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COMPOSITE REPORT ON THE STATUS AND TRENDS REGARDING THE KNOWLEDGE, INNOVATIONS AND PRACTICES OF INDIGENOUS AND LOCAL COMMUNITIES

Regional report: North America

Note by the Executive Secretary

1. The Executive Secretary is circulating herewith, for the information of participants in the third meeting of the Ad Hoc Open-ended International Working Group on Article 8(j) and Related Provisions, the regional report for North America on the status and trends regarding the knowledge, innovations and practices of indigenous and local communities, which was used as input to the first phase of the composite report on the same subject (UNEP/CBD/WG8J/INF/1).

2. The report is being circulated in the form and language in which it was received by the Secretariat.

* UNEP/CBD/WG8J/3/1.

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REGIONAL REPORT: NORTH AMERICA (CANADA AND THE UNITED STATES)

1. State of retention of traditional biodiversity-related knowledge

1.0 Overview – regional issues

The state of retention of traditional knowledge in Canada and the United States (US), including Hawai'i and American Samoa, is both on the brink of collapse and experiencing a renaissance (Battiste & Henderson, 2000). Some fear for the ultimate loss of much traditional knowledge with the passage of the current generation of elders (Clarkson & Andre, 2002), while others point to the survival of indigenous peoples in the face of terrible hardship as evidence that indigenous peoples and their cultures will survive any present or future challenge (Chitimacha Tribe of Louisiana, 2002). Yet others feel that while there has been erosion of traditional knowledge it is changing and evolving, not dying (Johnson, 1992). It would appear from the literature that all this and more is true of indigenous knowledge. Indigenous knowledge, innovation and practice in North America are simultaneously extinct, threatened, in decline, in recovery and thriving. Overall, however, there is evidence of drastic decline over the last century or so and indications are that this decline may well continue.

This is a complex topic. A comprehensive study is complicated by the fact that North America, Hawai'i and American Samoa are home to a diversity of indigenous peoples spread across assorted ecosystems and experiencing vastly different pressures. The present day reality of indigenous peoples, including the state of traditional knowledge, innovations and practices, reflects these varied conditions. In any given community one might find elders who continue to practice traditional lifestyles and who share their knowledge with youth keen to learn and continue the traditions. In the same community or in a neighbouring community you may find elders who hold only memories of life on the land from a long ago childhood and youth who have scant interest in the traditions, their imaginations seized instead with the wonders of the 21st century. As Paci, *et al*, (2002) note, "*not all members of a given community are TEK holders, and the maintenance of this knowledge is patchy at best. There is a constant ebb and flow of erosion and revitalization of this knowledge. Constantly, the traditions are being adapted.*" The level of traditional knowledge held in a community or between communities (Paci, et al, 2002; Turner, Ignace & Ignace, 2000) or the degree of skill in particular activities is uneven (Ohmagari & Berkes, 1997), further complicating any attempts to draw general conclusions.

The following report attempts to present a picture of the state of traditional knowledge in Canada and the United States and describe some activities currently underway to protect, promote and facilitate the use of traditional knowledge. Before launching into the topic, however, a few introductory comments are worthwhile.

As per Conference of the Parties Decision VI/10, this report focuses on the subject matter of the first phase of the Composite Report, specifically the state of traditional knowledge, innovation and practice and activities underway to facilitate the retention and use of the knowledge, innovation and practice. It does not address, except in passing, issues relegated to the second phase of the Composite Report; that is issues of language or the causes of decline of traditional knowledge, innovation or practice. Further, the report only briefly touches upon the consequences of the loss of traditional knowledge, innovation or practice on biological diversity or indigenous or non-indigenous communities. Finally, although the report is divided into sections, it is important to consider it as a whole. It is difficult to divide traditional knowledge into categories of ecosystems or distinguish between plants and medicine, for example. Thus information included in one section may be equally applicable to another section of the report, and examples of activities to protect and promote the use of traditional knowledge can and are used as examples of the state of traditional knowledge and vice versa.

This is a desktop study, relying on published materials. Sources of material included books, the Internet and academic journals. In light of this it was not possible to confirm the current state of traditional knowledge, innovation or practice in all instances. Much of the literature presented traditional knowledge, innovation and practice from an historic perspective. Information on current practices was limited and often what evidence there was has been gleaned indirectly from the content of the record. Even studies of modern practices are soon out of date and no longer necessarily present an accurate picture of traditional knowledge or practice. A report by the Arctic Monitoring and Assessment Programme, (1997), for example, cites a study from 1991. In that study it was found that 38% of the Dene community in North West Territories and 30% of the Yukon First Nations relied on the non-cash economy, implying a substantial reliance on the land for sustenance. That particular study is now over ten years old. Indigenous communities in North America are under tremendous stress and what may have been true of a particular community even a few short months previously may be altered rapidly and substantially. The discovery of oil and gas reserves, damming of a river, or loss of a revered Elder can undermine a community's ability and resolve to pursue its traditions. Thus, the state of traditional knowledge is in constant flux and can only be described within the context of a given people at a given time.
Many comments in the literature on the state of traditional knowledge are broad general statements, such as,

- *Canupawakpa First Nation is 27 kilometres south of Virden, Manitoba... There is a good retention of the language in the community and a lot of cultural preservation.* (Dakota Ojibway Tribal Council, 2003).
- *The Blackfeet, once referred to as "Lords of the Plains," continue to take part in traditional and contemporary ways of life* (Spoonhunter, 2003).

While providing a tantalizing peak at the state of traditional practice, the comments provide little information on which to base conclusions. Many questions remain outstanding including how are the practices maintained, what practices are still pursued, how is the knowledge being passed to successive generations, etc.

There are also a couple of issues with respect to definitions that arise in the context of this paper. First, note that this report deals solely with indigenous communities. While Article 8(j) also makes reference to local communities, no definition has been offered by the Conference of the Parties as to what constitutes a "local community" and it is uncertain whether any community in North America would qualify. Second, this report does not investigate various definitions nor does a definition of traditional knowledge appear in these pages. There is no definition provided by the Conference of the Parties, no agreement on a definition of traditional knowledge in the literature, and some controversy about the adoption of any particular definition. This report attempts to address the question of the state of traditional knowledge, innovation and practice despite this uncertainty.

Finally, as with determining one's physical well being, determining the health of traditional knowledge could be deduced from the existence or not of particular symptoms. While we have a general understanding of concepts of health in one's corporeal body, there is no agreement on what may constitute a healthy body of traditional knowledge, innovation or practice. What are the indicators of health? Examples might include the degree of language retention, degree of access to traditional territories, social health of communities, duration and degree of contact with non-indigenous communities, extinctions of species, etc. It is suggested that examination of the indicators of a healthy state of traditional knowledge, innovation and practice is worthwhile. It was not possible to do so in this

report and was beyond the four corners of the assignment. Yet agreement on this may well facilitate greater ease in preparing future reports particularly by defining a baseline of health.

So now to the report itself. A brief overview of conditions for indigenous peoples in North America will help to situate the reader unfamiliar with the North American landscape.

Canada recognizes three groups of indigenous peoples under the *Constitution Act, 1982*, collectively referred to as aboriginal people. This includes Indians or First Nations; Inuit, previously referred to as Eskimos; and Métis, or those of mixed First Nations-European heritage. In the United States, the US Census Bureau identifies indigenous peoples as American Indian, Alaskan Native, or Native Hawaiian, and their communities as Tribes. In the Canadian context the term "First Nations" refers to over 50 traditional nations of peoples, such as the Cree, Maliseet or Dene, now divided into 633 Bands or communities. The term "American Indian" and "Alaskan Native" are also collective nouns referring to over 560 different tribes, such as the Creek, Shoshoni, Yupik, etc. The term indigenous peoples, although not in common parlance in North America to describe the original peoples of this continent, will be used in this paper to refer to the collective. The names that people call themselves, or names that have come into common use, will be used when referring to a specific group. Please note, however, that as few of these peoples had a written language, the spellings used herein are only approximate phonetical renditions and may change depending on the source of information.

North America, including Hawai'i and American Samoa, is composed of ecosystems ranging from tropical to arctic. There are vast oceans and inland lakes, mountain ranges, deserts, grand swathes of forest and prairie, as well as densely populated mega-cities. It is home to a human population of over 330 million people.

Of that, close to six million self-identify as indigenous peoples. In the 2001 Canadian census, 976,305 people self-identified as being of aboriginal heritage. This included 608,805 First Nations, 292,305 Métis and 45,070 Inuit (Statistics Canada, 2003). The United States Census Bureau reported 4,119,301 people who self-identified as American Indian or Alaskan Native alone or in combination with one or more other races (Ogunwole, 2002) and 874,000 Native Hawaiian or South Pacific Islanders of single race or two or more races. Note that this final category includes Polynesian: Native Hawaiian, Samoan, Tongan, and Other Polynesian; Micronesian: Guamanian or Chamorro, or Other Micronesian; and Melanesian: Fijian, Other Melanesian and Other Pacific Islander (US Census Bureau, 2001).

While there is considerable disagreement about the number of indigenous people living in North America prior to contact, there is little debate that disease, war, and attrition took its toll on these populations (Dobyns, 1983; Stiffarm & Lane, 1992). Some cultural groups are completely lost. The Beotuk of Newfoundland for example were extinct by the early 19th Century (Marshall, 1996). Many individuals and sometimes entire communities perished from foreign disease long before Europeans even entered their territory. "*A serious contagious disease causing significant mortality invaded North American peoples at intervals of four years and two and a half months, on the average, from 1520 to 1900"(*Stiffarm & Lane, 1992, p.31).

The degree of diversity is reflected in the languages of the indigenous peoples of North America. There are over 78 First Nations' languages in Canada as well as Inuktitut, the language of the Inuit, and Michif, the language of some of the Métis. This number includes some regional variations i.e., six subcategories of Cree including Plains, Swampy, Northern East, Southern East, Moose and Woods. Five languages are extinct including Beothuk, Wyandol and Pentlatch. A further 11 are nearly extinct including Haida, Tuscarora, and Munsee (SIL International, 2003). In the US a total of 162 indigenous languages currently exist. As in Canada, some of these are regional variations of a single language such as Yupik Central, Central Siberian and Pacific Gulf. Fifty languages are extinct including Natchez, Powhatan and Atakapa,

and 74 are nearly extinct including Wichita, Pawnee and Catawba (SIL International, 2003). In American Samoa most people are bilingual – Samoan and English (Central Intelligence Agency, 2003).

Many of these peoples have strong linkages following geographical, not political, boundaries. The traditional territories of many of the indigenous peoples of North America crossed the current international boundaries between Canada and the United States, and in the southern United States crossed the boundary into the territory of Mexico. This includes the likes of the Iroquois, Gwichi'in, Lakota, and Pima. Some continue to hold territories across international and intra-national boundaries, such as the Mohawks of Akwesasne, situated at the junction of upper New York state in the US and the provinces of Ontario and Quebec in Canada. These traditional linkages remain strong in many communities, even where the territories they now control are no longer contiguous. Evidence of the historical links can be found in the shared languages, including for example, Michif, Plains Cree and Northern Haida.

As a rough estimate, there are 43,450,266.97 acres of tribally owned land, 10 million acres of individually owned land, and 309,189 acres of federally owned land that is held in trust status in the United States (Bureau of Indian Affairs, 2003). In Canada, reserve land amounts to 3,189, 543.10 hectares plus another 3,787,615.30 acres of addition to reserve commitments, 1,787,603.00 acres of which have not yet been selected. In addition are the Métis Settlement Lands and lands held by indigenous peoples as the result of land claim settlements. This last category of lands includes over 2,000 square kilometers held by the Nisga'a (Federal Treaty Negotiation Office, undated), 14,000 square kilometers held by the James Bay Northern Quebec Cree as Category 1 lands (lands over which they have exclusive authority) (Indian and Northern Affairs Canada (INAC), 1998), 41,000 square kilometers for the Yukon First Nations (INAC, 2002) and 1.9 million square kilometers for the Inuit under the Nunavut Land Claims Agreement (INAC, 2000). There are also a significant number of outstanding claims by First Nations and Métis in Canada, including claims for most of the province of British Columbia.

Launched in 1993 the Royal Commission on Aboriginal Peoples tabled its report in 1996 after having *visited 96 communities, held 178 days of hearings, heard briefs from 2067 people and accumulated more than 76,000 pages of testimony* (Dussault & Erasmus, 1996). Among other things, the Commission found that the indigenous population in Canada is generally poorer, younger, less educated, more likely to be incarcerated, suffer greater illness and die younger and more frequently from suicide than the general population (INAC, 2002). The same is true in the United States (Prairie Band of Potawatomi Nation, 2003). These facts of life undoubtedly impact the state of traditional knowledge.

Finally, note that Canada is a party to the Convention on Biological Diversity, while the United States is not. Canada has submitted two national reports. The first notes, [t]*he key to making decisions that do not adversely affect biodiversity is a better understanding of ecosystems and how they are affected by human activity. This includes a better understanding of traditional knowledge and the role it might play in conservation and sustainable-use efforts.*" (Public Works and Government Services Canada, 1998).

1.1 Status of traditional knowledge of plant genetic resources for food and other purposes

Plants are used for many different purposes in all traditions, indigenous or not. In addition to plants for food, plants were, and in some cases still are, used by indigenous and non-indigenous peoples for dyes, medicine, art supplies, building materials, firewood, clothing, cooking utensils, hunting aids, etc. This is the case in North America. Traditional knowledge of some plants continues to be of vital importance, not only to indigenous peoples of North America, but also to people around the world. The knowledge of other plants is falling into disuse or has ceased to exist.

As a static record of information, the written documentation of traditional knowledge with respect to plant and genetic resources for food and other purposes is robust and the activity of recording such knowledge is thriving. One can go to virtually any public or university library in North America and find numerous books or log on to the Internet and find websites dedicated to describing the traditional knowledge, innovations and practices of indigenous peoples with respect to plant genetic resources. Information is available on the growth, collection, storage, methods of preparation, and use of plants relevant to indigenous peoples. If one wants to know how to make traditional cedar root baskets, or how to preserve berries, or when to pick lilies one can likely find a book or website on the subject. This information may someday serve as a means to recapture traditional knowledge that has been otherwise lost to its original practitioners. If this knowledge remains bound in the four corners of the page, however, it becomes purely theoretical with little relevance at all to the preservation of biological diversity.

The traditional knowledge of particular plant species is flourishing, though perhaps there is little recognition of such knowledge as being traditional indigenous knowledge. *"Acculturation, as the anthropologists indicate, proceeds in more than one direction, although the drama of the conquest and settlement of America has tended to obscure this reality"*(Vogel, 1970, p. 5). Much traditional knowledge related to North American plants has been absorbed by the dominant culture, though often with little if any acknowledgement of where the knowledge came from in the first place. "*Fully two-thirds of all the vegetal foodstuffs now consumed by humanity were under cultivation in Native America – and nowhere else – at the moment Columbus first set foot on Hispañola."* (Stiffarm & Lane, 1992, p.30).

As noted in the Canada and US Country Reports in *The State of the World's Plant Genetic Resources For Food and Agriculture* (1996) prepared for the Food and Agriculture Organization, a tremendous diversity of plants were important food sources for the indigenous peoples. The report from Canada notes that 170 species of native plant materials were used for food and 52 species for beverages. Some of these have formed the basis for extensive commercial application including grasses such as barley and flax, berries including blueberry, buffalo berry, cherry, cranberry, current, elderberry, highbush cranberry, lingonberry, raspberry, saskatoon berry and strawberry, fruits such as grape, apple and plum, nuts including walnut, hazelnut, and hickory, and other species such as wild rice, corn, squash, and beans (Agriculture Canada, 1996). The United States also acknowledge species used by indigenous peoples before European colonization, many of which are the same as in Canada. These include sunflower, Jerusalem artichoke, pecan, and paw paw, as well as many plants utilized for their medicinal properties. As many crop varieties were developed both by indigenous and non-indigenous peoples from plants native to North America, protection of their genetic roots is essential for continued well being globally.(US Dept. of Agriculture, 1996)

The Native Seed Search seedbank houses approximately 2000 different accessions of traditional crops utilized by the Apache, Chemehuevi, Cocopah, Gila River Pima, Guarijio, Havasupai, Hopi, Maricopa, Mayo, Mojave, Mountain Pima, Navajo, Paiute, Puebloan, Tarahumara, Tohono O'odham and Yaqui cultures. Over one-half of the accessions are comprised of the three sisters -- corn, bean, and squash. An additional 48 species of crops and wild crop relatives wait in frozen storage, including amaranth, tepary bean, chile, cotton, devil's claw, gourds, melon, sunflowers, tobacco, teosinte, and wild beans, chile, cotton, and gourds.

Though maize, beans, and squash account for just over one-half of the collection, other unique and often rare crop varieties are being systematically collected and preserved in the NS/S seedbank: red-seeded amaranth used to dye piki bread by the Hopi; black-seeded sunflowers used as a dye stuff; drought-tolerant beans grown by O'odham in the Pinacate region in northwestern Mexico (perhaps one of the hottest regions in North America); Sonoran panic grass

(Panicum sonorum) - once thought extinct; sunflowers containing genes for resistance to a commercially devastating sunflower rust; other sunflowers that are restricted to serpentine soils; lemon basil; chia - an important source of protein, oil, and fiber for the O'odham; red-seeded watermelons. All these and more contribute to the rich genetic legacy maintained by the many peoples and cultures that have inhabited and survived among the coastal deltas, lowland plains, bajadas, and high mountain plateaus contained within the southwestern U.S. and northwestern Mexico.

Native Seed Search, 2002

Furthermore, indigenous peoples in North America shared their knowledge of agricultural practices with the newcomers; some of which were adopted, some of which fell into disuse, others that were outlawed. *"The methods employed in North America included planting rather than sowing seeds in the Old World fashion – a practice that allowed for seed selection and the perfection of specific plant strains – as well as crop rotation and fertilization*" (Stiffarm & Lane, 1992, p.30). Many traditional agricultural practices have fallen into disuse, however. For example, the Iroquois planted corn, squash and beans – the three sisters – together. The corn provided a pole for the beans to climb, the squash provided shade and weed control and beans added nitrogen in the soil. While this model may still be followed in small local gardens, modern agricultural technique relying on monocropping and the use of insecticides, herbicides, and fertilizer widely replaced the indigenous system. Some practices, which have since been demonstrated to improve biological diversity, were made illegal. The use of fire to stimulate new growth, encourage the growth of food for animals, control pests, or even prevent the spread of wild fires was wide spread in North America (Lewis & Ferguson, 1988; Berkes, Colding, & Folke, 2000). Land management policies imposed by the dominant society, however, required the suppression of fire and severely curtailed its use for positive effects. "Wild" rice or *manomin* was traditionally not wild at all, but the result of a deliberate management policy practiced by the Ojibway (Chapeskie, 1999). The *Wild Rice Harvesting Act* of Ontario now dictates ownership and management of wild rice, based on the assumption that wild rice occurred naturally (Chapeskie, 1999).

The notion of "pristine" wilderness held by the dominant society assumes a void of human interaction. This simply was not the case, as indigenous people had significant deliberate interaction with the landscape. The practice of some processes and the knowledge of plant species to which the practices related is clearly in decline or has been lost altogether as the following passages indicate.

> *An unidentified native grain, which the Spanish described as 'excellent pasture", once covered the valleys and low slopes in the Kumeyaay area…The grain gradually became extinct as the Kumeyaay lost control of the land, first to the missions and later to the ranchers, who covered the land with sheep, cattle, and horses. Many native annuals were replaced by European pasture grasses and weeds which had evolved in conjunction with grazing domestic animals…The native grain survived longest in the inland southern mountains, where the Kumeyaay successfully resisted Spanish and Mexican entry. Here, surviving Kumeyaay bands still harvested the grain, burning the stubble and broadcasting the seed, until the late 1880's. Thus elderly witnesses could describe the process and the grain for me in the period between 1950 and 1960* (Shipek, 1993, p. 330).
>
> *[T]he vertical structure, spatial extent, and species composition of the various plant communities that early European visitors to California found so remarkably fecund were largely maintained and <u>regenerated</u> over time as a result of constant, purposive human intervention. When that intervention ceased, a process of environmental change began that led to a gradual decline in the*

> *number, range and diversity of many of the native species and habitat types that once flourished here. When elders today are asked why the rich resource base and fertile landscape that they remember as having existed in the past has changed so drastically, they are apt to respond by saying simply "No one is gathering anymore". The idea that human use ensures an abundance of plant and animal life appears to have been an ancient one in the minds of native people.* (Blackburn, Thomas, C. & Anderson, Kat, 1993, p.19, emphasis in the original).
>
> Secwepemc elder Mary Thomas notes that, "[e]*verything is deteriorating – the surface of the soil where we used to gather our foods, there's about 4 to 6 inches of thick, thick sod and all introduced [plants]. And on top of that the cattle walk on it, and it's packing it to the point where there's very little air goes into the ground, very little rain and it's choking out all the natural foods [e.g. rice-root, avalanche lily, spring beauty], and its going deeper and deeper, and the deeper they go the smaller they're getting. She said that her grandmothers and mother would not even consider harvesting avalanche lily bulbs that were smaller than 2.5 cm across and 7 – 8 cm long. Now, because of the cattle and the dense turf, and because people are not digging these roots anymore, it is almost impossible to find plants with bulbs of this size. She also observed that much of the prime digging meadowlands for avalanche lily are being inundated by shrubs such as black hawthorn (Crataegus douglasii). This is because people are not burning the way they did formerly. Gradually she believes these meadows will be completely covered in bush.* (Turner, Ignace & Ignace, 2000, p.1284).

As noted earlier, many books and journals present traditional knowledge as history. Few of these books or journal articles indicate whether the knowledge is still in use by the indigenous peoples or others. Often, there is nothing more than a short sentence or fragment that indicates whether the practices continue. Examples of the latter include the following.

> "*Thus the inner bark of western red-cedar and yellow cedar was (and still is) harvested in quantity by Northwest Coast peoples for use in basketry, mats, cordage, and clothing."* (Turner, Ignace, & Ignace, 2000, p. 1277, emphasis added).
>
> *""Indian celeries" is the English phrase used by contemporary Sahaptin speakers to refer to a set of plants which provide fresh edible sprouts, stems, and shoots, several of which are still eagerly sought as snacks by Indians of all ages."* (Hunn, 1982, emphasis added).

Sometimes, however one comes across an article that is dedicated to the examination of current practices. For example, Ortiz (1993) describes the contemporary work of weavers from the Mikilakawna Pomo, Kashia Pomo, Yurok, Olemitcha Miwok, Dunlap Mono, Tongva, Ajachme, Hupa, and Karuk Tribes of California. The work includes observations of traditional teachings such as when to pick, how to pick, and how to give thanks. Another example is the ethno botanical survey involving the Gosiute, Pahvant-Southern Paiute and Ute peoples, which included consideration of whether the communities continue to use the plants identified by representatives of the peoples and whether the information is being transmitted from elders to the youth (Halmo, Stoffle, & Evans, 1993). Basket making in particular appears to remain wide spread among the indigenous peoples (see for example, Chitimacha Tribe of Louisiana, 2002; Hopi Tribe, 2001-5; Walker, 1999).

Some knowledge and practice has been displaced because other alternatives are available, but not entirely lost or forgotten. The construction of birch bark canoes, for example, is very limited. Not only have new materials become available from which to construct canoes, but also motorboats and other forms of transportation have displaced the use of the canoe itself. While the knowledge and practice of canoeing and canoe making may not be as widely spread among the inhabitants of North America as it once was, there is continuing interest in the traditional skills and crafts of canoeing canoe building both by

indigenous (Penobscot Nation Forestry Department, 2002) and non-indigenous peoples (Canadian Canoe Museum, 2002-3).

The true test of the vitality of the knowledge is its use, however. First hand observation or primary research is the best indicator of use. For example, one can attend indigenous ceremonies in Canada where cedar, tobacco, sage and sweetgrass are used in prayers, or attend community feasts where moose and wild rice is served. One can infer from use that the knowledge exists and innovations and practices continue to be vital to the community.

Some plants and the associated knowledge and practice have gone extinct in North America. Some traditional knowledge and practice, though much reduced, continues to be held and pursued by small communities. Sometimes the practice has been pushed out by various influences and thus the associated knowledge is declining. Other knowledge of plants, though associated practices may have changed, is thriving and has been adopted far beyond the indigenous population. While there is evidence that some traditional knowledge and practice continue, there is a greater preponderance of evidence demonstrating a decline in this knowledge and skill.

1.2 Status of traditional knowledge of animals and microorganisms for food and other purposes

As with plants, there are many books and journals that describe the traditional knowledge of animals for food and other purposes. Many of these materials, as with others noted above, highlight traditional knowledge from a historic perspective, that is, what indigenous peoples used to do. However, in contrast to the information available on plants, there were many more articles that address current hunting practices. This is particularly true with respect to indigenous peoples living in northern Canada and Alaska.

The land use study undertaken by Terry Tobias in the Métis community of Pinehouse, Saskatchewan to quantify the value of wild foods and fuel wood collected by the community is an example. The study was prepared at the request of the community to counter government intentions to restrict access to their traditional land base and activities. Previous studies undertaken by various government consultants had either completely omitted the reliance of the community on wild foods or had grossly underestimated their importance to the economic well being of the community. Tobias notes in his study that "[i]*n one year, the almost 700 residents, 50% of whom were under 15 years of age, harvested 186,000 pounds (84,370 kg) of edible meat. In that same year, harvesting activities accounted for approximately one-third of the village's income."*(Tobias, 1993, p. 87). Animals harvested consisted of traditional wild meats including fish, moose, rabbit, bear, waterfowl, beaver, muskrat, deer, grouse, and caribou. A total of 3,033 kgs of berries and 682.5 cords of wood were also harvested (Tobias, 1993). A similar study undertaken of the Mitchikabibikok Inik (Algonquins of Barriere Lake) in the early 1990's showed that only 23 of 450 people in this community had full time employment. However, the study also demonstrated that "[t]*he 90% unemployment rate is offset by reliance on the traditional economy…* [I]*n a given year, the land provided the community with 60,000 kgs of edible meat (780 kgs per household and 130 kgs per person). On average each household harvested meat at a value of $6,623. Families burned an average of 10.5 face cords of wood, which gives a fuel value of $48,000. In addition, non-meat resources from the bush added at least $845 per household. The estimated value of goods taken by the Algonquin economy was $575,245 a year from the land base."* (Algonquin of Barriere Lake, 2001).

Reports such as this give some indication of the state of traditional knowledge that can be inferred from practice. A number of articles suggest current practices of indigenous peoples continue to rely on traditional knowledge.

> "*James Bay Cree hunters rotate trapping areas on a four-year cycle (ideally) to allow populations of beaver to recover. They use a similar rotation technique for fishing areas, using the declining catch per unit of effort as the feedback that informs decision-making, basically an optimum foraging model*."(Berkes, Colding, & Folke, 2000, p. 1255).

> "*In Yaqui stories and ceremonies still ritually enacted by thousands of participants every year, the dozens of wild creatures that inhabit the huya ania and sea ania are communally remembered and paid respect by Yaqui communities on both sides of the U.S./Mexico border. Reverence toward deer and other sacred creatures from these legendary worlds is publically demonstrated so frequently in older Yaqui communities that it remains a vital component of contemporary life, not simply a vesitage of the past*" (Nabhan & St. Antoine, 1993).

Hunting and fishing are still pursued in many communities as a daily activity (Secretariat aux affaires autochtones du Quebec, 2003; Tobias, Terry, 1993) or during occasional visits to the bush (George, Berkes, Preston, 1995; Ohmagari & Berkes, 1997).

There is also evidence that some traditional knowledge is in recovery (Berkes, et al, 1994).

> [T]*he Nez Perce tribe of Idaho was able to work directly with the federal U.S. Fish and Wildlife Service to help reintroduce wolves into Idaho. The motivation for this partnership from the perspective of the Nez Perce was centered in their traditional relationship with wolves, who they viewed as tribal forebears. The representatives of the state of Idaho were opposed to the reintroduction of wolves because of fears of cattle predation and limited buy-in to the concept of ecosystem management requiring the return of dominant predators to the landscape. (Ross & Pickering, 2002).*

> *"Some traditional activities now take precedence over town living. For example, schools take a "goose break" during the goose hunting season in spring"* (Ohmagari & Berkes, 1997).

While there is no specific mention of traditional knowledge, that knowledge is evident in the words of the Chairman of the Northwest Indian Fisheries Commission, Billy Frank Jr. (2003) in describing the importance of salmon to the people.

> "*Those who think it is a matter of choosing between salmon and people are missing an important point. Salmon are an indicator species for all life in the Pacific Northwest, including human life. To have healthy communities in the years to come, we must have healthy runs of salmon. As a species that swims through both fresh and salt water throughout the region, the salmon is a living gauge of environmental health, as well as a vital component of our cultural and economic strength and overall quality of life."*

Animals were sought, not only for food, but also for skins, bones and horn, for use for clothing, shelter and tools. This knowledge is being lost, as alternatives to these are widely available commercially.

> *It has been well over 100 years since Gwich'in traditional caribou skin clothing was made and there are no examples of this clothing in either the Gwich'in communities or the North West Territories today. It has been over 50 years since porcupine quillwork was used as the primary decorative motif on Gwich'in jackets, slippers, and gloves* (Kritsch & Wright-Fraser, 2002).

In a project to create five replicas of a 19th century Gwich'in outfit, the seamstresses noted that,

> *[t]he difficulty we had in obtaining home-tanned caribou hides was symptomatic of the widespread decline in home tanning that is occurring in the North today. In future, we intend to carry out projects that will revitalize this traditional skill before it is lost entirely* (Kritsch & Wright-Fraser, 2002).

The Alaska Traditional Knowledge and Native Foods Database contains a wealth of detailed information on the hunting and consumption practices of the indigenous peoples of Alaska. The information is gleaned from reports prepared by the Alaska Department of Fish and Game Division of Subsistence. Many of the reports date from the late 1980s and early 1990s, however and so are of limited value to determine current practices (Alaska Native Science Commission, Institute of Social and Economic Research, 2002).

Obviously, much traditional knowledge related to endangered or extinct species is lost or seriously threatened as a relevant body of knowledge today. Some attempts to revive this knowledge have met with resistance (Northwest Indian Fisheries Commission, 1998). In other instances, knowledge of non-indigenous species has become central to the traditional way of life of some peoples. For example herding sheep and goats has become central to the traditions of many Diné and Hopi peoples (Halberstadt, 1998-2002). As will be seen below, reliance on traditional wild foods has reduced over the years giving rise to wide spread health problems in the indigenous community. In other cases, such as for the peoples of Alaska and northern Canada, contamination of wild foods from persistent organic pollutants has required a reduced reliance on these traditional food sources (Centre for Indigenous Nutrition and Environment, 2001). Overall, while hunting and fishing remain favorite activities in indigenous communities, the day to day reliance on indigenous animals for food is in decline, hence the knowledge and practice of traditions related to animal harvesting is also likewise in decline.

1.3 Status of traditional medicinal knowledge

As was seen with respect to plants it is important to note the impact traditional medicinal knowledge has had on non-indigenous medicine.

> *The most important evidence of Indian influence on American medicine is seen in the fact that more than two hundred indigenous drugs which were used by one or more Indian tribes have been official in The Pharmacopoeia of the United States of America for varying periods since the first edition appeared in 1820, or in the National Formulary since it began in 1888.. So complete, in fact, was the aboriginal knowledge of their native flora that Indian usage can be demonstrated for all but a bare half dozen, at most, of our indigenous vegetable drugs. In a surprising number of instances, moreover, the aboriginal uses of these drugs corresponded with those approved in the Dispensatory of the United States. There is in addition a list of several hundred aboriginal remedies which have been used in domestic medicine as well as by physicians, although they have not won official acceptance* (Vogel, 1970, p.6).

> *The United Nations subcommission on Prevention of Discrimination and Protection of Minorities reports, The annual market value of pharmaceutical products derived from medicinal plants discovered by Indigenous peoples [world wide] exceeds US$43 billion,…Traditional Healers have employed most of the 7000 natural compounds used in natural medicine for centuries; 25 percent of American prescription drugs contain active ingredients derived from Indigenous knowledge of plants* (Hill, 2003, p.16).

The US country report to the Food and Agriculture Organization on the State of the World's Plant Genetic Resources noted that at least one thousand plants native to the US are used in western medicine.

As noted above, many of the plants are used in pharmaceuticals for the same purposes described by indigenous peoples.

In the literature, there is some evidence that indigenous peoples in Canada and the US continue to rely upon traditional medicinal knowledge. For example, Joe (1994) states that,

> [t]*he use of herbs, in particular, continues to be an important part of the healing practices of most American Indians and Alaska Natives today. However, it is not the biological properties as much as the healing spirit or essence of the plants that is considered important. Most of the plants used for healing are considered to have these qualities, and therefore the healing spirit of the plant must be approached and harvested in a special way. For example, various songs and prayers are said before the plants are harvested and often some of these plants may only be harvested or prepared by herbalists. In addition, most Indian families also keep their own supplies of "home remedies" for minor illnesses* (p. 542-3).

The Métis of Labrador were also noted to continue to rely on traditional medicine, to some degree in a *"combination of Indigenous and modern subsistence strategies"* (Hanrahan, 2000, p.238). The author also notes that "*a Wisconsin study of Indigenous people from many nations,… found that 38% saw an Indigenous healer whilst receiving Western medical treatment; of those who did not, 86% said that they would consider seeing one in the future* (p.238).

Traditional medicinal knowledge is also being used to address modern diseases, such as diabetes (Battiste & Henderson, 2000; Native American Diabetes Project, 2003), HIV/AIDS (see for example the work of the Indian Health Board of Minneapolis) and cancer (Assinewe, 2002).

> *Groups like Native Seeds/SEARCH (NS/S), Tohono O'odham Community Action (TOCA), and the Arizona-Sonora Desert Museum are working to help reintroduce traditional foods to Native communities. Desert plants as common as prickly pear cactus, mesquite, and creosote have been pharmacologically proven to be helpful in the treatment and prevention of diabetes. Programs such as NS/S's "Desert Foods for Diabetes" are focused on promoting such foods, which slow down the digestion and absorption of sugar while reducing blood cholesterol levels* (Nelson, 2001).

> *Homeless urban kanaka maoli suffered most. Rural natives, retaining their close spiritual and physical relationship to the land and sea, fared better. Unable to afford haole medicine, they refined their uses of native plants and adopted newly-introduced folia in their treatment of foreign infections and "degenerative" diseases of Western civilization, such as heart and kidney failure, diabetes, hypertension and cancer, in spite of scorn and suppression by the dominant haole society* (Blaisdale, 1997).

Or traditional and non-traditional healing practices are used together (Goodwill, 1999).

In addition, indigenous people schooled in non-indigenous medicine are training as traditional healers, incorporating traditional values in their work (Goodwill, 1999). A bibliography of traditional medicine is available on line through the Association of American Indian Physicians (AIAI, 2001). However, some traditional knowledge has been appropriated by those who would use it for their own ends (The Hopi Tribe, 2001-5).

Indigenous peoples recognize the link between biological diversity and health. Social ills, such as suicide, alcoholism, and physical and sexual abuse, have been linked to a decline in traditional lifestyles (Niezen, 1993). For example, the link between the decline of moose and the increase of abuse in a Cree

community has been identified (Leech, Lickers, & Haas, 2002). Others, such as Tshakuesh Elizabeth Penashue, an elder from the Innu settlement of Sheshatshiu, Labrador have seized the initiative and led a walk to the bush. "*Her philosophy is simple: "return to the old ways," respect each other and the land, and individual self-worth and community strength will follow*" (Hasinoff, 2002).

Reluctance to discuss traditional medicine as a result of past and in some cases ongoing persecution of indigenous healers and practices may be a limiting factor in determining the state of traditional medicinal knowledge (Weitzel, 2001, Hill, 2003).

> *While facing declining numbers, many Healers in the Americas, remain "underground" and are only visible within indigenous societies, for several reasons, including fear arising from historic and continuing oppression and suppression, lack of institutional support or recognition or simply because the Healer lives within a community that avoids contact with outsiders.* (Weitzel, 2001:6)

> *Another common theme throughout the discussions is Elders' apprehension about the government regulating traditional medicine or in some way controlling their activity. The Elders/healers highlighted the fact that it was in their recent history that these ways were outlawed, and perhaps now, the government is finding another way to control their spirituality, healing and ceremonies. The legal issues arising from insurance from malpractice of traditional healers are a very current and real challenge for Aboriginal health facilities that have traditional medicine as a public service. Also they felt threatened by any documenting of traditional medicine in health facilities* (Hill, 2003).

Efforts to control the practice of traditional medicine in Hawai'i are documented by Blaisdell (1997). This initially included official bans on practice, suppression, and coercive assimilation. Eventually licensing boards were established but under the control of non-indigenous peoples and required non-indigenous nomenclature. In 1965 the licensing boards were abolished, because it was assumed the need for them was obsolete. In 1986, however, a small group of *Kanaka Maoli herbalists* founded *E Ola Mau* (Live On!) to pursue and encourage the traditional practices. Their efforts resulted in the passage of *the Native Hawaiian Health Care Act of 1988*. However, traditional healers in Hawai'i continue to struggle with a number of issues including, achieving official recognition, developing standards, insurance related issues, and continued persecution by the state.

The Diné recognize the struggle to continue the traditions and have established the Traditional Navajo Apprenticeship Project to train the next generation of traditional healers. Particular focus is on those ceremonies most in danger of being lost. (Office of the Diné Cultural and Language and Community Services, 2003).

As with the traditional knowledge of plants and animals, traditional medicinal knowledge is practiced in indigenous communities. There is often tremendous pressure to abandon this knowledge and practice, however. Determining the state of practice is complicated by the fact that many practioners are afraid to expose their knowledge. The state of knowledge and practice therefore, as with traditional knowledge of plants and animals, is uneven.

1.4 Status of traditional knowledge concerning ecosystems

As noted in the overview, it is often difficult to distinguish the knowledge of one ecosystem from that of another, particularly as the ecosystems often run together, such as rivers traversing the drylands, or coexist, such as forests on mountain sides. In reviewing the following sections, the reader is reminded to consider them as a whole.

1.4.1 Forests

North America was once a vast track of forest, stretching from east to west and from south to north. Many different forest ecosystems exist – everything from lush tropical rainforests to the northern boreal forest, which thins to dwarfed pines at the edge of the tree line.

Much of this forest was cleared in the course of habitation by non-indigenous peoples. Many of the peoples of the forests were likewise cleared from the land. These include the Cherokee, Delaware, Choctaw, Shawnee, Iroquois, Ojibwe, and Potawatami.

The traditional knowledge of the forests, particularly in the United States, east of the Mississippi and in Canada in the eastern provinces and in southern Quebec and Ontario, has been severely depleted, as have the forests of those regions.

> *What one elderly chief from a reserve on the French River in northern Ontario had done was very unusual in the late nineteenth century. He and his band had refused to allow their white pine timber to be cut down. Many other reserves east of the Great Lakes were not so lucky; most had already been stripped of their valuable trees. In the department of Indian affairs' defence, the pressures on them were enormous — lumbermen from Canada and the United States were after what remained of the virgin white pine stands that had once covered much of eastern Canada. By 1900, all that was left were small pockets on eastern Georgian Bay and a narrow strip along the north shore of Lake Huron; by 1920, these stands, including the pine on the various reserves along the shore, were gone as well. The scale of forest operations had been prodigious, with sawmills along Georgian Bay and Lake Huron producing hundreds of millions of board feet every year, but once the trees had been cut down, most of the sawmills closed and the lumbermen moved on* (Royal Commission on Aboriginal Peoples, 1996).

Nevertheless, remnants of the vast forests and the cultures of the peoples who depended on them remain. In Canada at least, 80% of indigenous communities are located in forest areas (National Aboriginal Forestry Association, 2002). The peoples of the forest include the Mi'kmaq, Maliseet, Innu, Cree, Abinaki, Pequot, Mohegan, Passamaquoddy, Narragansett, the peoples of the Iroquois Confederacy – Seneca, Cayuga, Onondaga, Oneida, Mohawk, and Tuscarora – as well as the Catawaba, Creek, Cherokee, Miccosukee, Seminole, Choctaw, Ottawa, Chippewa, Sioux, Potawatomi, Dakota, Menominee, native Hawaiians and Alaskan Natives as well as over one hundred tribes of the western region.

It is not possible to make definitive statements about the state of forest related traditional knowledge, innovation and practice without conducting field studies. It is only possible to stipulate that some traditional knowledge can be found in books and journals, much of it presented from an historic perspective or can be inferred from various reports or activities that touch tangentially on the issue of traditional knowledge.

Indicators of the degree of reliance of indigenous peoples on forest resources suggest a measure of traditional knowledge. As mentioned elsewhere in this paper, various communities continue to rely on subsistence hunting, fishing and gathering practices for a substantial portion of their economies (Tobias, 1993; Arctic Monitoring and Assessment Programme, 1997) Located as these communities are in forested areas, one can presume a degree of retention and practice of traditional knowledge, innovation and practice.

Indigenous involvement in the forestry industry may also serve as an indicator of the state of traditional knowledge with respect to forests. There are a number of indigenous communities involved in forestry

management in both Canada and the United States, many of whom have brought traditional knowledge, innovation and practice to bear in the development of forest and forest related industry.

For example, the forest management goals of the Penobscot Nation Forestry Department, (2002) include the following.

> *Ensure the availability of natural resources occurring on the forest for the use by tribal members (firewood, brown ash, birch bark, fiddleheads, quality cedar logs for canoe manufacturing, black spruce for gum and roots and others) Where appropriate, emphasise the management of the forest to maintain and improve the populations of moose and white-tailed deer. Identify and protect significant natural resources located on the trust lands; including but not limited to fisheries and important wildlife habitat such as deer wintering areas, habitat for threatened and endangered species and vernal pools.*

Obviously, there must be some awareness of the traditional knowledge related to the biodiversity of the forest based simply on the list of issues highlighted for consideration. Other evidence of the state of traditional knowledge is found in comments of the Intertribal Timber Council, (1993), which found a high incidence of un-even aged trees in commercial woodlots managed by indigenous peoples in the United States. This suggests continued respect for traditional teachings being practiced by indigenous managers. Tanizul Timber, Ltd, a forestry company owned and operated by the Tl'azt'en Nation in British Columbia has incorporated traditional knowledge in its work. It recently won a clean audit from the Forests Practice Board, one of only eleven of the 30 randomly chosen companies to achieve the highest level of audit approval (Forest Practices Board, 2000). As part of its work and to assist in improving forestry management and forestry practices, the company has been involved in a number of projects including wildlife habitat mapping (Ministry of Sustainable Resource Management, 2001) and the Historical Forest Research Project to determine the historic state of the forests (Faculty of Natural Resources & Environmental Studies University of Northern British Columbia, 2001). Other examples of the inclusion of traditional knowledge in the forestry industry include:

- The Algonquin of Barriere Lake Tripartite Agreement with Quebec and Federal Government, which has provided an opportunity to blend traditional knowledge with modern forestry practices (Algonquin of Barriere Lake, 2001);
- the Nuu-chah-nulth acquisition of Tree Farm License 57 in Clayaquout Sound managed by Iisaak Forest Resources Ltd., which pursues conservation-based forestry defined as *"forest operations designed to achieve conservation as a primary objective*"(Iisaak Forest Resources Ltd, 2000);
- efforts by the Nisga'a under their self-government agreement to protect non-timber forest resources and establish no-cut zones including in the Nass Bottomlands; and
- the efforts of Little Red River Cree and TallCree First Nations to co-manage forest resources in their traditional territories thus incorporating traditional forest related knowledge, innovation and practice (Ross, Monique & Smith, 2002).

The National Aboriginal Forestry Association in Canada promotes the inclusion of traditional knowledge in the development of forestry management plans and has played an active role in efforts in Canada to establish criteria and indicators for sustainable forestry management. The fact the Association is pushing for greater awareness of indigenous peoples' interests in the forest is in part driven by an awareness of traditional knowledge, innovation and practice of indigenous peoples and their relationship with the forests. "*Aboriginal peoples have developed special knowledge of forest ecosystems, knowledge which may be shared and used in improving forest management practices*" (NAFA, 1995). The Association recommends including specific criteria and indicators for sustainable forestry management that relate to the opportunity to pursue traditional activities including: opportunities for the practice of cultural and

spiritual activities; the extent to which traditional knowledge been used in forest management planning; the overall economic well being of Aboriginal communities, including the continuation of traditional Aboriginal economic activities; and, traditional land use through traditional land use studies (NAFA, 1995).

Conversely, the forest industry can have a negative impact on the opportunity to pursue traditional activities and thus practice, retention and sharing of traditional knowledge. The degree to which activities such as clear cutting, road building, spraying of herbicides and pesticides are pursued in a particular area will have a related impact on traditional activities. Many disputes between indigenous and non-indigenous peoples have arisen in North America around forestry practices. The disputes in Clayaquot Sound are one such example.

The traditional knowledge of forest ecosystems is in likely one of the healthiest states in North America, but solely by virtue of the combined sizes of the various forest ecosystems in North America. There is considerable pressure on forest resources, however, many of which have a detrimental impact on the opportunity and ability of indigenous peoples to pursue traditional activities and pass on traditional knowledge.

1.4.2 Drylands and steppes ecosystems

This is the traditional territory of the Dakota, Lakota, Nakota, Potawatomi, Winnebago, Cree, Sioux, Blackfoot, Pegan, Iowa, Plains Cree, Métis, Assiniboine, Crow, Shoshonee, Gros Ventre, Paiute, Arapaho, Cheyenne, Goshute, Ute, Zuni, Diné, Hopi, Apache, O'odham, and Yaqui. The drylands and steppes of North America extend from the Mexican border in the south to the edge of the boreal forest of Canada in the north. Technically the Arctic is a cold desert, but it will be addressed separately. The geography once ranged from scrub deserts to lush prairie grassland. While the area is generally drier than other parts of the region, significant river systems, including the Colorado, Red, Assiniboine, Platte, and Missouri Rivers, traverse the territory. A Great Plains wetlands also once dominated the area (Winnebago, 2003).

It is a challenge to differentiate the knowledge held by indigenous peoples of the prairies and drylands from the knowledge the people of these lands hold about the other ecosystems that make up their traditional territories. The territory of the Diné, for example, is composed of deserts, mountain valleys and alpine meadows.

The buffalo once dominated vast areas of this landscape. In fact, although the buffalo are often associated with the plains, they ranged as far east as the Atlantic Ocean, north to the North West Territories and the Yukon, west to the Rocky Mountains and south to the Gulf of Mexico and the Gulf of California. Exact numbers are impossible to determine, but it is estimated that the buffalo of North America in the early 19th century numbered around 60 million. Within 70 years, only 800 animals remained in the United States (American Museum of Natural History, 1996). Efforts to revive the herds and the associated traditional knowledge and culture of the buffalo are being pursued, including by the Intertribal Bison Cooperative formed in 1990. The Cooperative is composed of 42 American Tribes working to assist in returning the buffalo to its traditional territory and *"to restore bison to Indian Nations in a manner that is compatible with their spiritual and cultural beliefs and practices"* (Intertribal Bison Cooperative, 2003). The efforts of individual indigenous peoples are also notable. The Buffalo Project of the Winnebago or Ho-Chunk is an example of efforts to restore the entire ecosystem upon which buffalo and ultimately the Ho-Chunk depend. [*I*]*n tandem with the maintenance of the bison pasture, the project intends to attract plant and animal species native to the Great Plains wetlands. By creating an entire ecosystem*

synchronized with the bison life cycle, we can realign our life ways with those of Ho-Chunk ancestors. (Winnebago, 2003).

Today, much of the drylands and steppes of North America is used for grazing domestic animals (particularly sheep and cattle) or extensive and intensive production of grain and vegetable oil seeds. Much of this agriculture is highly mechanized and generally consists of monocropping. These activities have displaced many of the indigenous peoples, plants and animals and restricted the opportunities to pursue traditional practices. Nabhan and St. Antoine (1993) note that eighteen of thirty plant species considered at risk in the area of the Organ Pipe Cactus National Monument were used traditionally by the O'odham but only eight are used currently.
Overgrazing and modern agricultural practices, not traditional use by the O'odham, account for the depletion of traditional flora in the O'odham territory.

The arrival of the Spanish in the Americas introduced non-indigenous animals, specifically the horse and domesticated sheep and goats. Some indigenous communities, such as the Hopi and Diné, have embraced sheep and goat rearing for meat, milk and wool and incorporated this into their traditional culture. Others, including the Plains Cree, Cheyennes, Dakota, etc., adopted the horse, which came into their lands in advance of the Spanish or other Europeans. The relationship with these non-indigenous animals has become part of the traditional culture of these peoples (Halmo, Stoffle, & Evans, 1993 and 1999; Halberstadt, 1998-2002; Kuznar, 2001).

The traditional knowledge of these ecosystems, though deeply threatened by imposed migrations, restriction to reservations, and limitations on traditional hunting, fishing and gathering rights and opportunities, continue to survive albeit in much reduced circumstances. Elements of the culture are evident, for example in dance, music, weaving, basket making, religious practices, and the gathering and consumption of some traditional foods.

1.4.3 Marine and coastal ecosystems

There are four coasts of North America, bounded by the Artic Ocean in the north, the Atlantic Ocean in the east, the Gulf of Mexico in the south and the Pacific Ocean and Bering Sea in the west. As with other places in the world, some of the greatest cultural diversity resides beside the sea. This is the traditional territory of the Wampanoag, Mi'kmaq, Maliseet, Innu, Inuit, Native Hawaiians and Alaskan Natives who include the Athapaskans, Haida, Tlingit, Iñupiaq, Yu'pik/Cu'pik, Alutiiq, Aluet, Eyak, Tsimshian, and Siberian Yupik. The west coast of the Americas was particularly diverse with over one hundred distinct linguistic and cultural groups.

The traditional knowledge of other ecosystems also relates to knowledge of marine and coastal ecosystems. The salmon, an anadromous fish, is an example of the relationship between inland waters, mountain ecosystems, and marine and coastal ecosystems.

The indigenous peoples of the west coast of North America have relied heavily on the bounty of the seas for food and sustenance. Fish, whale, shellfish, fish eggs, and various sea plants were and continue to be important staples of the diet. Even interior peoples, such as the Nez Perce and the Okanogan rely on the runs of anadromous fish, particularly salmon, that return to inland waters on a regular basis (Winthrop, 1999). The same is true of the east coast. In fact, Mi'kmaq and Maliseet peoples recently won an important Supreme Court of Canada decision that acknowledged their treaty rights to continue to fish for trade. The case originated from a charge of fishing eel out of season and without a license by a Mi'kmaq. (See R v. Marshall, SCC, [1999] 3 S.C.R.)

There are many efforts underway in Canada and the United States to revive indigenous traditions associated with these ecosystems. The efforts of the Tulalip Nation to restore traditional salmon runs to their territory are such an example. When the Tulalip stopped fishing 30 years ago because of the declining number of fish, they relied on purchased salmon to conduct their first salmon ceremonies. In 1997, Tribal Chairman Stanley Jones, Sr. remarked, *"Something is very wrong if we have to buy our fish for the First Salmon Ceremony"* (Tulalip Tribes, 1997). The Tribe has embarked on a programme to restore the salmon fishery and has experienced tremendous success in its efforts. By 2003, they were able to report substantial returns of most salmon species to their territory (Tulalip Tribes, 2003). The Tulalip Tribes also manages a shellfish program to maintain populations of littlenecks, butter clams, horse clams, and cockles at a traditional gathering site (Tulalip Tribes, 2002). The Makah people of the Olympic Peninsula of Washington State have recently undertaken efforts to revive the traditional whale hunt, guaranteed by treaty with the United States but now uncertain in the face of recent court rulings. In defense of their intent to recommence the practice the Makah note,

> *Whaling and whales have remained central to Makah culture. They are in our songs, our dances, our designs, and our basketry. Our social structure is based on traditional whaling families. The conduct of a whale hunt requires rituals and ceremonies which are deeply spiritual… There has been an intensification of interest in our own history and culture since the archeological dig at our village of Ozette in 1970, which uncovered thousands of artifacts bearing witness to our whaling tradition. Many Makahs feel that our health problems result, in some degree, to the loss of our traditional diet of seafood and sea mammal meat. We would like to restore the meat of the whale to our diet. Many of us also believe that problems besetting our young people stem from lack of discipline and pride. We believe that the restoration of whaling will help to restore that discipline and pride. Whale hunting imposes a purpose and a discipline which we believe will benefit our entire community* (Northwest Indian Fisheries Commission, 1998).

Other efforts are underway to preserve the traditional knowledge of marine and ocean ecosystems. For example, the University of Alaska has produced recordings of a Tlingit, Sitka elder Herman Kitka Sr., speaking of the traditional ecological knowledge associated with the lands and waters of his traditional territory. By 2001, over 250 recordings had been made detailing the Elder's knowledge of everything from deer calls to herring bait to harvesting Tlingit carrots (Kitka, 2001).

As with the knowledge of other ecosystems, the traditional knowledge, innovation and practices related to marine and ocean ecosystems face an uncertain future. Though some efforts are underway to revive the traditions and restore health of the ecosystems on which the knowledge and practice rely, risks abound that threaten the further loss of the knowledge or practices that give the knowledge meaning within indigenous communities.

1.4.4 Island ecosystems

There are many major island ecosystems within North America, Hawaii and American Samoa, including, in addition to Hawaii and American Samoa themselves, Haida Gwaii, Vancouver Island, Cape Breton, Thousand Islands of the St. Lawrence River, the many islands that make up the Arctic Archipelago, the islands of the Pacific and Atlantic Coasts, and the island homes of the Siberian Yupik, the Aleuts and Alutiiq.

Development pressures have had tremendous negative impact on the indigenous peoples of the island regions. The experiences of the Wiyot at Indian Island are not atypical. These peoples had traditionally inhabited Humboldt Bay and Tuluwat Village on Indian Island. A massacre in the 1860's and subsequent removal of the Wiyot to reservations almost completely wiped out the Wiyot culture. Efforts underway

currently to restore the culture include the purchase of the traditional ceremonial grounds of Indian Island and restoration of the natural habitat (Table Bluff Reservation-Wiyot Tribe, 2003). Isolated communities have had the best chance of maintaining traditional knowledge, innovations and practices, as is the case of the more remote communities of the Hawaiian Islands (McGregor, Davianna, 1999). A number of significant island ecosystems have been restored through joint efforts of the US National Parks Service and the indigenous inhabitants of the regions, although relations between indigenous peoples and parks has not always been an easy one. Island parks include:

- the Boston Harbour Islands, where representatives from the Wampanoag, Penobscot, Mohican, and Delaware Tribes serve on the Advisory Council and a Wampanoag representative on the Partnership management entity (National Park Service, 1998);
- the creation of Apostle Islands National Lakeshore with the support of the Bad River Band of Lake Superior Chippewa (Keller & Turek, 1998); and
- Gwaii Hannas National Park Reserve and Haida Heritage Site, which encompasses 138 islands of Haida Gwaii and the remains of SGang Gwaay which, with the agreement of the Haida, was declared a World Heritage Site by UNESCO in 1981 (Parks Canada, 2003).

There is evidence from published materials that traditional knowledge, innovation and practice associated with island ecosystems continues (McGregor, Davianna,1999, Steiner, 1999).

Efforts are underway to restore these ecosystems through the involvement of indigenous peoples presumably, in part, through the application of traditional knowledge associated with the ecosystem. However, efforts to maintain or restore the traditional knowledge, innovations and practices related to island ecosystems are countered by continuing threats to these ecosystems and related knowledge and practice.

1.4.5 Mountain and valley ecosystems

There are a number of extensive mountainous areas in North America. This includes the Appalachian and Adirondack Mountains that run north south through the eastern portion of the US and the vast western ranges associated with the Rockies. Hawai'i, formed from volcanic activity is also mountainous.

In the United States, war, forced displacements and general development pressure killed or displaced from their traditional territories many indigenous peoples. The traditional knowledge related to these ecosystems was lost as the people lost the land to which the knowledge was connected. While the lands east of the Mississippi River were fully occupied at the arrival of Europeans in North America, the present day map of indigenous peoples in these territories shows only a smattering of settlements (US Environmental Protection Agency, 2003). While some indigenous peoples and the knowledge they held survived the onslaught of European advancement into their traditional territories, much of the traditional knowledge, innovation and practice related to the mountain and valley ecosystems of the eastern United States is extinct. In eastern Canada the indigenous peoples fared somewhat better, but as the mountains peter out to large hills in Quebec and New Brunswick, the knowledge, innovation and practice of these peoples is included in the discussion of the forest ecosystem.

In the west, though individual communities have suffered greatly, the wealth of indigenous cultures of this region has mitigated against the wholesale loss of traditional knowledge. In Washington State alone there are the Chehalis, the Confederated Tribes of the Colville – which includes the Methow, Okanogan, San Poil, Arrow Lakes, Nespelem, Nez Perce, Palouse, Moses, Entiat, and Wenatchee peoples – the Cowlitz, Hoh, S'Kallam, Kalispel, Lower Elwha Klallam, Lummi, Makah, Muckleshoot, Misqually, Nooksack, Puqallup, Quileute, Quinault, Samish, Sauk-Suiattle, Skokomish, Snoqualmie, Spokane, Squaxin, Stillaguamish, Suquamish, Swinomish, Tulalip, Upper Skagit, and Yakama. The primary

exception to this are the indigenous peoples of California who were heavily impacted by European migration. There are also seven groups of peoples who are landless and officially unrecognized including the Chinook, Duwamish Kikiallus, Nooksack, Snohomish, Snoqualmoo and Steilacoom. Without a land base, their knowledge, innovation and practice may well be threatened. In British Columbia, a primarily mountainous region of Canada, unsettled land claims continue to cause uncertainty about the ability of indigenous peoples to retain their traditions and cultures.

Clearly much knowledge has been lost or is in decline. The comments noted above of Ms. Mary Thomas an Elder of the Secwepemc people with respect to harvesting are typical. Other examples are noted elsewhere in this report, including the experiences of the Kumeyaay, Hawaiians and the Haida.

Much traditional biodiversity related knowledge is contained in traditional teachings of indigenous peoples. The Dineh and Stoney teachings of the creation of the mountains is an example of how traditional knowledge lives on (Matthews, as adapted, 1897; Snow, Chief J., as adapted 1977).

Various efforts to protect sacred sites on mountains also serve to underscore the continuing importance and demonstrate the status of traditional knowledge with respect to these sites (Martin, as adapted, 1993; Assembly of First Nations, 2001).

In the east, the traditional knowledge, innovation and practices associated with mountain and valley ecosystems has been virtually wiped out. In the west, there is some evidence that traditional knowledge and practices is maintained but uncertainties around land tenure continue to threaten their long-term retention.

1.4.6 Inland waters

North America is blessed with many lakes and rivers, including the largest freshwater body in the world, Lake Superior. The importance of the water is expressed well by Grand Chief B.G. Cheechoo (1984), chief of the Nishnawbe-Aski Nation,

> *Our history is tied to these waters. Our continued reliance on fishing, trapping and hunting and our desire to do so is dependent on these waters. Our future is based on these waters . . . Any threat to such waters poses a direct threat to our survival.*

The traditional teachings with respect to water are evident in the Indigenous Environmental Network, Indigenous Declaration On Water, *Water Is Life: Protect Water Now!* endorsed at the 12th Annual Indigenous Environmental Network 2001, August 2-5, 2001, Protecting Mother Earth Conference, Penticton Indian Band - Okanagan Nation Territories, British Columbia, Canada. *Our knowledge, laws and ways of life teach us to be responsible at all times in caring for this sacred gift that connects all life.*

Many indigenous communities, when they had the option, choose to remain on traditional territories close to traditionally important inland water bodies. The reliance on fish as a staple of the diet was often a deciding factor. The Menominee Tribe of Wisconsin, for example, chose its current reservation based on the annual sturgeon migration on the Wolf River. *The Menominee had always hunted, fished and gathered in this area, which is a part of Menominee aboriginal territory. A major attraction to this area was Keshena Falls or Barricaded Falls which is the traditional spawning grounds of the Lake Winnebago sturgeon.* (Minominee Nation, 2003).

Traditional knowledge, innovations and practices related to the waters and their associated biodiversity is well documented in the literature (Chapeskie, 1999; Biegert, 1999; Whiteley & Masayesva, 1999). The practice of traditional knowledge as it relates to the biodiversity of inland waters is reflected in many

indigenous peoples efforts to restore traditional species to the waterways. The effort of the indigenous peoples along the Columbia River system in Canada and the United States is one such example. In fact, The Confederated Tribes of the Umatilla Indian Reservation were honoured by Harvard University in 2002 for their efforts to restore salmon runs under the Umatilla Basin Salmon Recovery Project. (Confederated Tribes of the Umatilla Indian Reservation, 2003). The Eskasoni Fish and Wildlife Commission has established the Eskasoni Native Fishery Guardians whose ultimate objective is to care for the rivers and brooks to ensure the traditional reliance on the fishery can survive (Eskasoni Fish and Wildlife Commission Inc., 2003).

In Canada, the Long Plain First Nation engaged elders and other resource people to undertake a comprehensive assessment of the Assiniboine River following the establishment of a hog processing plant, which dumps treated waste into the river. The Elders stressed the importance of the river system for food and ceremonial purposes and noted the pollution from the hog factory had already altered their traditional way of life (Environment Canada, 1999). There are many other examples of indigenous peoples protesting the establishment of dams or other water related in their traditional territories, include the Piikani protesting the establishment of the Oldman River Dam, the Northern Quebec Cree fighting the creation of the second Great Whale hydro project, and the Hopi seeking relief from the siphoning of water by the Peabody Mining Company.

There are also examples of situations where the non-indigenous population has come to rely upon indigenous peoples' knowledge of the water. One example is the work currently being undertaken by Environment Canada, the Innu Nation, the Gorsebrook Research Institute of Saint Mary's University (Nova Scotia) and Natural Resources Canada. This research is examining *ashkui*, bodies of water that either do not freeze or which break up early in spring (Environment Canada, 2002).

These activities suggest that this knowledge continues to exist, but its practice is threatened. Continued threat to the practice of traditional knowledge will eventually lead to the decline of the knowledge itself except as a static record of fact in the library.

1.4.7 Arctic

A special report on the Arctic has been prepared by the Arctic Athabaskan Council. Far more detail on the state of traditional knowledge, innovation and practice is provided in that report than could be included in this report on North America. The following comments are included primarily to provide the reader with a complete overview of the indigenous peoples of North America and the state of traditional knowledge, innovation, and practice within their communities. It is important to include references to these peoples in this report to demonstrate the differences between their experiences and those of indigenous peoples in the more populated southern portion of the continent. In general one can conclude that the indigenous peoples of the Arctic, though facing significant challenges, have had the opportunity to retain their traditional knowledge and pursue traditional practices to a degree far beyond that of many others.

The Arctic Circle cuts Alaska virtually in half and grazes the northern portion of the Yukon Territories, North West Territories and the new territory of Nunavut in Canada. The vast majority of the Artic is composed of the Arctic Archipelago including Banks, Victoria, and Baffin Islands. The peoples of this land include the Inuit, the Inuvialuit, and the Iñupiat. However, although culturally distinct and not technically in the Arctic, many other indigenous peoples of the near Arctic identify strongly with the northern perspective. This includes the Athapaskans, Yupik, Cupik, Siberian Yupik, Dene, Yukon First Nations and Métis, as well as the Inuit of northern Quebec and Labrador.

The Arctic landscape is characterized by the long months of below freezing weather and the wide variance in daylight hours over the course of the year – the sun never setting in the month of June and

never rising in December. Traditional foods concentrate on marine resources including fish, seal and whale as well as caribou, birds and bird eggs. Berries and other plants supplement the diet.

The degree of knowledge of the indigenous peoples of these lands and the ecosystems at play upon them is evidenced by the number of times indigenous peoples have shown up the mistaken assumptions of non-indigenous scientists (see for example Freeman, 1992). These experiences have strengthened the credibility of indigenous knowledge and have encouraged the participation of indigenous peoples in many activities in the north, which provide opportunities to include their traditional knowledge. These are discussed at greater length in section II of the report below, but include the conclusion of self-government arrangements, participation in co-management arrangements, recognition of Inuit as an official language of the new territory of Nunavut, various policies and legislation which requires consideration of indigenous knowledge, as well as indigenous peoples' participation in international arrangements for the protection of the northern lands such as the Inuit Circumpolar Conference.

In 1997, the Arctic Monitoring and Assessment Programme, a working group established under the Arctic Environmental Protection Strategy, produced a *State of the Arctic Environment Report.* A second report has been produced, which does not contain however the same level of detail about traditional knowledge as the 1997 report. Among other things, the 1997 report identified the reliance on traditional foods and the state of language retention in the Arctic – two possible indicators of the state of traditional knowledge. The use of indigenous languages is strong, as is observance of other traditional customs, and reliance on country foods is high. Between 230 and 300 kilograms of subsistence foods per person are harvested each year by the peoples of northern Alaska. The greatest portion of this is a reliance on the bowhead whale, followed by caribou. Among the indigenous peoples of northern Canada, the collection of wild foods ranges between 250 and almost 2,000 tonnes per person per year.

> *Employment figures indicate that subsistence activities are important, as almost 40 percent of the indigenous population in Dene communities were not part of the labor force according to a survey in 1991. Almost 38 percent of people over 15 years of age answered that they used non-cash activities to provide for their families. A slightly larger percentage said that they had lived on the land in the previous twelve months. An estimate of the per-capita harvest suggests that the communities are self-sufficient in their protein requirements. Yukon First Nations also rely heavily on subsistence activities. About one third of the people in the 1991 Aboriginal People's Survey said that they had lived on the land in the previous year and 30 percent support their families with activities that are not part of the cash economy* (Arctic Monitoring and Assessment Programme, 1997).

While the report concentrates on the state of the environment, with contaminants a major threat, a conclusion also can be drawn that the state of traditional knowledge in the Arctic appears to be one of the healthiest in the Americas, though also at risk. Of particular concern are the level of contaminants in country foods, including persistent organic pollutants, and the impact of climate change. The opening up of the region to resource extraction including for diamonds and oil are also likely to have impacts on the opportunities and interest in pursuing a traditional lifestyle and maintenance of associated traditional knowledge. For now, however, the distance from large non-indigenous centres and the large percentage of indigenous population in the region foster a high degree of traditional knowledge and practice.

1.5 Knowledge versus practice: state of retention of traditional knowledge concerning practices relevant to the customary management, conservation and sustainable use of biological diversity that are no longer maintained or are at risk of disappearing

This section is concerned with the state of retention of traditional knowledge with respect to particular practices no longer pursued or at risk of disappearing. To answer this question requires first an understanding of whether particular practices are no longer maintained or at risk of disappearing. It then requires an examination of the state of knowledge about those practices. Issues arise as to what practices might be considered to be related to biological diversity, what is an agreed upon definition of a practice "no longer maintained" or "at risk of disappearing", as well as the issues raised earlier about defining the state of traditional knowledge. This is really a question about who knows what and who practices what. Addressing this question, however, quickly leads into the area reserved for discussion under phase two of this report, that is, an examination of the causes of decline of traditional knowledge. There are many influences that come to bear on indigenous peoples that affect their interest in and/or ability to pursue traditional activities. Opportunities to pursue particular practices have a direct impact on the state of retention of knowledge about that practice. In this then there is a strong link between phase one and phase two of the Composite Report. This report will confine itself to the issues in phase one, however.

Some conclusions are clear. For example, the state of knowledge about practices related to extirpated or extinct species is likely low or rapidly in decline. There is simply no opportunity to pursue practices related to these species anymore in the original cultural context and little reason to pass on this knowledge other than as a sad story of fond remembrance by a few elders.

The traditional knowledge of species that may not be extinct or even threatened may also be in decline because of lack of opportunity to pursue traditional practices. For example, traditional practices related to the buffalo hunt have little opportunity to be pursued following the mass slaughter of the 19th century and the undermining of the traditional economy related to the buffalo. As the heavy reliance on the buffalo has diminished, the knowledge related to the care of buffalo can be assumed to be slipping away. Ohmagari and Berkes (1997) found that traditional skills no longer necessary to guarantee one's livelihood were not being transmitted between generations. Some skills are being lost altogether, while others are being only partially transmitted. The knowledge of the central role of the buffalo in the collective memory of indigenous and non-indigenous peoples in North America may remain, but many of the practices associated with the buffalo will likely never be revived. It is unknown to what degree the lost or endangered species or species simply no longer of relevance to the successful livelihoods of indigenous peoples will remain in their cultural lexicon.

Citing an article by Robert Pyle, Nabhan and St. Antoine (1993) note that loss of direct personal contact with wildlife causes an "extinction of experience" and creates a cycle of "*disaffection, apathy, and irresponsibility toward natural habitats*" *(*Nabhan & St. Antoine, 1993, p. 239). As noted above, social disruption have been linked to a decline in traditional lifestyles (Leech, Lickers, & Haas, 2002). Perhaps it is the loss of the practice that is of greatest concern. The passing of the knowledge is simply the final death knell.

> *Since indigenous knowledge of ecosystems is learned and updated through direct observations on the land, removing the people from the land breaks the generation-to-generation cycle of empirical study. Deprived of routine direct interaction with the ecosystem, indigenous peoples lose the means of transmitting old models and data, as well as the means of acquiring new knowledge. Basic concepts may survive, but lose their concrete applications. What remains can be as abstract as Western theories of ecological dynamics. Maintaining the full empirical richness and detail of traditional knowledge depends upon continued use of the land as a classroom and laboratory.*
>
> Russel Lawrence Barsh, 1999

There certainly was evidence in the literature that a number of practices are no longer maintained or little observed (Shipek, 1993, Blackburn, Thomas, C. & Anderson, Kat, 1993, Turner, Ignace & Ignace, 2000). This includes plants no longer gathered or planted, methods of caring for the land restricted by government decree, and animals and fish no longer eaten. The traditional knowledge related to these species and practices can be assumed to diminish with the passing of each individual who had direct personal experience of these species and practices.

As noted throughout this report, there are many sources of information on traditional knowledge. These include scholarly papers, television programmes, web sites, education programmes and the simple sharing of stories between individuals. The amount of information available, however, is not sufficient indication of the degree of practice. Just because there are half a dozen recipes for traditional corn soup on the Internet does not mean many people actually make their own lyed corn anymore. The knowledge may continue, but it is meaningless without practice.

1.6 Assessing the feasibility of using existing traditional knowledge to maintain customary practices relevant for the management, conservation and sustainable use of biological diversity.

Many examples were found in the literature of the revival of customary practices based on the traditional knowledge of the indigenous peoples in question (McGregor, Davianna, 1999; Berkes, Colding, & Folke, 2000; Kritsch, & Wright-Fraser, 2002). For example,

> "*The reestablishment of beaver management rules by the James Bay Cree provides an example of the revival of local ecological knowledge for restoring a population. Local Cree ethics for beaver conservation were suspended when their territory was overrun by outsiders in the 1920s. The ethics and the territorial management system itself were revived in the 1950s with the departure of the intruders and government protection of Cree land tenure*."

> *"For two years, the Gwich'in Social and Cultural Institute (GSCI) has worked in partnership with the Prince of Wales Northern Heritage Centre (PWNHC) to create five replicas of a multipiece 19th-century Gwich'in traditional summer outfit that is housed at the Canadian Museum of Civilization (CMC). The project has given us an opportunity to document, understand and appreciate how this clothing was manufactured and the extraordinary amount of time, knowledge and skill that Gwich'in women need to clothe their families and protect them from the elements. It has also helped to repatriate skills and knowledge no longer practiced in the Gwich'in Settlement Area"*(Kritsch & Wright-Fraser, 2002, p. 205)

> *An analogy that conveys a sense of the significance of these areas* [traditional Hawaiian communities] *can be found in the natural phenomena in the volcanic rainforest ...eruptions, which destroy large areas of forest land, leave oases of native trees and plants called kipuka. From these natural kipuka come the seeds and spores for the eventual regeneration of the native flora upon the fresh lava. Rural Hawaiian communities are cultural kipuka from which Native Hawaiian culture can be regenerated and revitalized in the contemporary setting. Protection of the natural resources and the integrity of the life-style and livelihoods of the Hawaiians in these rural districts is essential to the perpetuation of the Hawaiian culture* (McGregor, Davianna, 1999 p. 114).

There are many issues that would have to be considered in answering this question. As Berkes, et al (2000) report,

> *Ecological knowledge does not function in isolation. It is embedded in institutions and local social norms…The coordination of appropriate resource use practices is often entrusted with traditional leaders. For example, the collective leadership of stewards of different hunting areas is the key common-property resource management institution among the Cree. A hunting leader may act as the steward of resources on behalf of the community, as well as a social leader…[A] clan chief developed and pursued his vision of the future Gitskan forest, a telling case of the key role of stewards/wise people in bringing about a revival of local knowledge*"(p. 1258)

Other issues that appear to be at least somewhat relevant are access to traditional territories, availability of traditionally relevant species, mechanisms for intergenerational transmission of knowledge including the number and availability of Elders or others who hold the knowledge, language retention, survival of social norms and religious practices, etc. The Menominee of Wisconsin, for example, have recently revived their sturgeon celebration. The traditional celebration ended in 1892 with the construction of dams below the reserve that prevented the sturgeon from migrating to their traditional territories. The Menominee now celebrate the sturgeon in the traditional manner, albeit under much reduced circumstances with a token number of fish supplied by the Wisconsin Department of Natural Resources. (Menominee Nation, 2003).

> *"Outside the sphere of ecology, but relevant to indigenous knowledge, are cultural values as a social mechanism behind traditional practice. Cultural values such as respect (for humans as well as nature), sharing, reciprocity, and humility characterize a diversity of systems of traditional knowledge and practice, including those of American aboriginal groups."* (Berkes, 2000, p. 1259)

Another relevant issue is the degree to which non-indigenous peoples are comfortable with and can adapt to a new (to them) way of viewing the world and of doing things.

Ultimately the feasibility of maintaining or reviving cultural practices is determined by the investment of effort by all concerned in achieving the desired end.

1.7 Conclusion on state of traditional knowledge

While it would be unwise to draw firm conclusions on the state of traditional knowledge based on a literature review, generally one could conclude that the state of traditional knowledge is varied and in flux but overall in decline.

Some traditional knowledge, innovation and practice are lost forever. The grain referred to by the *Kumeyaay* is such an example. There are, regrettably, many more such examples. The traditional innovation and practice of extinct species is lost forever, as is the traditional knowledge, innovation and practice of indigenous peoples that have succumbed. This is our greatest loss. Unfortunately efforts to reverse this trend appear to be failing at the present time.

There is other traditional knowledge, innovation and practice for which the future is uncertain. The example of the buffalo comes to mind. The buffalo is not extinct, as is perhaps the grain. The numbers of buffalo are greatly reduced, however, and they no longer roam free as they once did over most of North America. The animals are no longer the critical element of the plains economy they once were. They are no longer the primary source of food, or material for clothing, shelter, or tools. Nevertheless, the centrality of the animal to the peoples of the plains remains etched in the spirit of these peoples. At least for now. The day may come when the buffalo lose any significance to the indigenous peoples of North

America. Then the buffalo, like the grain will pass from all human memory except as a passage in an old book. On the other hand, the efforts to revive the herds, discussed below, may also have the effect of reviving the traditional knowledge, innovation and practices related to the animal. Time will tell. There are unfortunately many other species, like the buffalo, that teeter on the brink. In fact over 350 species in Canada (Environment Canada, 2003) and 1263 species in the United States (US Fish and Wildlife Service, 2003) are endangered, threatened or of special concern. Obviously the traditional knowledge, innovation and practice associated with these species are likewise under threat.

The interest of the academic world in traditional knowledge may help to secure the knowledge, even if the interest does not extend to the practice and innovations related thereto. The many activities underway presently to record traditional knowledge may at the very least provide future generations with a record of the knowledge. Whether the knowledge is ever put into practice will in large part decide whether it remains fresh, vibrant and relevant or becomes mere fodder for the academic machine.

Finally, some knowledge, innovation and practice are alive and well, relevant to not only indigenous peoples but to all of humanity. As noted, there are many plants and medicine that derive from North America that are now relied upon around the world. While the debt to the indigenous peoples of North America may be seldom if ever acknowledged, this traditional knowledge, continued innovation and daily practice is now so widely shared only a catastrophic event will smother it.

The state of traditional knowledge, innovation and practice in North America then is at once extinct, on the brink of disappearing, and healthy and flourishing depending on the circumstances in each case. From a holistic view, however, there are worrying signs that the health of traditional knowledge, innovation and practice will continue to decline.

2. Identification and assessment of measures and initiatives to protect, promote and facilitate the use of traditional knowledge

2.0 Overview

This next section will present examples of activities in North America to protect, promote and facilitate the use of traditional knowledge, innovations and practices undertaken by governments, indigenous peoples, and other actors. It is not possible to provide an exhaustive list of every activity undertaken, but efforts have been made to present indicative examples in each area.

In some cases the examples provided rely on a presumption that if the activity involves indigenous peoples it is likely that at least some traditional knowledge, innovation or practice is included. While this may not be an appropriate assumption in all cases, the involvement or not of traditional knowledge can only be confirmed through primary research, which shall have to await another day.

There is little land use planning undertaken at the regional level in North America. National land use planning is complicated in Canada and the United States by virtue of the fact that provincial and state authorities have primary responsibility for land management while the federal governments have jurisdiction for relations with indigenous peoples. There are, however, some international agreements and arrangements that address environmental issues and which contain references to indigenous peoples in the text or which have come to include indigenous peoples in their operation.

Incentive measures that directly focus on encouraging the retention and use of traditional knowledge are also very limited. The identification of factors that threaten the maintenance, preservation and application of traditional knowledge will feature in phase two of the Composite Report. Perhaps once this work is completed further effort can be made to better understand the interrelationships between political, legal,

economic and social elements that support or detract from the retention and use of traditional knowledge. The identification, implementation, analysis and review of possible incentive measures to support traditional knowledge would be a next logical step.

From the regional perspective it is clear that a great deal of effort at the present time is focused on capacity building efforts. The number of activities suggests a resurgence of interest in traditional knowledge. It should be noted that efforts are directed at building both the capacity of indigenous peoples to revive and use traditional knowledge, innovations and practices and the capacity of non-indigenous peoples to understand and appreciate traditional knowledge, innovations and practices.

The repatriation of human remains and cultural objects to indigenous communities is an ongoing effort that will likely take many years to complete in light of the number of remains and objects held and the relatively recent start at this work. In some cases the initial steps have been made to facilitate their return.

It is important to acknowledge that this is a desktop study particularly with respect to the review of strategic planning for conservation and sustainable use of biological diversity within the context of community development planning. A reliance on the written word in this case likely underestimates the degree of importance of traditional knowledge in this category. There are likely a number of instances where traditional knowledge comes to bear on an issue, but which may not be obvious from written materials available. Many indigenous peoples have a degree of autonomy to manage community affairs, including through the operation of self-government agreements or decisions of Chiefs and Councils on First Nations' reserves in Canada or of Tribal organizations in the United States. As such, the opportunity exists to include traditional knowledge in their efforts, and indeed it is likely that a large percentage of indigenous peoples responsible for managing the day to day affairs of indigenous communities including long term planning automatically rely on traditional knowledge, innovations and practices, without anyone drawing attention to the fact. Nevertheless, examples are available of efforts to include traditional knowledge in community development, through resource management strategies, co-management arrangements and local land use mapping and planning. There is little evidence that non-indigenous communities are prepared to include traditional indigenous knowledge in their community planning.

There has been some effort on the part of governments to encourage the involvement of indigenous peoples in the decision-making process, including recognition of their traditional knowledge through legislation, policy and administrative arrangements. To some degree this has been lead by the courts in Canada and the United States, as important decisions recognizing the rights, titles and interests of indigenous peoples have required the adoption of new, more inclusive processes.

While this paper calls for an assessment of the efforts to retain and encourage the use of traditional knowledge, it is not possible in this short paper to provide a review of each of the individual activities presented below. For one thing, no criteria for measuring success have been established. Determining indicators of a successful programme is a worthwhile endeavor, one in which the ad hoc Working Group on Article 8(j) could play an important role. Sharing best practices and success stories, as determined by indigenous peoples, is another means that could be facilitated by the Secretariat and Conference of the Parties to the Convention on Biological Diversity. Ultimately, however, it is not the success or failure of a single activity that will turn the tide on the collective decline of traditional knowledge in North America. Instead it is the sum of these efforts and the redress of the causes of decline of traditional knowledge, innovation and practice that will prevent further decline and create the conditions for re-building the knowledge.

It would appear from the literature research conducted for this report, that efforts to sustain the knowledge must ultimately address the indigenous connection to the land, which is the pillar of traditional knowledge. *We lived a nomadic lifestyle, following the vegetation and hunting cycles throughout our territory for over 10,000 years. We lived in harmony with the earth, obtaining all our food, medicines and materials for shelter and clothing from nature. We are the protectors of our territory, a responsibility handed to us from the Creator. Our existence continues to centre on this responsibility* (Denise Birdstone, 1992). The Royal Commission on Aboriginal Peoples, (1996) notes,

> *Even today, Aboriginal people strive to maintain this connection between land, livelihood and community. For some, it is the substance of everyday life; for others, it has been weakened as lands have been lost or access to resources disrupted. For some, the meaning of that relationship is much as it was for generations past; for others, it is being rediscovered and reshaped. Yet the maintenance and renewal of the connection between land, livelihood and community remain priorities for Aboriginal peoples everywhere in Canada — whether in the far north, the coastal villages, the isolated boreal forest communities, the prairie reserves and settlements, or in and around the major cities.*

For now, it is possible to conclude that while the many individual efforts listed below may be proven to be necessary, they are as yet insufficient to sustain traditional knowledge.

2.1 Regional and national land use practices

The sheer size and ecological diversity of the region and the two nations involved challenge the land use planner working at the regional or even national level. In addition, the division of authority over lands between federal and state or provincial authorities further complicates the process of developing national or regional land use planning. With respect to indigenous peoples, the federal responsibility for indigenous issues juxtaposed with state or provincial jurisdiction over the majority of land creates yet another degree of complication. With the exception of some international agreements, national resource policies, and national environmental legislation and policy, land use practices in this region generally arise from the accumulation of activities at the local level.

This section will examine the international arrangements between Canada and the United States that include considerations for indigenous peoples. This includes co-management agreements that cross international boundaries in the region. In addition, Canada has two national resource strategies that will be discussed. The national parks programmes in Canada and the United States will also be considered. National legislation and policy with respect to land use will be discussed in the section on legislation below.

2.1.1 International Arrangements

The International Joint Commission was established under the 1909 *Boundary Waters Treaty* between Canada and the United States. The Treaty was established to manage lakes and rivers that cross the international boundary between the two countries. The Commission sets water levels, approves applications for the construction of dams or canals and investigates water and air pollution (IJC, 2003). The 2000 State of the Great Lakes Conference (SOLEC) hosted by the International Joint Commission was the first time indigenous peoples were invited to participate in the agenda. The goal was to develop means to involve indigenous peoples in the work of SOLEC, and facilitate use of their traditional knowledge to address contamination of the Great Lakes (McGregor, Deborah, 2002).

The Protocol Between the Government of Canada and the Government of The United States of America Amending the 1916 Convention Between The United Kingdom and The United States of America for the

Protection of Migratory Birds in Canada and The United States (Parksville Protocol) came into force in 1999. The Protocol contains amendments to the Migratory Birds Convention to "*ensure conformity with the aboriginal and treaty rights of the Aboriginal peoples of Canada*" and "*to provide for the customary and traditional taking of certain species of migratory birds and their eggs for subsistence use by indigenous inhabitants of Alaska*" (Preamble). The parties agree that "*aboriginal and indigenous knowledge, institutions and practices*" will be used in the management of migratory birds (Article II). Among other things, the protocol outlines conditions under which indigenous peoples may have access to migratory birds. *The Agreement on the Conservation of Polar Bears, Treaty Between the Government of Canada and the Government of the United States of America Concerning Pacific Salmon*, and *Agreement between the Government of Canada and the Government of the United States of America on the Conservation of the Porcupine Caribou Herd* also contain elements addressing the interests of indigenous peoples.

The North American Bird Conservation Initiative is an agreement between Canada, the United States and Mexico to coordinate bird conservation efforts across North America. The Initiative is supported through the auspices of the Commission for Environmental Cooperation, established under the *North American Agreement on Environmental Cooperation*. Among the operating principles of the North American Bird Conservation Initiative is an agreement that decisions will be based upon the best scientific and traditional knowledge available and that the Initiative will promote sustainable traditional and modern land use. Further, one of the three main considerations in determining priority bird species to protect is ensuring sustainable use for sport, food and traditional practices although the emphasis is on protection of game species (Bird Studies Canada, 1999). While the Commission for Environmental Cooperation has supported efforts by indigenous peoples to address environmental concerns, there is nothing in the *North American Agreement on Environmental Cooperation* or in the mandate of the Commission for Environmental Cooperation that specifically refers to traditional knowledge. In fact, the Agreement specifically excludes from review failure to effectively enforce laws directed at "subsistence or aboriginal harvesting"(Article 45(2)).

Co-management practices are a common means of including indigenous peoples and their associated traditional knowledge in decision-making processes. There are a number of co-management agreements in place, particularly in the north, to deal with specific species. For example, the Inupiat of North Slope of Alaska and the Inuvialuit of the western Canadian Arctic signed an international agreement in January 1988 to manage polar bears in the Beaufort Sea area (Adams, Frost & Harwood, 1993).

> *Alaska and Inuvialuit Beluga Whale Committee is involved in harvest monitoring, biological sampling and research, preparation of management plans and commenting on development plans. Fundamental to the structure of the committee is this strong representation by beluga whale hunters. All discussions and management decisions involve hunter representatives and many villages and communities harvest data and samples are acquired through the resource users themselves. Hunters make up well over half the committee and only representatives from beluga whale hunting communities vote on matters relating to hunting* (Adams, Frost & Harwood, 1993, p. 136).

2.1.2 National Strategies

Canada has two national resource policies that include references to traditional knowledge that might be noted here. This includes the National Forestry Strategy and the National Biodiversity Strategy.

The *Canadian Biodiversity Strategy* (1995) was drafted and adopted following Canada's ratification of the Convention on Biological Diversity. The chapter on traditional knowledge notes the accumulated knowledge related to medicine, food and changes in the environment can serve as a basis for policy and

programme development. The Strategy pledges to "*identify mechanisms to use traditional knowledge, innovations and practices with the involvement of the holders of such knowledge, innovations and practices, and encourage the equitable sharing of benefits arising from the utilization of such knowledge, innovations and practices"* (Environment Canada, 1995).

Canada has also recently adopted *The National Forest Strategy 2003-2008*. This is the fifth National Forestry Strategy. Arguably the references to eco-system based management and need to respect the totality of the forest resources reflect traditional knowledge in action. In addition, there are specific references to traditional knowledge throughout the document, including proposed objectives directly on topic. The 2003-8 Strategy proposes to:

- *incorporate traditional knowledge in managing forest lands and resources in accordance with the Convention on Biological Diversity;*
- *direct federal and other available funding to support Aboriginal capacity building and participation in implementing the National Forest Strategy, through measures such as a renewed and expanded First Nation Forestry Program and the development of a parallel Métis forestry program, and in supporting Aboriginal participation in related local, regional and international meetings; and*
- *develop a framework to use traditional knowledge along with current scientific knowledge and to protect the intellectual property rights of Aboriginal Peoples.* (National Forestry Strategy Coalition, 2003).

2.1.3 National Parks

Both Canada and the United States have a national park programme. Parks often become flash points for disagreement between indigenous peoples and government officials responsible for their management. Some efforts have been made in Canada and the United States to address this friction.

The *Canada National Parks Act, 2000, c. 32* provides for the authorization of the use of parklands, and the use or removal of flora and other natural objects, by aboriginal people for traditional spiritual and ceremonial purposes. In the *Canada National Marine Conservation Areas Act*, c. 18, Parliament affirms the need to *"consider traditional ecological knowledge in the planning and management of marine conservation areas"* (preamble).

It is Parks Canada stated policy to increase indigenous peoples involvement and representation in national historical sites and national parks. Co-management agreements have been or are being negotiated with respect to a number of national parks in the traditional territories of indigenous communities, including at Tuktut Nogait, Wapusk, Mingan Archipelago, Pacific Rim, Gulf Islands, and Bathurst Inlet. The Mi'kmaq have signed an agreement with respect to Forillon National Park, which allows them to pursue their traditional culture within the park. In the agreement the Mi'kmaq note that given the fragile state of the ecosystem they will refrain from taking traditional items from that territory, but will pursue their customs using traditional materials taken from outside that territory (Parks Canada, 2001). Traditional gathering activities are permitted at Pukaskwa, Gros Morne, Wood Buffalo and Wupusk National Parks (Cadieux, 2000).

The National Parks Service of the United States has an American Indian Liaison Office. The purpose of this Office is to assist the National Park Service field and program managers to establish relationships with American Indian Tribes and Alaska Native groups on a government-to-government basis; educate National Park Service field and program managers concerning Indian Self-Determination, Tribal Self-Governance, and effective means of working with tribes; help ensure that American Indian, Alaska Native and Native Hawaiian concerns are considered in policies, regulations, and programs that affect them;

assist and promote American Indian participation in carrying out National Park Service policies, programs, and activities; and work with other National Park Service Indian Offices, Indian Offices in other agencies, tribes, intertribal organizations and other National Park Service partners in pursuing these objectives (ParkNet, 2003). The National Parks Tribal Preservation Program, established in 1990, works with indigenous peoples of the United States to protect sites of historical and cultural importance to indigenous peoples and allow them to preserve cultural traditions. There is a strong capacity building element to this work to help strengthen the capacity of indigenous peoples to develop sustainable preservation programmes.

The *Inuit Impact and Benefit Agreement for Territorial Parks* signed between the Nunavut Territorial Government and several Inuit Associations will formalize the role of Inuit in joint park management and planning at a territorial and community level. It also ensures the involvement of youth and the incorporation of Inuit *Qaujimajatuqangit* (Inuit traditional knowledge) and oral history along with conventional knowledge into park management.

A March 28, 2003 joint news release of the Government of British Columbia and the Haida Nation announced a framework agreement to co-manage land use planning on Haida Gwaii/Queen Charlotte Islands. The parties have agreed to co-develop a land-use plan that is ecosystem-based, protects the environment, maintains spiritual and cultural values, and fosters community well being. It is expected to also open up economic opportunities to all people of Haida Gwaii/Queen Charlotte Islands (Ministry Of Sustainable Resource Management & Council Of The Haida Nation, 2003).

While efforts to include traditional knowledge in regional and national land use planning and to provide opportunities for indigenous peoples to pursue traditional practices are to be applauded, they are as yet in a nascent state. Further, there are still too few opportunities for indigenous peoples to be involved in the decision making process. As a result conflict between indigenous peoples and governments continue over land use, access to traditional territories, and access to natural resources.

2.2 Incentive measures

Decision 24 of the third Conference of the Parties to the Convention on Biological Diversity includes the following definition of an incentive measure.

> *An incentive measure is a specific inducement designed and implemented to influence government bodies, business, non -governmental organisations, or local people to conserve biological diversity or to use its components in a sustainable manner. Incentive measures usually take the form of a new policy, law, or economic or social programme. However, a single incentive measure functions within the broader set of incentives governing human behaviour, and its effectiveness depends upon support from the existing social and economic environment. (UNEP/CBD/COP/3/24).*

Few direct incentive measures exist to support the use and retention of traditional knowledge. Examples that were found include efforts to protect indigenous languages and to support traditional hunting practices.

Although language issues will be addressed in full in phase two of the report, it is worthwhile noting here that some incentive measures have been adopted to support language initiatives. The languages of some indigenous peoples in Canada including the Nisga'a and Inuit are confirmed as official languages under the terms of self-government agreements. The Government of Nunavut, for example, operates in three official languages – English, French and Inuktitut. The Canadian Government has agreed to provide

financial support to the Government of Nunavut through the 2002-2003 Canada-Nunavut Cooperation Agreement on French and Inuktitut Languages. Of the funds provided, $1.1 million will support community initiatives to support Inuktitut (Office of the Government of Nunavut, 2000).

The Government of Quebec offers an income security programme for Cree Hunters and Trappers "*to encourage and preserve the traditional way of life of the Crees*"(Cree Hunters and Trappers Income Security Board, 2001). The programme was established as part of the James Bay and Northern Quebec Agreement, 1975 to counter concerns about the impact of the Great Whale hydroelectric dams on the traditional livelihoods of the indigenous peoples of the region. [P]*ersons who, according to community custom, are practising harvesting and related activities as a way of life in accordance with the harvesting traditions and the rules of the community*" (section 31.1 of the *Act respecting income security for Cree hunters and trappers who are beneficiaries under the Agreement concerning James Bay and Northern Québec* (R.S.Q., c. S.3-2)) are eligible for the programme. To qualify, the individual must pursue traditional activities including hunting and fishing or other related activities including tourism, handicrafts or trap line and equipment maintenance. They may pursue other activities as well, but must spend at least 120 days per year engaged in these traditional activities. The programme provides a guaranteed annual income based on the number of days spent at these activities per year. In 1999-2000, the average rate of eligible participants' registration for the Cree Hunters and Trappers Income Security Program was 22% (Secretariat aux affaires autochtones du Quebec, 2003). There has been a slight decline in the number of participants in the programme as well as an overall decline in the number of days in pursuit of traditional activities. The most common reason for leaving the programme was pursuit of education or training, particularly by those under age 30 (Cree Hunters and Trappers Income Security Board, 2001).

Access and benefit sharing and recognition and protection of intellectual property rights might be considered "incentive measures" as their just application would at least recognize the economic value of traditional knowledge, innovation and practice, thereby providing incentive to protect that economic value. Considerable work is underway through other mechanisms including the Convention on Biological Diversity with respect to access and benefit sharing and recognition and protection of intellectual property rights so this paper will not address these issues to any significant degree. It is worth noting, however, that Canada does provide some limited protection for traditional knowledge through the operation of copyright, trademark and trade secrets legislation (Second National Report, Canada, 2001). No specific access and benefit sharing legislation has been developed. However, some indigenous communities in Canada have authority to control access to their lands and natural resources through the operation of land claim and self-government agreements (Second National Report, Canada, 2001). The United States has general laws with respect to copyright, patents and trademarks, but has no national laws on access and benefit sharing and no provisions to require the prior informed consent of indigenous peoples for access to traditional knowledge, innovation or practice.

In conjunction with the general work on incentives it is recommended that specific work be undertaken by the Working Group on Article 8(j) to examine incentives and disincentives, intentional or otherwise, for the pursuit of traditional activities. In particular, it will be important to note the impact of the loss of land on the ability of indigenous peoples to put their traditional knowledge to use. Phase two of the Composite Report may constitute a good preliminary examination of the issue.

2.2 Capacity-building measures

Capacity-building measures appear to be the focus of a great many activities at this time. This includes building the capacity of indigenous peoples to maintain and in many cases revive their traditional knowledge, innovations and practices. It also includes efforts to build the capacity of non-indigenous peoples to understand and accept indigenous worldviews including traditional biodiversity related knowledge, innovations and practices.

Capacity building can take many forms. Education programmes, both formal and informal at the primary, secondary and post secondary level, are obvious examples. But books and websites, research projects and community-sponsored initiatives are also opportunities to build capacity. Many activities of indigenous peoples could be cataloged a number of ways, including as evidence of the state of traditional knowledge or as examples of activities for the use and preservation of traditional knowledge. Indeed, many capacity building activities are discussed elsewhere in this paper, such as the reproduction of caribou skin clothing, efforts to reintroduce buffalo to the plains, or the development of traditional land use maps. These are not repeated here, but should be noted by the reader as further evidence of capacity building activities. What follows are examples not presented elsewhere in the paper.

2.3.1 Education

There are thirty tribal colleges in the United States, and 15 Universities in Canada, which offer native studies programmes (Mitten, 1995-2003, American Indian Higher Education Consortium, 2003). Many of them describe a critical element of their mission to provide culturally appropriate education to their indigenous students and to maintain cultural traditions. The Saskatchewan Indian Federated College presents courses from the indigenous perspective, aided by Elders (Goodwill, 1999). The Mi'kmaq Institute at the University College of Cape Breton offers courses in Mi'kmaq language, science, culture, and history. Some of the courses are offered in Mi'kmaq communities to bring the education to the people (UCCB, 2003). The Centre for Indigenous Environmental Resources was created for the express purpose of establishing and implementing environmental capacity-building initiatives for First Nations (CIER, 2001). The Environmental Education and Training Program is offered in conjunction with the University of Manitoba. Graduates earn two years of degree credit at the University. In the United States, the first Tribal College, Diné College, was established in 1968 to provide institutions of higher learning to indigenous students. *The mission of Diné College is to apply the Sa'ah Naagháí Bik'eh Hózhóón principles to advance quality student learning:* [including] *through Nitsáhákees (Thinking), Nahatá (Planning), Iiná (Living) and Sihasin (Assurance)* (Diné College, 2003).

> *In many ways, Tribal Colleges are similar to mainstream community colleges. However, the trait that distinguishes them from other community colleges is their dual mission: 1) to rebuild, reinforce and explore traditional tribal cultures, using uniquely designed curricula and institutional settings; and at the same time 2) to address Western models of learning by providing traditional disciplinary courses that are transferable to four-year institutions* (American Indian Higher Education Consortium & The Institute for Higher Education Policy, 1999).

Many indigenous communities offer programmes for indigenous students at junior levels of education as well. Examples include:

- Badabin Eeyou school located in a Cree community on the mouth of the Great Whale River; Cowessess Community Educational Centre in Saskatchewan; and Leo Ussak Elementary School, which bills itself as the "coolest" school in Canada's Arctic;
- The Cradleboard Teaching Project, a project of the Nihewan Foundation for American Indian education, founded by Buffy Sainte-Marie in 1996 (Nihewan Foundation, 2002); and

- the Alaskan Native Knowledge Network, which has established the Alaskan Standards for Culturally Responsive Schools for consideration by schools in Alaska to support indigenous cultural values within the education system (Battiste, 2002).

In Canada, the federal government has supported the establishment of a First Nations SchoolNet programme, an on-line, interactive educational tool for children, teachers and parents providing a variety of educational programmes aimed at indigenous peoples. Resources include lesson plans, classroom resources, and links to at least one hundred indigenous related websites. Links include everything from pictures by the grade 5/6 class at Indian Brook First Nation School, to *Analysis of Health Statistic for Status Indians in British Columbia, 1991-1998*, to the First Nations and Inuit Youth Business Network. The lesson plans are geared to indigenous students, relying on examples familiar to the students, such as the study of the force of water with reference to the movements of a canoe in the rapids (Industry Canada, 2003).

There are many concepts contained in traditional indigenous philosophy about the land that are contained in indigenous languages and are not easily translated into other languages. Thus, indigenous language instruction is worth noting at this juncture as a capacity building effort. A number of school programmes focus on the introduction of indigenous language instruction into the curriculum. For example, a preschool language immersion program at Cherokee Elementary School on Qualla Boundary, will allow the children to follow the program until they graduate from high school (Moore, 1999). Another example is the work of the Alaska Native Language Centre at the University of Alaska Fairbanks, which documents and facilitates retention of the 20 indigenous languages of the territory (Alaska Native Language Center, 1999-2003).

2.3.2 Reintroduction of Skills

There are also a number of examples of indigenous peoples reintroducing traditional skills and associated knowledge to their communities. In many cases traditional skills have not been practiced for many years. *"Cultural revival for the Innu does not entail a simple rejection of all non-indigenous influences, but requires a re-learning of the old ways so that traditional culture can guide ongoing activities"* (Hasinoff, 2002). Examples include:

- the Full Circle Carving Project by the Suquamish Tribe to construct a traditional cedar canoe (Suquamish Tribe, 2003);
- the Oral History Project, a five volume collection of Inuit Knowledge, based on interviews of Inuit Elders conducted by Inuit students of the Inuit Studies program supervised by Susan Sammons of Nunavut Arctic College including information on law, health, childrearing, and cosmology and shamanism (Nunavut Arctic College and Nakasuk, et al, 1999); and
- the Zuni Eagle Sanctuary, established in 1999, to provide a refuge for injured bald and golden eagles, provide a source of eagle feathers for Zuni and other indigenous peoples in North America for cultural practices, and to re-establish the ancient traditions of the Zuni in raptor care (The President and Fellows of Harvard College, 2002-3).

2.3.3 Communications

New communication technologies including radio, television and the World Wide Web have substantially increased learning opportunities. In Canada, the Aboriginal Peoples Television Network, described as the first national aboriginal television network in the world, came on air September 1, 1999. Programmes include entertainment, current events, coverage of traditional sporting events and educational programmes for children in various indigenous languages. Indigenous radio stations operate out of Alaska, Arizona,

California, Nebraska, New Mexico, Oregon, North and South Dakota, Fredericton, New Brunswick, and Oshweken and Sioux Lookout, Ontario. Native American Public Telecommunications has a mission to *inform, educate and encourage the awareness of tribal histories, cultures, languages, opportunities and aspirations through the fullest participation of American Indians and Alaska Natives in creating and employing all forms of educational and public telecommunications programs and services, thereby supporting tribal sovereignty* (Native American Public Telecommunications Inc., 2003). It should be noted, however, that while television can help to communicate the importance of traditional knowledge there are also concerns about the impact of television on indigenous populations.

> *The potential problems of television, especially among indigenous populations, have received considerable attention by medical researchers, educators and sociologists. Responding to the recent introduction of television to the Dene Nation in Canada's Northwest Territories, Dene educator Ernie Lennie (form Mander 1991:111) commented: "The type of learning we get in school and also on TV is the type of learning where we just sit and absorb. But in family life…children learn directly from their parents. Learning has to come from doing." Both television and certain formal education approaches run counter to the ways of indigenous education – for examples, apprenticeships with elders – that have been most successful for previous generations.*
>
> Nabhan and St. Antoine, 1993.

The World Wide Web is a tremendous resource and while there are issues of access, indigenous groups in Canada and the US have begun to put it to use as a means of promoting indigenous culture and to share traditional knowledge. Some discretion must be applied in researching traditional knowledge, however, as not all websites offering "traditional knowledge" are in fact connected with indigenous peoples. Reference here is not intended to be an endorsement. Examples of information that can be found on the web include:

- virtual museums, such as the Mashantucket Pequot Museum and Research Centre (Mashantucket Pequot Museum and Research Centre, 2003);
- wilderness skills training, such as tracking and wilderness survival offered by the Ndakinna Wilderness Project (Ndakinna Wilderness Project, 2003);
- traditional stories, history, teachings on CDs such as the materials developed by the National Museum of the American Indian, *Maawenji'iding*: *Gathering Together*, a CD volume containing hours of information gathered from the Ojibwe peoples in Wisconsin (hup!); Multimedia, 1999); and
- instruction in indigenous technology including traditional arts and crafts (Prindle, 2003).

Books on gardening, cooking, herbal medicine, animal tracking, and traditional teachings are available, as are collections of art, music, and videos of traditional dance. Elements of traditional biodiversity related knowledge are often embedded in these medium.

2.3.4 Research Projects

A number of research projects that incorporate an element of traditional knowledge have been established, many in conjunction with universities. These are a primary means to not only facilitate the retention and use of traditional knowledge in indigenous communities, but also to share this knowledge with non-indigenous peoples.

- Coasts Under Stress, is a five-year project, funded by the Social Sciences and Humanities Research Council of Canada and the Natural Science and Engineering Research Council of Canada, participating universities and partners in government, business, non-governmental organizations and First Nation groups. Among the questions being examined are how different kinds of ecosystem knowledge influence decision-making and how local and scientific knowledge can allow the development of better ecological recovery strategies (Coasts Under Stress, 2000-2002).
- The Ashkui Project involving Environment Canada, in partnership with the Innu Nation, the Gorsebrook Research Institute of Saint Mary's University (Nova Scotia) and Natural Resources Canada (Environment Canada, 2002).
- Environment Canada scientists have also partnered with a local hunters and trappers association to interview Elders in Pangnirtung, Nunavut, about seals, polar bears and ice patterns; with indigenous peoples to study Ivory Gulls, Harlequin Ducks and Common Eider; and with Gwich'in Elders and fishers to identify Dolly Varden char as "at risk" (Environment Canada, 2002).
- The Dene Cultural Institute in partnership with the Arctic Institute of North America undertook a number of studies that include the *Fort Good Hope-Colville Lake Traditional Environmental Knowledge Pilot Project* (1989-1993), the *Dene Justice Project*, Wha Ti (1991-1993), the *Dene Medicine Project*, Wha Ti (1993-1994) and the *Traditional Governance Project*, Rae Lakes (1993-1996).
- the Canadian Arctic Resources Committee, the Environmental Committee of the Municipality of Sanikiluaq and the Rawson Academy of Aquatic Science undertook a project to examine ecological changes in Hudson Bay resulting from hydroelectric developments in the provinces surrounding the Bay. The results are published in *Voices from the Bay* capturing the traditional knowledge of the Inuit and Cree peoples living in the territory (MacDonald et al. 1997).
- The Northern Contaminants Program is documenting the impact of contaminants on the Arctic. "Working to reduce and, wherever possible, eliminate contaminants in traditionally harvested foods, while providing information that assists informed decision making by individuals and communities in their food use" (INAC, 2003). A number of reports of the studies to date have been published.
- The *West Kitikmeot/Slave Study* funded jointly by federal and provincial governments, industry, indigenous communities and environmental organizations has completed a series of projects examining the potential effects of industrial development in the area stretching from Great Slave Lake north to the coast of the Arctic Ocean. Projects completed include: the *Tuktu & Nogak Project,* which examined the Bathurst Caribou; the *Caribou Migration and the State of their Habitat,* which recorded the Dogrib elders traditional knowledge with respect to caribou movements, caribou habitat and the relationship between the Dogrib and the caribou; *The Habitat of Dogrib Traditional Territory: Place names as Indicators of Bio-geographical Knowledge*; and the *Traditional Knowledge Study on Community Health*.
- Arctic Borderlands Ecological Knowledge Co-op linked with the national Ecological Monitoring and Assessment Network is to promoting ecological monitoring in the Northern Yukon. The Co-op brings together representatives of co-management boards, Inuvialuit and First Nation Councils, Canadian and American federal and territorial government agencies and academic and research institutions in Canada and the United States to share information with a focus on contaminants, climate change, and regional development.
- The Gwich'in Social and Cultural Institute has conducted a number of traditional knowledge studies aimed at building understanding and awareness of Gwich'in culture and knowledge of the land. Some of the projects completed include:
    - Gwichya Gwich'in Traditional Knowledge Project;
    - Tsiigenhnjik Ethnoarchaeology Project;

  - Traditional Knowledge of the Campbell Lake Area; and
  - Delta Science Camp (Heine, et al and the Elders of Tsiigehtchic, 2001).
- The Western Pacific Community Demonstration Project Program which promotes the involvement of western Pacific communities including Hawaii and American Samoa in Western Pacific fisheries by demonstrating the application and/or adaptation of methods and concepts derived from traditional indigenous practices; promoting the development of social, cultural and commercial initiatives that enhance opportunities for western Pacific communities to participate in fisheries, fishery management or conversation; and benefit the indigenous community who have not had capability for substantial participation in the fisheries or marine resource management in their native lands (Western Pacific Fishery Management Council, 2003).

2.3.5 Health and Traditional Foods

There appear to be a large number of capacity building projects related to traditional foods and health. The issue of diabetes is of particular concern in the indigenous population, as the rate of diabetes is three to five times that of the non-indigenous population (Health Canada, 2003). Changes in lifestyle, exercise and diet, seem to be the greatest contributors to the rise of the disease. Many efforts are underway to encourage indigenous peoples to return to traditional foods as a way of combating the disease. There are a number of organizations in Canada and the US dedicated to addressing the issue including Health Canada; the Centre for Indigenous Nutrition and Environment; and the National Diabetes Education Program American Indian Campaign run by the National Institutes of Health and the Centre for Disease Control and Prevention; Association of American Indian Physicians; and Desert Foods for Diabetes run by Native Seeds/SEARCH.

- The Alaska Traditional Knowledge and Native Foods Database is engaged in a number of projects to support capacity building among the indigenous peoples of Alaska with respect to issues of traditional foods. This includes work on contaminants, developing a database of consumption of traditional foods, and calculating the nutritional value of traditional foods. The section of the database on cultural benefits of traditional foods and related activities is a particularly rich mine of information on traditional practices (Alaska Native Science Commission and Institute of Social and Economic Research University of Alaska Anchorage, 2002).
- Native Seeds/SEARCH, a seed conservation organization in Arizona that concentrates on traditional crops of the Southwest USA and Northwest Mexico and their wild relatives, distributes seeds to approximately 4,000 gardeners each year. (US Dept. of Agriculture, 1996; Native Seeds/SEARCH, 2002) One particular activity of this organization, the Cultural Memory Bank collects stories about the seeds retained at the seed bank (Native Seeds/SEARCH, 2002).
- The Centre for Indigenous Peoples' Nutrition and Environment has a mandate to "*document, promote and incorporate traditional knowledge of nutrition and environment and contribute to the development of techniques to identify trends in deterioration in quality of traditional food systems, and to suggest possible remedial actions*" (Centre for Indigenous Nutrition and Environment, 2001).

2.3.6 Traditional Names

There are also a number of efforts underway to reintroduce traditional names to local sites. For example, the Haida, through the Skidigate Haida Immersion Programme and Parks Canada are working together to introduce traditional names and associated traditional knowledge of plants, animals, birds, land and waters in Gwaai Haanas National Park Reserve (Parks Canada, 2000). The Confederated Salish and Kootenai Tribes of the Flathead Nation, in northwestern Montana under the authority of the *State Historic Preservation Act* are using place names to evaluate the cultural significance of resources (Pablo, 2001).

2.3.7 Tourism

Youth camps and eco-tourism are a fun means to build capacity in the traditional arts and inform non-indigenous peoples about traditional environment related knowledge. By providing employment to indigenous peoples these programmes also offer an economic advantage in the retention of traditional skills. Indigenous tourist operations can be located easily on the web and appear to operate in virtually every state of the United States and province and territory in Canada. Activities might include sleeping in teepees, preparation of traditional foods, and visits to culturally important sites. Note, however, that some non-traditional and possibly environmentally unfriendly activities might also be included such as golfing, swamp buggy tours, and accommodation at luxury casino-hotels. Youth camps such as the Mamaweswen, The North Shore Tribal Council "Youth Environmental Leadership Forum II", a week long programme for teenagers from seven First Nations, provide an opportunity to share traditional skills with indigenous youth. This particular programme concentrated on traditional knowledge including story telling, paddle making and shelter construction as well as non-traditional skills such as water sampling and the use of GIS systems.

2.3.8 Government Initiatives

Governments are providing financial support to assist indigenous peoples' capacity building efforts.

- The First Nations Forestry Program, Canada, established in 1996, has supported more than 1,300 projects, which, among other things, enhance the capacity of First Nations to sustainably manage First Nations lands and advance the knowledge of First Nations in sustainable forest management and forest-based development.
- In response to the Royal Commission on Aboriginal Peoples, the Department of Indian Affairs and Northern Development announced plans to support initiatives to provide accredited professional development programs in the area of Lands and Environmental Stewardship (Indian and Northern Affairs Canada, 1997).
- The Government of Ontario, in 2002, provided funding to the Nishnabwe Aski Nation to assist in capacity building in the area of lands and resource development and management. The First Nations plan to use the funds to develop, among other things, culturally appropriate land management planning (Government of Ontario, 2002).

Governments are also exploring opportunities to become more enlightened about traditional knowledge. Recently an Aboriginal Traditional Knowledge Perspectives Workshop was hosted by the Centre for Traditional Knowledge for employees of Indian and Northern Affairs Canada, Environment Canada and the Canadian Environmental Assessment Agency. Kumik, an Elder's Lodge in the offices of Indian and Northern Affairs Canada is open to all government employees as, among other things, an opportunity to study traditional indigenous values.

This is just a sample of initiatives to enhance the capacity of indigenous peoples to sustain their traditional knowledge, innovations and practices related to the protection of biological diversity. Many other examples are found throughout the paper, though they may not be identified as such. A concerted

effort to catalogue capacity building initiatives and review them for their effectiveness as best practices would be a worthwhile enterprise – perhaps an activity that could be sponsored under the auspices of the Convention on Biological Diversity. Even the limited review here, however, makes it clear from the number and variety of capacity building programmes and opportunities that there is a great deal of interest in indigenous traditional knowledge and that efforts to save what remains of that knowledge and ensure it is passed on to successive generations are paramount.

The long unfortunate history of denying indigenous peoples the right and opportunity to pursue their traditional practices and to pass on their traditional knowledge will take many years to overcome. It remains to be seen if in fact the traditions can be revived as vibrant cultural practices. Rebuilding the capacity of indigenous peoples to pursue their traditional practices requires more than education. It will also require opportunity and encouragement to continue the traditions.

2.3 Repatriation of objects and associated information to communities of origin

Both the Smithsonian Institute in the United States and the National Museum of Civilization in Canada have legislation or policy with respect to the repatriation of indigenous artifacts and human remains to the community of origin.

A National Museum of the American Indian was created in 1998 as a part of the Smithsonian Institute. The National Museum of Natural History established a Repatriation Office in the Department of Anthropology in 1991 to facilitate the return or repatriation of Indian human remains or Indian funerary objects under the *National Museum of the American Indian Act*. The Museum has been working with tribal representatives to determine the disposition of human remains and cultural objects (Smithsonian Institute, 1999). In addition, the *Native American Graves Protection and Repatriation Act* (NAGPRA) passed by Congress in 1990 applies to museums, universities, and federal agencies.

In Canada the Canadian Museums Association issued ethical guidelines on the exhibition of human remains, funereal artifacts and related objects in 1999. These guidelines recommend that museums consult with indigenous communities about the display of objects, and that efforts be made to repatriate human remains to the appropriate community (Canadian Museums Association, 2003).

Culturally Sensitive Objects and Human Remains

Information about certain culturally sensitive objects may not be readily available, and it is the responsibility of museums to actively seek it out from knowledgeable members of the appropriate cultural groups before using the object in any way. Presentations, research and museum-sponsored archaeological field trips should be accomplished in a manner acceptable to the originating community. In specific cases, it may be appropriate to restrict access to certain objects, to honour the protocols and ceremonies of that community regarding storage, treatment, handling and display, or to facilitate special access as appropriate. Where appropriate, museums could assist in the reinterment of (archaeological) human osteological material by assisting local reburial committees or other community groups.

Canadian Museums Association, 2003

A number of pieces of federal legislation in Canada serve to prevent the inappropriate sale or destruction of indigenous cultural artifacts.

- *Cultural Property Export and Import Act*, 1985, chapter C-51 permits the Government of Canada to control the export of objects or classes of objects of any value *that are of archaeological, prehistorical, historical, artistic or scientific interest and that have been recovered from the soil of Canada, the territorial sea of Canada or the inland or other internal waters of Canada* or objects with a fair market value of more than $500.00 (Cdn.) that were made by, or are books, records, documents, photographic positives and negatives, sound recordings, and collections of any of those objects that relate to, indigenous peoples in Canada (s. 4). When an application is made to export an object that is on the control list, an expert examiner shall determine *(a) whether that object is of outstanding significance by reason of its close association with Canadian history or national life, its aesthetic qualities, or its value in the study of the arts or sciences; and (b) whether the object is of such a degree of national importance that its loss to Canada would significantly diminish the national heritage.* (s. 11).
- A building or other place of national historic interest or significance including buildings or structures that are of national interest by reason of age or architectural design may be designated as an historic place under the federal *Historic Sites and Monuments Act*, 1985 C.S.C. c.H-4 site. (s.2) The Act provides that such places may be commemorated, acquired, preserved and maintained. (s.3)
- The *Indian Act*, Chapter I-5 stipulates that without the written consent of the Minister of Indian and Northern Affairs, no person may acquire title in an Indian grave house, carved grave pole, totem pole, a carved house post or a rock embellished with paintings or carvings. Furthermore, no person shall remove, take away, mutilate, disfigure, deface or destroy any such object without the written consent of the Minister. (s.91).

Indigenous communities have made efforts to facilitate the return of items to their communities.

- The *Nisga'a Final Agreement* provides for the return of Nisga'a artifacts including from the Canadian Museum of Civilization and the Royal British Columbia Museum, without condition. All human remains of Nisga'a ancestry will be returned to the Nisga'a Nation. The parties also agree to use reasonable efforts to facilitate Nisga'a access to artifacts and human remains of Nisga'a ancestry that are held in other public and private collections (Nisga'a Final Agreement, c. 17).
- The Prince of Wales Northern Heritage Centre, with funding from the Museums Assistance Programme of the Department of Canadian Heritage and the Department of Education, Culture and Employment undertook a project to reproduce Gwich'in traditional caribou skin clothing and repatriate the related traditional knowledge and skill. The Canadian Museum of Civilization loaned the community a 19th century man's garment to facilitate the work of the Gwich'in seamstresses producing replicas (Kritsch & Wright-Fraser, 2002).
- An agreement to divide the Prince of Wales Northern Heritage Centre's museum and archives collections between the Government of Nunavut and the Government of the Northwest Territories has been reached (Office of Government of Nunavut, 2000).
- The Menominee Tribal Historic Preservation Department designated by the Menominee Tribal Legislature works with Menominee Elders to repatriate Menominee remains and artifacts in a culturally appropriate manner. (Menominee Nation, 2003).
- The National Congress of American Indians has passed a resolution calling for the establishment of a Sacred Lands Protection Coalition. The role of the Coalition will be to encourage the strengthening of legal protection of sacred sites and to allow the use of sacred sites for traditional indigenous religious practices (National Congress of American Indians, 2001).

Although not strictly a programme for repatriation, the National Park Service Tribal Preservation Program is worthy of note in its efforts to assist indigenous peoples in the United States and Hawai'i to preserve their historic properties and cultural traditions. The programme, established in 1990 consists of a series of

grants to Tribes for among other things, identifying and protecting historic sites, drafting preservation regulations, and building capacity to manage sustainable protection programmes (National Park Service, 2003).

Efforts to repatriate human remains and cultural objects have just begun in Canada and the United States. There will doubtless be many challenges in completing this task over the coming years.
However, it would appear that at least some of the necessary first steps have been taken to facilitate the repatriation.

2.5 Strategic planning for conservation and sustainable use of biological diversity in the context of community development planning

Many indigenous peoples manage at least local elements of their affairs and therefore have the opportunity to include traditional knowledge in their community development planning. There is evidence of the inclusion of traditional knowledge in community development planning, though it may not be couched in terms of "strategic plans".

2.5.1 Strategic Planning

The Government of Nunavut is an exception to this. It has published a twenty-year plan for community development in the Territory*, The Bathurst Mandate Pinasuaqtavut: that which we've set out to do.* The traditional philosophy of the Inuit is found throughout the document with specific reference to Inuit knowledge. For example*, "The health of Nunavut depends on the health of each of its physical, social, economic and cultural communities, and the ability of those communities to serve Nunavummiut in the spirit of Inuuqatigiittiarniq; the healthy inter-connection of mind, body, spirit and environment"; "Inuit Qaujimajatuqangit* [traditional Inuit knowledge] *will provide the context in which we develop an open, responsive and accountable government*", and "*We will incorporate traditional activities and values into new strategies to participate actively in the development of our economic resources*" (Nunavut Government, 2000).

This degree of explicit reflection of indigenous knowledge in community planning is uncommon. Incidental evidence such as co-management arrangements, resource management strategies and local land use planning suggest indigenous communities are including traditional knowledge in community development planning.

2.5.2 Natural Resource Management

One of the primary means indigenous peoples in North America have available for inclusion of traditional knowledge in community planning is in the management of natural resources. Forestry programmes, fish management initiatives, habitat rehabilitation, and protection of endangered species are often structured around traditional teachings about environmental stewardship and respect. The relationship between resource stewardship and community development are neatly summed up by Simon Lucas,

> *In my vision, our communities thrive and prosper through the careful management, sharing and use of fisheries and other resources like they once did. You see, my vision is not based on the survival of salmon, but on the thriving of wild salmon. My vision is not based upon the survival of our people and our communities, but on their thriving. Most importantly, my vision is based on the complete interdependence between our people and wild salmon. Our communities are spread along the coast and we cannot thrive unless wild salmon thrive. Equally, I do not believe that wild salmon will again flourish, unless and until our communities flourish again. This is why we*

> *can share a common cause and struggle together -- for our communities and for wild salmon to survive and thrive* (Lucas, 1988).

This relationship between communities of humans, plants and animals are often recognized in natural resource management plans. For example, the Sustainable Forestry Management Network and Little Red River Cree Nation in Alberta have developed a programme intended to provide both protection to the indigenous people's way of life as well as develop forest resources. A list of elements to consider in developing forestry resources has been created to ensure those activities do not detrimentally impact land, flora and fauna, areas of biological, cultural and historical significance, or aboriginal and treaty rights. Recommendations include improving education and training programmes for indigenous peoples, and involving community members in the decision-making process including through greater use of traditional knowledge (Natcher & Hickey, 2002). The Canadian Model Forest Programme supports indigenous peoples' participation in sustainable forest management and encourages initiatives to document traditional knowledge, develop non-timber product business and develop indigenous forest management plans. The National Aboriginal Forest Association recommends the inclusion of indigenous participation in traditional activities, use of traditional territories and access of indigenous peoples to forest resources as indicators of sustainable forest management.

> *Traditional land use activities have an economic value within Aboriginal communities. If an Aboriginal community is part of a forest area, the people in those communities should be able to continue cultural, spiritual and traditional harvesting activities. Current forest management planning practices often do not take into account the need to ensure that there is a balance in planning for fish and wildlife habitat, medicinal plants, traditional food plants, good water quality, recreational, spiritual and cultural pursuits, and the use of timber to provide shelter and heat, as well as for economic gain. Use of traditional areas tends to decrease where any one type of forest use suffers damage as a result of another activity* (National Aboriginal Forest Association, 1995).

An assessment of Indian Forests and Forest Management found that indigenous peoples' valued resource protection, scenic beauty and an integrative holistic approach over economic opportunities in the forestry industry. The report also found that, "[d]*espite funding and staffing difficulties, many Indian forests are places of experimentation and innovation. Some of the most highly developed uneven-aged management anywhere is found on Indian forestlands*…" and that "[i]*n general, natural regeneration is relied upon for reforestation more on Indian lands than on the National Forests, reflecting, in part, the heavier use of uneven- aged management in Indian forestry"* (Intertribal Timber Council, 1993).

Fisheries management is another area where traditional knowledge is incorporated by indigenous peoples. Activities such as those undertaken by the Tulalip Tribe to rehabilitate the salmon stock are indicative of this. The Taku River First Nation has developed a model fisheries programme for integrated watershed management including protection of existing fish stocks. Both traditional knowledge and scientific methods are used to facilitate the creation of an effective and inclusive management model. The ultimate goal of the Watershed-based Fish Sustainability Planning for the Taku Region is to ensure long-term conservation of fish and fish habitat by involving all fisheries agencies and interests in a strategic planning exercise. The incorporation of traditional knowledge into the process included a review of government legislation and policy and First Nation values to find common conservation principles. Planning priorities were then selected based upon an overlap of interests from both sources. As well, spatial data was collected from Elders and scientific reports. It was then mapped in a GIS format that visually displayed the combined information relating to fish distribution (Heinemeyer, 2003).

In 2000, the Taku River Tlingit First Nation, in cooperation with researchers from Round River Conservation Studies, conducted interviews with hunters and Elders of their Nation to record and document traditional and indigenous knowledge, with a particular focus on key wildlife species of the region. An interview question set was developed, based upon a question set used by the Gwich'in Renewable Resource Board in the mid-1990s to document traditional knowledge about wildlife species. The interview questionnaire included approximately 60 questions, ranging in topics from Tlingit names, traditional uses and management, current status, basic ecology and seasonal habitat requirements of several fish and wildlife species. Particular attention was focused on species of cultural interest to the Tlingit and special management significance for the area: grizzly bear, woodland caribou, moose, mountain sheep and mountain goat. Over 1200 pages of transcribed interviewee responses were recorded, as well as a spatial database of their mapped responses.

For each of the 5 wildlife species, habitat suitability models were developed based primarily on the traditional and indigenous knowledge. This traditional and indigenous knowledge information was supplemented and checked with general seasonal habitat relations, as described in the scientific literature. The habitat suitability models have received peer-review from regional scientists, biologists and species experts; these reviews have confirmed the ecological robustness of the traditional and indigenous knowledge, and the utility of using this information in the habitat modeling application.
The habitat suitability models are currently being used in the development of a regional Conservation Area Design for the traditional territory of the Taku River Tlingit First Nation, and will also contribute to the completion of a Taku River Tlingit First Nation land use plan for the area.

Richard Erhardt, 2003, Fisheries Biologist for Taku River Tlingit First Nation, Personal Communication.

2.5.3 Wildlife Co-management Boards

Wildlife management boards are a relatively common means in the north of integrating traditional knowledge through the participation of indigenous peoples. Co-management boards are often responsible for setting hunting quotas. The quotas are set based on the results of harvest studies. Interviews with indigenous hunters, trappers and fishers document the level of catch, species taken, and location of the catch. These wildlife management boards have sponsored a number of traditional knowledge studies. The Inuit Bowhead Knowledge Study is such an example (Nunavut Wildlife Management Board, 2000). In the Inuvialuit Settlement Region, the Fisheries Joint Management Committee has supported research on beluga, arctic char, whitefish and bowhead whales. The Hunters and Trappers Organisations of Broughton Island, Clyde River, Pond Inlet, Arctic Bay, Igloolik, and Hall Beach, and the Qikiqtaaluk Wildlife Board are presently developing a *Strategy for Future Research on the North Baffin Caribou Population*. The research guidelines for this study stress the importance of Inuit *Quajimajatuqangit* (Inuit traditional knowledge) and local participation in management decisions (Johnson, 2003).

Co-management arrangements in Canada include: the Wildlife Management Advisory Council - North Slope; North Yukon Renewable Resources Council, Wildlife Management Advisory Council - Northwest Territories; Fisheries Joint Management Committee; Gwich'in Renewable Resources Board; Sahtu Renewable Resources Board; Porcupine Caribou Management Board, Nunavut Wildlife Management Board; Yukon Fish and Wildlife Management Board; and the Hunting, Fishing and Trapping Coordinating Committee. There are also a number of indigenous councils and government agencies responsible for environmental management that likely include traditional knowledge in their

deliberations. These include the Inuvialuit Game Council; Aklavik Hunters and Trappers Committee; Council of Athabaskan Tribal Governments; and the Vuntut Gwitchin Lands and Resources Department.

Co-operative arrangements are also found in the United States. The Umatilla Basin Salmon Recovery Project addressed the conflict between indigenous peoples reliance on salmon and agriculturalists that were drawing so much water from the river for irrigation purposes that for several months of the year the river ran completely dry. Developed by the Confederated Tribes, irrigators, Bureau of Reclamation, Bonneville Power Administration, Oregon Water Resources Department and Oregon Department of Fish and Wildlife, the Umatilla Basin Salmon Recovery Project resulted in a return of salmon while also protecting the interests of the agriculturalists. A number of international co-management arrangements, such as the Alaska and Inuvialuit Beluga Whale Committee are discussed in the section above on regional and national land use planning.

Efforts to encourage cooperative management of resources are another means to build capacity to work with traditional knowledge. Workshops in 1998 and 2000 were sponsored by Ecotrust and Canadian Parks and Wilderness Society – BC to address First Nations cooperative management of protected areas including through the use of traditional knowledge (Gardner, 2001). The Saskatchewan Federated Indian College (1996) authored *Co-managing Natural Resources with First Nations: Guidelines to Reaching Agreements and Making Them Work*, (Department of Indian and Northern Affairs, 1996), which encourages governments and private industry to involve Elders, hunters and trappers in co-management arrangements.

2.5.4 Land Use Mapping

Another means by which traditional knowledge is incorporated in community development planning is through land-use, occupancy and habitat maps. One such example is the Manitoba Keewatinowi Okimakanak (MKO) geographic information system (GIS) Development Project. Upon completion of the project MKO has a GIS system that can be used to "*incorporate existing and future land use mapping data, allow overlay and comparison of resource inventories and economic activity, and enable effective modeling of possible alternative patterns of development"* (Wavey, 1993, p. 14). Efforts to develop capacity to link laboratory analysis with traditional ecological knowledge sampling is also underway (Wavey, 1993). A book has been published by Ecotrust and the Union of British Columbia Indian Chiefs on land use mapping called *Chief Kerry's Moose: A guidebook to land use and occupancy mapping, research design and data collection* (Tobias, 2000) which aims to serve as a self-help book and is available on the world wide web. The Government of Alberta (2003) has published a *Best Practices Handbook for Traditional Land Use Studies.* In 2002 the Canadian Arctic Resources Committee announced plans to develop a land use plan in the Slave Geological Province, in the Northwest Territories. It will draw upon the knowledge of indigenous and non-indigenous peoples of the region (Canadian Arctic Resources Committee, 2002). A Gwich'in Environmental Knowledge Project was undertaken to collect and utilise the traditional knowledge of Gwich'in Elders to guide resource management plans, identify areas in need of protection and advise on the permitting of development in the Gwich'in Settlement Area. The project resulted in the publication of a book *Nanh Kak Gwich'in Ginjik; Gwich'in Words About the Land* (Gwich'in Renewable Resources Board, 1997), which focuses on a number of key wildlife species in the area (Johnson, 2003).

These examples of inclusion of traditional knowledge in community development are just the "tip of the iceberg" (Berkes, *et al*, 1995). It is likely that many indigenous peoples in the development of their communities rely on traditional knowledge, as has been their custom for generations although it may not be coached in terms of "strategic planning" or in fact even reported in written format. Perhaps future field research will permit the identification of the degree and extent of such practices.

While greater efforts are being made to include indigenous peoples in the decision making process there are still many other situations where indigenous peoples are sidelined. Even where indigenous peoples have been included, for example in some co-management arrangements, concerns have been expressed that non-indigenous people dominate. There is a need to ensure that participants recognize indigenous knowledge as being of at least equal value (Nakashima, 1993).

2.6 Legislative (including policy and administrative) measures

Broad policy directions to recognize inherent indigenous authority over some issues of governance have been adopted by the governments of both Canada and the United States. These set the tone for much of the legislative, policy and administrative measures that follow with respect traditional knowledge, innovations and practices. Law, policy and administrative measures to facilitate the use and maintenance of traditional knowledge can be divided into three broad categories, including: 1) court decisions which have recognized the inherent authority of indigenous peoples to manage their affairs, thus providing the jurisdictional opportunity to engage traditional knowledge; 2) legislation to facilitate the participation of indigenous peoples relying upon their traditional knowledge in decision making; and 3) provisions which permit the exercise of traditional knowledge, innovations and practices. This section will also consider protocols and codes of ethics with respect to research in indigenous communities and access to traditional knowledge.

2.6.1 Indigenous self-government

Canada and the United States at various times in their history and through a variety of means have recognized the inherent right of indigenous peoples to self-government. It is suggested herein that this may provide a means and opportunity for indigenous peoples, working within other constraints, to exercise their traditional knowledge, innovations and practices. A brief overview of the development of and recent court decisions related to respect for indigenous self-government is provided below.

In Canada, the 1982 amendments to the *British North America Act* included recognition and reaffirmation of existing aboriginal and treaty rights (section 35). This section has been interpreted by the Supreme Court of Canada, for example in *R*. v. *Sparrow*, 1991, *R*. v. *Van der Peet*, 1996, *Delgamuukw* v. *British Columbia*, 1997, and *R*. v. *Marshall*, 2000, to confirm indigenous interests in land and natural resources. A number of these decisions have encouraged greater awareness of indigenous rights and encouraged the reexamination of federal and provincial law and policy as it impacts on indigenous peoples.

Among other things, the Royal Commission on Aboriginal Peoples considered the role of traditional knowledge in the self-governance of indigenous peoples (RCAP, vol. 4, 1996). In 1995 the Canadian Federal Government adopted a policy for the negotiation of self-government agreements. The *Inherent Right Policy* sets out the scope of negotiations. It stipulates that, *"... the Government views the scope of Aboriginal jurisdiction or authority as likely extending to matters that are internal to the group, integral to its distinct Aboriginal culture, and essential to its operation as a government or institution*"(Indian and Northern Affairs Canada, 1995). Although there is no specific reference to traditional knowledge in the policy, there are provisions that touch upon traditional knowledge. For example, under the Inherent Right Policy, the federal government is prepared to negotiate self-government for indigenous peoples within

areas dealing with, among others, health, land management, natural resources management, agriculture, hunting, fishing and trapping on indigenous lands, and indigenous language, culture, and religion. In addition, the federal government is prepared to negotiate some measure of indigenous authority with respect to environmental protection, assessment and pollution prevention, fisheries co-management and migratory bird co-management.

As a result, a number of self-government agreements that have been concluded and approximately another 80 agreements are under negotiation. Concluded agreements include the *Inuvialuit Final Agreement* of 1984, the *Umbrella Final Agreement* with the Council for Yukon Indians of 1993, the 1992 Gwich'in and the 1993 Sahtu Dene and Métis Comprehensive Land Claim Agreements, and the *Nisga'a Final Agreement* of 1999. These agreements provide at least some opportunities for the indigenous peoples involved to use and protect their traditional knowledge.

For example, the *Umbrella Final Agreement* between Canada and the Yukon First Nations lists the objectives of Chapter 16 dealing with fish and wildlife as including to preserve and enhance the culture, identity and values of Yukon Indian People; to ensure the equal participation of Yukon Indian People with other Yukon residents in Fish and Wildlife management processes and decisions; to guarantee the rights of Yukon Indian People to harvest and the rights of Yukon First Nations to manage renewable resources on Settlement Land; to integrate the management of all renewable resources; to integrate the relevant knowledge and experience both of Yukon Indian People and of the scientific communities in order to achieve Conservation; and to honour the Harvesting and Fish and Wildlife management customs for the Yukon Indian People and to provide for the Yukon Indian People's ongoing needs for Fish and Wildlife (Chapter 16). Among the objectives of Chapter 13 of the *Umbrella Final Agreement* with respect to Heritage is promoting *"the recording and preservation of traditional languages, beliefs, oral histories including legends, and cultural knowledge of Yukon Indian People for the benefit of future generations* and *to incorporate, where practicable, the related traditional knowledge of a Yukon First Nation in Government research reports and displays which concern Heritage resources of that Yukon First Nation.*

The Nisga'a Final Agreement provides that Nisga'a citizens have the right to harvest wildlife throughout the Nass Wildlife Area "*in a manner that is consistent with the communal nature of the Nisga'a harvest for domestic purposes, and the traditional seasons of the Nisga'a harvest"* (chapter 9).

The 1984 Inuvialuit Final Agreement recognizes "*that one of the means of protecting and preserving the Arctic wildlife, environment and biological productivity is to ensure the effective integration of the Inuvialuit into all bodies, functions and decisions pertaining to wildlife management and land management in the Inuvialuit Settlement Region*"(section 14(4)) and that "*the relevant knowledge and experience of both the Inuvialuit and the scientific communities should be employed in order to achieve conservation*" (section 14(5)).

The 1992 Gwich'in and the 1993 Sahtu Dene and Métis Comprehensive Land Claim Agreements establish Renewable Resources boards and local councils to encourage and promote local involvement in conservation, harvesting studies, research and wildlife management in the local community and the broader settlement regions. While there is no specific reference to traditional knowledge innovations and practices in these documents it is presumed that the inclusion of indigenous peoples on these boards and councils will ensure an opportunity for sharing this knowledge.

Other legislation and policy in the North that takes into account traditional knowledge, innovations and practices includes the 1998 *Mackenzie Valley Resource Management Act*, which provides for the collection of "*scientific data, traditional knowledge and other pertinent information for the purpose of monitoring the cumulative impact on the environment of concurrent and sequential uses of land and*

water deposits of waste in the Mackenzie Valley"; the proposed Nunavut Wildlife Act, Bill 35, which would recognize *"Inuit systems of wildlife management that contribute to the conservation of wildlife and protection of habitat"*; and the 1989 Traditional Knowledge Policy of the Government of the Northwest Territories which obliges all departments, agencies and employs of the Government to *"incorporate TK into government decisions and actions where appropriate"*.

The United States recognized the self-governing autonomy of indigenous peoples within its borders much earlier than did Canada. Early court decisions, such as *Cherokee Nation* v. *the State of Georgia,* (1831) found that although the Cherokee did not constitute a foreign state, the Cherokee were nevertheless able "*…to prove the character of the Cherokees as a state, as a distinct political society, separated from others, capable of managing its own affairs and governing itself…*". Although there have been ups and downs in the relationships between the indigenous peoples in the United States and the American Government, today many indigenous peoples (Tribes) are officially recognized by the federal government. As such they have a degree of autonomy akin to that of self-governing indigenous communities in Canada.

Not all indigenous peoples in North America have been recognized as holding an inherent right to self-government, however. First Nations Bands operating under the *Indian Act*, most Métis communities and Tribes in the US not recognized by the federal government have significantly less autonomy to manage their own affairs. First Nations Bands operating under the *Indian Act* have some limited authority to manage reserve lands, including authority to address limited environment related issues. Opportunities for these peoples to incorporate traditional knowledge or to practice traditional knowledge are generally limited to the exercise of hunting, trapping, fishing and gathering rights on reserve lands or on Crown Lands. Métis communities in Canada, which are generally landless, and non-federally recognized tribes in the US, who are also landless, have even fewer opportunities to continue to practice or otherwise exercise traditional knowledge. In Hawai'i and American Samoa, the right of the indigenous peoples to manage their own affairs has been usurped by the United States when these islands were colonized. Opportunities to exercise their traditional knowledge and pursue traditional practices are limited where these conflict with the interests of the colonial governments.

2.6.2 Recognition of indigenous interests by the Courts

The courts in Canada and the United States have also recognized the rights of indigenous peoples to be included in the decision making process with respect to the land. It is suggested that this too facilitates the recognition, use and preservation of traditional knowledge. For example, in Canada, there have been a number of cases, some currently under appeal, which address the issue of consultation with indigenous peoples. These include *Taku River Tlingit First Nation* v. *Ringstead* (2000), *Haida Nation* v. *British Columbia (Minister of Forests)* 2002, and *Copps (Minster of Canadian Heritage)* v. *Mikisew Cree First Nation*, 2002. These cases have generally found an obligation on the part of government and industry to engage in meaningful consultation with indigenous peoples prior to taking actions that may damage their ability to pursue their aboriginal rights and titles under the *Constitution Act*, *1982*. These decisions encourage the continued pursuit of traditional knowledge, innovations and practices by indigenous peoples by ensuring the means necessary to do so remain intact.

In the United States, a 1995 decision of the Supreme Court of Hawai'i relied on the *Hawaiian State Constitution* as well as other statutes to limit the authority of the State to extinguish indigenous Hawaiians' interest in the land. Article XII section 7 of the *Hawaiian State Constitution* reaffirms *and shall protect all rights, customarily and traditionally exercised for subsistence, cultural and religious purposes and possessed by ahupua'a tenants who are descendants of native Hawaiians who inhabited the Hawaiian Islands prior to 1778, subject to the right of the State to regulate such rights*. The 1995

Kohanaiki Decision, *Public Access Shoreline Hawai'i (PASH) and Angel Pilago* v. *Hawai'i County Planning Commission and Nansay, HI*, the Supreme Court of Hawai'i found that there was an obligation on Hawaiian Government agencies to respect the rights of the indigenous Hawaiians as affirmed in the Constitution, which include the traditional values of indigenous Hawaiians with respect to the land (Kohanaiki-Ohana, 2002-3). The case of *United States of America* v. *State of Washington*, also known as the Boldt Decision, considered treaty rights of the indigenous peoples in Washington State to fish. The Court found that the treaties did provide a right to fish, that indigenous peoples were entitled to up to 50% of the resource, and that they had a right to be involved in fisheries management (384 F. Supp. 312; 1974 U.S. Dist.).

There are still many outstanding claims before the Courts and petitions to various tribunal systems that have not yet been resolved. These cases deal not only with land claims, but also with interpretation of treaties and legislation. For some, such as the Métis, there are even disputes about whether or not they possess the right to pursue traditional activities (see for example, *R.* v. *Powley,* leave to appeal granted by Supreme Court of Canada, October 5, 2001).

2.6.3 Legislation

In addition to Court decisions, there are a number of pieces of legislation which facilitate the inclusion of traditional knowledge in the decision making process. Environmental assessment legislation is an example of an important tool that can serve to include indigenous peoples, and their knowledge in the land development. Environmental assessment legislation exists in both Canada and the United States. For example, *Act 50, Hawaiian Cultural Impact Statement*, stipulates that, "*The legislature finds that there is a need to clarify that the preparation of environmental assessments or environmental impact statements should identify and address effects on Hawaii's culture, and traditional and customary rights.".* The *Coastal Zone Management Act*, HRS 205A, of Hawai'i requires agencies to give *full consideration to cultural and historic values as well as the needs for economic development* when implementing the objectives, policies, and the Shoreline Management Area guidelines set forth in the Coastal Zone Management Act.

The Berger Inquiry in 1974-7 into the construction of an oil pipeline down the Mackenzie River Valley was a definite turning point in the inclusion of indigenous peoples in the decision making process. It also lent credence to the traditional knowledge of indigenous peoples (Sallenave, 1994). Evidence gathered from indigenous peoples during visits to numerous indigenous communities addressed issues such as caribou migration routes, bird nesting sites and the relationship of the indigenous peoples to the land and their dependence on the resources of the land to continue their way of life. The Inquiry concluded with recommendations to, among other things, delay pipeline construction until land claims were settled and to avoid disturbing the Porcupine caribou herd in any construction that might commence thereafter. Recently adopted amendments to the *Canadian Environmental Assessment Act*, stipulate that c*ommunity knowledge and aboriginal traditional knowledge may be considered in conducting an environmental assessment.*

Other legislation facilitates, or at least does not make illegal, the practice of traditional knowledge. The *American Indian Religious Freedom Act (1978)*, for example, stipulates that, "*It shall be the policy of the United States to protect and preserve [the] inherent right of the freedom to believe, express and exercise the traditional religions"* of American Indians, Alaskan Natives and Native Hawaiians. This provision allows indigenous peoples in the United States to pursue their religious beliefs, including gaining access to sacred sites, use of traditional plants for spiritual purposes and use of endangered species. The *Regulated Health Professions Act, 1991*, Statues of Ontario, 1991, c. 18 s. 35 imposes restrictions on who can practice medicine and types of practice. However it notes, *this Act does not apply to, (a) aboriginal healers providing traditional healing services to aboriginal persons or members on the aboriginal*

community or aboriginal midwives providing traditional midwifery services to aboriginal persons or members of an aboriginal community...". The *Magnuson-Stevens Fishery Conservation and Management Act* in 1996 recognized special rights of entry for the native people of American Samoa, Guam, Hawai'i and Northern Mariana Islands. Among other things , the 1996 amendments allow a stronger voice for local governments to control their fishing waters (Western Pacific Regional Fishery Management Council, 2003).

Canada has incorporated consideration for traditional knowledge, innovation and practice in a number of pieces of federal legislation. These include the *Species at Risk Act*, the *Nuclear Fuel Waste Act*, the *Canada National Marine Conservation Area Act,* and the *National Parks Act.*

The *Species at Risk Act* was developed with relatively more input from indigenous peoples than almost any other legislation in the history of Canada. An Aboriginal Working Group, consisting of representatives of the national aboriginal organizations and self-governing indigenous communities participated in an early review of the legislation and proposed amendments prior to its introduction in the House of Commons. As finally adopted, the legislation recognizes, "*the roles of the aboriginal peoples of Canada and of wildlife management boards established under land claims agreements in the conservation of wildlife in this country are essential* " and that "*the traditional knowledge of the aboriginal peoples of Canada should be considered in the assessment of which species may be at risk and in developing and implementing recovery measures".* A National Aboriginal Council on Species at Risk is created under the Act, consisting of representatives of the indigenous peoples in Canada to advise the Minister on the administration of the Act (section 8.1). An Aboriginal Subcommittee of the Committee on the Status of Endangered Wildlife in Canada, the scientific body established to determine the health of species, is also established under the Act (section 18.1). The Aboriginal Subcommittee will consist of experts in indigenous traditional knowledge. Traditional knowledge must also be considered in the development of stewardship action plans, which shall contain "*methods for sharing information about species at risk, including community and aboriginal traditional knowledge, that respect, preserve and maintain knowledge and promote their wider application with the approval of the holders of such knowledge, with other governments and persons*"(Section 10.2(c)). Indigenous people are to be included in the development of recovery strategies (section 39), action plans (section 48) and management plans (section 66). Finally, an exception to illegal possession of endangered species is made if "*it is used by an aboriginal person for ceremonial or medicinal purposes, or it is part of ceremonial dress used for ceremonial or cultural purposes by an aboriginal person"* (section 83(5)(b)).

The Nuclear Fuel Waste Act has been adopted to create a structure to examine and make a recommendation for long-term storage of waste nuclear fuel. The Advisory Council established under the Act shall reflect "*expertise in traditional aboriginal knowledge*" (section 8 (b.1)) and hold consultations with indigenous peoples potentially affected by a particular site being recommended (Section 12(7)).

Both the *Canada National Marine Conservation Areas Act* and the *Canada National Parks Act* contain provisions permitting use of the parks, including removal of flora and other natural objects from the parks by indigenous peoples for traditional spiritual and cultural purposes.

2.6.4 Protocols

A number of indigenous and non-indigenous institutions have developed protocols to address concerns about unethical research practices in indigenous communities. Examples include the Mi'kmaq Ethics Watch (Battiste, 2002); *Ethical Principles for the Conduct of Research in the North*, (Association of Canadian Universities for Northern Studies, 1998); and the *Yukon North Slope Research Guide* (Wildlife

Management Advisory Council, North Slope, 2001). A list containing other examples is available from the University of British Columbia (First Nations House of Learning, 2001).

Principles and Guidelines for Researchers
Conducting Research With and/or Among Mi'kmaq People
Principles:

- Mi'kmaw people are the guardians and interpreters of their culture and knowledge system- past, present and future.
- Mi'kmaw knowledge, culture, and arts are inextricably connected with their traditional lands, districts, and territories.
- Mi'kmaw people have the right and obligation to exercise control to protect their cultural and intellectual properties and knowledge.
- Mi'kmaw knowledge is collectively owned, discovered, used, and taught and so also must be collectively guarded by appropriate delegated or appointed collective(s) who will oversee these guidelines and process research proposals.
- Each community shall have knowledge and control over their own community knowledge and shall negotiate locally respecting levels of authority.
- Mi'kmaw knowledge may have traditional owners involving individuals, families, clans, association and society which must be determined in accordance with these peoples own customs, laws and procedures.
- Any research/study or inquiry into collective Mi'kmaw knowledge, culture, arts, or spirituality which involves partnerships in research shall be reviewed by the Mi'kmaw Ethics Watch. (Partnerships shall include any of the following: the researchers, members of a research team, research subjects, sources of information, users of completed research, clients, funders, or licence holders.)
- The Grand Council is the authorized body of the Mi'kmaw people and thus has the right to delegate authority for the Mi'kmaw Ethics Watch.
- All research, study or inquiry into Mi'kmaw knowledge, culture, traditions involving any research partners belongs to the community and must be returned to that community.
- The Mi'kmaw Ethics Watch shall conduct a fair and timely review of all research conducted among Mi'kmaw people and assess all research processes conducted among and with Mi'kmaw people.

Mi'kmaw Grand Council/ Mi'kmaq College Institute, 2000

While the success of legislative, policy and administrative efforts to recognize indigenous rights and interests and to include indigenous peoples in the decision making process is as yet uncertain, the efforts are to be applauded. Unfortunately, there has been a tendency to rely on the courts to make the difficult decisions about indigenous access to resources or inclusion in the decision making process. This is costly in time, money and human potential. Where indigenous peoples have settled land claims, they have seized the opportunity to pursue traditional knowledge and practice. The Inuit of Nunavut and the Cayuse, Umatilla and Walla Walla people of the Confederated Tribes of the Umatilla Indian Reservation are examples.

2.7 Conclusions

There are a vast number and variety of activities underway in Canada and the United States to facilitate the use and preservation of traditional knowledge, innovations and practices. This includes capacity building measures, the use of legislation and policy initiatives, research projects, land use planning and co management arrangements. Some efforts have only recently begun, such as the repatriation of human remains and cultural objects to indigenous communities. Other efforts, particularly incentive measures,

are not well developed and will require further consideration. The greatest number of activities at this time can be classified as capacity building initiatives. Efforts in other areas may be enhanced as the period of rebuilding and educating progresses.

As was discussed in the first part of this paper, the state of indigenous knowledge remains under threat. In light of this, one can draw the conclusion that the efforts outlined above – though possibly necessary to protect traditional knowledge – are as yet insufficient. The recognition of traditional knowledge in legislation, classes in traditional languages, and repatriation of human remains to the community of origin will go some way to facilitating the maintenance of traditional knowledge. But as was also noted in the first part of this report, it is the loss of opportunity to pursue the traditional practices that will result in the loss of the knowledge. Without opportunities to constantly review the traditional knowledge, innovation and practice, the indigenous way of knowing the earth will cease, except as a collection of data in reports such as this. Traditional indigenous knowledge is knowledge of a land. A pillar of the efforts to redress the decline in traditional knowledge, innovation and practice is to acknowledge the critical link between the land, the people, and the knowledge. Essential to the retention and use of traditional knowledge is the political will to address land claims, just as the feasibility of maintaining or reviving cultural practices is determined by the investment of effort by all concerned in achieving the desired end.

RECOMMENDATIONS

The following recommendations might be incorporated in a global programme of action regarding traditional knowledge, innovations and practices of indigenous and local communities relevant to the conservation and sustainable use of biodiversity.

A. The long term goal and objective of a global programme of action regarding traditional knowledge, innovations and practices of indigenous and local communities relevant to the conservation and sustainable use of biodiversity is to halt the current and continuing loss of traditional knowledge, innovations and practices of indigenous and local communities and to protect, promote and facilitate the retention and use of traditional knowledge, innovations and practices of indigenous and local communities.

B. The strategy will provide a framework to facilitate harmony between existing initiatives aimed at halting the loss of and encouraging the retention and use of traditional knowledge, innovations and practices of indigenous and local communities, identify gaps where new initiatives are required, and promote mobilization of the necessary resources.

C. Sub-objectives of the global programme of action would include the following:

a. Monitor the status and trends of traditional knowledge, innovation and practice by, among other things:

i. Agreeing upon reporting periods and pursue regular reviews of the status and trends of traditional knowledge, innovation and practice;

ii. Promoting the mobilization of resources to undertake regular reviews; and

iii. Under the auspices of the Ad Hoc Working Group on Article 8(j) and with the full and informed involvement of indigenous peoples, further developing the structure and models of inquiry of the status and trends report by, among other things,

1. Developing indicators of health of traditional knowledge, innovation and practice;
2. Undertaking field studies, with the full, active and informed involvement of indigenous peoples, to “ground truth” the status and trends of traditional knowledge, innovation and practice; and
3. Addressing current uncertainties in the reporting process including definitions, base lines and epistemologies of inquiry;

b. Address the causes of decline of traditional knowledge, innovations and practices of indigenous and local communities for the conservation and sustainable use of biodiversity, including by:

i. Identifying existing and new threats to the retention and use of traditional knowledge, innovation and practice;

ii. Undertaking research on and promote mechanisms to address the causes of decline in conjunction with, among other bodies, the Permanent Forum on Indigenous Issues of the United Nations;

iii. Encouraging State parties to pursue the fair and equitable resolution of land claims as an essential element of efforts to facilitate the retention and use of traditional knowledge, innovation and practice of indigenous and local communities;
iv. Under the auspices of the Ad Hoc Working Group on Article 8(j) and with the full and informed involvement of indigenous peoples, developing criteria for determining the success of efforts to protect, promote and facilitate the use of traditional knowledge, innovation and practice; and
v. Under the auspices of the Ad Hoc Working Group on Article 8(j) and with the full and informed involvement of indigenous peoples, researching incentives and disincentives, including access and benefit sharing and protection of intellectual property rights, to the retention and use of traditional knowledge, innovation and practice and promoting the adoption of incentive measures and mechanisms to offset the consequences of unintentional disincentives;

c. Conserve and encourage the pursuit of traditional knowledge, innovation and practice of indigenous and local communities, including through:
i. Research on and share best practices in the retention and use of traditional of traditional knowledge, innovation and practice in communities;
ii. The promotion of mechanisms which conserve and encourage the retention and use of traditional knowledge, innovation and practice and promote the mobilization of resources to support such mechanisms; and
iii. Under the auspices of the Convention on Biological Diversity and with the involvement of the Permanent Forum on Indigenous Issues among other UN agencies and supportive organizations, developing a clearing house mechanism to catalogue and share best efforts to protect, promote and facilitate the use of traditional knowledge, innovation and practice.

Peigi Wilson, June 25, 2003

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