Two high schools in Maine are piloting the project throughout the 2003-2004 and 2004-2005 academic years. The project has had many positive outcomes but this article will highlight the following: community participation, intergenerational learning, the impact the project has had on local perceptions of NOAA Fisheries, and how the project might contribute to an increased awareness of LFK within NOAA Fisheries.

NOAA Fisheries contracted with The Rural School and Community Trust (Rural Trust), a nonprofit education organization dedicated to helping rural communities strengthen their schools by using place-based education projects.

The Rural Trust assisted teachers with curriculum development, linkages with other Maine education initiatives, and technology issues.

### The Pilot Schools and Communities

Both schools are located in rural communities, situated in coastal counties in the northeastern section of Maine, known as 'Downeast Maine'. They were chosen based on the Agency's interest in working with communities impacted by its regulations and by the Rural Trust's interest in rural communities. Both have rich histories tied to fishing. Current issues facing the communities include uncertainty about the long-term economic sustainability of the fishing sector and gentrification. Many locals have lived in the area for several generations and cannot afford to pay the rising property taxes caused by an influx of summer residents and retirees "from away" bidding up local property. This has consequences for long-time residents including changes in community structure and sense of place.

#### *Jonesport and Beals Island*

Jonesport-Beals High School (JBHS) students come from Jonesport and Beals Island, coastal fishing towns with a combined population of approximately 2000. Many residents are descendants of multi-generational fishing families and have maintained a way of life centered on the marine environment by adapting to fluctuations in species abundance and by keeping up with fishing technology.

The communities are heavily dependent on lobster fishing at present; lobster boats and lobster pounds are plentiful along the craggy coastline and in quiet coves. In the past, residents prospered from the commercial harvest of groundfish species such as cod and halibut. As those were overfished in the early and mid-1900s throughout New England, the lobster population dramatically increased in the absence of their predator. Building lobster boats is also a local tradition and important business. What is now a state-wide

tradition of racing lobster boats got its start here.

About 35 high school students have commercial fishing licenses and some already own their own boats. Many want to pursue fishing full time so parents and teachers are concerned that some will drop out of school to do so, as many fishermen did in the past. Many adults are concerned that fishing will no longer provide a viable career for their children due to high financial risks, uncertain catch levels, and regulations that limit fishermen's past freedoms. Most parents want their children to finish high school and either pursue an alternate career or develop a trade to fall back on. They were, therefore, supportive of the students' interviewing elder fishermen, learning from them about the ups and downs of the fishing lifestyle, and also exploring alternative marine-related careers.

#### *Ellsworth*

Ellsworth High School (EHS) is located in Ellsworth, population 6500. Its students come from 18 surrounding communities. Ellsworth is located about 45 minutes from the coast and has many fishing supportive industries. It is a bustling town in the summer when tourists overnight and stock up on supplies on their way to and from nearby Acadia National Park. Several restaurants cater to tourists with local fare, including lobster, shellfish, and haddock. The town also has a major seafood processing and distribution business. In the past, Ellsworth supported fishing by building ships for the groundfish fleet and harvesting the timber used in their construction.

The two schools differ in size and number of participants. JBHS has approximately 125 students, while EHS has approximately 700. Ten students, mostly from the 12<sup>th</sup> grade, and 2 teachers from the business and entrepreneurship courses participated from JBHS. At EHS, the entire 10<sup>th</sup> grade (about 175 students) and 16 teachers, who called themselves "The Cod Squad," participated.

Two themes guided the interviews. JBHS students explored their role in the changing Jonesport-Beals' marine culture. They interviewed only community

members over 80 years of age. Ellsworth students explored connections between marine fishing and their communities. Therefore, they interviewed professionals such as fishermen, restaurateurs, worm diggers, and seafood distributors. Initially they were unsure they had *any* connections to marine fishing but quickly found many, some even within their own families. Students from both schools read books about local fishing industries, such as Mark Kurlansky's *Cod: A Biography of the Fish that Changed the World*, and James Acheson's *Lobster Gangs of Maine*.

Based on feedback from participants, the project provided academic benefits to students and expanded many of their career interests, including interest in marine science professions. Recording, transcribing, and archiving the interviews in the LFK Database allowed both teachers and students to learn new technical skills.

### Community Connections

Community participation was essential to the project and led to new relationships between the schools and their communities. A strong partnership developed between JBHS and the Jonesport Historical Society, which grew from a few members at the beginning of the year to over 130 by the end. Society members helped students identify people to interview and provided information about them so students could tailor questions for each interview. They also held joint community events at the school so students could present their work and discuss with community members how the information collected could be used locally. At one meeting, residents brought in old photographs to contribute to the community's historical resources. Students scanned the photographs, converting them into digital computer files for long-term preservation. It was the first time some elders had visited the school. The Society now would like to open a museum to display this material. These collaborations heightened the students' appreciation for the importance of local cultural and historic preservation. They also recog-

nized that they were leading an effort that has great value to their community.

In Ellsworth, the school and the community library partnered to promote community participation. The library adopted some of the books the students were reading for its community reading program. They jointly sponsored "Oceans to Table," a community event drawing over 70 people. Participants ate a fish chowder dinner while listening to a fisherman, a fish processor and distributor, and a restaurateur explain how fishing affects Ellsworth. Teachers also created a new relationship with a local watershed group and are planning some joint activities.

### Intergenerational Learning

The project brought together several generations. Students learned from elders and gained a new appreciation and understanding of them. "I really like hearing the older people tell stories of their childhoods. I didn't realize the effects on the elders about how much the community has changed over the years and the [recent] abundance of lobsters," stated a senior from JBHS.

Students learned from the experiences of their elders about fisheries management issues. Former groundfish and urchin harvesters explained how over-harvesting led to commercial extinction of the species and negatively affected their families and communities. Jim Roberts, the Local Project Coordinator, noted that "the interviews have provided students with a historical perspective on the lean and fat years of lobstering ... how they have prospered because of responsibly sustaining the species through measures such as restrictions on legal size, v-notching, and trap limits..." Many fishermen explained that sustainable management and local stewardship of marine resources would provide local benefits.

Learning was a two way street as JBHS students introduced many adults to the latest computer and recording technologies. Students showcased the digital recorders and transcription software they used. As a result, the Jonesport Historical Society is retiring

its analogue recorder and will purchase a digital recorder, computer, and projector.

As a result of community partnerships and interaction with elders, students developed a deeper sense of place, established new relationships, and gained a historical perspective on local fisheries, particularly as it applies to current management issues. Even in Jonesport and Beals Island, small communities where most families know each other and the fishing culture is palpable, participants remarked that they learned more than anticipated about their families and neighbors, their local history, and the direct impacts fishing has had on the lives of residents.

### New Perceptions of NOAA Fisheries

The LFK Project introduced the communities to other aspects of NOAA Fisheries than the one of a restrictive regulator: one that acknowledges that fishermen's knowledge is of value and another that is a partner in education, providing resources and opportunities to their schools. In the early stages of project planning, many community members were openly suspicious about the motives of NOAA Fisheries and the project's purpose. NOAA Fisheries, Rural Trust staff, and several teachers were asked if NOAA Fisheries was sending students out to collect information from fishermen that it was not able to obtain itself. The suspicion largely subsided when teachers and community members viewed the keywords listed in the LFK Database, many of which (e.g., fisheries folk art) could not be used for regulatory purposes.

Building trust with these communities was a challenge. NOAA Fisheries staff had to overcome both the communities' distrust of the Agency and, because they were "from away," they had to earn the trust and respect of the locals with whom they worked. As Jim Acheson describes in *The Lobster Gangs of Maine*, Downeasters do not eagerly welcome outsiders; one may be considered an outsider even after living in a Downeast community for a lifetime! Rural Trust staff had already worked in the communities for a few

years and had earned the trust of local educators. Being a Downeast local, an educator, and having worked on a lobster boat in the past gave Jim Roberts a great deal of credibility with community members and with fishermen. However, it still took considerable effort by the Rural Trust and several teachers to talk community members into giving NOAA Fisheries staff and the project a chance. Once people realized that the community was in control of their projects, Jim remarked that fishermen lined up to be interviewed and students and teachers had to figure out how to avoid offending those they could not interview within the first year.

### Improving Awareness of LFK Research at NOAA Fisheries

The project is foremost an education project, and does not represent policy change for conducting fisheries research at NOAA Fisheries. However, its mere existence and having LFK interviews readily available in the LFK Database is one of many steps that will lead to a greater awareness of LFK at the Agency. The authors have already made several presentations within the Agency about the project and general applications for LFK research. This has provided opportunities to explain how anthropology and other social sciences can contribute to fisheries science and management.

Although the students were not professional interviewers, they have produced a set of interesting oral histories and commentaries that contain, among other things, fishermen's perceptions of fisheries management and how regulations have impacted communities. They also include some valuable bits of information about marine species and habitats. These interviews may contribute to the development of future collaborative research projects with teams of fishermen, marine scientists, and social scientists.

### Conclusion

This is a critical time to document and preserve local fisheries knowledge. The oldest surviving fishermen began

their fishing careers prior to World War II. Their historical knowledge of fishing and the marine environment, particularly during the early and mid-1900s, as well as their lived experience of local sociocultural and economic change is nearing extinction. Preserving their specialized knowledge through systematic interviewing and electronic archiving makes it available for future use by fisheries scientists and managers, fishing communities, students, and the public. Although many scientists and managers are uncertain how to use LFK, others recognize its potential (e.g., special issue, *Ecological Applications*, Vol. 10, No. 5, 2000).

It is also important to engage other generations of individuals possessing LFK about recent conditions in marine ecosystems and communities reliant on marine resources. However, as gentrification causes many to move away and switch careers, it will become increasingly hard to locate and interview these individuals. Future collaborative research projects should include individuals from many generations as appropriate.

Some transcripts are now online at the LFK Project website and more will soon be added. Both schools are continuing the project this year. NOAA Fisheries is interested in establishing partnerships to start new projects throughout the U.S., though Agency funding for this is uncertain. The LFK Database will expand in 2005 to serve as a national archive for LFK interview transcripts conducted by community groups, professional researchers, and others. While the acceptance of LFK research and its use by NOAA Fisheries has not been established, the authors believe that this project and the information stored in the database are steps towards opening those doors.

*For more information and to access the LFK Database visit: <http://www.st.nmfs.gov/lfkproject>. Please direct all comments and questions to: Jennifer. Ise@noaa.gov and Susan.Abbott-Jamieson@noaa.gov. To archive LFK interview transcripts, contact Dr. Abbott-Jamieson.*

*Disclaimer: The opinions and conclusions of this paper are solely those of the authors. They do not necessarily reflect the views or policy of the Department of Commerce, National Oceanic and Atmospheric Administration, or NOAA Fisheries.*

### Endnotes

<sup>1</sup>The term "fishermen" is used throughout to jointly reference both female and male fishers. It was selected over the androgynous term "fishers" because this is how both male and female fishers typically identify themselves.

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# THE NOAA FISHERIES ALASKA NATIVE TRADITIONAL ENVIRONMENTAL KNOWLEDGE DATABASE

*By Heather Lazrus  
and Jennifer Sepez*

Anthropologists working in natural resource management agencies have particularly important and interesting roles to play in raising awareness of long-standing relationships between local communities and natural resources, and in promoting means of reflecting this relationship while avoiding potentially harmful outcomes of careless incorporation of traditional environmental knowledge (TEK) in resource management. While there are many different approaches to initiating TEK awareness and incorporation at agencies, one obvious place to start is by compiling existing resources and making them available to scientists and managers in an accessible format. Projects that accomplish this might include an annotated bibliography, a library, or a TEK database, along with guides that assist the unfamiliar but interested user in finding and interpreting relevant materials. Databases or other types of compilations formed from existing materials do not require time-consuming and expensive original research. They can be put together relatively quickly and with limited resources, hopefully demonstrating the value of TEK to the agency and engendering both interest and funding for larger projects that include original research and collaborative work. However, as this paper examines, such a database can be as much of a stumbling block to genuine incorporation of TEK within an agency as a stepping stone to a larger TEK program.

The NOAA Fisheries Alaska Native Traditional Environmental Knowledge Database (also referred to as the Database) contains material compiled into a catalog of quotes and paraphrases from published literature, videos, and pre-existing interviews relevant to the management of natural marine resources. The Database was designed as



*Heather Lazrus (left) and Jennifer Sepez*

a resource for biologists and managers who write National Oceanic and Atmospheric Administration Fisheries (National Marine Fisheries Service/NOAA Fisheries) documents and who wish to incorporate TEK. The creation of the Database is timely and corresponds with the increasing salience of TEK among natural resource managers at NOAA Fisheries. In this paper we describe the window of opportunity that led to the creation of the database and, based on interviews with agency scientists, contractors and others involved in the production of agency documents, critically assess how and why the database was used- or not used- in its first year. These lessons are then drawn together in a way that can be used to inform and improve similar efforts in the future.

## **Origins of the NOAA Fisheries Alaska Native Traditional Environmental Knowledge Database**

The NOAA Fisheries Alaska Native Traditional Environmental Knowledge Database was initiated by Jon Isaacs to address a lack of TEK in the Alaska Groundfish Fisheries Draft Programmatic Supplemental Environmental Impact Statement (PSEIS) 2001, as expressed in public comments. Under the National Environmental Policy Act of 1970 (NEPA), the PSEIS is required to undergo several iterations involving the solicitation of public comment and subsequent revision of the document. In line with NEPA's public disclosure mandate,

the process of tracking and synthesizing public comments is designed to ensure to the greatest possible extent that public opinion is taken into account by the policy procedure. Achieving this requires an open, public process. The PSEIS comment period resulted in a total of 21,361 public comments.

Following the submission of these comments, a team of contractors compiled the 2001 Comment Analysis Report (CAR) in which each public comment was reviewed, coded and categorized under a "concern statement." Alaska Native Issues, including concern statements about TEK, were within the top ten public concerns. A number of concern statements addressed the issue of TEK, some very directly:

*Concern statement:* "The perspective of Traditional Knowledge should be incorporated into the Draft PSEIS and NMFS' fishery management."

*Description:* "NMFS should expand the Draft PSEIS discussion of Traditional Knowledge to include anthropological and historic observations as well as information from current participants."

This concern statement was developed from public comments such as the following:

"Also, the section on traditional ecological knowledge by Aleuts is too limited. The PSEIS should categorize the types of changes that Native Alaskans have noted in the environment and look at existing anthropological records to see what could be added. In addition the National Marine Fisheries Services has never conducted a survey or review of traditional ecological knowledge by talking to elders or reviewing published literature." *False Pass Tribal Council, False Pass AK*  
"An additional portion of the document that could probably be expanded is also the traditional ecological knowledge section.... I think that the section could be

improved by trying to not only look at quotes from current participants—current residents from these areas—but also the anthropological data, to get an overview as to how uses in fishery resources may have changed over time. I think this could be particularly useful in trying to compare some of the anthropological findings to the general theory of a regime shift. In other words, there's some anthropological data being conducted by one researcher in our area which strongly indicates that there have been regular cycles of abundance of marine mammals over time, that could be evaluated by looking at—essentially, looking at bones and middens from the various sites, various communities, that used to exist along the Aleutians. That type of information could certainly provide increased understanding of the potential of this type of regime shift to occur."

*Glen Merrill (CAR 2001)*

### Methodology and Aims

The NOAA Fisheries Alaska Native TEK Database was designed as an immediate response to the public comments, which could improve attention to TEK in the PSEIS within the very tight NEPA time frame. It was designed to be an efficient way for NOAA Fisheries scientists to access and incorporate TEK information related to their specific subsections of the PSEIS. Database reports, containing quotes and paraphrases from existing literature along with source information, were distributed to each NOAA scientist or contractor coordinating a chapter. The reports followed the topical organization of the PSEIS: Physical Environment, Threatened and Endangered Species, Target Species, Prohibited Species, Other Species of Fishes, Fish Habitat, Seabirds, Marine Mammals, Socioeconomics, Ecosystem. Each packet also contained translations of species terminology into the five major language groups found on the Alaska coastline. The packet was pre-

ceded by a brief set of guidelines on how to use the database and examples of relatively simple ways to report on the information.

In order to gauge how well the Database met the original goals, Sepez and Lazrus designed an internal assessment project in early 2004. Lazrus interviewed eight coordinating authors of the Alaska Groundfish PSEIS, the original intended users of the Database, and three initiators of the Database project. Interviews were designed to determine the extent to which the Database played a role in the incorporation of Alaska Native TEK in written contributions to the revised PSEIS. Interviews with contributors to the PSEIS focused on barriers to incorporation of material from the Database, applicability of the material included in the Database, and possible improvements to the Database which could facilitate the incorporation of Alaska Native TEK in future environmental impact statements. Additionally, the majority of interviews encompassed at least some unstructured discussion of the generalized function and suitability of TEK in natural resource management at agencies such as NOAA Fisheries.

We have compiled information from the interviews into recurring themes. Each topic discussed in the following critique arose at least once and was determined to be significant to our present two-pronged goal of firstly, providing a retrospective look at how the Database has been used, and secondly, drawing prescriptive measures from the interviews to improve the Database for use in the future.

### Results of the Assessment

The Database was created under the assumption that TEK needs to be conveyed to scientists in a medium which demonstrates an appreciation of its relevance to natural resource management (Sillitoe 1998:225). The following topics describe prominent issues and concerns raised in interviews with scientists involved in the iterative PSEIS process. These have not been organized into strictly positive or negative opinions of the Database. Instead, most

points include both challenges which researchers faced in using the Database and corresponding suggestions for improvement which expand upon the positive aspects of the Database.

#### *Signposts*

The majority of interviewees highlighted the usefulness of the Database for 'signposting' salient social and environmental issues. Several researchers explicitly noted that the Database was useful for directing research teams to issues which need to be highlighted. To this extent the Database was used indirectly by at least five different researchers to foreground relevant issues in the second draft of the PSEIS which had been obfuscated, buried or left out altogether in the first draft. The Database can be an important instrument to facilitate stepping outside of the box of limited programmatic scientific inquiry. Moreover, it serves to call certain phenomenon to the attention of researchers which may otherwise not have registered on their research radars.

The Database was useful to another researcher in its indications of overlaps between issues of concern both to scientists and Alaska Natives of which researchers were not previously aware. Where there are shared concerns about the state of the environment and environmental regulations, the 'cultural capital' of consensus can be employed to enact positive change. Maintaining and expanding the Database's broad scope will further enhance its utility by calling certain ecological and social phenomenon to the attention of researchers.

#### *Temporal Depth and Historical Perspectives*

The majority of researchers noted that great advantages exist by gaining historical perspectives on environmental phenomena through engagement with TEK. In some Alaskan locations currently managed by NOAA Fisheries, the temporal depth of scientific measurements and records may be almost ineffectually shallow. The temporal depth and historical perspectives on environmental or social changes of-

ferred by TEK can broaden the scope of scientific observations, signal processes which are obscured by a narrow period of observation to scientists in the field, and contribute to understandings of patterns of natural resource use.

While most researchers appreciated the historical depth provided by TEK, at least one made an argument for retaining a strong privileging of contemporary observations over historical ones. She argued that, practically, a more contemporary focus would be in line with the temporal scale of the PSEIS reports themselves, thus providing material which could be compared and contrasted with other scientific data. As indicated, however, most participants in the project submitted that the expanded temporal horizon afforded by TEK would provide a necessary supplement to the shallow time depth of the scientific data with which they worked. Moreover, historical trends illustrated by references in the Database can draw attention to phenomena and changes researchers had not yet encountered by other means.

This is a positive reflection about the Database specifically and about the incorporation of TEK in scientific resource management in general. To maintain and enhance its usefulness in this respect, the Database should retain a wide scope of both historical and contemporary material.

#### *Geographic Scope*

Two issues were brought up in interviews regarding the geographic scope and level of analysis to which Alaska Native TEK applies. Firstly, the Database refers to a region (Alaska), yet the specific areas to which TEK entries in the Database pertain may be imprecise. TEK can be primarily useful to reflect local environmental and social conditions; however without an explicit link to place, the reflection is blurred. Much of this is due to the use of pre-existing sources, which may not be precise in identifying geographic scope. A second concern raised in this respect also relates to the specificity of TEK. One researcher noted that TEK is very place specific, making it difficult to extrapolate information to the broader level of

analysis of reports such as the PSEIS. TEK is on the order of community scale observation. However, reports such as those comprising the PSEIS cover more expansive areas relevant to contemporary management units.

The first concern could be well addressed by including appropriately scaled maps in the Database with notations of place names. The second concern broaches issues with which academic and applied anthropologists have grappled extensively. The Database could explicitly address this incommensurability in its guidelines for use, thereby highlighting the complexity and specificity of Alaska Native TEK. The questions about maintaining the meaningfulness of TEK without diluting its specificity, however, are multifaceted and must to some extent be assessed on individual bases according to researchers' discretion.

#### *Speaker's Authority?*

Two broad concerns were expressed about how the Database presents the source of traditional knowledge. In one case, the researcher was concerned about the way in which TEK is not qualified according to the knowledge holder's own positionality. No information is provided describing the informant's length of residence in the area or their degree of expertise. Furthermore, another researcher pointed out that there is no indication of how widely held the informant's view is by others with similar tenure and experience. This concern points to the need to formulate some categorical way for users of the Database to evaluate the source of TEK.

It should be made explicit to users of the Database that the secondary material from which the Database entries have been gleaned may not have specified the speaker's authority. The authority or expertise of the TEK holder is assessed by the original researcher, although this can be difficult to do and is not a problem which is unique to the NOAA Fisheries Alaska Native TEK Database.

#### *Two Paradigms*

In response to the 2001 Draft PSEIS, one concern statement included in the

corresponding 2001 Draft CAR called attention to the need for a reformulated conception of the environment and how natural resources are accordingly managed:

In the same vein, several researchers also contemplated ways of overcoming the often stifling (in their opinions) expectations of the quantitative scientific paradigm. A need to broaden the

such different paradigms, similar conclusions may be taken as a strong sign of robustness.

The possibility that the Database is more suited to specific reports and analysis was introduced by several researchers. It was often emphasized in interviews that the productive usefulness of TEK cannot be underestimated for projects on relatively small geographic scales, for instance, in decisions about implementing marine protected areas or changing seasonal regulations in a certain area. Direct translatability should neither be assumed nor expected, but some room should be allowed for TEK to meaningfully inform natural resource management on behalf of agencies such as NOAA Fisheries. Confronting the dominant scientific paradigm, and realizing that TEK may stretch current scientific understandings, is especially important in that the "cross cultural study of [traditional environmental] knowledge may advance our scientific understanding of natural processes by challenging our concept and models" (Sillitoe, 1998:227).

### Discussion

In response to critiques (offered on the postmodernist front [see Hensel and Morrow 1998; Nadasdy 1999] and the conservation-biology front [see Diamond 1992; Krech 1999]) of incorporating traditional ecological knowledge into agencies' natural resource management regimes, Hunn et al. (2003:79) argue that "detailed, empirically validated knowledge of plants and animals and their roles within a local ecosystem is prerequisite to appreciating the impact of human harvests and designating sustainable resource management strategies."

Yet agencies must proceed with caution. A database is a simple, relatively inexpensive way to make relevant, preexisting TEK information available to agency staff. However, this treats the information in a way that Sillitoe (1998:228) warns against, "as if it were possible to pluck information relating to their specialisms out of cultural context and treat it as independent technical

“ We know there is a need to convey to our natural scientist colleagues that traditional environmental knowledge is defined by a different mode of empirical observation than that required by the modern scientific paradigm, one which may chart a different chain of causality, and lead to anything from jarringly incompatible to strikingly similar conclusions. Though rightly cautious and skeptical about specifics, our colleagues generally seem willing and interested in following the signposts. ”

*Concern Statement:* The management of fisheries should adopt the perspective of aboriginal peoples, and change the emphasis from managing the resources to managing our connection/relationship with the resource.

*Sample Public Comment:* "The concept or paradigm of resource management embodies a narrow sighted philosophy (generally attributed to western civilization) of man's dominance of the natural environment. ... it is time to change this paradigm from resource management to good stewardship of the Earth. Simply three more words, but a significantly different perspective." *Two Crow Environmental Inc Silver City NM*

usage of TEK was widely emphasized in the interviews. One contributor to the PSEIS professed not to have thought a lot about TEK, not that he did not think highly of it.

One researcher explicitly noted the incompatibility of what appeared to them to be two very different systems of thought. TEK is relayed in an anecdotal or storytelling format and because of this level of colloquialism and specificity it is hard to generalize the material to fit it into a model generated by the dominant scientific paradigm. It is cumbersome and potentially misleading to work TEK into the scientific models applied in the environmental impact statement. On the other hand, in spite of scalar, cognitive and epistemological differences, TEK and scientific assessment may frequently validate each other. Because they are produced by

facts." The Database does this in many respects, in response to the perceived desire of agency staff for these facts. The irony then is that one of the key stumbling blocks to using the database entries are their lack of context. The "pluck it out and plug it in" model for incorporating TEK into the workings of a management agency is not only problematic (see Berkes 1999), it also turns out to present challenges to would-be database users. Nonetheless, Huntington makes the point that TEK can be meaningfully utilized if 'TEK [is] promoted on its merits, scrutinized as other information is scrutinized, and applied in those instances where it makes a difference in the quality of research, the effectiveness of management, and the involvement of resource users in decisions that affect them' (2000:1273).

In spite of the lack of any extensive incorporation of material from the Database in the revised PSEIS, it has emerged as, in the words of one researcher, an "excellent and promising tool for fisheries research and management." We know there is a need to convey to our natural scientist colleagues that traditional environmental knowledge is defined by a different mode of empirical observation than that required by the modern scientific paradigm, one which may chart a different chain of causality, and lead to anything from jarringly incompatible to strikingly similar conclusions. Though rightly cautious and skeptical about specifics, our colleagues generally seem willing and interested in following the signposts.

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*Disclaimer: The opinions expressed in this article and in this issue are those of the authors named, and do not necessarily reflect the opinion of the National Marine Fisheries Service.*

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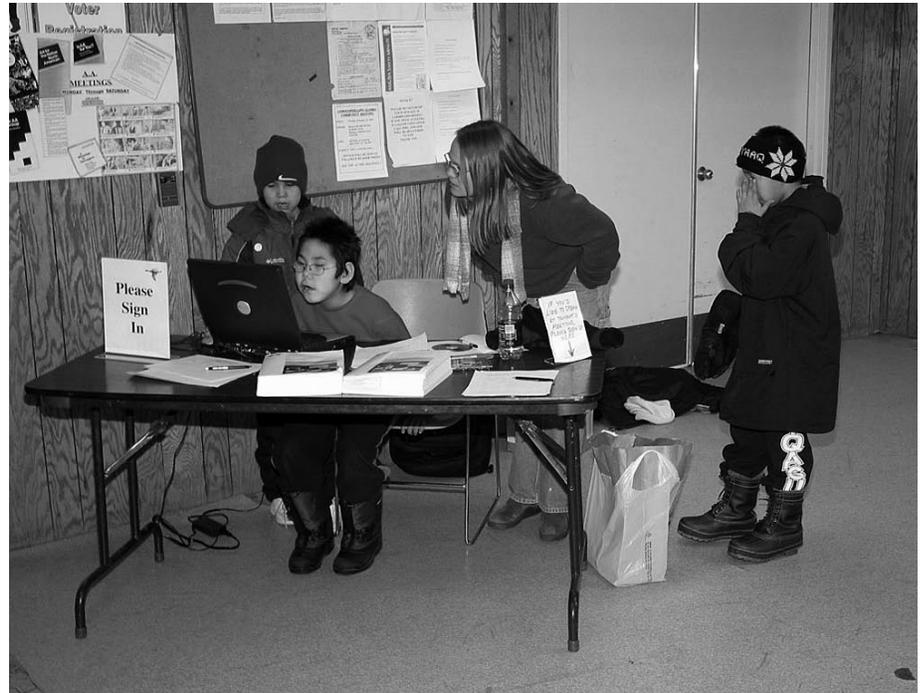
# INCORPORATING TRADITIONAL KNOWLEDGE IN THE BUREAU OF LAND MANAGEMENT'S PLANNING PROCESS IN THE NATIONAL PETROLEUM RESERVE-ALASKA

*By Stacie McIntosh*

The Bureau of Land Management (BLM), like many federal government agencies in the US, has specific handbooks and manuals to provide guidance for preparing, amending, revising, and implementing BLM land use plans. These land use plans (or LUPs in the acronym-heavy world of the federal government) establish the goals and objectives for resource management, and serve as the basis for management actions, on the public lands that are covered by the plan.

Although LUPs do not have a fixed shelf life, the BLM does require land use plans to be periodically evaluated, and recommends that this evaluation occur at least every five years. The LUP evaluation serves two primary purposes. At the internal scale, it determines if the decisions contained in the LUP are being implemented, whether the proposed mitigation measures are adequate, and if decisions should be changed or updated through an amendment or revision process. At the external scale, the evaluation determines whether there have been significant changes in the related plans of other entities, or whether new data exists that could be significant to the decisions contained with the LUP.

In reality, many LUPs that are currently in place for BLM lands have been identified as outdated and inadequate to cover the myriad of current uses undertaken by American citizens on their public lands. To their credit, BLM higher-ups have recognized this shortcoming, and for the past several years have placed special priority on funding LUP amendments, revisions, and new plans throughout the country. In Alaska,



*Stacie McIntosh*

where over 85 million acres of the state are under the exclusive management of the BLM, several new LUPs and plan amendments have been completed or initiated in the last year. This is especially the case in the National Petroleum Reserve-Alaska, where planning has taken the forefront in response to the President's National Energy Policy and America's growing concern over our dependence on foreign oil.

In making land use plan decisions, the BLM has a four-step process: 1) identify issues and concerns, 2) assess information, 3) identify desired outcomes, and 4) identify allowable uses and actions to achieve the desired outcomes. This

article will focus primarily on the information assessment stage of the LUP process, with emphasis on the use and misuse of traditional knowledge in recent planning efforts in the reserve.

## The National Petroleum Reserve-Alaska

The National Petroleum Reserve-Alaska (NPR-A) was established in 1923 by President Warren G. Harding as Naval Petroleum Reserve Number 4- one of four petroleum reserves set aside to provide oil for the U.S. Navy in times of shortage and national need.

That oil was present in large quantities on the North Slope of Alaska was a well-known fact. For years, explorers, commercial whalers, gold-seekers and others had reported both seeing for themselves and hearing about from the local Iñupiat, large petroleum seepages, sometimes called "oil lakes," along the Arctic coast. With the official designation, both the Navy and the United States Geological Survey undertook an extensive exploration program within the reserve that lasted for over 60 years.

In the 1970's, America's dependence on petroleum became glaringly apparent as a result of the oil embargo of 1973 and the subsequent gas shortages across the nation. Then-president Ford responded to this crisis by issuing the Naval Petroleum Reserves Production Act of 1976 (NPRPA), which transferred the reserve from the Navy to the Department of Interior, and renamed it the National Petroleum Reserve-Alaska. However, this same act disallowed actual production from the reserve unless authorized by an Act of Congress— an authority that was granted in 1980, calling for an expeditious program of competitive leasing of oil and gas resources in the National Petroleum Reserve-Alaska. To facilitate the sale of leases within the reserve, the BLM prepared an Environmental Assessment (EA) in 1981 and an Environmental Impact Statement (EIS) in 1983. Lease sales were conducted in 1982, 1983, and 1984 with only mediocre results. The oil industry simply wasn't interested in the remote area, especially given the oil boom that was occurring in Prudhoe Bay and Kuparuk located on State of Alaska lands to the east.

By the mid 1990's, oil infrastructure had expanded far enough west to result in serious interest by oil companies in the National Petroleum Reserve-Alaska. This interest, coupled with in-state politics, and the possibility of encroachment on subsurface oil fields by new technologies in oil extraction, resulted in the BLM taking a hard look at the reserve, and at the way in which planning occurred in the 1980's. Given the then-environmentally-friendly administration, the decision was made to divide the

large 23.5 million-acre NPR-A into three smaller management areas, and to stagger the planning as interest increased. In 1997, the BLM announced its decision to begin the planning process for the Northeast National Petroleum Reserve-Alaska, an area 4.6 million acres in size that bordered the new Alpine oil discovery and production facilities, which is the furthest west commercial oil infrastructure on the North Slope.

The resulting Northeast NPR-A Integrated Activity Plan/Environmental Impact Statement was completed in 1998, with the first lease sale occurring in 1999. The 1998 Plan and Record of Decision are considered by many to be an extremely balanced decision that was based on extensive science, law, public participation, energy need appreciation and stewardship. BLM worked for two years to achieve this balance, holding numerous public meetings, workshops, and scientific symposia, the results of which appeared as appendices in the final document. Also included was Appendix I, "The Iñupiat People's History and Future with regard to the National Petroleum Reserve-Alaska: A 1997 Perspective from the North Slope Borough" written by then-borough-mayor Ben Nageak. This appendix and a few direct quotes from local residents in the main body of the text, in my opinion, were a very well-intentioned, but meager first attempt to include more than just western scientific data in the analysis of effects and impacts.

In the past three years, planning efforts in the NPR-A have considerably increased, consistent with the desire from Washington D.C. to make as many federal lands available for oil and gas leasing as possible. In the past year, the final Northwest National Petroleum Reserve-Alaska Integrated Activity Plan/Environmental Impact Statement covering 8.8 million acres was released, and a lease sale for that area held. Current planning efforts by the BLM in the NPR-A include the Alpine Satellite Development Plan, as well as an amendment to the 1998 Northeast plan. In response to numerous comments from Iñupiat residents, local social and biological science researchers, and local

governments, each of these planning efforts has one thing in common—the stated use of "Traditional Knowledge."

### Use of Traditional Knowledge in Land Use Planning in the NPR-A

The first step in the land use planning process in which significant input from the public is solicited is called scoping. Through the scoping process, which, in Alaska, is usually comprised of face-to-face meetings in potentially-affected communities, the BLM actively asks the public to identify key resources and uses in the planning area, land use issues and conflicts that need to be resolved, and information that needs to be included in order to have a complete assessment. Consistently during scoping for all recent planning efforts, residents of communities located within the NPR-A have made the same suggestion—traditional knowledge must be incorporated in the plan. Specifically, traditional knowledge should be used when formulating alternatives, assessing impacts, and creating mitigation measures to alleviate negative effects.

The BLM heard and responded to these comments and every recent planning effort in the NPR-A does contain sections that include Traditional Knowledge in the titles— but, is traditional knowledge really being used? In the NW Plan, the BLM included sections within the Alternative analysis for five potentially affected communities entitled *Community Traditional Knowledge of Effects on Resources and Harvests*. The traditional knowledge consists of information received from various public meetings and hearings on the North Slope in which concerns and comments were requested in conjunction with proposed development. For example, here is a quote from the community of Nuiqsut:

Noting problems with seismic activity, Lampe continued, "I swear they seismicized the entire North Slope. It's dangerous with snowmachines to run into deep seismic trails. There's wire cables all over the place." At the Nuiqsut village scoping meeting for the

NE NPR-A, Lampe again related village conflicts with seismic activity, explaining that seismic work in the vicinity of the village threatened traditional sites and might somehow have affected the caribou food chain as well.

And another from Barrow:

just wanted to mention what some of my personal observations with what's happening with that seismic out there and that seismic displacing the animals. I just wanted to pass this on for your information, and I didn't see any furbearers except for the foxes, the red foxes and the different faces anyway. I didn't see no wolves out there, no tracks or anything like that. I was on my way back home just this Saturday and met up with my cousin and he just said, yeah I just ran into a set of wolverine tracks and followed them 26 miles one direction, and he didn't take a close look at the tracks and he started following the trail and it had just been scared away from where the activity was occurring...

While I am not saying that this information is not relevant, I do question whether its use fulfills the request to incorporate traditional knowledge in the plan. To me, these quotes represent recent observations and hypothesis generating- "I have experienced these situations and I think this might be happening"- but, they do not represent *traditional knowledge*, so much as *local knowledge*. Let me explain. Traditional knowledge, as I understand it, is shared and agreed upon direct experience that is passed on from one generation to the next, so that it becomes integrated not only at the community level, but at the cultural level. In contrast, local knowledge represents shared recent experiences; those hypotheses that still need testing and positive correlation before they can truly become "traditional." User knowledge is the direct experience of an individual (or one thing experienced by a group), that, when experienced by oth-

ers and shared through word-of-mouth, becomes local knowledge. Local knowledge becomes traditional knowledge when there is a majority consensus, and when it is actively taught to subsequent generations as "the way it is."

In the two most recent NPR-A planning documents, the Alpine Satellite Development Plan and the Northeast NPR-A Plan Amendment, the same examples of comments or statement by residents of the North Slope are considered traditional knowledge/local knowledge. While this is an improvement over simply considering any statement from an indigenous person as "traditional knowledge," it still ends up confusing the *substance* of the information being given. BLM planners feel safe that the request to have traditional knowledge incorporated in the plan has been fulfilled because sections entitled Traditional Knowledge are included. Yet the requests for its use still occur.

Why does this matter? At the most practical level, it matters because the requests of tribal governments and individual community members are not really being met, leading to frustration and a general feeling of insignificance of their opinions to the federal government. Fundamentally, it matters because the more local knowledge or user knowledge becomes attributed as traditional knowledge, the less legitimate traditional knowledge becomes in the realm of the land managers. How? By assigning the experience or hypothesis of an *individual* (local knowledge) to beliefs that are held by *all* and are grounded in empirical reaffirmation through time (traditional knowledge), we run the risk of characterizing these experiences as anecdotal, and thereby invalidate the value of traditional knowledge. This is especially true when the knowledge conflicts with western scientific conclusions. In saying this I am not trying to diminish the importance and usefulness of local knowledge; indeed, local knowledge is frequently the only information available given time and budget constraints, and is extremely valuable in crafting appropriate mitigation measures. What worries me is the potential long-term

effects of this mischaracterization, especially given the propensity of government employees and contractors to recycle, reuse and simply "update" already-existing land use plans- a mistake once made seems to reappear in various guises in perpetuity.

For example, in recent years there has been a severe decline in *qaaktaq* (Arctic cisco) in the Colville River, which is a primary subsistence fish resource for the village of Nuiqsut. Many residents of Nuiqsut have begun to speculate that the decline is predominantly caused by the Alpine oil production facility, operated by ConocoPhillips, Alaska and located approximately seven miles downstream of the community. This theorizing is because the decline in *qaaktaq* correlates with the years that Alpine was constructed and has been in operation (1999/2000), the fact that Alpine is located on the Nigliq Channel near the harvest area, and the fact that Alpine is basically the largest readily identifiable "change" in the area. However, studies conducted by the U.S. Fish and Wildlife Service indicate that for the past several years the prevailing winds have been primarily from the west, resulting in Arctic Ocean currents trending toward the east. The Arctic cisco, which originate in Canada's Mackenzie Delta, travel on the ocean currents, and, have, therefore, been turning right (toward the east) instead of left (toward Alaska) as a result of the prevailing winds. What results is that the concerns and comments (i.e., "traditional knowledge") by Nuiqsut residents that Alpine is causing a decline in *qaaktaq* end up being treated as unfounded by the western scientists, document reviewers, and land managers who favor the data and facts as presented by fish biologists. This slow erosion of trust in individual applications of "traditional knowledge" cumulatively leads to the mistrust in the concept and application of traditional knowledge as a whole.

### Potential Causes and Solutions

So how is it possible that traditional knowledge could be so misapplied during the land-use planning process? For

one, the anthropological explication of traditional knowledge (or traditional ecological knowledge, or indigenous knowledge, or traditional knowledge systems) remains unfinished. Indeed, as a research paradigm, traditional knowledge has been applied to numerous aspects of culture- from ecosystem and ecological studies, to folklore and myth, to religion and ritual- and it will most likely be applied to many more. For, at its heart, traditional knowledge is indigenous science and philosophy.

In the academic realm, traditional knowledge has really only gained popularity and widespread recognition in the past ten to twelve years. Given that academia is the forefront of new and innovative theoretical frontiers, it stands to reason that agencies, especially non-research oriented agencies such as the BLM, would not be well-versed in the particulars of traditional knowledge. Similarly, many of the studies that are currently occurring in the Arctic fall under the broad header of "traditional knowledge," but many are ongoing and have yet to be published in any great detail. The information that has been collected is actively being collated and turned into usable databases, which will contribute greatly to our analyses related to land-use planning. Therefore, a lack of understanding of the concept, as well as a lack of data/information are both contributing factors. The continued funding of ongoing research, and new projects that seek to document traditional knowledge now, will be vital in assessing the ongoing impacts of oil exploration and development in the future.

Another cause is the land-use planning process itself. Planning begins with scoping, which usually takes the form of a public meeting in which numerous individuals relay their comments and concerns, each of which are recorded, and transcribed, and given to the author of the section to which the comment applies. On any given plan there are numerous authors- the NW NPR-A Plan lists 42 preparers, the Alpine Satellite Development Plan lists 52- all working independently to produce what becomes a 1000-page document. Usually, the authors who are responsible for analyzing the

impacts of alternative land-uses on their resource specialty do not attend scoping meetings, but rather read comments, both from scoping and in response to the draft plan, in a vacuum. Not once was the question "What do you mean by traditional knowledge?" posed during the planning process. I think that this question needs to be asked.

Finally, the lack of employees trained in social science research, especially applied anthropology, needs to be addressed. In Alaska, there are two employees within the BLM who are trained anthropologists- myself, and our statewide subsistence coordinator, who primarily deals with BLM's responsibilities on the federal subsistence advisory board. Contrast this to statewide totals of 7 archaeologists, 12 wildlife biologists, and 10 fisheries biologists, and you see a decided focus on tangible and biological resources. This same statistic could be applied across agencies throughout the state. The solution involves not only recognizing the importance of humans within the ecosystem, but of responding by diversifying the workforce.

### **A Different Approach: The Iñupiat Knowledge of Subsistence Fish in the NPR-A**

The BLM is currently funding a project in conjunction with the North Slope Borough Department of Wildlife Management entitled the Iñupiat Knowledge of Subsistence Fish in the NPR-A. This project is a first attempt to gather traditional knowledge on fish resources in the NPR-A. Currently, there is little understanding of fish populations on the North Slope, despite the large density of lakes, river and streams. However, several elder Iñupiat fishermen and fisherwomen live within the NPR-A, all who have a detailed biological knowledge of fish distribution, diversity and habitat. These men and women have the potential to add significantly to the small amount of western scientific information currently documented on subsistence fish. This information includes: the location of fish bearing lakes, species distribution, changes in

fish distribution through time, migration corridors, migration periods, and spawning and overwintering areas.

Instead of interviewing as many people as possible about fish, it was decided to identify key Iñupiat fish biologists, many of whom are elders, and to conduct multiple, comprehensive interviews until the subject of fish was exhausted. While informant burnout is a genuine concern, this approach is actually more culturally appropriate, as the interviews tend to be less question-and-answer and more conversational. Meeting multiple days allows the interviewers to actually get to know the key informant, and served to convey both the importance of the project and the dedication felt by the researchers. The core Iñupiat values of respect, sharing, and cooperation are regarded as the foundation upon which the project was developed.

Although this project is still in its infancy, it is the hope that the information generated will contribute to our understanding of traditional knowledge, as well as contributing to western scientific inquiry. Ultimately, it is our (both the BLM and the North Slope Borough's) goal that the information from this project and others like it will be commonly used in the land use planning process, and will be utilized when formulating alternatives, analyzing impacts, and crafting mitigation measures to alleviate negative effects so that we can truthfully and affirmatively state that we have satisfactorily responded to the request to incorporate traditional knowledge in land use plans.

*Disclaimer: The views expressed in this article are solely those of the author, and not the Bureau of Land Management, or the Department of Interior.*

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# COMMENTARY: TRADITIONAL KNOWLEDGE STUDIES AND THE INDIGENOUS TRUST

*Preston Hardison*

*I want to tell you a story. I tell it to you with the utmost faith that you will use the knowledge wisely, as the Creator wishes you to do with all the Creator's Gifts. As it is said.*

The Indigenous Lyric

A grandmother takes her granddaughter with her as she goes to collect basketry materials. On the way she passes a number of places that have ancient stories associated with them, stories from the time before time, stories from the time of emergence or arrival, stories of historical importance, and more recent stories. The grandmother mentions some of the names to her granddaughter, and gives some instruction on their meaning. But she reserves some of the names and stories to herself, because her granddaughter is not in line receive them. On the way, the grandmother notes the many other beings and their kinship to her and her tribe. They pass the boundary of the national park to an area to which their tribe has gathering rights. Arriving where the grass culms grow long and straight, the grandmother tells her granddaughter the story of how the grass came to be, how it was gifted to their people, how to look for the best locations and best grass blade qualities for making baskets. She teaches her to only take an amount that will allow the patch to persist and thrive.

They take the materials they have gathered back home, and with the other women make baskets for the harvest season, weaving a design that links each basket cosmologically to the season and designates its appropriate use. The conversation drifts among the generations, under the watchful eyes of assembled spirits and ancestors. Some of the basketry materials are set aside for an offering to be made when the Harvest Chief

opens harvesting. This harvest year, it is hoped, will be good, and nourish the cycle of generations. The grandmother is very happy because her granddaughter has begun to accompany her and learn the old ways—so many of the young children now do not even know their own language, and many who learn the old ways seem more interested in learning how to market the knowledge rather than respect for the Creator's wishes. But more and more are beginning to recover their tribal pride and tribal gifts. She has begun working with a young anthropologist who seems respectful of her ways to create an archive of her knowledge, and her heart swells with hope for the future.

## The Indigenous Reality

Tribes often face resentment and resistance from a public unaware of even basic facts about tribal law and history. Tribes have been accused of being "super-citizens," granted sweeping rights that are unfair to other stakeholders. This view ignores the vast estate tribes ceded to the United States through treaties, and Supreme court decisions and governmental policy stretching back to 1823 that hold that tribes have sovereign rights that are recognized, not granted, by the federal government, and are not stakeholders but have government-to-government relations with the United States.

On their journey, they harvest from national park lands. Although United States law has long recognized tribal rights to hunt, fish and gather on public lands, the tribes often encounter cultural resource access problems, and are sometimes excluded from public land management planning even when federal actions clearly affect traditional cultural resources. The lack of tribal participation and communication can have serious consequences. In the mid-1990s, basket makers in California



*Preston Hardison*

were passing thousands of grass stems between their teeth they had gathered from federal lands. The native women did not realize the grass had been sprayed with pesticides by federal land managers, and began to suffer health problems, miscarriages and birth defects. The standard exposure tables for the pesticides assumed a "standard" recreational exposure by hikers or riders through the park. The federal planners, lacking a path of communication with the local tribes, had failed to appreciate the exposure pathway from customary practices.

Other aspects of the story also fail to mirror indigenous reality. Fewer children are learning traditional languages, and when they do learn, they often acquire an ever shrinking vocabulary, with some of the most rapid loss in concepts about the natural world. Modern tribal and federal institutions are displacing many of the old ones—harvest chiefs, fish chiefs, and other elders are being displaced by federal regulatory demands and the rise of tribal resource management agencies. Some of the seeds were sowed with the Indian Reorganization Act of 1934, which created Western-style Indian administrations sometimes separated from traditional management structures.

The value of traditional knowledge in resource management has been growing in the last two decades. The elder

appreciates the presence of the anthropologist who is interested in learning the customs and helping with cultural revitalization. There are undoubted benefits from this turn towards recognizing the value of traditional knowledge, and has brought many new benefits and opportunities to tribes. But there are also some troubling issues in the rapid expansion of interest in and use of traditional knowledge systems.

### Knowledge as a Trust Resource

The globalization of the knowledge society has also influenced tribal approaches to their knowledge. Traditional knowledge was put on the global agenda in a large way with the development of the Convention on Biological Diversity (CBD), in which Article 8(j), which was not introduced or authored by indigenous peoples, was ratification as an international obligation by the CBD parties:

(j) Subject to its national legislation, respect, preserve and maintain knowledge, innovations and practices of indigenous and local communities embodying traditional lifestyles relevant for the conservation and sustainable use of biological diversity and promote their wider application with the approval and involvement of the holders of such knowledge, innovations and practices and encourage the equitable sharing of the benefits arising from the utilization of such knowledge, innovations and practices

Here, although there are provisions to "respect, preserve, and maintain" traditional knowledge, there is also a strong motivation for the dissemination of traditional knowledge, both to support private economic benefits and general public goods. Many tribes view the push towards sharing or commodification without securing their ability to control the flow of their knowledge or access to their resources that such knowledge gives is dangerous to their sovereignty and tribal well-being.

Traditional knowledge has also been put on the agenda of the World Property Organization (WIPO), which is investigating the creation of an internationally binding legal regime under the framework of intellectual property for the protection of traditional knowledge, and is related to the trade in traditional knowledge, symbols, paintings, art, song, and knowledge related to genetic and biological resources.

Traditional knowledge is also the subject of the UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage passed in October, 2003. Here, traditional knowledge is presented in a human rights and cultural rights context, and rather than principle for trade, principles for protection are emphasized. Another avenue to interest in traditional knowledge has been through the sustainable development and resource management pathways. Less concerned with commodification, these approaches emphasize the benefits both to tribes and to nations or humankind that come from the wider distribution and application of traditional knowledge.

The intense economic and policy pressures caused by these developments are beginning to get indigenous peoples to think about and clarify their positions. Indigenous peoples have a range of opinions of how to deal with this interest. In the United States, there is a growing reassessment by tribes of the relationship of their knowledge to the wider society in which they are embedded. Tribes increasingly view their tribal information and traditional knowledge as part of their sovereign domain protected by their treaty rights and reserved rights. Just as tribes sought to have rights to ancestral lands, to traditional resources, and cultural objects and human remains recognized, tribes are applying the same logic to tribal information and traditional knowledge, and starting to treat communication within the government-to-government relationship. In this view, tribal knowledge, customary or not, becomes a part of the federal trust obligation as it is central to cultural self-determination and cultural survival.

One issue is tribal sovereignty over rules of disclosure for tribal proprietary information. Information transmitted to the United States government, tribes often assert, should be treated as protected government-to-government communications. In a case related to tribal water use information, *Department of the Interior v. Klamath Water Users Protective Ass'n* (2001), the Supreme Court ruled that exemptions from disclosure under the Freedom of Information Act (FOIA) did not apply to all communications between Native American tribes and the Federal government as part of the Federal Trust relationship. This raises difficult questions about tribal abilities to carry on privileged and sensitive government-to-government communications, and the protectability of information submitted to the government or generated through federal funding, even if this funding occurs within the federal trust relationship.

Another issue is strategic. Even where tribes have historically shared knowledge, doing so in the face of potential exploitation or competition is problematic. For example, the United States Forest Service (USFS) has been promoting the expansion of non-timber forest product (NTFP) markets, and are funding projects to collect and disseminate information on economically useful NTFPs that include some traditional knowledge. Elders often complain about the difficulty in accessing traditional resources on federal lands, and any level of increase in harvest rates by non-Indians will necessarily erode their access with special mitigation or meaningful harvest controls. A final issue is related to the deep differences between traditional knowledge and secular knowledge systems, and the differences between tribal and non-tribal rationales for the documentation of traditional knowledge systems.

### Integrating Science and Traditional Knowledge, or Mutual Respect?

Indigenous worldviews are highly spiritual and based on a shared cosmology, and often diverge strongly from scientific worldviews. Indigenous peoples generally view themselves as

a product of special creation, coming from the sky, the earth, or made when the world was created. They often believe in spirits and action at a distance, and in divine retribution for transgressions of the law of their creator(s) and/or spirits. Often, they believe that the use of medicines releases very powerful forces, both good and bad, that must be controlled by the shaman or healer. Failure to control these forces can bring great physical or spiritual harm to the person who releases them, and to the tribe, shamans or healers who failed in their spiritual obligations to control the release of the powers.

All knowledge inherits some of these characteristics. Language and knowledge and is often viewed not as evolved, but created—gifted from the Creator or the Creator's creations. Knowledge of medicines and the environment is often gained through direct conversation with plant people, tree people, living rocks—all of Creation is often thought of as alive and can be directly conversed with. As a sacred gift, knowledge is not privately owned and belongs ultimately to the Creator, evokes powers of the earth both good and ill, and can be withdrawn if it is not cared for and obligations for its proper use met.

Different forms of knowledge come with their own forms of cosmological and social regulation. Knowledge may often be shared widely, but that does not mean it is within the public domain for the free and unfettered use by any other individual or group. A particular song, for example, may be shared freely and openly, and may be known by all members of a tribe, but the rights to sing the song may be held by a single individual or family. Even if indigenous peoples do not have the strong beliefs alluded to, many healers view themselves as the equivalent of the "Indigenous Medical Association". Many healers believe they are the only ones who should be able to dispense medicinal knowledge and preparations. They fear that the misuse of their knowledge and medicines may harm those who use them unwisely or in ignorance.

Misappropriation of knowledge and resources is not merely "offensive", but dangerous to their spiritual, cultural

and physical health and well-being. These violations and their impacts are not defined by Western law and belief systems, but by customary law and traditional beliefs. The secular tradition of academic research and publication in an open society finds difficulty in recognizing research limits, and the "facts" uncovered by academic work, once disclosed and published, are generally considered to be part of the public domain. The public domain, as a system of free and unfettered use, itself is not itself a general feature of traditional knowledge systems. Traditional knowledge systems are common property systems with complex internal rules. Knowledge may traditionally be shared widely, and open to adoption and use by others, but that sharing was still within the context of sharing among those who generally understood the rules and spiritual and social obligations of using the knowledge.

The attempt to harmonize the domains of knowledge itself may be harmful. The mapping is also often a mechanism for disclosure to make internal traditional knowledge logic legible to land managers so that they may more effectively incorporate it into their decision making and planning. Tribes are often concerned that the mapping occurs in one direction. Indigenous views are the object of the mapping, and tribal views may be considered to be the less fundamental, to be "explained" by the more fundamental scientific worldview. Knowledge that does not fit into the concepts of science is discounted. While this might be useful in Western resource management or advance the scientific understanding of traditional knowledge systems, the activity has conflicting effects on tribes. Indigenous peoples have the concern that the some of the theoretical apparatus of Western scientific theory is erosive to tribal cosmological beliefs and connections that underlie the efficacy of their knowledge systems. The spiritual worldviews of indigenous peoples are not captured in many traditional knowledge research projects.

Tribes, on the other hand, already have the knowledge, and are often more concerned about program aid to

help them maintain and revitalize their cultural traditions, for example through the creation of digital archives. Since the knowledge involves management of their customary resources, many tribes believe self-management or co-management with their retaining control of the traditional knowledge allows for more sensitive application of the knowledge in natural resource decision making. It also allows them to protect sacred and spiritual values. Tribes are therefore concerned that studies of their knowledge can reveal sacred and sensitive knowledge, that it can forcefully put their knowledge into the public domain, that it can expose them to economic exploitation without permission or compensation, it can expose them direct competition for culturally-vital resources, and it can detract from issues of tribal trust resources and tribal regulatory authority. Because of this, secrecy and non-disclosure is one of the few options for tribes wishing to protect their traditional knowledge, which stifles the ability to carry on the conversations and exchange of knowledge needed to effectuate the use of traditional knowledge in natural resource planning and management.

### Which Way Forward?

There are some core principles that should be borne in mind as traditional knowledge finds an expanded place in environmental and development policy. The first is to become knowledgeable of the fundamentals existing canon of law concerning tribes. Tribes are sovereign with a government-to-government relationship to the United States that has trust obligations to the Tribes. A number of agencies (such as the Environmental Protection Agency) have prepared guidelines on research and consultations with tribes. Researchers should perform research in utmost good faith and respect for tribal traditions. Researchers should strive to discover and respect customary law and protocols for the use and distribution of traditional knowledge. Working with traditional knowledge is less an issue of "integrating" the Western science and traditional knowledge by finding an algorithm to

map one system into the other, than of respecting differences across a cultural chasm. Ensure that projects are chosen by tribes to fulfill their needs, and not imposed to meet researcher needs.

Develop mechanisms for obtaining prior informed consent (PIC) from tribes. Although an important concept, there is a poverty of institutions to allow tribes to fully consider and give consent to the use of knowledge. Those doing the informing often have a vested research or economic interest in obtaining traditional knowledge, and there are limited guidelines as to what consequences should be presented, even were these are well known. Having given consent, tribes may have limited ability to monitor and enforce their restrictions, or to have these restrictions recognized beyond tribal boundaries. The common use of "memoranda of understanding" (MOUs) and contracts for consent also generally fails to provide conflict resolution in those cases where tribes that share knowledge in common disagree over the use of their knowledge, or where tribal governments (sometime imposed by national governments) disagree with traditional knowledge custodians.

Unlike the sharing of physical resources, knowledge shared by one is disclosed for all, so that a local decision by an individual elder or tribe may have wide repercussions. Moving beyond the PIC conundrum will necessarily involve more support for tribes to develop intra-tribal and inter-tribal institutions and guidelines for the management of tribal knowledge and implementation of PIC, and for tribes to work directly with government agencies to develop acceptable guidelines.

Rights to use and publish traditional knowledge should be construed narrowly, such that any use outside of an original consent agreement should require that the researcher go back and get further authorization from an indigenous community. For example, permission to compile a personal database of traditional knowledge for research does not imply permission to make that database available to other researchers or over the Internet. Historically gathered knowledge should be regard the new regime, as it is customary law and not

the changing fate of non-indigenous statutes that matters regarding traditional knowledge. Some issues will need a higher-level governmental fix. There is a lot that can be accomplished short of legislative fixes. Presidents and Cabinet Secretaries have used Executive Orders and Secretarial Orders to clarify policy within existing law. Without crafting new law, these Orders can be used to clarify ambiguity within existing law, and such Orders have been issued on Native American sacred sites and federal interpretation of tribal obligations and federal obligations to tribes under the Endangered Species Act.

Governments can also make it clear that although certain activities are not illegal, they consider them to be vices, and use their program power and fiscal power to shape behavior. Governments can, for example, refuse to fund otherwise legal activities, and have the power to regulate the programs they fund, the requirements of these programs and to show moral leadership. For example, it would be possible to require a certificate of prior informed consent to be deposited with a grant report, require local ownership of research findings, drop requirements of deliverables to federal granting agencies so that sensitive traditional knowledge is not deposited in a publicly accessible federal archive. In addition to making funds available for studies of traditional knowledge, they should also target studies looking at the legal and policy aspects of traditional knowledge, make available funds to tribes to improve tribal governance over tribal knowledge. Given the scope of rapidly emerging international regimes over genetic resources and traditional knowledge, governments should strongly increase the participation of indigenous peoples in the international conventions and forums touching on their recognized rights.

Indigenous peoples are calling upon nations to recognize that when violations allow, these violations are defined and understood under their customary laws and tribal systems of governance. They are asking not only that they be allowed to practice their beliefs within their reserves, but that their customary laws

be respected across boundaries as part of governmental trust responsibility and the kinds of agreements that result from government-to-government relations.

With proper care, the new institutions can be constructed that allows traditional knowledge to carry on with less conflict. Just as NAGPRA did not result in the collapse of American archaeology, these new institutions can embody new compacts with indigenous peoples that respect tribal rights while serving both tribal and academic interests. These institutions will come about as the principles of recognition and respect become fundamental to the traditional knowledge research enterprise, and ensure the direct participation of those who hold and care for the knowledge.

*Preston Hardison has been an evolutionary biologist, studying the evolution of animal communication, social behavior, and sex allocation in coral reef fishes. His overseas field work turned his interests towards human-nature relationships and the conservation of biocultural landscapes. For the past decade, he has worked on issues related to biodiversity conservation, cultural landscape restoration, and the revitalization and protection of the knowledge of indigenous and local communities. He has directly participated in the Convention on Biological Diversity (CBD) since 1996, where he serves on the Informal Advisory Committee to the Clearinghouse Mechanism (CHM) for the Indigenous Biodiversity Information Network (IBIN) and as an expert on Access and Benefit Sharing (ABS) arrangements for the use of traditional knowledge and genetic resources. He currently works for the Tulalip Tribes of Washington on the Cultural Stories Project for documenting and restoring tribal lands, ecology and cultural resources, and as a watershed policy analyst. For the past three years, he has represented the Tulalip Tribes at the World Intellectual Property Organization (WIPO). He thanks the Tribes on whose lands many of these ideas were developed and presented, and Terry Williams and the Tulalip Tribes for their leadership, guidance and patience. ■*

# 'TEACHING' PRACTICING

By Jeanne Simonelli

In considering the work described in this issue, Jennifer Ise and Susan Abbott-Jamieson note that natural resource agencies are mandated to use the best available science in deriving management actions, which are codified in major environmental legislation. Given that proven reliable methods of integrating local knowledge with science are not yet established, how can resource agencies justify incorporating information that is experientially derived rather than derived from the scientific method? Taking this further, Preston Hardison points out that his article takes a protectionist approach towards traditional knowledge, while in many traditions knowledge is a resource to be shared, even with strangers. In many cases, traditional knowledge has diffused so widely that identifying "owners" of the knowledge is impracticable. While wide sharing may have occurred openly in the past, it was generally shared in a context of natural diffusion and restricted use. Knowledge shared today can be rapidly globalized and used in ways unintended by traditional knowledge holders. If this is the case, what are the advantages and disadvantages of legal protection approaches relative to informal approaches?

All of the articles featured in this issue describe work with, and in groups outside the discipline and outside the academic setting. Like those quoted above, these authors provide a perspective on making anthropology important to more than those who attend the AAA meetings each November (or December!). They ask you to consider the following additional questions:

- How do you bring together disparate communities that have common interests

- How can you monitor your work with volunteers to assure accuracy of data collection in the field?
- Conflicts arise between tribal customary law and national civil law, statutory law and Constitutional law. What are some of these conflicts relevant to research, education and the publishing of traditional knowledge? How might these conflicts be resolved?
- How might National Parks and the Native peoples who traditionally lived within those parks work together to conserve not only the natural but also the cultural values of the lands in question?
- How should competing views of the history of a National Park – for example, that of Indians versus that of settlers or park administrators --be presented to the public?
- What are the advantages and disadvantages (and to whom) of the 'pluck out and plug in' method of treating TEK as a series of technical facts that can be removed from context and used by scientists and policy makers?
- What are some of the challenges of incorporating TEK into natural resource management? What are some solutions?
- What do you think the role of the anthropologist should be in creating policies or affecting decisions made by the federal government? Does the anthropologist have the responsibility to understand how their data or work is being applied during the land management decision process?
- What hurdles are non-tribal state and federal agencies faced with in working to protect tribal cultural values and how can these agencies incorporate cultural protection measures into regulation while still maintaining cultural sensitivity.
- In researching traditional knowledge of pre- or early contact practices, how many generations post-contact can useful information still be gathered from and at what point does knowledge become anecdotal?

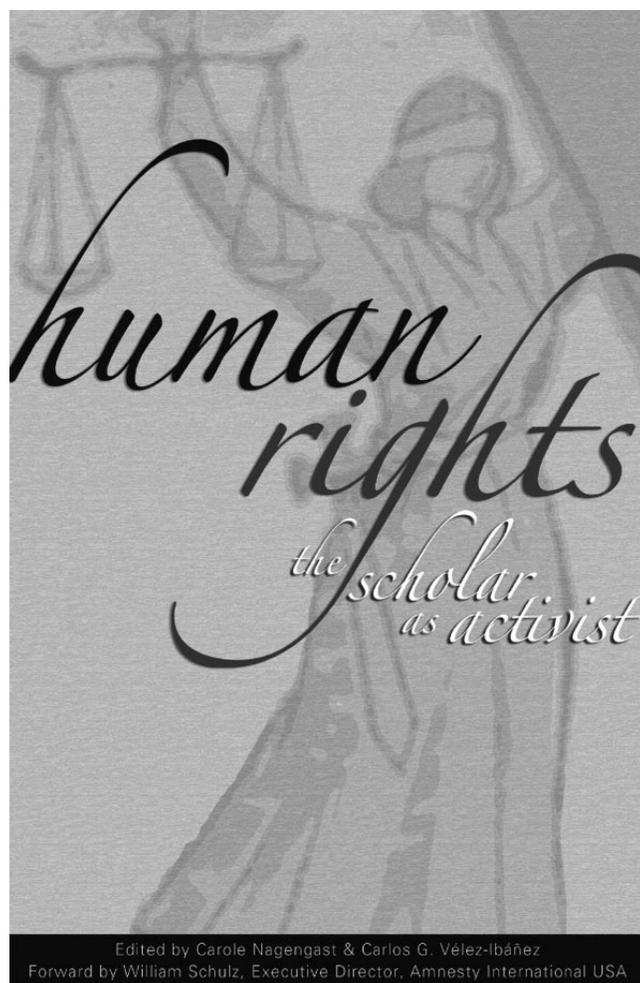
## INTELLECTUAL PROPERTY RIGHTS FOR INDIGENOUS PEOPLES, A SOURCEBOOK

Editor: Tom Greaves

The rights of indigenous societies to control access and use of their cultural knowledge is an issue of global scale, debated in the United Nations, in the biodiversity and human rights movements, within the pharmaceutical industry, in government and private corporations, among the social and applied scientists, and most importantly, among indigenous leaders. The *Sourcebook* offers both cases where indigenous groups have asserted these rights, and analyses of the legal and political context. It is intended to be useful to indigenous leaders reviewing their options; to advocacy groups for indigenous rights, human rights and biodiversity preservation; to policy specialists; and to scholars. The *Sourcebook* provides a consolidated source of very current information on the rights of indigenous peoples with respect to the use of their cultural knowledge.

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## The Dynamics of Applied Anthropology in the Twentieth Century: The Malinowski Award Papers

Thomas Weaver, Editor and Contributor of Introductory Materials

The Malinowski Award has been presented annually since 1973 by the Society for Applied Anthropology in recognition of efforts to understand and serve the needs of the world's society through social science. Bronislaw Malinowski (1884-1942) was a leading figure during the 1920s and 1930s in the nascent but growing discipline of anthropology. While best known for his contribution to fieldwork methods and anthropological theory, he also promoted the practical use of anthropology. Anthropologists, he argued, mu

The careers of the twenty-eight persons who had received the award by 1999 illustrate major themes in the development of applied anthropology in the twentieth century, and their Malinowski Award addresses provide an interesting reflection on issues and events of this era. This collection presents all the Malinowski Award addresses that exist in written form, as well as a biographical essay on each recipient and on Bronislaw Malinowski.

The Malinowski Award Collection is available in electronic format as pdf (Acrobat Reader) files. You may purchase and download the entire collection for \$10.00. Or, you may review the abstract of each chapter, and select and download chapters for \$2.50 each. If you wish to purchase 4 or more chapters, it is more cost effective to purchase the entire Malinowski Monograph. The entire collection is also available as a pdf file on CD ROM for \$17.50.

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## **HERITAGE, ENVIRONMENT AND TOURISM MEETINGS OF THE SOCIETY FOR APPLIED ANTHROPOLOGY LA FONDA HOTEL, SANTA FE, NEW MEXICO**

**APRIL 5-10, 2005**

The Santa Fe meetings provide an excellent locale for exploring the closely related themes of Heritage, Environment and Tourism. In its own right, heritage has become a major focal point for national, regional, and local development initiatives. As heritage is seen to have both external and internal value, how can we participate in such areas as heritage development and resource management while still defending the rights of communities and other groups to control how their heritages are represented? In a similar manner, the environment is increasingly being viewed as a kind of "natural heritage," implying a strong association between environmental conservation and human associations with the environment. What does this tendency suggest in terms of understanding and negotiating different stakeholder interests related to particular acts of environmental decision making? How are different ideals associated with natural heritage reflected in environmental and natural resource management policies and practices? How do environmental issues relate to health concerns? Finally, tourism, as one of the world's largest industries, is increasingly being cast in the terms of both cultural and natural heritage. What does the increased popularity of such tourism "niches" as heritage tourism and ecotourism imply for the conservation of local heritage practices and the preservation of popular "natural" places? What are the roles played by museums in the presentation of heritage and the promotion of cultural tourism?

In keeping with the society's interdisciplinary roots, the program committee invites the participation of a wide variety of professionals, including anthropologists, archaeologists, geographers, sociologists, folklorists, public historians, tourism researchers and practitioners, natural scientists working on environmental issues, museum professionals, and other professionals in the areas listed below. We encourage the active involvement of anthropologists and other professionals who are employed outside of academia. Symposia and individual papers are also invited and actively encouraged in all other areas of applied endeavor, such as health and medicine, agriculture and rural development, education, migration and resettlement, business and corporate issues, language, urban and regional development, community-based and participatory models for practice, applied research methods and planning approaches, and diversity and human rights initiatives.

For additional information or to make suggestions regarding the program theme or other matters related to the professional program contact Erve Chambers, c/o Society for Applied Anthropology, P.O. Box 2436, Oklahoma City, OK 73101-2436; [sfaa2005@sfaa.net](mailto:sfaa2005@sfaa.net); (405) 843-5113. Register for the meeting online at:

<http://www.sfaa.net/sfaa2005.html>