

6 **The Ashkui Project: Linking Western Science and Innu Environmental Knowledge in Creating a Sustainable Environment**

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Special thanks to Julia Sable

Intuitively, it seems impossible to talk of development without the inclusion and consultation of the people whose lives will be affected, aboriginal or not. Furthermore, aboriginal populations have a wealth of knowledge accumulated over centuries of living in their regions that can enhance government efforts to protect the environment. The obligation to protect and include aboriginal communities as part of environmental conservation and sustainable development initiatives is enshrined in several international declarations, including the Rio Declaration and the Convention on Biological Diversity (CBD), as well as Canadian legislation and declarations (Canadian Environmental Protection Act 1999). However, the relationship between scientific research and community involvement and capacity building is still a much debated issue. This debate is not just among scientists in regard to the validity of aboriginal peoples' environmental knowledge, but among aboriginal peoples themselves who are asking how scientific research can serve their needs given its long association with colonization and industrial development projects (Marzano, this volume). The legacy of colonisation, and the subsequent institutions and development projects that have accompanied it, has often served to dislocate aboriginal peoples from their lands and discount their environmental knowledge as inferior (Bieder 1986). As

a result, an atmosphere of distrust exists among aboriginal peoples toward social and natural scientists. This paper will examine a collaborative project called the Ashkui Project (a.k.a. the Labrador Project). The Ashkui Project is an example of how scientists and aboriginal communities can work collaboratively to redress this legacy, and build trust, with the ultimate goal of building capacity among all stakeholders around a common vision.

Since 1997, the federal department of Environment Canada has collaborated with the Innu Nation (First Nation) of Labrador and social scientists from the Gorsebrook Research Institute (GRI) at Saint Mary's University in Halifax, Nova Scotia to incorporate social sciences and community involvement into environmental research. The initial goal was to develop comprehensive baseline ecological data of the Labrador landscape from both Innu and Western scientific perspectives. To provide an initial focal point for research, consultations were held with members of the Innu community to identify an aspect of the landscape that was deemed culturally significant and distinct. The landscape feature the Innu chose is *ashkui*, giving rise to what was referred to as the Ashkui Project in Labrador, Canada.

Ashkui have been defined by Innu elders (*tshishennuat*) as early openings in the water. The importance of *ashkui* comes in the springtime when an abundance of waterfowl, fish and animals are attracted to the newly opened water. Innu families set up camp near these sites and stay for weeks and months at a time to exploit and celebrate the rich and varied resources of the land and water. These sites are still of importance to Innu for their livelihood and psychological well-being. Conveniently, *ashkui* were also the home of the Harlequin duck, an endangered species that Environment Canada was mandated to study. Conducting research at these sites would allow for Environment Canada's continued focus on waterfowl inventories and hydrometric research.

GRI social scientists, working closely with *tshishennuat* and Innu co-researchers/Guardians, have documented some of the complex knowledge of those Innu who grew up on the land, and whose lives were inextricably linked to the *ashkui* sites. Based on this research and the identification of a number of *ashkui* sites that were in current use or had been regularly used in the past by Innu families, Environment Canada scientists in the spring of 1999 set up a 325 km *ashkui* research network comprising fifteen stations. These sites were used to sample and analyse three freshwater systems – clear, coloured and brackish. Over the last three years, the project has expanded to include the Innu Environmental Guardians Program, an initiative to assist in training members of the Innu community in ecosystem management in preparation for self-government. The project has a commitment to incorporate Indigenous Ecological Knowledge (IEK) and to work with the Innu Nation in the overall project design and structure.

We will discuss some of the crucial aspects of this research effort in documenting and working with the different perspectives of the landscape, Innu and Western scientific, and setting up cross-cultural dialogues. In particular, we will focus on the concomitant capacity building and shifts in thinking that, by necessity, had to occur among all stakeholders in order for the research to serve both the needs of the community and the mandate of Environment Canada to monitor and protect the environment.

Background and Innu Perspective

The *tshishennuat* commonly speak of their ancestral lands, *Nitassinan*, as medicine.³ They often complain of the mental and physical sickness that has afflicted them since government settlement programmes in the 1960s isolated them from their traditional lands. The food they eat is no longer ‘medicine’ because it does not come from the land. Even the animals they used to hunt are confused and sick, and do not always follow predictable migration routes. Furthermore, the *tshishennuat* say they can no longer communicate with their youth, who are being educated in unfamiliar ways and in a foreign language. Within their communities, there is concern that the Innu youth no longer have the same relationship to the land as the *tshishennuat*, and are losing the language of the land. This is worrying because *tshishennuat* are the holders of a complex and specialised knowledge of the environment, which has been passed down orally through centuries. They are the speakers and holders of the language of the land and carry the Innu ‘library’ of knowledge in their heads. Because of their knowledge and relationship to the land, they are the best to advise and define the needs of any environmental development. This library will be lost with their passing.

The loss of such an extensive body of knowledge has become a global issue that is gaining widespread advocacy in the fields of conservation and bio-diversity as the link between cultural diversity and biodiversity becomes evident (Davis 2002). Indigenous peoples, such as the Innu, intimately understand the fragility of their local ecosystems, whether it be the boreal forest of Labrador or the Himalayan mountains of Bhutan. Their language, songs, dances and legends reflect and express its many aspects, creative and destructive. With the loss of more than 3,000 languages within the last fifty years, the languages that have articulated this environmental knowledge is lost, and the language of science is increasingly being used to replace it (Davis 2002; Maranzo, this volume).

Metaphorically speaking, finding the medicine again has been the challenge of the last seven years of collaboration with the Innu. Due to the many pressures facing their communities from development projects, the Innu have hired scientists, anthropologists and a variety of consultants to help in their quest for self-determination. In addition, the Innu Nation received First Nations Status in 2002, the last First Nations group in Canada to do so. The gaining of status has opened up negotiations for self-government (right of use to Innu), but has also

increased the need for educated and skilled Innu negotiators, lawyers and scientists, and sound ecological information.

The Innu have considerable self-interest in facilitating scientific research in Labrador. They are in the process of negotiating a land claims agreement with the federal government for which they have to do extensive documentation of their own land use. As they win a voice in environmental assessment and impact–benefit agreements for specific development projects, they need rigorous baseline scientific data. From the perspective of the Innu Nation, part of the challenge has been finding scientists and researchers willing to work with Innu priorities, not the other way around. In the words of Peter Penashue, past President of the Innu Nation, it has been a ‘long hard road’ toward achieving self-determination since the formation of the Innu Nation twenty-five years ago:

From the start, we worked closely with anthropologists and other scientists to help us build our case. As many of you know, Canada takes the position that Aboriginal people who wish to negotiate land claims must prove that we were here first, before the Europeans.

Now, what seems like common sense to us is obviously hard for governments to understand, so we had to hire experts to work with our *tshishenuat* to conduct interviews in order to make the maps that were finally accepted by governments in 1989. Throughout this process, we had to explain to our governments why Innu were the ones who had to make the maps, not the governments . . . That kind of relationship also exists between Innu and many scientists.

We’ve anticipated many environmental assessments, and we’ve often been puzzled by the certainty of some of the experts that governments and companies bring up from the south to tell us about our land and the animals that we have studied for thousands of years. It was frustrating to listen to some consultant who maybe had spent a summer in our territory, or more likely had read a few reports about it, think he understood our land better than our *tshishenuat* who had spent their entire lives there. It shouldn’t be surprising, then, to hear that many of our people started to think that some scientists would say anything if they were paid well enough. These kinds of scientists would descend on our communities every summer and leave them again in the fall. They were kind of like flies. They buzzed around, getting into people’s hair, but we thought that they were mostly just an annoyance. This is until we realized that governments took these scientists seriously, and used their findings to approve developments like low-level flying.

What scientists often forget is that Innu, like everyone else, have priorities. . . . We spend so much of our time trying to come to terms with the White man’s world that many of our people have lost touch with their own. Regaining control of our lives, our communities, and restoring our culture are among the most important goals. (Penashue 2001: 4–6)

From the Innu view of the world, Western science is based on a mechanistic conception of the universe. It views the world as composed of discrete entities and processes, and is biased towards studying things that can be quantified and measured (Sillitoe, this volume). The Innu worldview, as with many aboriginal peo-

ple, features a more holistic approach to the world, inclusive of the people who inhabit it. They see themselves as an integral part of the landscape, and are wary of their knowledge being used in a way that betrays this fundamental principle. 'Science' is not seen as a neutral framework, but rather as highly political. Considerable power lies in the hands of those who decide what information will be gathered and how it will be used (Innu Nation 1999: 2–3).

Over time, the Innu Nation has developed its own agenda and determined its goals in accordance with their needs. What has made the Ashkui Project unique has been that it is Innu driven and conducted in dialogue with the Innu Nation. As noted by Peter Penashue:

Today, most of the researchers who come to our communities are invited by the community itself. They generally work as part of the agenda the Innu have helped to develop. This has allowed us to deal with developers on our own terms, and challenge their science with our own science . . . The *Ashkui* Project was developed out of the dialogue about these issues that has taken place for several years between researchers and members of our community. This is a reversal of the usual research relationship between Aboriginal communities and researchers, where the researchers would come in from the outside with a project already conceived, and attempt to sell it to the Innu. (Penashue 2001: 5–6)

While the Labrador Project has been sensitive to Innu priorities, e.g., the Ashkui Project was based on the Innu Nation's suggestion of ashkui sites as a research focus for Environment Canada, it has still been a challenge for both sides. To access IEK, western scientists have to appreciate a whole different way of conceiving of the world. It requires scientists to open up their scientific paradigm to accommodate Innu knowledge, and vice versa. From the Innu side, it is difficult to translate scientific concepts into their language when no corollaries exist. For instance, when various scientists from the federal government explained their mercury research at a community meeting in the Innu community of Sheshatshiu, Labrador, it was pointed out by an Innu Guardian working with Environment Canada that the Innu had no concept of mercury or its relevance to their community. The scientists had assumed they were speaking in universal language and that mercury was a commonly shared concept.

At all stages, the entire project depends on translating from one knowledge paradigm to another without losing the integrity of either. An inevitable knowledge hybridisation will occur, but this can be a positive outcome if it is a chosen and conscious process rather than a choiceless 'mental colonization' (Battiste 1998: 20) and the process involves all parties (Dove et al., this volume). To set up this dialogue has required a shift in thinking and in practice on the part of Environment Canada staff as well as the Gorsebrook Research Institute social scientists. The shift is not only in who drives the agenda, but also in who controls the knowledge, and how that knowledge is collected, archived, published and made meaningful to the Innu.

Environment Canada

Environment Canada, Atlantic Branch has been interested in Labrador since the early 1990s. The area represented a gap in the agency's knowledge of ecosystems in Atlantic Canada, and accounts for over 53 percent of the region's territory (approximately 286,000 square kilometres). The ecosystem in Labrador is threatened by a number of anthropogenic activities, including clear-cutting, nickel-mining, low-level flights from a NATO air force base, hydroelectric projects, commercial fishing and climate change. Environment Canada wanted to gather baseline ecological data in order to monitor the environmental impact of these activities and to ensure compliance with environmental agreements and legislation on the local, national and international level. As well, the relatively pristine conditions provided a natural laboratory to monitor environmental change.

Initially, Environment Canada had a narrow interest in wetlands classification. It attempted to gather information using satellites, airplanes and a crew of scientists on the ground, without consulting the local community (Wilson 2004). When this approach proved unsuccessful in obtaining community buy-in, Environment Canada sought input from the community. At the suggestion of an Innu contact, four staff members went on a cultural orientation trip 'in-country' during the winter of 1997, tenting for five days in -25°C weather. This camping experience fostered a profound appreciation of the Innu culture and their relationship with the land. From these early consultations with members of the Innu community, *ashkui* sites were identified as culturally significant to the Innu way of life, particularly in the springtime when families camped in tents near *ashkui* for weeks at a time. Research at these places would benefit both parties. As mentioned previously, the sites allowed for Environment Canada's continued focus on water quality and waterfowl inventories and seabird research. And it could answer Innu concerns about changes in the environment from development projects, e.g., NATO low-flying jet corridors over *ashkui* sites; acid rain from the south; mercury levels in the water, mammals and fish from industrial developments; and climate change, to mention a few.

Following these initial consultations, Environment Canada invited social scientists at the Gorsebrook Research Institute to join the project to help 'develop the capacity to recognize the intrinsic values of Northern landscape and peoples' (Environment Canada 1999: 3–1). The agency needed assistance in translating between IEK and Western scientific knowledge, an area with which researchers at the GRI had experience. In May 1998 the first GRI social scientist went up to Sheshatshiu, Labrador and spent over three weeks in the community with *tshishennuat* and Innu co-researchers/Guardians and translators documenting environmental knowledge. Eight days were spent at an *ashkui* site at Lake Shipiskan with an Innu family who had camped there for generations.

The research conducted during this initial and subsequent field trips not only served to document extensive land use practices of the Innu (subsequently

included in Environment Canada's on-line maps) but also identified a number of *ashkui* sites that were in current use or had been used in the past by Innu families. Environment Canada scientists proceeded to set up the *ashkui* research network stations in the spring of 1999 and hired an Innu co-worker (and future Environmental Guardian) to assist in the research, testing and presentation of results to the community. This network was designed to provide information on *ashkui* formation and behaviour across a latitudinal gradient. The sites were sampled for eighteen parameters (major ions, metals and nutrients) from the first opening in the spring until the summer or early fall. Along with conducting water quality sampling to establish seasonal patterns, questions of particular importance to the Innu people were addressed, such as site productivity, sensitivity to acid rain and drinking water quality.

Environment Canada found this nascent partnership beneficial. It noted in its 1999 evaluation report that the Innu were able to add new insights into the description of the environment, and that they could decrease the cost of fieldwork by directing and focusing the research (Environment Canada 1999: 5–6). This laid the groundwork for the inclusion of local human resource capacity building in the project mandate, an evolution that met with some initial resistance within Environment Canada because of the shift from its normally mandated scientific responsibilities towards the inclusion of social science work (Wilson 2004). Including the Innu also had a significant effect on the project's philosophy and direction. For instance, the 1999 Environment Canada report discusses the shift towards a more holistic, ecosystem-based approach and acceptance of the principle of 'biological integrity' as a result of Innu participation (Environment Canada 1999: 4–5, 6). Unexpected spin-offs, such as NATO low-level jets altering their flight corridors to avoid the waterfowl staging areas, resulted from the *tshishennuat* identifying productive *ashkui* sites, which, in turn, led to Environment Canada designating these sites as waterfowl staging areas.

Why are Ashkui Important?

When asked what *ashkui* means, most Innu say it refers to open water in the ice (literally, clear water). But rephrasing the question to ask, 'What do people do when they camp at *ashkui* in the springtime?' opened up a description of a way of life that involved a web of relationships between people, animals and the landscape. These descriptions involved the worldview and personal histories of Innu families. These histories are embedded in the landscape where Innu have camped and lived for generations. Sites associated with legends throughout the landscape further attest to the inseparability between the Innu psyche and the land. It is for this reason that Innu speak of the land as 'medicine', and liken *ashkui* to supermarkets and pharmacies, where you can get everything you need.

This intimate and personal relationship with the land is borne out further in the *tshishennuat* description of *ashkui* as 'like a father because it provides every-

thing'. Many *tshishennuat* also talked of ice as a living being. It has its own sounds, and a person has to learn how listen to, talk to, and make offerings to ice in order to survive and travel safely. The legends of 'ice person' inevitably ended in misfortune if people abused ice. Some people had been told stories as children that the ice would grab them if they got too close to it. Drownings were always a concern near *ashkui* sites, especially for children playing too near the thinning edges of the ice in the springtime while their families camped near *ashkui* sites.

Because of their longstanding relationship to their ancestral landscape, the *tshishennuat* are sensitive to the many environmental factors that affect the break-up of ice and the opening of water. These conditions vary from one body of water to the next, from one day to the next. *Ashkui* can occur on any body of water – lakes, rivers, ponds, and even puddles. Winds, rain, currents, depth of water, the presence or absence of rivers and brooks flowing in and out of lakes, the weather, as well as man-made alterations to the environment, are all factors that affect the formation of *ashkui*. *Ashkui* are present in the fall as ice forms, and in the spring when ice begins to break up. In some places, perennial freezing over never occurs because of the continual shifting of ice caused by the fast currents.

During the initial research, three types of ice were mentioned in discussing the formation of *ashkui*. The first was white ice, or solid frozen ice. The second was black ice, also called rotten ice, which appears as the ice begins to melt and push up from below the surface. The third was the 'nail' ice or a crystal-type ice that has the appearance of nails or crystals as the ice begins to melt. The ice below darkens as it begins to melt, and then pushes upward, or pops up. This occurs after the edges of the lake open and *ashkui* have begun to form. At this point, the winds play a crucial role in moving it off the lakes. It is the winds that move the ice back and forth on the lakes causing it to break up and move off down rivers if present. Another impact of the movement of ice by the winds is the piling up of the ice on the lake shores.

The ability to predict weather is obviously important. Winds, rain and sun all affect the ice conditions and the ability to travel on land and water, as well as the presence of animals around *ashkui*. Three birds were mentioned as weather indicators: the loon, the robin and a bird the Innu refer to as the rain bird. When the loon sings, it forecasts winds and storms. The robin foretells rain. The rain bird, which has the appearance of a swallow and arrives in the spring, forecasts rain when it sings. Others spoke about using the stars, the sky colour, and the way smoke rises as methods of predicting the weather. Other indicators are shooting stars, which tell which way the wind will blow from the direction they fall, and the redness of the sky at night and in the morning. Although most people do now have two-way radios in their camps to keep posted on news and weather, reading the weather from environmental indicators remains significant.

Ashkui sites are associated with the first arrival of flocks of waterfowl in the spring drawn to the open water. Later in the spring, the birds will pair off for

mating and the laying of eggs in the nearby marshes, woods and islands. These wetlands, islands and wooded areas are also a significant part of the overall *ashkui* ecosystem. It is near these *ashkui* sites that Innu families set up camp and live for weeks and months at a time to exploit the rich and varied resources of the land and water. The sites are also significant for the fish that come to the newly open water and the numerous animals that come near *ashkui* to eat fish or feed off the plant material washed down by the fast spring flows of the rivers. The smaller openings at the mouths of brooks are where animals come, and are favoured places for trapping a number of small mammals; they are also favoured caribou crossing points. During interviews, people were shown the pictures of waterfowl and were asked to discuss when they arrived, special characteristics, eating habits (vegetation vs. fish, deep divers vs. dunkers or swimmers), their habitats, and the uses to which different parts of the birds were put. Each picture was labelled with the Innu name for the waterfowl, and informants were asked the meaning of these names, and to make corrections.⁴

Inevitably, climatic and environmental changes have affected the formation of *ashkui*. Many *tshishennuat* mentioned that *ashkui* were opening earlier, or that springs are shorter at their camping areas than in previous years. At these places, *ashkui* would usually form in the first week of May, although one estimate was that *ashkui* were opening one month earlier than twenty years ago at one lake. Ducks and geese are also arriving sooner with the earlier opening of *ashkui*. One *tshishennua*⁵ estimated that thirty-five years ago there was still ice in May and even June, and people would not go to camp near *ashkui* until early June. Now there is no ice by the end of May. Further, increased rainfall creates more weight on the ice as it collects on the surface, which presses down on the ice thus expediting the popping up of the ice from below the surface.

Others attributed earlier spring break-ups to the Churchill Dam. One couple who camped in the Churchill Falls area mentioned that the ice sits higher on the water, no longer touching it, and that it is really dangerous for people who do not know about *ashkui*. There are now more *ashkui* everywhere. Sightings of Harlequin ducks had also diminished, according to one woman, and had not been seen since the building of the dam. Another couple complained that environmental changes are reflected in less fat on the animals because they work hard looking for food to eat, and the food is not quite right in the winter. A once productive *ashkui* site at Northwest River was destroyed by the building of a bridge. This site used to be rich in seals, ducks, and fish, including salmon. Seals came up onto the ice edge as the water opened. Seals were once of major importance to the Innu, used for medicine, food and clothing. They would cook the fat and drain it into a bottle or can and take it as medicine. Sealskin boots were especially good in *ashkui* when there was slush because the water did not penetrate the hide.

Low-level flying from the NATO air force base in nearby Goose Bay was mentioned during a number of interviews. People had first-hand experience of low-

flying jets and described the effect on animals and fish, and how frightening the sound was to people and animals. Stories of children and women running scared during an overhead pass were told by a number of people. Dead fish also started appearing in the water. And beaver were hesitant to come out for their night-time feeding during night-time flights. Many *tshishennuat* also spoke of how the taste of the meat from animals had changed particularly when hunted near industrial development sites, and mentioned observations of enlarged hearts, or other malformations in animal and fish.

The collaborative research effort has amassed a large body of information, now digitised and incorporated into maps and environmental assessments. As an unexpected spin off, this research assisted the Innu in their much publicised battle to change low-level NATO air force flight-testing corridors passing over *ashkui* sites, upsetting the life below. Currently the construction of an extension of the Trans-Labrador highway through Innu lands is further focusing interest on a specific area of wetlands and migratory bird habitats, staging grounds and moulting sites in a unique baseline study of environmental impact of the highway.

Western Scientific Perspective – Making it Relevant and Addressing Concerns

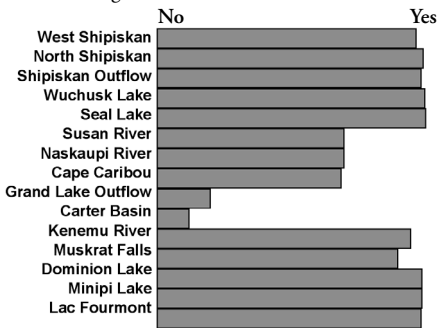
The objective of the Western science research was to undertake water quality investigation. The first objective was to develop a basic understanding of the water quality and general limnology of Labrador freshwater ecosystems. The second objective was to evaluate the trophic status of *ashkui* and to relate productive potential of these sites to the Innu observations of them as areas which are important for fish and waterfowl production. The *ashkui* sites are sampled yearly starting from initial open-water formation, through the summer period and into the autumn. At each *ashkui*, field measurements of water temperature, specific conductance, dissolved oxygen, turbidity and pH are taken. The water is also tested for ultra-trace mercury.

The focus of the Ashkui Project on the value and importance of different cultures, activities and perspectives on the Labrador landscape requires a dedicated emphasis on reporting results in ways that have meaning across cultures. In an effort to make the water chemistry research at *ashkui* meaningful to the Innu people, Environment Canada scientists endeavoured to answer some of the basic questions that the *tshishennuat* and other Innu asked them. The following are some of the questions that Environment Canada Scientists attempted to answer about water quality at *ashkui* sites. These questions came from the immediate concerns voiced by the Innu regarding the changes they were experiencing in their environment and issues fundamental to their way of life.

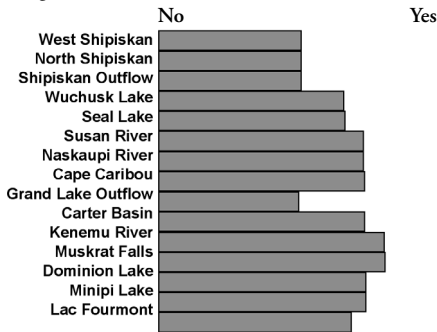
Will it make good Tea?

Tshishennuat often talk about *ashkui* water from the perspective of the taste of tea. The ability of the *ashkui* water to make good-tasting tea could be evaluated using a variety of water quality measures. Most of the *ashkui* had good quality water although some sites with high water colour (e.g. Susan River) or marine influence (e.g. Carter Basin) would be less suitable for making good tea; for example *tshishennuat* camping at the Susan River *ashkui* talked about poor tasting tea there. (Figure 6.1 indicates answers to questions.)

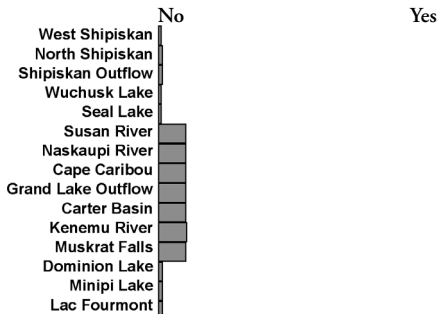
Will it make good tea?



Is it good for fish?



Does it have chemicals?



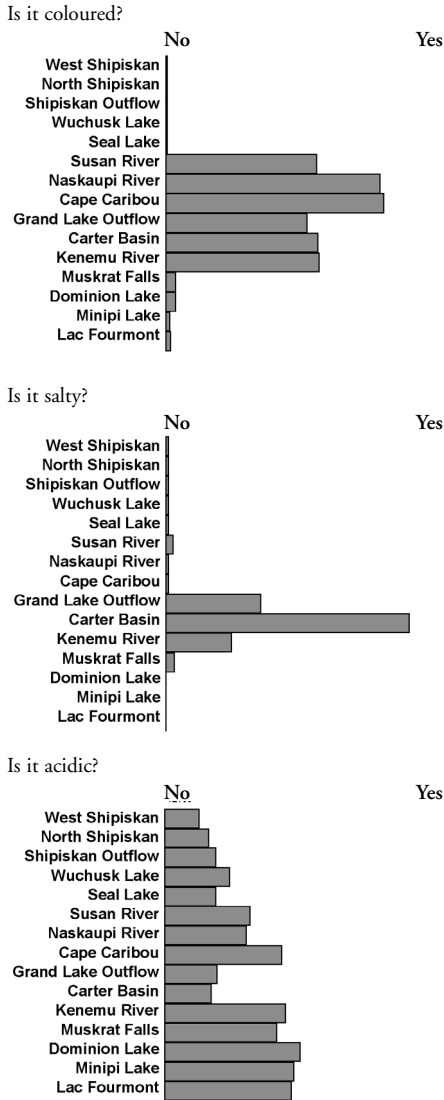


Figure 6.1 Assessment of ashkui water quality.

Is it Good for Fish?

The ability of an *ashkui* to support healthy populations of fish and other animals can be predicted from simple measures of primary production. In general, all of the *ashkui* have low production which suggests that they will support small but healthy communities of aquatic plants and animals. *Tshishennuat* have remarked that the concentration of fish at *ashkui* is thought to be related to high water movement and available light at open areas. The low production estimates also suggest that physical aspects may be responsible for high fish abundance at *ashkui*.

Does it have Chemicals?

One of the major concerns expressed by the Innu is whether or not the water is safe to drink. The metal concentrations at *ashkui* are low, suggesting that in general the water is safe for human consumption. In the more highly coloured waters, concentrations of metals such as aluminum are higher but this is to be expected and is not a health concern. The chemical analysis does not include evaluation of bacterial contamination, although given the remote location of these sites, elevated bacterial populations are not expected.

Is it Coloured?

Waters which drain bogs and other wetlands are often coloured brown by decaying plant materials. As decaying plant material produces fulvic and humic acids, these tea-coloured waters often provide less favourable habitat for fish and other aquatic animals and are less appealing as a source for drinking water. The *ashkui* in the Grand Lake area are the most highly coloured while the northern and southern sites are generally clear.

Is it Salty?

Tshishennuat appear to have considerable capacity to identify changes in salt content of fresh waters. These changes in salt have a profound influence on perceptions of the use of water for drinking. For example, several *tshishennuat* have talked about Grand Lake water near the Susan River being saltier now than in the past. Interestingly enough, sodium and chloride are often the dominant ions at the Susan River site. Several sites (Grand Lake Outflow, Carter Basin and Kenemu River) have salt influence from Lake Melville.

Is it Acidic?

Tshishennuat have expressed concerns about acid rain. The dilute nature of waters in Labrador makes most sites sensitive to acid rain, as they have limited ability to counteract incoming acids. However, none of the sites have as yet experienced major acid rain impacts. Excluding the sites influenced directly by salt water from Lake Melville, the potential for acid rain effects is more pronounced

in the southern sites. This makes sense as these sites are located closer to the industrial sources of acid emissions.

In essence, bringing the research back to the community is a way of reaffirming the Innu's practical knowledge from a scientific perspective, and showing the importance of their roles as collaborators in the project design and assuring that their knowledge features in and is passed on to policy makers. It gives Innu Knowledge political credence and significance which is central to them achieving a degree of autonomy in their own country. In turn, this will aid Innu in addressing increasing resource management responsibilities emanating from land claims negotiations and related co-management and benefit-sharing agreements, such as ones recently signed with the province of Newfoundland and Labrador Department of Forestry Resources and Agrifoods and with the Voisey's Bay nickel-mining operation taking place within Innu ancestral lands.

Labrador Project Evolution: Innu Environmental Guardians Program

A rich and comprehensive body of knowledge has been compiled that is of mutual benefit to the Innu community and environmental scientists. The work has evolved into assisting the Innu with a community capacity-building project referred to as the Innu Environmental Guardians Program (IEGP). The aim of the programme is to develop an educational path to train Innu in the management and protection of their ancestral lands based on Innu traditional values and current community needs. The program requires education not just as it is defined by Western scientists, but as it is defined by *tshishennuat*, custodians of Innu environmental knowledge and worldview. The Environmental Guardians concept recognises the importance of both the longstanding and substantial body of environmental knowledge held by the Innu, and the need for the Guardians to develop competency within Western scientific and technical disciplines concerned with environmental protection, management and resource use. Incorporating these two ways of knowing requires Innu Environmental Guardians to acquire a unique set of skills and competencies that can reflect both Innu knowledge traditions, and the disciplines and skills that are recognised by formal Western educational institutions. At its core, however, the programme is based on Innu values, needs and concepts of well-being.

The key to the programme's success is incorporating on-going community concerns, with which the Guardians are involved daily. Some of the programme's key components are:

- Courses offered in 2–3 week modules and delivered within the community or at field sites where projects are underway.
- Learning is related to on-going projects, e.g., a forestry co-management agreement with the provincial government, the monitoring of waterfowl

and wetlands in relation to the building of the Trans-Labrador Highway extension, monitoring the Voisey's Bay nickel-mining activities, etc.

- Modules are scheduled around 'real' life situations, e.g., seasonal work, family obligations, and time at camps in the country.
- Training crosses disciplines, Guardians receiving training in all aspects of environmental monitoring.
- Programmes are bilingual (Innu Aimun and English) when *tshishennuat* are present.
- The programme is Innu-driven, which means the community decides the priorities, and learning is geared towards the preservation of their own land use and cultural practices. This knowledge is then used as the basis of decision-making processes in any development project.
- *Tshishennuat* are involved as advisers and as teachers.

The Guardians play a key role as translators and communicators to and from their communities, and within their own communities between different generations. Many government agencies, educational institutions, businesses and non-profit organisations are approaching the Innu for a variety of research and development projects. The Guardians are responsible for communicating their cultural beliefs and values to these various outsiders, and then relate what is discussed back to their community in a meaningful and comprehensible way. This translation process back to the community involves the creation of new terminology for scientific concepts that have no equivalent in Innu Aimun (Innu language) since many of the *tshishennuat* speak only Innu Aimun. In short, the Guardians provide access to information often inaccessible to community members, particularly *tshishennuat*, and also create intergenerational bridges. This communication helps unify the community as well as address the loss of knowledge that will occur with the passing of the *tshishennuat*.

As a team, they support one another, share knowledge, offer different strengths to solve problems, and so forth. In turn, the community is beginning to regard them as a team of experts with a mandate to manage and protect their lands and cultural heritage. This includes the *tshishennuat*, who through their involvement are respected as teachers, but who are also learning the new way of looking at the environment through Western scientific eyes, and being able to compare it to their own ways. Increasingly, a hybridiation of knowledge occurs and the question that can only be answered in time is how this knowledge will be carried forward to serve the well-being of the community in the generations to come, given changing political winds and new generations yet to born.

During the autumn of 2002, some members of the Saint Mary's University faculty joined in the effort to develop a curriculum, offering formal academic accreditation to the training modules as a way to open up a university path to the Guardians. There was no requirement for any Guardian to take the two modules offered for credit – the intention was to train the Guardians, whether

or not credit was gained. However, during the first of a two-module accredited course, all fourteen participants signed up with the University. This is a unique and historic move. Saint Mary's University faculty acknowledged the role of the *tshishennuat* as the legitimate authority on their own knowledge and teachers of equal stature on the modules. During the first accredited course, the *tshishennuat* were involved in the evaluation of the Guardians.

The *tshishennuat* are co-evaluators with the module instructors. The Guardians are required to present their learning to the *tshishennuat*, who then evaluate according to their criteria. In so doing, the *tshishennuat* are learning about such concepts as ecosystems, watersheds, urbanisation and pollution, as well as the use of instruments such as the GPS, clinometers, and compasses. Anecdotally, during an evaluation where the Guardians were displaying the use of various instruments they use on the land, a *tshishennua* said, 'We carry GPS in our heads to find locations.' This was a poignant remark because it showed both his understanding of how the GPS worked as well as the changes occurring in how environmental knowledge is studied and stored.

Some of the faculty at Saint Mary's University also recognises the need for people to write and present in their first language within the Western educational system. Faculty working with the Innu Environmental Guardians Program are attempting to broaden the definition of literacy to recognise different languages as unique and enriching to the educational process. Doing so does not overlook the necessity to learn English as a requirement for dealing with contemporary issues, but English does not have to be exclusive of other languages. Recognising the importance of including the *tshishennuat* as well as responding to community needs, especially by traditionally established educational institutions, is part of the process to develop trust across cultures.

Although these are steps towards redressing the legacy of distrust brought by settlement and colonisation, there is still much more ground to till. Some of the Guardians, succumbing to social pressures and the recent influx of money into the community from Voisey's Bay, have been laid off, while Environment Canada itself has been undergoing reorganisation, shifts in priorities and funding cuts that are impacting on the programme. With the death of Geoff Howell, a crucial player in and protector of the project from the beginning, the value of the project began to be questioned by people with Environment Canada regarding the role of capacity building within scientific research.

Conclusion

Capacity building has to involve all stakeholders. Putting Western scientific and Innu knowledge in dialogue provides a much more comprehensive understanding of the Labrador landscape, and has raised Environment Canada's awareness of the significance of culturally valued areas. Through enhancing the role of the Guardians, they, in turn, can provide the community with access to information,

allowing for greater community in-put for decisions affecting their ancestral lands. Working with *tshishennuat* as advisers and professors bridges intergenerational divides that have arisen since settlement, and assists in the incorporation of Innu environmental knowledge into resource management, stemming the loss of knowledge with the passing of the *tshishennuat*. Further, the incorporation of Innu knowledge and the use of Innu Aimun within the educational process expands the notion of literacy, including scientific literacy, commonly held within university settings. This recognition of Innu Aimun adds further credence to language preservation efforts as an integral part of resource management and environmental sustainability. The *tshishennuat* involvement with the learning process of the Guardians makes them privy to the information exchange, and empowers them as professors of their knowledge equal to that of university professors. The offering of the choice for academic accreditation by the university opens a pathway to higher education that many Innu have rejected, or have been rejected from, entering in the past. Further empowerment of the Guardians came through the dedication of an Environment Office from the Innu Nation, giving the Guardians a distinct space from which to operate, again fostering an identity as a team of people versus individuals hired independently by various government agencies, as had been the case in the past.

In a preliminary way, we suggest six indicators for wholeness or wellness of the people in relation to any project. Each of these questions could be developed into an indicator, or a measurable value.

1. Have all the people been engaged in defining the motivation to undertake the project?
2. Does the research serve the community as well as the investors? Who is the ultimate beneficiary of change?
3. Who is defining the knowledge that is being gathered and documented? Is it inclusive of all stakeholders?
4. Who is governing the decision-making process and to what ends?
5. To what extent have avenues of communication, e.g., different languages, been included and respected?
6. To what extent have cultural land use practices and values been included in co-management agreements?

The true significance of the research is in the relationship between the collaborators, and the way research is conducted so that Innu priorities are respected and their needs for building capacity met. It requires a holistic view of the landscape, an integrated, interdisciplinary approach to knowledge,⁶ and a deep appreciation of the 'translation' process and role of the 'translators'. It has shown that communities are willing to take on these roles, develop a hybridised language to work with issues, and step forward into decision-making roles to bring about policy changes.

Notes

1. Geoff Howell died unexpectedly in 2003, leaving the Ashkui Project as part of his legacy. It was his initial vision to work collaboratively with the Innu Nation and social scientists at the Gorsebrook Research Institute to create a new paradigm for scientific research. Since his death, many changes have occurred in the project.
2. Dave Wilson, former project manager for the Ashkui Project at Environment Canada, Atlantic Region, retired in the spring of 2004. The Innu Nation, in gratitude for his years of dedication to the project, presented him with a gift. The gift was a painting of one of their respected *tshishennua*, Matthew Penashue, now deceased, accompanied by the story of Matthew's life. The picture was painted by Mary Ann Penashue, wife of the past Innu Nation president, Peter Penashue.
3. Anthropologist Frank Speck in writing about the Innu (formerly referred to as the Montagnais-Naskapi) stated, 'No wonder, then, the proper food of the tribe being either directly wild fruits or indirectly vegetable through the diet of game animals, that with their food in whatever form consumed, the Montagnais-Naskapi are "taking medicine." Thus the native game diet is prophylactic to mankind. A deep significance lies beneath this doctrine' (Speck 1935: 81).
4. Much has been written about the methodological weakness of using pictures as a research tool for developing indigenous taxonomies (Sillitoe 2003). In this case, a respectable body of research had already been developed regarding Innu taxonomies, e.g., Clement (1995) and the ongoing work of linguists, José Maillhot and Dr Marguerite MacKenzie, and my research interest was not in Innu taxonomic systems. The emphasis in the interviews was on the habits, conditions and characteristics of the different species of waterfowl that came to ashkui, the relationship of these species to *ashkui* in terms of the Innu way of life and worldview, and changes over time that could be identified in their behaviour.
5. *tshishennua* is the singular form of *tshishennuat*, according to José Maillhot, linguist and recognised authority on Innu Aimun (Innu language).
6. I recognise that there is a body of writing relating to interdisciplinary research (Sillitoe 2004) and the challenges involved. This is a topic that needs further consideration in the work we are undertaking, particularly with some shifting political and funding structures that are currently affecting our project.

References

- Battiste, M. 1998. 'Enabling the Autumn Seed: Toward a Decolonized Approach to Aboriginal Knowledge, Language and Education', *Canadian Journal of Native Education: Creating Power in the Land of the Eagle* 22(1): 16–27.
- Bieder, R.E. 1986. *Science Encounters the Indian, 1820–1880: The Early Years of American Ethnology*. Norman, OK: University of Oklahoma.
- Canadian Biodiversity Strategy, available at http://www.eman-rese.ca/eman/reports/publications/rt_biostrat/cbs27.htm.
- Canadian Environmental Protection Act (1999), available at <http://laws.justice.gc.ca/en/C-15.31/text.html>.
- Clément, D. 1995. 'Why is Taxonomy Utilitarian?', *Journal of Ethnobiology* 15(1): 1–44.

- Convention on Biological Diversity, Principle 8.j available from <http://www.biodiv.org/convention/articles.asp?lg=0&a=cbd-08>
- Davis, W. 2002. 'Wade Davis: Writer and Defender of Life's Diversity', *Ideas CBC Radio*, 4 February.
- Environment Canada 1999. *Labrador Biodiversity and Environmental Monitoring Project: Linking Western Science and Indigenous Ecological Knowledge*. Halifax, Nova Scotia.
- Innu Nation 1999. *Innu Nation Discussion Paper: Research Priorities in Nitassinan, Four Perspectives on Ecosystem Research Priorities in Labrador*, ed. Environment Canada, Collaborative Research Workshop, Memorial University, St. John's, Newfoundland, 8 April.
- Penashue, P. 2001. 'Building Respectful Research Partnerships', in *Ashkui Symposium Papers*, compiled by Trudy Sable. Halifax, Nova Scotia: Gorsebrook Research Institute.
- Rio Declaration on Environment and Development*, Principle 22 available from <http://www.unep.org/Documents/Default.asp?DocumentID=78&ArticleID=1163>.
- Sillitoe, P. 2003. *Managing Animals in New Guinea: Preying the Game in the Highlands*. London: Routledge.
- 2004. 'Interdisciplinary Experiences: Working with Indigenous Knowledge in Development', *Interdisciplinary Science Reviews* 29(1): 6–23.
- Speck, F.G. 1935. *Naskapi: the Savage Hunters of the Labrador Peninsula*. Norman: University of Oklahoma Press.
- Wilson, Dave 2004. Personal Interview, 26 March 2004. Environment Canada Atlantic Region Office, Dartmouth, Nova Scotia.

