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The Ecology of Knowing the Land

We come full circle. The book itself is a trail or a journey, an exploration of knowing the land, of living with and on the land. For Dene and others such as the Gitksan, the Land encompasses much more than a mere extent of the earth's surface, or any area of soil. As Legat and her co-authors (2001) remind us, the concept of land held by Dene differs considerably from the concept of land or terrain that is the underpinning of contemporary mainstream European and North American society, and forms the basis of our legal concepts of land tenure. For the Gitksan and for other groups of Canada's Northwest Coast, the land too is much more than real estate or a source of resources; it is the locus of history and of identity, the centre of a web of relationship that encompasses all beings in a moral framework, and provides both living and home. This very different worldview is eloquently communicated by indigenous authors such as Umeek, A. Richard Atleo (2004), and non-indigenous authors who have worked long and closely with indigenous teachers and communities (e.g. Turner 2005). The challenge of trying to communicate across epistemologies, in shifting contexts, and in fields of power relationships is immense (cf. Nadasdy 2003).

The problem is how to bring *space* into communication with *place*. In contrast to the patchwork quilt of polygon based mapping, the virtual bird's-eye view alluded to by Ingold in his discussion of mapping and mapmaking (Ingold 2000, Chapter 13), many local people experience the Land as a series of trails, which can be extended metaphorically to the trail through life, or to walking the trail as the proper way of living and relating to the Earth. The metaphor of *walking* as a skilled way of being in the world, of moving through the world, encapsulates the embodied, experiential way of knowing and doing. Walking, Tilley (1994:29) writes, is “. . . simultaneously an art of consciousness, habit and practice, that is both constrained by place and landscape and constitutive of them. Walking is the medium and outcome of a spatial practice, a mode of existence in the world.” Robert Wishart also takes up the theme of walking (Wishart n.d.). Wishart tells us that to walk well, for a Gwich'in man, means a man is competent to move in the frequently difficult and challenging world of his low-Arctic homeland, understands place and moment, and knows how to best make his way across the landscape, is able to hunt and to return with meat to family and others who need it. Landscape is a medium, imbued with meaning, a partner in the business of living, and skilled walking is a way of competently moving through it.

Living on the land implies identity, and wellness. Naomi Adelson (2000) explicitly draws the connection between skilled movement on the land and wellness, for the Cree of the James Bay region. Dene Elders also often see the Land, being on the land in appropriate relationship and with skill, as the path to health and well-being.

In aboriginal Australia, the Dreaming Tracks, which record in the frozen substance of the Land itself the activities, transformations and metamorphoses of the ancestors, are reminiscent of the understandings of the land held by indigenous peoples of North America, though the system of trackways and power charged sacred places seems more comprehensive and deeply developed in Australia than among Canadian First Nation peoples, and more directly linked to specific social groupings than among the Dene. When I read of Australian understandings of land (Strang 1997; Rose 2000; Ingold 1996a:137-139), I am particularly reminded of the travels of Yamoria or Yamózah in the Mackenzie region, and the landforms that bear testament to his activities and adventures (Andrews et al. 1998; Andrews 1990). Considering what I have read of Australia, I also think of those places of power and danger in the Canadian North, rapids where giant animals are said to dwell, and which require special care to cross (cf. Sharp 1987); the stories

told by my Kaska Elder teacher Mida Donnessey, where she alludes to the places where giant animals were overcome; or the sentient landscape revealed by Julie Cruikshank (2005) as she explores indigenous understanding of the surging glaciers of the Kluane-Saint Elias-Glacier Bay region of the Alaska-Yukon border.

In indigenous concepts landscape has agency. This perspective implies a relationship between humans and other entities of the land, and the Land itself, different than that prevalent in European cultures. Indigenous North Americans stress the necessity for respect in relations with other entities on the land (e.g. Bastien 2004). People are enjoined to follow the “Dene way” (*Dene k'eh*, in Kaska) or warned of the consequences of failure to respect, in powerful narratives. Lessons are instantiated in the form of the land itself, visible and memorable for those who have been taught the stories. Shiltee Rock standing above the Peel River remains forever a warning about the consequences of failing to follow the appropriate rules of respect, and continues to be a place of power (L.M. Johnson field notes 1999, 2000; Gwich'in Social and Cultural Institute, Place Name Map, Peel River, No. 2). Stekyooden, looming above Hagwilget and the Hazeltons, remains a visible reminder of when the mountain goats took revenge on careless ancestors for overhunting and disrespect (Harris 1974). The red rocks in Moricetown Canyon are a reminder of the grisly consequences of infidelity, and the repercussions that such acts have in the balance of power and ability to successfully hunt (Madeline Alfred Dzee, L.M. Johnson interview notes 1988).

Landscape ethnoecology

One aspect of knowledge of the land I have focused on in this work is the place kinds that people recognize in their local landscapes. At this detailed level of knowledge of the land, one can gain insights into the subtleties of people's understandings, which illuminate aspects of relationship to the land and what is needful to be able to travel safely on and live from it. All of the groups of people I have worked with recognize many kinds of landscape features, and features of waterways, in their homelands. The lists of English glosses of feature types recognized show many similarities among the groups I have worked with, though reasonably comprehensive landscape and water feature lexicons have only been recorded for Gitksan, Witsuwit'en and Kaska. The range of terms include physiographic features (mountain, pass, slope, slide area, etc.), water features (spring, creek, river, lake and parts thereof), complex features such as “swamp” which are both hydrographic and vegetation

types, vegetation, snow and ice terms, substrates, features defined on the basis of animal behaviour, features related to human use (camp, trail, grave), and sacred or powerful sites. This last, owing to its sensitive nature, has neither been explored nor presented in detail, though the sacred and powerful aspect of the land must always be borne in mind. The list is rather heterogeneous, as colleagues such as Eugene Hunn (pers. comm.) have pointed out. Hunn prefers to separate out ecotopes of evident biophysical character from those less determinate in terms of physical features, and consider the latter to be “special purpose” categories (cf. Hunn and Meilleur 2009). I argue that, though the list is indeed heterogeneous, it is artificial and obscures important connections to decide a priori which kinds of features are “really” landscape features with ecological content, and set the others aside.

For all groups I have worked with, recognition of vegetation variants is frequently descriptive or offered in terms of a few dominant types, though people have good ideas of where to find particular plants of interest and when to pick or harvest those wanted for foods, medicines, or materials. The correlation of plant occurrence with various aspects of habitat can be described, as when Elders were asked to list plants occurring on shorelines, *tamā*, or in the alpine zone *héskage*, at a Kaska language meeting (Johnson 2007, this work). In contrast to the exposition of plant occurrence in correlation with distinct habitat types characterized by physiography and substrate or soil types, as obtained by Legat and her co-authors, I did not gain much explicit connection of plants and soils in the work that I did. Perhaps if I had framed my work in a different way, such connections would have emerged. The methodology and purposes of Legat and her co-authors was quite different from that which I employed, and focused on careful description of a set of named places chosen by Elders of the various Tłı̄ch̄o communities, with the intention of establishing environmental baseline conditions and presence of biotic resources in the face of probable future resource development.

It is also instructive to consider the kinds of features and processes recognized by a group of people in a given area and to consider their similarity or difference from the geographic ontology of other groups of people. Understanding the patterns of seasonal change of environments, seasonal use of habitats and places by animals, successional change after disturbance, and phenological cycles of plants and fruiting are all dynamic aspects of people’s pragmatic landscape knowledge. Davidson-Hunt and Berkes (2003, 2009) give some particularly cogent examples of the understanding of burn cycles and fruiting cycles in their work with the Shoal Lake Anishinaabe.

Gitksan and Witsuwit'en understanding of burn cycles, and how to manage land through burning in connection with berries, was discussed at length in Chapter 5. Deep knowledge of the movements of animals through the seasons, and in what kinds of places they may be encountered is a salient aspect of Kaska, Sahtú'otine and Gwich'in knowledge of the land.

The sense of the dynamic and shifting landscape, with trails or paths of connection focusing at spatio-temporal nodes, is also extremely important in the understanding of the northern landscape. As with contemporary landscape ecology, landscape ethnoecology deals with dynamic landscapes, fluxes and connections, as well as more static patterning of categories in local classifications. As Roy Ellen (2009), and Tim Ingold (1996b), in their different ways have asserted, knowledge may not be lexicalized or cognized, but may instead be embodied and demonstrated as needed, in context. Reading Ingold's work, I reflected that Dene knowledge of land involves training in observation, replication, and creative problem solving informed by rich layered traditions that require active engagement to tease out their relevance to the situation at hand, a characterization that also reflects the understanding of the storied landscape communicated by Dinim Gyet and other Gitksan and Witsuwit'en elders and knowledge holders.

The view from elsewhere

There are commonalities among the understandings of landscape in different regions of the world, despite large differences in the biophysical environment itself, and there are, as it were, local flavourings. As I read studies of others' landscape knowledge, I found myself considering the kinds of entities named, the relations attended to, and the integration of the sacred or spiritually powerful, with other aspects of the lived world. In many societies beyond those of northwestern Canada, the Path as organizing principle is apparent.

Strong similarities between the landscape perceptions of indigenous peoples of Siberia and those of the northern regions of Canada are evident, though the inscription of the Soviet period on Siberian lands and societies has given a different trajectory to landscape relations of the past century. Most Siberian peoples are traditionally herders (of reindeer—domesticated deer of the same species as caribou—or cattle) rather than strict hunters, but the taiga landscape of their homeland and the north Canadian environment are similar. Vitebsky (2005) writes about the paths taken by Eveny herders and their reindeer, and the spirits of place. Despite the strong changes induced by Soviet state policies, successful herders retained a perspective

of the sacral landscape, of path and season. Gravesites on the land remain sacred places. Relations of respect with animals sound similar to Koyukon in Alaska or Dane-zaa in Canada, except a supreme lord of animals called Bayanay directs the animals and decides whether they will offer themselves. He is at once the owner of the animals, and is incarnate in all the animals. This is a somewhat more personified relationship than apparent in most Dene or Gitksan discussion of relations with animals. Vajda (2007) writes of Ket landscape perception in the upper Yenisei River. Rare among Siberian indigenous peoples, Ket were traditionally hunters and gatherers until Soviet collectivization during the 1930s forced change. Their landscape perceptions were organized along the Yenisei River north-south axis, with upriver south:

. . . a source of positive energy, goodwill, and economic benefits as was the sky itself. The downriver north was a realm of cold, ill will, and death that merged with conceptions of the underworld. The east, the point of the rising sun, was likewise a source of life, whereas the west, where the sun disappeared was associated with extinguishment of life. (unnumbered pre-print)

As with other northern peoples, strong seasonal contrasts existed in terms of which portions of the landscape were used, with summer activities focused by the riverbank, and winter hunting activities in the forest. Vajda (2008) reports that the Ket conceived of time as a repeating cycle of birth and rebirth. Their cosmography was relatively elaborate, with seven layers of the sacred sky, and seven levels of the underworld (which was the abode of the dead), and the ordinary land in between. The Ket recognized a region of stony land (*tynbang*) and a region of watery land (*ulbang*) within their homeland. Trees were symbolically important to Ket, and “cedar” (*Pinus sibirica*) was considered sacred. The similarity of Ket and Athapaskan conceptions of landscape may be indicative of ancient relationship as well as similarity in environment and way of life; recently Vajda and other linguists have provided evidence of deep genetic relationship between Yeniseic and Na-Dene languages (Vajda 2008).

King (2002, 2006) has written about the relationship to sacred and storied land in Kamchatka, emphasizing the integrated view of people and land held by native Kamchatkans. He coins the term “culturescape” to encapsulate his sense that the people, their social relations and cultural understandings, and the landscape are not analytically separable. His exposition attends

particularly to symbolic systems and meanings, and includes instances of rocks as power places and sites of transformation, and to the layered cosmography with an upper world, the quotidian world of ordinary human life, and an underworld. This perspective of land, as for other indigenous Siberian peoples, has vertical dimensions, similar to the medieval European landscape Tuan (1974) described, where the layered world is more significant than vast horizontal expanses.

Collignon's (2006) exposition of Inuinnait geographic knowledge is discussed extensively in Chapter 10. Here too was a traditional seasonal opposition between where people wintered and where they summered, which for the Inuinnait was the time of the ice and the time of the land, respectively. Collignon evokes the succession of named places associated with stories, which lie along the traditional routes of travel between camps and hunting areas.

Stephen Feld (1996), describing a very different environment emphasizes Bosavi perception of landscape through sequences of acoustic landmarks in the highlands of New Guinea, and Joseph Bastien's (1978) eloquent analysis of the significance of *ayllu* as a social, spiritual and ecological organizing principle in the Bolivian Andes near the border with Peru provides a strong example of the explicit integration of the sacred into local ecological understanding in a South American agrarian context.

While these studies discuss habitation, broad environmental orientation, and aspects of hunting and fishing ecology, narratives, cosmography, and the integration of the sacred, there is relatively less discussion of the ecotopic level, and the kinds of place recognized in local geography, especially plants and habitats. This is partly because of the interests and skills of those who have recorded the traditional geographic knowledge and partly because of the obvious and overwhelming importance of animals and knowledge about animals in the north.

Ethnographer Peter Dwyer wrote a piece that compared and contrasted the landscape perceptions of two nearby groups in Highland New Guinea, which had different degrees of agricultural intensification, population densities, and degrees of contact with the larger world. The description of the Kubo world presented by Dwyer (1996) and the importance of the network of trails, different resource sites, and locations that indicate human activity pervasive on the landscape, is strongly reminiscent of Dene and Gitksan perspectives of the land. He writes, "The invisible world permeates the land. Fabulous beings are associated with specific environmental zones or even particular places . . ." (Dwyer 1996:168). He continues:

The visible and invisible worlds are co-extensive. In each, the significance of particular places is pre-eminent but always transient. Through time, places of current significance drift across the land. The two worlds converge in a mutual dynamic that facilitates their intercommunication. (Dwyer 1996:169)

Alice Legat and her co authors (2001) write about the relationships of place names and landscape knowledge for the Dogrib (Tłı̄chǫ) of the Northwest Territories, showing the linkages between ethnoecological and cultural knowledge of different types, in ways that resonate with the understandings I have gained over the years of working with different Canadian First Nations:

. . . patterns associated with Tłı̄chǫ placenames suggest that names that contain topographic and water flow terms have the primary purpose of describing safe understandable travel routes, whereas the primary purpose of the placenames containing biological terms seem to indicate locations with various resources or biodiversity. Placenames stimulate oral narratives that contain knowledge of socio-political relationships, social behaviour, resources, ancestral use, graves and obstacles while traveling and camping in the area. Often a placename will be mentioned to stimulate the listener's memory, hoping to encourage them to think and act in a certain way.

Keith Basso (1996) has described the use of place names for the same purposes among the White Mountain Apache, Athapaskan speakers who live in the mountains of the desert Southwest of the United States.

Various authors such as Beatrice Collignon (2006) have commented on trails linking named places, which in turn may be both point and surrounding region. I also discuss this in Chapter 3 in considering the Gitksan storied landscape. People can and do generalize about places and extrapolate knowledge from known places to similar new exemplars. However, most people carry an inventory of named sites that serve for wayfinding, locating resources, and to integrate information about place from and within narratives. Cruikshank (1990b, 1998, 2005) and others (e.g. Hunn 1996; Fowler 2009; Rosaldo 1980; Johnson 2000) have commented on how history is written spatially, as it were, on the land, rather than as a dislocated chronological listing, for many small-scale, land-based societies, especially those without a written literate tradition or formal calendrical reckoning.

The comments made by Legat and her co-authors (2001) about the kinds of places named resonate with my own understanding of kinds of place on the landscape. Place names and kinds of places that are significant reflect the requirements of travelling people. They show a concern with features needful to know in order to travel safely and effectively, knowledge about the locations, or potential locations, of resources (useful plants, animals, etc.), a geography of power and the sacral, and place knit together by story.

The nature of nature

Understanding the nature of nature is an implicit background to the differences in perception and understanding of the landscape between many indigenous peoples, cosmopolitan science, and many strands of contemporary Western culture. In a holistic view, nature and the human inhabitants of the land form a seamless, interrelated whole, while the analytical perspectives which predominate Western thought and science have tended to separate the human and the natural, seeing them in opposition and often, as with the writing of the Romantics in the nineteenth century, holding up Nature as a mirror to reflect the purity and virtue missing in polluted and soul-less human society (e.g. Thoreau 1854/1849; Muir 1912, 1915; Cronon 1996). Previously, the imposition of human order upon the unseemly messiness of raw nature was seen as a virtue, for example as in the discussion of the ecological transformation of New England by eighteenth century commentators in Cronon (1983:5-6).

Many authors (e.g. Ingold 2000; Johnson 2000; Turner 2005, other references; Nadasdy 2003; Davidson-Hunt and Berkes 2003; Cruikshank 1998, 2005; Dwyer 1996; Strang 1997; Rose 2000, 2005; Roberts and Wills 1998; Fienup-Riordan 1990, 1999), including indigenous commentators (Atleo [Umeek] 2004; Kawagley 1995; Colorado 1988; Merculieff 2002; Burda et al. 1999), have commented upon holistic indigenous conceptions of humans-in-nature that are prevalent in many small-scale local and indigenous communities. Others such as Kay Milton (2002) have considered perspectives on nature of contemporary environmentalists in Euro-North American contexts.

Arturo Escobar (1999, 2001) looks at the interrelationships of nature and culture from the perspective of political ecology, regarding conceptions of both—as opposed to the underlying “biophysical reality,” which he characterizes as prediscursive and presocial—from a constructivist perspective. Escobar considers conceptions of nature, and of culture, to reflect political power and hegemony, resistance and hybridity. Escobar comments:

. . . we might be witnessing—in the wake of unprecedented intervention into nature at the molecular level—the final decline of the modern ideology of naturalism, that is, the belief in the existence of pristine Nature outside of history and human context . . . We are talking here about nature as an essential principle and foundational category, a ground for both being and society, nature as an “independent domain of intrinsic value, truth, or authenticity” . . . (Escobar 1999:1)

Lessons for the present and future

During this time of great change in the relations of peoples with homelands and other lands, of increasing population and broad human impact on the planet, its climate, and its chemical contamination, as rapid globalization casts planet-wide webs of connection while severing and dislocating local ones, how shall we learn from the storied landscape? How can we express and share the insights of the traveller’s path in the contemporary world, and perpetuate knowledge among cultural, social and linguistic communities whose demography and ecology may be shifting rapidly? Nature and culture, for many, slip into imaginaries, and as Escobar points out (1999, 2001), conceptions of nature and culture are tools of domination, resistance, or identity construction, which are communicated and experienced in mediated forms, often through mass media. The World Wide Web allows communication of localities to an undefined world-at-large, and of imagined and imaged culture to Self, within the community to local people, their children, and others. What exists on the ground can be transformed at the stroke of a metaphoric pen, by states and transnational industries, lending an unreality to what was previously a solid, factual, empirical world and world view (cf. Tsing 2005). Or transformation in the relations of people and land can come through war and civil unrest, or civil or inter-ethnic strife.

GIS and electronic representations of land and landscape—media? mediation? transformation? useful tools?

Contemporary technologies such as GIS, remote sensing, and GPS units collaborate in transformations of understandings and of land. As various authors have pointed out, GIS is both method and medium. As such, it has been widely used by indigenous groups and those working with them, to

represent indigenous knowledge(s) in a number of contexts, often disseminated or accessed via websites. The hypertext and linkage patterns of websites, together with their multimedia capabilities, allow presentation of traditional information about land in a relatively rich, if virtual, manner. Storytelling and trail can both be accommodated, although the bandwidth of such virtual experience, and the ability to contextualize tellings and experiences according to season, place, and social relations, is far less than “real” experience.

A website that works hard to reproduce a traditional experience of land and its meanings is the Iḍaà Trail website, produced by the Prince of Wales Northern Heritage Centre. The organization of Iḍaà trail website is explicitly a “virtual” trail or traveller’s path; while Web access allows entry at any point, the *body* is not experiencing the land, nor is the listener actually present as the audience of the recorded story, which cannot shift in the way live telling does depending on context and listener, as Cruikshank describes in *The Social Work of Stories* (1998). However, in an electronic fashion, the essential features of the storied landscape, travelled by a trail that links places is preserved, and enables a range of people to experience this through multimedia. Given an enriched context, as, for example, in a northern classroom, such websites can contribute significantly to the transmission of traditional understandings to the young, and also give a sense of the northern sense of land to non-local audiences worldwide.

GIS representations familiar to most of us as non-specialists are computer-generated maps which draw on centuries of mapping conventions developed in Europe. GIS theorist Donna Peuquet writes:

Since maps are human-derived representations of geographic space, it can be inferred that this image vs. structure duality also holds for how humans perceive geographic space, corresponding to the world as seen (image) and the world as understood (structure) . . . The fundamental difficulty with attempting to develop an overall or uniform representation for geographic space is that there can never be a single representation of or view of the world that incorporates every possible viewpoint. (Peuquet 1988: 378)

This last I would urge people to keep in mind as local understandings, indigenous or other, are all reconfigured to be “processed” and “output” in GISs, digested and homogenized to make apprehension of geographic information easier and more effective.

As geographic information systems and GPS units become ubiquitous, at least among elites in more technological countries, and among scientists and resource managers, there are implications for how we understand landscape and how we deal with it (e.g. Aporta 2009; Aporta and Higgs 2005). We leave further behind the embodied travel across land, the skills necessary for wayfinding, the particularity of place, and the ability to deal with shifting or ambiguous positions and fuzzy boundaries. If you can't geo-reference it, does it exist? GPS and remote sensing change ability to deal with spatial information. They are enormously powerful tools, but are not designed to deal with ambiguity. They are inherently reductionist. GIS cannot include information about place in database without precise georeferenced positions. As with other types of quantitative data analysis, imprecise data cannot be entered, however significant. Daily lived experience is often difficult to quantify precisely. As of this writing, the ability to express shifting or unbounded areas lies at theoretical cutting edge of GIS (Goodchild et al. 2007; Peuquet 1988), and as yet far from routine practice. But we risk missing the proverbial "elephant in the room" if we cannot deal with ambiguous or poorly bounded information and relationships and so simply leave them out. We may miss essential aspects of indigenous landscape ethnoecology and local experience altogether. As with the difficulty of dealing with the value of beauty or nature in economic terms, it is not yet possible to georeference a sense of place, though the insights garnered with GISs have been very powerful and, some have argued, empowering for indigenous peoples and other less advantaged groups such as inner city residents (Elwood 2006).

Roy Wagner (1977), in a comparison of scientific and Papuan conceptions of the innate, commented that, analogous to the quantum dilemma of position and motion, if you focus on relationship, then the identity of the objects is not significant and is not the focus, while if you focus on objects then the relationships recede. Wagner sees Western science as focusing on the objects (a particularly strong aspect of geographic information science), and Papuan worldviews as focusing on relationship. Relationship is not something that GIS does well. As Peuquet (1988) commented, with raster¹ data, attributes are attached to located cells and spatial patterning or relationships are only implicit.

Difficulties with GISs as representations of indigenous knowledge of the land arise on several levels. One I dwell on at length is the removal of knowledge from the realm of direct experience and of storied social context. Another issue is the reductionist and abstracting nature of quantitative

analysis itself, necessary before one can construct databases and carry out analyses informed by them. However, the fact remains the GISs are powerful tools, and can help to reduce unmanageably complex relationships to something that one may be able to apprehend. As Weinstein points out in his 1992 report to the Ross River Dena Council (a Kaska community) on ecological and social impacts of mine development, without GISs and some forms of abstraction and generalization in analysis, spatial data are far too complex and multifaceted to allow full use to be made of graphic results of qualitative research such as map biographies, the sine qua non of land-use and occupancy studies. These are familiar issues in the complementary and contradictory natures of qualitative and quantitative research within western research paradigms.

Where methodologies of landscape research and practice are adequately collaborative, creative syntheses that serve local communities can result. One of the underpinnings of successful collaborative syntheses is genuine power sharing, and such efforts, occurring as they inevitably do in dialogue between systems of thought, involve translation and careful explication. In January 2008 I was fascinated to hear a presentation by Gabrielle Mackenzie-Scott, then Chair of the Mackenzie Valley Environmental Impact Review Board at the Northern Truths forum at the University of Alberta. Mackenzie-Scott is a Tłı̄chq woman, and her eloquent exposition of the role that indigenous members of the environmental review board played in interpreting the significance of traditional knowledge to more scientific and industry oriented colleagues suggested ways that holistic perspectives and local spiritual perspectives on land can be integrated in important real-world decisions (Struzik 2008).² Aporta's work on community use of the mapping potential of a simple GPS program in Igloolik, Nunavut also suggests ways that new technologies can serve to continue indigenous knowledge of land (Aporta 2003). The collaborative Whitefeather Forest initiative is a multifaceted and multi-partner initiative to document a boreal forest cultural landscape in northern Ontario. This initiative pioneers cross-cultural methodologies to further the aims of the Pikangikum First Nation in stewardship of their homeland (Davidson-Hunt pers. comm., n.d.; <http://www.whitefeatherforest.com/>).

For the communities with whom I have worked, it is difficult to present a clear picture of innovative and creative approaches to documenting and managing the land and its resources. The landscape, so to speak, of successful approaches to landscape management is complex and can change quite quickly. There have been interesting Gitksan initiatives, such as the Strategic

Watershed Analysis program (Burda et al. 1999; Darlene Vegh, pers. comm.) and the Lax̓ Skiik plans for the Fiddler Creek territory (Art Loring, pers. comm.), but it is a bit more challenging to say what is happening in 2009. The Gitksan GIS department is largely associated with the Gitksan Watershed Authority, which primarily focuses on fisheries-related issues. It has been engaged in innovative training and in representations of traditional territory, continuing a counter-mapping effort which was developed in the Delgamuukw land claims case; however, these efforts do not appear to have much influence on forestry development planning on the territories (A.S. Gottesfeld, pers. comm.). The Kaska efforts around land use are similarly complex, and have been marked by political success in terms of joint agreements and impact benefit agreements; how this articulates with other qualitative efforts to document and preserve knowledge is difficult to assess. The Gwich'in Renewable Resource Board has institutionalized co-management based largely on western paradigms of data collection and analysis, though considerable community direction, consultation and participation in the research is also standard in their procedures. How their efforts coordinate with the innovative talking maps (<http://www.gwichin.ca/Research/place-NameMap.html>) and other traditional knowledge initiatives of the Gwich'in Social and Cultural Institute is not clear.

Further reflections

Peuquet (1988:378-379) writes that “a geomorphologist’s view of a mountain would be different from a climatologist’s or a botanist’s. Yet all would recognize the same entity as a mountain.” I would add, keeping Mark and Turk (2003) in mind, at least within a Western cultural and linguistic context. She further comments, “A mountain may look very different in summer from how it does in winter but would still be recognized as a mountain. Some necessary invariant qualities must therefore identify these objects . . .” (Peuquet 1988:379). Again, Mark and Turk (2003) and Mark and his co-authors (2009) might comment on the difficulties of establishing the boundaries of the mountain-as-object, and here also seasonality enters in: depending on the type of feature, and what qualities one needs to keep in mind, the mountain may still be a mountain, but its meaning in late summer, mid winter, or spring may be significantly different. When Witsuwit'en or Gitksan Elders speak of travelling in the mountains in the springtime, it is a time of great danger of being swept away by avalanches of heavy snow from far above, a risk Dinim Gyet spoke of when he discussed the Gitksan term for “slide,”

describing the faces in the trees which must be exposed by snow melt before a passage of the trail could be attempted (Chapter 3). When Kaska Elders speak of mountains in late summer, it is with anticipation of ascending to the alpine zone to look for caribou in the fall hunt.

Geographer Yi-Fu Tuan wrote about this about “mountain” and “valley” in his classic monograph *Topophilia*, reminding us that topographic terms have connotations, entailments, and connections with the moral:

As scientific terms, “mountain” and “valley” are types in a topographical category. In metaphorical thought, these words carry simultaneously the value-laden meanings of “high” and “low,” which in turn implicate the idea of male-female polarity and antithetical temperamental characteristics. (Tuan 1974:141)

A mountain in the distance has different meanings than a mountain up close. As Mark et al. (2009) write, “a mountain *qua* mountain is *away* from us, in the visual landscape, and when we stand on it, our proximate environment is filled not with ‘mountain,’ but with rocks, trees, snow etc.” (emphasis added). Their conception of “ethnophysiography” is more concerned with the distance than the proximity. A mountain in the distance can have myriad meanings: as a symbol, a method of wayfinding, the abode of deities, scenery, an emblem of wilderness, and so on. A mountain up close, when you are, as Gitksan and Dene languages alike phrase it, “on mountain,” is a different matter. Then one may well be concerned with places and place kinds of smaller scale, such as trails, berry patches, lookouts, passes, avalanche tracks, alpine meadows, cliffs, scree slopes, or snowfields. These too are ecotopes, may be named, have meanings, may be sacred or ordinary, integrated in daily life, of seasonal significance, or are perhaps to be avoided. Eugene Hunn’s *Nch’i-Wána, “the Big River,” Mid-Columbia Indians and Their Land* (Hunn with Selam and family 1990) comments that Sahaptin often name these smaller, more local features rather than focusing on mountains-at-a-distance.

This book has been an exploration of landscape ethnoecology based on fieldwork in northwestern Canada. My approach integrates detailed delineation of local knowledge of place kinds, or ecotopes, with the overarching domain of meaning and combines ethnoscience, visual, and narrative traditions. I have reflected extensively on relations of local landscape knowledges to science, geographic information systems, resource management and

government policy. Relationships between land and culture are mutually constitutive. Identity and polity are rooted in the ways people understand and act upon land. The environmental relationships and economies created through this understanding may be sustainable or ephemeral. Understandings of land also underlie the complicated dance of development of natural resources, and even the concept of “resource” as it is negotiated between local populations and larger socio-political and economic forces, states, and the global market. In this time, both environment and economies are undergoing rapid change, and sustainability of either is an open question. Resilience of the land and of human societies will be key in shaping the future.