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Landscape Ethnoecology

NEXUS OF PEOPLE, LAND, AND LIFEWAYS

Patterning in landscape is complex. Understanding its nature, including anthropogenic patterning, and considering the implications of pattern for landscape and ecological process, is of both practical and theoretical importance. At another level of remove is the study and understanding of human cultural perception and understanding of landscape patterns, and the entailments and meanings imputed to these understandings of the land.

The comparative understanding of landscape terms, variously termed ethnophysiography (Mark and Turk 2003), ethnobiogeography (Hunn and Meillear 1998), and landscape ethnoecology (Johnson 2000; Johnson and Hunn 2009), is an emerging area of research which articulates with other aspects of the study of traditional ecological knowledge, ethnoecology, the anthropology of landscape, and the study of space and place. I first briefly review the literature on anthropology of landscape, space and place, ethnoecology, and landscape in order to set the conceptual grounding for what follows.

Anthropology of landscape, space and place, and cultural landscape

Classic works in the anthropology of landscape in the broad sense have included the seminal works of Hirsch and O'Hanlon, and their contribu-

tors (1995) in the *Anthropology of Landscape*, and the papers in the volume *Senses of Place* edited by Feld and Basso (1996). These two volumes explore “landscape” as setting, image, soundscape, and object of local understanding in a range of cultural contexts, exploring place and meaning. Edward Casey’s (1996) thought-provoking discussion of “space” and “place” from a philosophical perspective helped to set the parameters of the discussion of place in anthropological and philosophical thinking. The literature on “space and place” explores the differences between lived-in experiential “place,” and a more objective sense of “space,” teasing apart abstract space and the locales of people’s lives. Although much of this literature deals with built environments, significant discussions of the experience of landscape and place embedded within larger regions is also present, and is pertinent to my explorations of meanings of “landscape.” The review article of Lawrence and Low (1990) was an early exposition of issues of place and space in anthropological research, and their 2003 edited volume (Low and Lawrence-Zúñiga 2003) presents a synopsis of more recent writing in the field. Particularly relevant to conceptions of landscape are Rodman’s piece on multilocality and multivocality, and Munn’s chapter on excluded spaces in Australia. Rodman (2003:206) usefully differentiates two senses of “place” in anthropological thought:

- 1) Place is “an anthropological construct for ‘setting’ or the localization of concepts.”
- 2) Place is “socially constructed spatialized experience.”

Rodman (2003:206-207) articulates the tension between objective space and experiential place, quoting Entrikin (1991:203):

This divide between the existential and naturalistic conceptions of place appears to be an unbridgeable one, and one that is only made wider in adopting a decentered [objective] view. The closest we can come to addressing both sides of this divide is from a point in between, a point that leads us into the vast realm of *narrative forms*. From this position we gain a view from both sides of the divide. We gain a sense both of being “in a place” and “at a *location*,” of being in the center and being at a point on a centerless world. (emphasis added)

Rodman continues,

But places come into being through praxis, not just through narrative. One should also be wary of the assumption that the geographers' and inhabitants' discourses will be consistent and that all inhabitants (and all geographers) will share similar views. (Rodman 2003:207)

Munn's powerful piece introduces a number of significant concepts in anthropological approaches to space, place and landscape, including linkage to the morality and cosmology instantiated in the Land or country, and the conception of "relative spacetime," which has evident links to Ingold's (2000) concept of journeying. She differentiates *location* into *locale*, a place where things happen, and *locatedness*, which "refers primarily to mobile action rather than things" (Munn 2003:93). Munn describes "a moving spatial field" of the actor in contrast to fixed spatial localities or determined regions. The linkage to cosmology, morality and social order is especially evident as she describes linkage of the Law to the Land:

I have noted that Aboriginal law is said to be in the ground, especially the rocks. "You see that hill over there? Blackfellow Law like that hill. It never changes . . . [It] is in the ground," said a Yarralin man to Deborah Rose. The "Law" is the hill, or is in the hill. The Law's *visible signs* are topographic "markings"—rocks, rock crevices and stains, soaks, trees, creek beds, clay pans, and so forth—remnants of the multiple, so-called totemic ancestors who made the land into distinguishable shapes. (Munn 2003:95; emphasis added)

More symbolic and archaeologically informed anthropological approaches to landscape are embodied in a trio of important works: Bender's edited volume *Landscape, Politics and Perspectives* (1993), Tilley's *Phenomenology of Landscape* (1994), and Ashmore and Knapp's *Archaeologies of Landscape* (1999). As one might anticipate, meaning of landscape, spatial arrangement of human settlements, paths and monuments, and a concern with built environments characterize these rich volumes.

Deriving from archaeological and heritage perspectives, the term *cultural landscape* is used by a range of authors in various ways, in their expositions of relationships between people and landscape. Most relevant to this work are Davidson-Hunt and Berkes (2003), Andrews and Zoe (1997) and Strang

(1997). “Cultural landscape” in their sense comprises the larger framework of meaning of *land*, including cosmology, history, the sacred, and the customary activities and places of activities of the people on the land, and is somewhat distinct from how the term cultural landscape is used in heritage conservation frameworks.

Ethnoecology and ethnoecologies

I characterize my approach to landscape and human relationships to land as “ethnoecological.” What distinguishes ethnoecology from environmental or ecological anthropology? In my estimation, work is *ethnoecological* only insofar as it deals with local conceptions of environmental relationships, and local practices for managing, moving within or using elements of the local landscape. As with other ethnoscientific areas of inquiry, there is a productive tension between local and cosmopolitan scientific conceptions. Mexican biologist Victor Toledo (2002:513) quotes a range of authors’ definitions of ethnoecology, beginning with A. Johnson in 1947, who characterized ethnoecology as “a distinctive approach to human ecology which draws its goals and methods from ethnoscience.” Eugene Hunn in 1982 (p. 830) described ethnoecology as a “new field integrating ethnoscientific and ecological theory,” and the late Darrell Posey wrote in 1986 that ethnoecology involved “indigenous perceptions of natural divisions in the biological world and plant-animal-human relationship within each division.”

In order to distinguish my approach from the general ethnoecology, political ecology, and “space and place” literature, I have described my approach as landscape ethnoecology. Through landscape ethnoecology I highlight perception and understanding of the landscape, biota, and landforms, rather than focusing on specific resources or processes. I do not focus on landscape in the global system, in which significant political ramifications of power differentials are implicated in how the interactions of different peoples and systems of understanding and land use play out in particular contexts and in the present global arena, though this is of obvious importance.

Ethnoecology has meant many things in contemporary anthropology and related work, and typically encompasses a broader range of relationships between land and social and cultural institutions than is my intent to investigate in this work. Much of the literature is quite eclectic, and often process-oriented. Virginia Nazarea’s 1999 volume *Ethnoecology: Situated Knowledge, Located Lives* is explicitly heterogeneous, and aims to capture some of the messy diversity of approaches and applications, focusing on *mezzo* scale

theory as opposed to unifying or grand theory. Much of the literature on ethnoecology deals with topics such as agroecosystems, and issues of the commons and property regimes.

Seminal works by Victor Toledo (1992, 2002), Virginia Nazarea (1999), and Luisa Maffi (2001) lay out different conceptions of and theoretical perspectives on ethnoecology. In *On Biocultural Diversity, Linking Language, Knowledge and the Environment*, Gary Nabhan (2001:149) quotes an early definition of ethnoecology by ethnobotanists Bye and Zigmond published in 1976 that characterizes ethnoecology as “The area of study that attempts to illuminate in an *ecologically* revealing fashion man’s [sic] interactions and relationships to his [sic] environment” (emphasis original). This minimal definition is rather circular, and does not get us into conceptual aspects of local understanding of environmental relationships. It also is not distinguishable from the broad sub-field of environmental anthropology. Nazarea’s 1999 volume seeks to capture the rich ferment of current research on the nexus of people-place-environment, including knowledge, practice, and political ecology. In setting the background for the volume she quotes (page 7) pioneering ethnoecologist Hal Conklin, who wrote in a paper on shifting cultivation:

Ethnoecological factors refer to the ways in which environmental components and their interrelations are categorized and interpreted locally. Failure to cope with this aspect of cultural ecology, to distinguish clearly between native environmental categories (and associated beliefs) and those used by the ethnologist, can lead to confusion, misinformation, and the repetition of useless clichés in discussing unfamiliar systems of land use. (Conklin 1961:6, emphasis added)

Later in her introduction, Nazarea writes:

Ethnoecology, as the investigation of systems of perception, cognition, and the use of the natural environment can no longer ignore the historical and political underpinnings of the representational and directive aspects of culture, nor turn away from issues of distribution, access, and power that shape knowledge systems and the resulting practices. (1999:19; emphasis added)

Here she clearly lays out both the domain of ethnoecology, and then affirms that both historical and political factors must be considered in ethnoecological work.

More recently, I wrote “Ethnoecology is the broad domain of local understanding of the environment, of the land and the entities that dwell there, and of the relationships among them, including the relationships of people to other living things and the land” (Johnson 2008:146).

Toledo (1992, 2002) has explicitly theorized ethnoecology as a discipline. His approach has a focus on production, the active business of working the land to derive one’s livelihood. Toledo has formulated a particular notion of ethnoecology that is composed “of the three inseparable dominions of landscape: nature, production, and culture” (Toledo 2002:514). In his theoretical formulation, he brings to bear notions of world view, or “cosmovision,” and the cognized natural world (*kosmos*) with how people act in the landscape to procure their needs (*praxis*) and the body of indigenous knowledge, or TEK, which he calls the *corpus*, to explore how they form an integrated ethnoecological system in use (*ibid.*). Toledo’s analytical frame is particularly relevant to the lifeways of small-scale cultivators and indigenous communities, such as the many peoples of rural and southern Mexico.

I share Toledo’s interest in holistic perspectives that include cosmological and spiritual elements along with what people do, their practices, and their cognized and embodied knowledges. Currently my interest is more in researching and understanding this realm than in focusing strongly on the nuts and bolts of economic activities per se. In Toledo’s (2002) schema of the types of human knowledge that comprise ethnoecology, he describes the landscape level of knowledge that is of primary interest in this volume as “ecographical” knowledge, though my own notion of landscape ethnoecology also includes elements of the “physical” realm, particularly substrates and waterbodies and their elements, as I discuss below.

Implicit in Toledo’s formulation of the *corpus* is the importance of local languages in naming and shaping concepts and in carrying the cognized information of the ethnoecological realm. As has been elsewhere noted (cf. Maffi 2001; Krauss 1992), a high proportion of the world’s languages are presently endangered, particularly those in high-diversity regions of North America such as British Columbia, and environmental knowledge is closely tied to language. Indigenous geographic and ecological understanding of landscape, or landscape ethnoecology, reveals similarities and differences between scientific and local understandings of “kinds of place” (geographic ontology) and their entailments or affordances (Gibson 1979 in Ingold 2000:169). The research presented here presents several North American indigenous landscape term systems, thereby contributing to the recorded

environmental lexicons of several different endangered indigenous languages, and describes articulations of these systems of geographic nomenclature with other aspects of meaning of “landscape” within the framework of landscape ethnoecology.

Tim Ingold (1996a) offers a different approach to understanding of human relationships with homelands through the concept of “dwelling,” which I take up in more detail later in this work. This process-oriented perspective on landscape and relationships deals with the domains of practice and meaning, and seems particularly apropos to the understanding of landscape held by non-cultivating people. Exploring the implications of local concepts of landscape, Ingold writes that in Pintupi understanding, landscape is

not a given substrate awaiting the imprint of activities that may be conducted upon it, but is itself the congelation of past activity. . . . Secondly, it is not so much a continuous surface as a *typologically ordered network of places, each marked by some physical feature, and the paths connecting them* (Ingold 1996a:139; emphasis added).

He continues later in the same paper, quoting his earlier work:

“it is through *dwelling* in a landscape, through the incorporation of its features into a pattern of everyday activities, that it becomes home to hunters and gatherers.” (Ingold 1991b:61)

Ingold then asserts that singing, storytelling and activities “of hunting and gathering” all are “ways of dwelling” (Ingold 1996:144).

“Place making” in the ethnoecological and ethnobiological sense includes how people think about and understand place(s) and landscape, both as cognized and through narrative, and what they do in place(s), including environmental management and manipulation, habitual practices, harvesting, and dwelling.

On landscape and land

Before we move further into questions of landscape ethnoecology, let us take a moment to consider the concept of landscape. What is landscape? A seemingly simple question, upon closer examination it becomes apparent that the term is used in a number of contrasting senses, which vary by discipline

and over time. It behooves us, therefore, to reflect on the ways that this term is employed.

One perspective, derived from European notions of landscape painting and the scenic, sees landscape as a (framed) prospect, as it were, like the view from one's window (Gow 1995; Tuan 1974). The term *landscape* itself was derived from the Dutch *landschaft*. When this term crossed to England with the Dutch painters of the Tudor era, its meaning shifted from designating a tract of land, to a scenic painting of a view of a tract of land (Tuan 1974:133). Landscape, in this sense, is a visual backdrop, the scene of a stage. In this tradition, landscaping and landscape architecture render scenic surroundings around and within the built environment. In the common European and North American sense, *landscape* is largely equivalent to *scenery*, re-emphasizing the sense of land as a (generally aesthetic) backdrop to the foreground of human activity (Tuan 1974:133).

An interesting aspect to this framing of landscape as primarily visual is that dwellers of heavily forested environments may lack the ability to visually perceive anything beyond the "proximity" in the sense of Granö (1997), having no vantage point from which to view a "prospect" and so may, in that sense, lack a broad brush sense of place. For such peoples, both the trail, or pathway, and the acoustic environment may play a key role in organizing understanding and linkage of places in their homelands (e.g. Feld 1997, Gow 1995, Turnbull 1961 reported in Tuan 1974:79-81). Ingold (1993) also contains an extensive exploration of pathways and their significance in theorizing landscape. Landscape implies region, or contextual locational setting, as well as local or specific point sites.

A completely distinct understanding of landscape is found in geography, ecology, and natural science, where it comprises the suite of landforms and ecosystems existing on/in a landscape, a three-dimensional extent of territory. Landscape ecology is the interdisciplinary framing of the significance of spatial scale in ecological process. According to Monica Turner, a leading exponent of contemporary landscape ecology,

"Landscape" commonly refers to the landforms of a region in the aggregate (Webster's New Collegiate Dictionary 1980) or to the land surface and its associated habitats at scales of hectares to many square kilometers. Most simply, a landscape can be considered a spatially heterogeneous area. Three landscape characteristics useful to consider are structure, function and change. "Structure" refers to

the spatial relationships between distinctive ecosystems . . . “Function” refers to the interactions between the spatial elements. . . . “Change” refers to alteration in the structure and function of the ecological mosaic through time. (Turner 1989:173)

In one of the defining papers of the field, Richard Forman wrote:

A landscape is a kilometers-wide area where a cluster of interacting stands or ecosystems is repeated in similar form; landscape ecology, thus, studies the structure, function and development of landscapes. The structural components, or landscape elements, are patches of several origins, corridors of four types, and a matrix. (Forman 1982)

How “landscape” is conceived and defined in a landscape ecological context depends on the nature of the research being undertaken, and the focal scale. Kevin McGarigal (2003) writes:

For example, from a wildlife perspective, we might define landscape as an area of land containing a mosaic of habitat patches, often within which a particular “focal” or “target” habitat patch is embedded. . . . Because habitat patches can only be defined relative to a particular organism’s perception and scaling of the environment . . . landscape size would differ among organisms. However, landscapes generally occupy some spatial scale intermediate between an organism’s normal home range and its regional distribution. In other words, because each organism scales the environment differently (i.e., a salamander and a hawk view their environment on different scales), there is no absolute size for a landscape; from an organism-centered perspective, the size of a landscape varies depending on what constitutes a mosaic of habitat or resource patches meaningful to that particular organism.

This definition most likely contrasts with the more anthropocentric definition that a landscape corresponds to an area of land equal to or larger than, say, a large basin (e.g., several thousand hectares). (<http://www.edc.uri.edu/nrs/classes/nrs223/readings/fragstatread.htm>)

Landscape ethnoecology is ethnoecology focused on local understanding of local landscape. It is cultural understanding of landscape, including

structure through time and space, predictability, disturbance, interactions with the landscape through management, and entailments of kinds of place, landscape elements, or ecotopes. It includes what one might call a human or anthropogenic “layer,” to borrow an analogy from geographic information systems (GISs), which encompasses significant kinds of place such as places of habitation, orchards and fields, sites of story, and sacred places. It encompasses the network of relationships to the land and other entities that dwell there.

Synthesizing the ecologically based definitions of landscape above, the landscape level of environments or ecological systems includes a variety of habitat types, or patches, and a range of landforms. It is also characterized by scale (the size of the overall landscape under consideration) and grain (the uniformity or heterogeneity of the landscape, and the range of sizes of its components). For the purposes of landscape ethnoecology, which is explicitly anthropocentric, *landscape* may be more or less equivalent to the drainage basin. In anthropological usage, *landscape* may encompass the range of environmental types or patches within the “territory,” “country” or “homeland” of a local group. As well as the range of environmental types or habitats, landscape in the ethnoecological sense also encompasses the broad aesthetic or cosmological sense of the local environment.

In this volume, “landscape” and “the Land”¹ can be read as synonyms. “The Land” is the way the homelands of indigenous north American peoples are spoken about in English, and is roughly equivalent to *nan* or *nánb’* in Dene languages such as Kaska or Gwich’in, or *dè* in Dogrib (Legat et al. 2001). “The Land” encompasses the relationship that originated in the distant past, of a people, those who dwell there, with a regional homeland. This concept encompasses the entire range of geographic, physiographic, and ecological features of the homeland, and all of the living beings, including the human population whose identity and way of life is strongly tied to the land. Sacred or spiritual components, which may include loci of power, are part of the concept of “the Land.” Very similar conceptions of “country” are found in Australian Aboriginal cultures (e.g. Rose 2000, 2005; Strang 1997; Robinson and Munungguritj 2001; Morphy 1995; Layton 1995; Williams 1982; Merlan 1982; Turk 2008; numerous others).

This concept of Land perhaps has resonances in the “Back to the Land” movement of the 1960s and 1970s, in the sense of what the meaning of “the Land” is. The Land in this sense is also seen in opposition to the built environment, and is conceptualized as Nature. In the ethnoecologies of indig-

enous peoples there may also be somewhat of a sense of a distinction between core human/built environments such as “the village” and more peripheral environments such as “the bush,” though this varies by culture and depends on the spatial patterning of their interactions with their homeland. (See the range of cases discussed in Dwyer 1996.)

Of environment and ethnoecologies

The word *environment*—meaning that which surrounds us, *medio ambiente*, a thing distinct from us—helps to encapsulate some of the differences between scientific perspectives and those of traditional local peoples. In many local ethnoecological perspectives, especially those of people who live in intimate contact with and make their homes in landscapes which lack permanent built environments and field systems, there is no sharp separation between the realm of people and an abstracted other called “nature” (e.g. Dwyer 1996; Ingold 1993). Rather, the landscape is a humanized homeland. This is certainly true in all of the communities in which I have investigated these topics (Johnson 2000; Johnson and Hargus 2007; Johnson 2009) and has been nicely articulated by many other voices for other places (e.g. McNeary 1976; Dwyer 1996; Nelson 1983; Davidson-Hunt and Berkes 2003; Roberts and Wills 1998; Nadasdy 2003; Cruikshank 1990a, 1990b, 1998, 2001, 2005; Turner 2005; Deur and Turner 2005; Rigsby 1982; Atleo 2004; Auld et al. 2005; and others), and in many statements and publications by local indigenous people and groups. It has now become almost cliché to articulate this holistic relationship between people and their homelands, but the relevance of local understandings remains important to acknowledge in the face of totalizing discourses which create global environments analytically and conceptually separate from people, in order to discuss environmental change and degradation on the one hand and resource potential and international resource development on the other. (See Tsing 2005 for a particularly cogent discussion of the affects of filtering out both local people and their landscape from the environment and natural resources of Kalimantan.²) Even in a somewhat more benign context, nation states are relatively limited in their readiness to respond to alternative conceptual frameworks of indigenous homelands. Julie Cruikshank comments for the Yukon:

Oral traditions from northwestern North America consistently demonstrate the social nature of all relations between humans and nonhumans (animals, plants and landscape features such as glaciers),

a concept that fits awkwardly with Western science. Codified in government reports, information formulated as TEK tends to *reify and reinforce a Western dualism*—prying nature from culture—that local narratives challenge in the first place. Sentient landscapes shift their shape once they are engulfed by these frameworks and transformed into “land and resources.” (2001:389, emphasis added)

It remains thus timely and important to investigate the landscape ethnoecology of local peoples, to record and share these perspectives as a counter to the globalizing and generalizing rhetoric, and to try to record the perspectives of peoples who have been arguably in a much more sustainable relationship with their homelands than has characterized the resource frontier or the large industrial nations. It is, of course, necessary to avoid vacuous environmental romanticism in the consideration of local ethnoecologies, as these caricatures reveal more about the inhabitants of industrial nations and the de-localized and dispossessed than they do about working relationships between people and the land. It is equally necessary to avoid reconfiguring local ecological understanding to mirror Western and scientific conceptions of environment, but rather to learn from peoples’ understandings and practices, to present alternative understandings as fully and accurately as possible.

Reviewing the scattered but growing literature on landscape perception and systems of ethnogeography, many questions arise. A fundamental question that relates to notions of ecological setting and way of life is whether there are differences in landscape ecology between settled and mobile peoples, and between those who till the soil and those whose way of life involves hunting, fishing, and gathering the products of the land—recognizing, of course, that many gradations occur between these categories. A first order examination of the literature suggests that people who till the soil include soil characteristics in their ethnoecological classifications. Sillitoe (1996) gives an extensive exposition of Wola “ethnopedology” in the New Guinea highlands, while Atran’s 1993 treatment of Itzá Maya agroforestry includes a number of soil categories, as does Anderson’s Yucatec Maya chapter in Johnson and Hunn (2009) and Bandeira et al.’s treatment of Tzotzil landscape perception (2002). I have not found such categories in the landscape ethnoecologies of the Gitksan, the Witsuwit’en, or the Kaska, who are all Canadian indigenous groups whose main traditional economic focus is on fishing, hunting, and collection and management of certain favoured perennial plant foods,

though the “habitats” described for Dogrib (Tłı̄chǫ) by Legat et al. (2001) do include characteristics of surficial deposits and soils in their defining traits.

Similarly, it is of interest whether people recognize and designate seral phases or successional communities. Several Mexican indigenous groups who practice swidden agriculture, including Mixe, Chinantec, Tzotzil and Sierra Nahua, are reported to recognize successional relationships and name seral phases (Martin 1993, 1995; Bandeira et al. 2002; Mora et al. 1985) as do the Wola of New Guinea (Sillitoe 1995, 1998). Anderson (2009), however, reports that the people of Chunchuhub (Yucatec Maya) recognize such phases but do not name them, bringing up a key issue also raised by Roy Ellen (2009) with regard to Nuaulu forest classification in Seram, Indonesia: how much of people’s landscape and ethnoecological knowledge is lexicalized? I have also raised this question in terms of recognition of aspects of vegetation for the Gitksan. In my own research with Canadian First Nations, overt recognition of seral relationships, or naming of seral phases is weak or lacking, though the past action of avalanches or forest fires may be recognized. This does not imply people do not notice progressive change in vegetation after disturbances, but simply that they do not ordinarily name such phases. For example, they may well understand the ecological effects of fire on fungi and on berries, as well as on fish, game animals and aquatic ecosystems, without elaborating names for seral communities. (Plant communities themselves, including seral phases, are arguably abstractions; Gleason [1939] and Curtis [1959], among others, advocated a “continuum theory” of plant distribution and denied the objective reality of plant “communities.”)

A key question regards the degree to which landscape ethnoecological systems, or ethnogeographies, comprise a single unified system, or whether they are a poorly ordered hodgepodge of partial, intersecting and overlapping classifications that are context-dependent. That is, do folk ecotopes fall into a single system, or might vegetation, river terms, other waterbodies, landforms, etc. perhaps represent different “filters” or “layers of information” in examining landscape (in the broad sense) or environment? These issues are debated by Hunn and Meilleur (2009) and Ellen (2009). In my own work, I have tended toward the perspective of overlapping and intersecting multiple classifications. An aspect of traditional knowledge in general, and landscape ecological knowledge in particular, that bears on these questions is, as Ellen suggests; how much of the knowledge is cognized and systematized, and how much is tacit knowledge-in-practice or experiential knowledge? Tim Ingold argues that a “dwelling” perspective involves substantial knowledge-in-practice and

evolves through movement between places, downplaying the importance of cognitive mapping (Ingold 1996a, 2000). My own suspicion is that this may in fact vary between cultures and individuals, and perhaps between rural and urban or educated people as well.³

What is ecological and how are ecotopes recognized?

I have found it difficult to bound “ecological” terms, and have found that “kinds of place” that had ethnoecological importance were quite eclectic and included a mixture of vegetation, landforms, waterways and their features, and ambiguous categories like “swamp” or “quicksand.” In my research I counted any place kind that seemed to have ecological relevance in local landscape understanding, using both language and practice as evidence. Vegetation terms in the areas where I have worked seem weakly developed, perhaps in part because vegetation is relatively depauperate in the areas I have worked, and perhaps also because in the long seasons of snow cover, vegetation, other than a few significant tree and shrub species, is not visible.

One important question is, how fundamental is the distinction between lands and waters? While this may be a higher-order branching point in the geographic knowledges of European peoples and their descendents, it is increasingly evident that for maritime peoples and for northern peoples, that water and ice features are included in their “landscape” ethnoecologies, a point made with particular force by Aporta (2000, 2009) with regard to the home “land” of the Iglulik Inuit, who still travel and hunt on both shore-fast and moving ice, and who have place names for recurring ice features as well as an elaborate vocabulary of place kinds for ice and associated water features. Indeed, there are traditional village sites that were on the sea ice adjacent to productive leads, or *polynyas*, which focused game and provided opportunities to hunt. Collignon (2006) discusses similar aspects of Inuinait geographic understanding in the Canadian Central Arctic. In a more southerly setting, Johannes (1981) has made similarly detailed observations of marine geographic and ecological knowledge for South Sea Islanders with regard to marine ecotopes and knowledge of current and wave features. These observations underscore the ethnocentric separation of land as subject to sovereignty and private property rights, and waters, which are open-access and therefore exclude sea claims and rights. This has been problematic for Torres Strait Islanders and Aboriginal Australians (Peterson and Rigsby 1998; Mulrennan and Scott 1996, 2005), the Makah of Washington State (Society of Ethnobiology conference field trip to Neah Bay 2003), and the Inuit, and

also bears on questions of Canadian national sovereignty over seasonally or permanently frozen waterways in the Canadian Arctic Archipelago.

Another area of research interest is the degree to which there may be systematic variation in landscape ethnoecologies. Ways of life, depth of time in place, the nature of the land-/sea-/icescape itself, and features of language might all influence the ways that landscape elements are perceived and classified, and how the local people interact with their landscape. (See Collignon 2006 for a discussion of some of these issues.) It seems logical to me that those who till the soil, herd animals, hunt, or focus on marine or aquatic resources might all attend to different aspects of their respective environments, and elaborate knowledge about their components accordingly. It also seems logical that dwellers of tropical forests, which lack strong seasonality, might understand the land differently from those who live in highly seasonal environments such as the northern taiga or in Arctic landscapes. By the same token, dwellers in arid landscapes may be expected to perceive soil, vegetation and especially waterways and waterbodies differently from people who live in forested landscapes, dwellers of the plains from those who live in mountainous environments, and so on.

Mark and his co-authors (2003, 2009), based on research with desert dwellers, challenge the primacy of the division between lands and waters in another way; to peoples who dwell in places where surface waters are ephemeral, the bed of the watercourse, or the basin in which waters accumulate may be separated in local thought from the waters which sometimes occupy those sites. Northern peoples, along with dwellers of arid landscapes, appear to have very rich vocabularies describing features of the physical landscape and waters, and perhaps more depauperate vegetation terminology. Lehtola, describing Sami landscape knowledge in northern Fennoscandia writes:

Leif Rantala counted the words describing landscape in one dictionary. There were 109 words depicting shapes of mountains and hills; 40 for bogs and marshes; and 60 for valleys, ravines and hollows. For example *vággi* is a “shortish, deepish valley”; *gorsa* is a “smallish, deep ravine”; *gurra* is a “ravine, gorge, narrow valley”; *roggi* a “pit”; *lákku* a “flat highland valley”; and *leakši* is an “ordinary marshy, widish valley on a treeless mountain. (2002:14)

I am not proposing environmental, economic or linguistic determinism, but I believe all of these factors influence the ways people perceive, cognize,

articulate and interact with their environments or homelands. Indeed, the diverse ethnoecological systems reported in Johnson and Hunn (2009) suggest that these kinds of difference do in fact occur.

Notwithstanding diversity in naming and recognition of various features of lands and waters, certain patterns also recur. Vegetation, for example, is often described as 'place of x', such as 'place of corn' (Chinantec farmers in Mexico, Martin 1993), 'place of cottonwoods' (Akimel O'odham of the Sonoran desert in Arizona, Rea 1997) or 'place of pine' (*sbaayt sginist*), the Gitksan term for a pine stand (Chapter 3). Convex features such as the English concepts 'hill', 'ridge' and 'mountain' are recognized in all ethnogeographic systems I have been able to review, though as Mark and his co-authors (Mark and Turk, 2003; Mark et al. 2009) indicate, the division points between categories may differ between languages, a point also elaborated in Krohmer (2009) in her examination of Sahelian Fulani landscape knowledge, where substrate as well as elevation is important in local classification. Certain key environments defined by animal behaviour are pertinent to hunters, particularly mineral licks that attract game, which are widely recognized and named (Johnson 2009, this work; Shepard et al. 2004:147).

One factor that may be missed in an attempt to fix local landscape ecological knowledge, place kind inventories, and local ecological relationships is seasonality. In an equable low latitude environment, the nature of places and their human significance may not vary significantly through the year, while in seasonally arid lands (cf. Krohmer's 2009 exposition of Fulani ethnoecology) or in high latitude northern environments, the influence of season cannot be ignored (Johnson and Hunn 2009). While reading Peter Dwyer's description of human use and understanding of landscape in New Guinea (1996), I was struck that the relationship to land he described seemed very similar to the way landscape is understood in northwest North America, even to the potato gardens adopted by Gitksan, Witsuwit'en, and other groups in the nineteenth and twentieth centuries, which are similar to the New Guinea garden patches along waterways. The key difference between indigenous peoples in northwest BC and the tropical forest dwellers in New Guinea is the lack of seasonality as a prime organizer of activities and use of space.

Differences in kind between landscape understanding of local indigenous peoples and more recent migrants may be significant. A pioneering work which has investigated contrasting ways of viewing, articulating, and understanding the "same" landscape is *Uncommon Ground* by Veronica Strang (1997). She investigated Aboriginal and non-aboriginal grazier landscape

understanding in northern Queensland, and found some systematic and important contrasts in how they saw their homeland. For Queensland graziers, in contrast to Aboriginal peoples, land categories are generic. Strang writes, "'types' of country—scrub, forest country, coastal plain, melonhole country, saltpan, wetlands, grassland—are thus described according to physical characteristics of soil and vegetation" (1997:182). This is very similar to my discussion of the contrast between Anglo-Canadian landscape categories, especially those of trained resource managers, and those of the Gitksan (Johnson 2000). In contrast to the graziers, Strang writes, "Aboriginal 'country' is primarily defined by its *story places*, mythological associations and the associated groups of people" (1997:182, emphasis added). This latter mode of understanding of country or territory has strong resonances with Gitksan perception of land, and also, at least as a storied landscape, with Dene peoples (cf. Andrews 1990; Andrews and Zoe 1997; Andrews et al. 1998; Cruikshank 1990b, 1997, 2005). Palmer (2006) has crafted a detailed account of Secwepemc narrative and landscape which underscores the importance of this relationship. Strang makes some intriguing comments about the effect of language—here not of lexicon, but rather of mode of thought and expression—stating that aboriginal groups employ a "much fuller use of metaphor and analogue" (1997:182), and she speculates whether the very nuanced and particularized understanding of place may be facilitated both by the small size of the aboriginal community and the very deep time depth of local development.

Connecting place kinds with overarching structures of cultural meaning can be accomplished through story, as Strang and others have demonstrated in Australia and the Canadian North. Pierre Beaucage and his local associates (Taller de Tradiccion Oral del CEPEC and Pierre Beaucage 1996; Beaucage and Taller de Tradiccion Oral del CEPEC 1997) have analysed landscape knowledge in the Sierra Nahua in terms of three interlinked aspects: specific place names, place types, and two axes of symbolic and spiritual nature, with mountain as "good" and the river and valley as "bad." Certain portions of the landscape are recognized for beneficent, or malevolent, spiritual power. Beaucage and his associates also recognize and situate anthropogenic types such as communities and orchards. Martin suggests that there is an axis of wild-domesticated which is present in Chinantec ethnoecology as well (1993, Figure 4), with the mountain tops and higher elevations as wild, familiar more to men, and containing spiritually powerful places, while a mid elevation is the domesticated sphere of settlement and *milpas*, and a

lower altitudinal zone is “semi-domesticated.” The exposition of the Shoal Lake Anishinabe cultural landscape presented by Davidson-Hunt and Berkes (2003) also reveals structures of meaning; the community members felt that human and spiritual places had to be included to represent their homeland as they understood it.

The relationship between general ecological classes (folk ecotopes or “place kinds”) and specific places is rich and revealing. Kari (1989) and Hunn and Meilleur (2009) have successfully used toponyms to establish “place kind generics” by analysing the included place elements in the names of specific places. It often seems in practice that people with deep knowledge of local environments refer to specific named places rather than designating ecotopes or more generic place kinds. When I asked Maori biologist Mere Roberts about general kinds of place for her people, she replied she was not certain if such concepts were developed in Maori; people tended to refer to places as specific, unique named places (pers. comm., 1997). I have found the same applies for Gitksan interlocutors. Meilleur (pers. comm. 2006) commented that he had to frame questions carefully in his ethnogeographic research in Savoie, France, to obtain generic rather than particular locations to obtain specific plants. It is clear that place names are important mnemonics in referencing ecological information (cf. Fowler 1999; Collignon 2006; Thornton 2008), and often are involved in other aspects of relationship to landscape, as when toponyms organize orientation information, or recall history (e.g. Tom 1987; Nyman and Leer 1993; Thornton 2008). Toponyms, and knowledge of named places often seems to evoke strong emotional attachment (Palmer 2006; Young-Leslie 2007). Some groups may be rather ad hoc in designation of places, perhaps indicating who is staying or has stayed at a particular site (e.g. Gwich’in place designation reported in Andre and Kritsch 1992; Kritsch and Andre 1994; Greer 1999), while for other groups there may be very specific “rules” in how places are named (Hunn 1996; Thornton 2008), and place names may be proprietary information that is revealed only to the proper owners of the land (Johnson 2000). For the Gitksan and Nisga’a, for example, toponyms are key aspects of corporate-owned territories, and are intimately entwined with oral histories of the land and a group’s relationship to it. Thornton (2008) brings out connections of place to history, identity, social structure and resource knowledge for the Tlingit of southeast Alaska, describing both seasonal pathways and recalling past configurations of the landscape. Basso (1990a, 1990b, 1996a, 1996b) has eloquently explained how for the White Mountain Apache, the structure of place names includes

components which explicitly locate the point of view of the observer in the name, and how place names are used to index stories with moral force, that are used to comment on, and to motivate, appropriate moral behaviour. Beatrice Collignon's work (2006) on Inuinnait place names and the memories associated with these places in the Canadian Arctic is also revealing in the deep connections of people and land-, sea-, and icescape. Early work of Cruikshank (1990b) strongly articulates the significance of place names in oral histories and the connections of story, named places, relationship to land, and moral and social values for Yukon Athapaskans and Tlingit. Named places of peoples discussed in this book are further explored in Chapter 10.

An area of persistent theoretical interest and practical significance is the degree of congruence between local landscape classifications, and the diverse classifications of Western sciences and managers. In my 2000 paper on Gitksan landscape ethnoecology this was a major theme, and is addressed also in Shepard et al. 2001, Shepard et al. 2004, and Mark and Turk 2003. In a sense, this is again a particular aspect of traditional, or local, ecological knowledge and its relationship to Western scientific knowledge.

The topic of local landscape knowledge and sustainability has garnered considerable interest (Posey and Balée 1989; Frecchione et al. 1989; Toledo 2002; Martin 1993; E. Anderson 1996; Turner 2005; M. K. Anderson 2005; numerous others). The relatively long duration of relationship with landscapes which remain intact or stable as evinced in local settings encourages the notion that local understandings may underpin, enable, or instantiate sustainable relationships with the natural world. Indeed, this is one motivation for recording and studying such systems of local understanding. An important caveat must be born in mind however: local landscape ethnoecology reflects local contexts and understandings, and cannot be unproblematically ported to other locales, or assimilated to international conservation agendas. Peter Dwyer cogently discusses some of these issues in his 1994 paper on conservation and traditional societies, drawing particularly on his New Guinea background. It is also true that the regional, national, and global contexts in which all local groups and their homelands exist cannot be neglected; as has been true in the past (e.g. Cronon 1983), these exert forces on local communities and landscapes which can constrain or completely transform them (cf. Tsing 2005; Scott 1998).⁴ Subtler interactions play out in many places as local groups negotiate the articulation of their understandings and practices with those of state and regional entities under whose jurisdiction they lie.

Local ethnoecologies and ecotopes

The remainder of this book examines, in detail, local landscape knowledge and articulations of local landscape knowledge with mapping conventions and scientific conceptions of landscape, and concludes with a discussion of the significance of landscape ethnoecology. To provide some orientation to the rich and somewhat eclectic material contained in the various descriptions of landscape ethnoecological systems in the chapters that follow, I briefly review common themes in the ecotopes recognized by the Gitksan and Dene groups with whom I worked. First, broad topographic features such as ridges, mountains, slopes, peaks, passes and summits are recognized and named in all of the systems I examined. Similarly, rich terms for waterways such as ‘river’, ‘slough’, ‘eddy’, ‘bank’, ‘canyon’, ‘waterfall’, ‘lake’ and ‘pond’ are recognized and named. Complex areas such as ‘swamp’, or muskeg, are recognized and differentiated; these features offer a range of wetness, and of differing vegetation and water chemistry. Their classification and significance is variable, and revealing. Snow and ice terms are also recognized in all areas I have worked. These do have significance as kinds of place or ecotopes, especially for terms such as ‘glacier’ and various rich terminologies for kinds of ice, which encode aspects of travel safety. Similarly, multi-year snowfields are recognized, and may be rather loosely differentiated from glaciers, which are formally defined as ice that moves downslope with gravity. Vegetation, as indicated above, may be generally differentiated into treed areas—often designated by something that means ‘among the trees’—and open non-treed areas. Treed areas may be further distinguished by the dominant species. Areas dominated by hard-to-traverse scrub or “brush” may also be specifically labelled. Treeless areas may be designated as meadows or places of grass, or may be classified by an absence of vegetation or by the character of winter snowpack. Trails, various types of camps and places of habitation, lookouts, and mineral licks are widely recognized. Finally, places of spiritual power may also be explicitly recognized as a class of places, as well as specific unique and perhaps named places.

I further explore the significance of various kinds of landscape entities, and issues of boundaries and flows in the chapters that follow.