PLANTS, PLACES, AND THE STORIED LANDSCAPE:

Looking at First Nations Perspectives on Plants and Land

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INTRODUCTION

Plants shape landscapes and are, in turn, responsive to the characteristics of the land. In British Columbia, people interacted, and still interact, with plants through travelling over their territories, through the pattern of the seasons, through the course of other activities, and through specific journeys to places known to be plant-harvesting sites. Plants also, to a large degree, mediate our encounter with landscapes: we walk *in* the forest, *among* the trees, *through* the brush, and *on* the grass. The stature of vegetation influences our perceptions and experiences. Tall forest, impassable scrub, open meadow, or zoned vegetation along a shoreline all shape our readings of landscapes.

In the alpine, low scattered cushion plants or tufts of dwarf sedges may punctuate expanses of rock, and, in arid lands, plants dot the landscape in clumps or patches. Even the dearth of plants on a fresh rockslide has meaning. As the Witsuwit'en would say,[1] "nothing on it" (*wizulh kit*). Vegetation interacts with physiographic features and seasons to affect ability to travel as well as destinations for gaining access to potential resources (e.g., presence of food plants or plants used by animals).

To consider the relationships of people to plants on the land, and how these shape the land and histories of the people, I begin with the concept of landscape. The intent of this article is not to re-examine the broad orientations towards landscape of government managers, the non-Indigenous public, or the nature conservation community, nor is it to carry out an extensive review of the landscape literature; rather, it is to look at connections between plants and landscape from an

[1] "Wet'suwet'en" is the older spelling of the group and is still used by a number of groups in the area. "Witsuwit'en" is now widespread, and it is what I use in this article except when giving the names of local organizations.

ethnoecological perspective, granting the fundamental relationships of Indigenous peoples to their homelands and recognizing British Columbia as a humanized landscape. The concept of landscape is paramount in ethnobotany and ethnoecology, particularly at a scale on the order of the drainage basin of a major river or inlet, or the extent of lands and waters known by and travelled on by local Indigenous people, and it is roughly congruent with a people's homeland (Johnson and Hunn 2010; Johnson 2010a). Landscape-related knowledge in an ethnobotanical perspective includes knowledge of targeted harvests, of specific harvesting locales (often named), and of general habitat requirements (with associated terminology). Over the past couple of decades, reviews of "landscape" have examined the diverse ways that states, local and Indigenous peoples, and international nature conservation organizations have conceived of landscape (cf. Cronon 1983, 1995; Tsing 2005; Harris 2002) and have deconstructed the concept of "wilderness" (Cronon 1995; Denevan 1992). Guernsey's recent work (2008) in British Columbia highlights postcolonial and decolonizing perspectives to contest the construction of the forested landscapes of northern British Columbia as "wilderness," arguing that, for the Ts'msyen (Tsimshian) and other First Nations, the landscape is humanized and occupied, points I have made in earlier discussions of Gitxsan landscape ethnoecology (Johnson 2000).

In this article I focus on plants and landscape, primarily by considering Gitxsan and Witsuwit'en ethnoecology in northern British Columbia, and reflect on the relationships to landscape explored by Ron Ignace for the Secwépemc. I also discuss some comparative material from other First Nations. I first review methods in ethnoecological landscape research and then examine connecting people, plants, and landscape through the lens of place names and narratives. I follow this by looking at plant habitat concepts and naming, along with interaction with landscape through plant management, before finishing with a case study of Gitxsan landscape knowledge and discussing past and future landscape research.

METHODS

Visual elicitation, often used by linguists or ethnobotanists in identifying plants or animals, can also tease out habitats and vegetation types (cf. Collier 2001). I use schematic line drawings to elicit landscape terms, following on the early example in Hunn with Selam (1990, 92), and block diagrams in ecological depictions of vegetation zonation (Johnson

2000, 2010a). I also use landscape photographs in an interactive process (e.g., asking such questions as: "If you were walking in a poplar [trembling aspen] stand when you were hunting, what would you call that?") as well as narrative techniques (listening to terms used in narratives about travel on the land or harvesting). I was able to apply these various techniques because of my deep familiarity with the local landscape, vegetation, and habitats of many plants and with the places people likely frequented while conducting their on-the-land activities.

Perusing dictionaries (Mark, Turk, and Stea 2010) and parsing toponyms (Hunn 1996) to look for place-kind generics relevant to landscapes and plants (cf. Kari and Fall 1997) are two other important methods used to identify general landscape terms that may be significant to descriptions of plant habitats or vegetation types. One can also listen to natural narratives or responses to open-ended interview questions and note instances of discussion of local landscape kinds or lists of plant localities and their characteristics. These may take place both in the local language and in local English (which may differ from standard English), sometimes through the process of "loan translation" of Indigenous terms and concepts, and sometimes because local vernacular spoken by non-Indigenous residents may not match with standard English. The term "swamp," for example, has different technical and local meanings (Johnson 2008, 2010b). Linguistic skills are important for recording and transcribing terms and for assisting in the analysis of the meanings of key terms and their referents. Collaboration with local language and culture experts, as well as with experts in plant knowledge, is essential. When those who are highly competent in a local language and experienced with the landscape and its plants undertake research, very rich and nuanced descriptions of local knowledge result (e.g., Ignace 2008).

There are also various mapping approaches to acquiring knowledge of people-plant-landscape relationships, and these are both highly useful and potentially limiting (cf. Burda, Collier, and Evans 1999; Johnson 2010a). The appeal court decision on the *Delgamuukw* case in the early 1990s sparked an increase in studies intended to demonstrate unextinguished Aboriginal interests in land, primarily through the Traditional Use Study (TUS) format, which was shaped by government funding and requirements (Weinstein 1997). Funding by Forest Renewal BC also supported some land-use planning efforts (e.g., by the Strategic Watershed Analysis Team [SWAT], a Gitxsan group employing GIS

and databases to attempt to demonstrate traditional sites and resource interests in land; see also Burda et al. 1999).

Both of the above mapping approaches to acquiring knowledge of the people-plant landscape took advantage of, and were to some degree driven by, advances in GPS and GIS technology and its availability. The website for the Aboriginal Mapping Network describes and supports a number of such mapping-based efforts to intervene in land-use planning on traditional territories (http://nativemaps.org/). In the early 1990s, I had various discussions with members of SWAT regarding the potential of biogeoclimatic type classifications of the BC Forest Service (e.g., Banner et al. 1993) *as predictors* of Aboriginal plant resource presence as well as regarding whether the traditional knowledge of elders and experienced users should be considered in parallel with the insights from the Forest Service system. TUS and other traditional knowledge studies undertaken by the Secwépemc were insightful and involved substantial linguistic sophistication and subtlety. Among other things, they highlighted concerns about the limitations of GIS regarding areas of "fuzzy boundaries" (Ignace 2000) and, in common with other efforts (e.g., Weinstein 1995, 1997), concerns regarding the recording and accessibility of sensitive cultural knowledge. Tobias (2010) provides a useful handbook for appropriate First Nations documentation of connections to land through mapping approaches.

LOOKING AT PLANTS AND LANDSCAPE THROUGH PLACE NAMES AND NARRATIVES

The presence of plant resources, plant-based activities, and salient vegetation is often marked by toponyms (Fowler 2010; Hunn 1996; Ignace 2008; Johnson 2010a; Thornton 2008). A village along the Skeena River, for example, is called *Miinhl Sginist*, "under the lodgepole pines" (Johnson 2010a), and a traditional berry patch near Gitwingak is called *An Sim'maay*, "black huckleberry ('real berry') on it" (Trusler and Johnson 2008). A Witsuwit'en toponym refers to water flowing among cattails (*Typha latifolia)* (Johnson 2010a). Haisla elder Gordon Robinson identified a little mountain between Moore Creek and Anderson Creek called *ko kwakwanalas dums*, "place where there is yellow cedar (*kwanaalas* [*kʷànalas*])." He explained:

> They used to make blankets of yellow cedar bark … At the end of June groups of young women would climb the mountain and strip bark off yellow cedar trees. They took the bundles of bark to the slough

> where the Alcan site is now. They would soak the bark in the slough for one month weighted down with rocks. Then the inner bark easily separated from the outer bark." (Interview notes, Gordon Robinson, Haisla, 1988).

Traditional narratives often focus on plant-people-place relationships. For example, a chiefly territory of the Gitxsan, north and east of present-day Hazelton, is the site of the origin of a Giant woodfern, *'Wii ax̲*, which is a crest of Woxsimlaxhaa (Barbeau 1973, 86; Alvin Wiget, personal communication, 1988), a Gitxsan chief of the Gisk̲'aast in Kispiox.[2] The story also describes how people first learned to cook the fern rhizome for food (Turner et al. 1992). Plants on the landscape and in narrative are thus linked to social structure and tenure. The use of this food is also associated with the now abandoned village of G̲'aldo'o (Kuldo) as good harvestable fern rhizome was known to be abundant on the mountain behind the village (People of Ksan 1980).

Another example of plant-people-place relationships involves an ancient northern Gitxsan village in the Skeena headwaters area called *Lax̲'wiiyip*, which was called Gitangasx̲ ("people of the place of *gasx̲*" [northern riceroot lily, *Fritillaria camschatcensis*]) (Sterritt et al. 1998; Daly 2005). Riceroot bulbs are called *gasx̲*, "bitter," but are widely eaten on the Northwest Coast. I have speculated that the current distribution of riceroot up the Skeena and Bulkley rivers, where it is far from the coastal marshes (its usual habitat), may be anthropogenic (Johnson and Downs 2007).

Secwépemc elder, linguist, and knowledge holder Ron Ignace eloquently describes how toponyms that travel on the land combine to create a holistic appreciation of that land:

> As our people lived and traveled throughout our lands, they made history not only by naming places of heroic events; in addition, they named places after the resources, including game, fish and plants, they knew they could harvest there: *Pellcílcel* ("has silverweed") reminds us of the occurrence of an important indigenous root plant, *Potentilla anserina*. *Pellskwenkwinem* reminds us of the Indian potatoes (*Claytonia lanceolata*) associated with this place; *Ts'otinétkwe*, "rattlesnake lake," *Pestsets'úye*, "has porcupines," *Pelltnilmen*, "has Indian hellebore," are further example of place names that give clues to past animals and plants found there, although, with logging, mining, urban devel-

[2] "Gitxsan" is the spelling from the Eastern, or Gigeenix, dialect, which is "Gitksen" in the Western Gyeets dialect. I formerly used "Gitksan" but shift to "Gitxsan" in this article.

> opment and other changes to the land, these resources have disappeared from many of the areas. Yet other place names give hints about what we DO there, referring to the plants and animals we harvested in strategic, ecologically suitable locations. (Ignace 2008, 174-75)

The landscape itself, if not altered by recent disturbance from logging or other activities, may reveal the history of human interaction with plants on the landscape, where cooking pits show harvests of root crops in large numbers, or culturally modified trees (CMTs) show past bark harvest (Peacock 1998; Turner, Deur, and Mellott 2011; Ignace 2008; Johnson 2009). A high density of CMTs along Aboriginal trails may reveal sites of past harvesting of cedar bark or edible pine cambium (see Eldridge, this volume; Dilbone, Turner, and Aderkas 2013). A preliminary examination of a former trail beside Tenas Hill along the Skeena River north of Hazelton revealed intensive past cedar bark harvesting and a longer record of other uses (L.M. Johnson, field notes, 21 May 1998). It was adjacent to a number of formerly important salmon-fishing sites, for which cedar inner bark (for tying up the drying fish) and cedar whole bark sheets (for roofing smokehouses) were required (Johnson 1997).

PLANT HABITATS AND PATTERNS OF HABITAT NAMING

Classification of cultural ecotopes, or ecological "kinds of place," on the landscape provides another lens for exploring people-plant-landscape relationships. Various terms denoting "kinds of place" – forest, woods, meadow, swamp or berry patch – have been recorded in dictionaries and lexicons (e.g., Moore and Wheelock 1997; Antoine et al. 1974), but my dissertation research, including the study of Gitxsan ethnoecology, provided a more systematic investigation of place classification (Johnson 1997, 2000), which, later, I extended to Witsuwit'en and Kaska landscape terms (Johnson 2008, 2010a, 2010b, and 2011). Marianne Ignace (2000) and Ron Ignace (2008) have documented similar "generic toponyms" for Secwépemc:

> In addition to biogeoclimatic zone knowledge, an important way in which our people oriented themselves to the landscape includes the numerous terms for landscape forms, or generic toponyms, that our language has to refer to places at different elevations, in different ecological areas and geographic formations. For our ancestors, who learned to live in this changing, but intimately known landscape for

> hundreds of generations, the generic teknonyms [*sic*] are more than speech labels for geographic locations: One term invokes the other, and people can predict what kinds of landforms they will encounter throughout their travels, and what kinds of sources of animal and plant foods, sources of water and shelter, and ecological indicators for all of these they will encounter. For example, as elders explained to us in mapping out these generic landscape terms, you know that a plateau lake will have an outflow, where you usually find trout after break-up in spring. As forest ecologists know, you will find certain plants on the sunny (south-west) side of mountains, others on the moister north-east side. Forested areas in the Plateau will include moist meadows (*ckwelta*), that will, in turn, provide pasture for horses, a nearby creek and a good overnight camping location. Along the rivers, back-eddies exist in predictable locations near out-croppings and, as we have seen, are the locations for salmon fishing.[3] (Ignace 2008, 168-69)

As I and co-authors have discussed (Johnson 2010a, 2011; Johnson and Hunn 2010), landscape classification presents some challenges not seen in ethnobotanical or ethnozoological classification: How, for example, do you voucher a mountain?

When I explicitly asked for terms in Gitxsan to differentiate forest types, using the landscape diagram shown in Figure 1 as a reference, I learned that the generalized word for "forest" is often used, frequently with a topographic term to indicate, for example, a forested slope. To specify the type of forest, you can say "pine forest," "cottonwood forest," or "mixed forest," much as in vernacular English. Other discourse about forest emphasizes aspects such as "in the bush" (Gitxsan *galdo'o*, as opposed to "in the village," *lax galtsap*) or "on mountain" (*laxsga'nist*, as opposed to "down by the river"). These terms may become "habitat" or "habitat type" only when we seek information on what grows or is found in sites characterized by specific cover. Similarly, what initially appear as physiographic terms may convey key habitat information.

Clearings or openings in the heavily forested country of northwestern British Columbia are also particularly important. Meadows in the alpine may receive the same descriptive terms as similar non-treed places at low elevation. And some of the important characteristics turn out to be related to snow traits and winter travel as much as does summer season vegetation; absence of woodiness is key here (see Figure 2 and Figure 3).

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[3] Ignace presents a detailed block diagram of an idealized Secwépemc landscape (Figure 3) with Secwépemctsin labels as a person in the Skeetchestn and Kamloops area would find it.

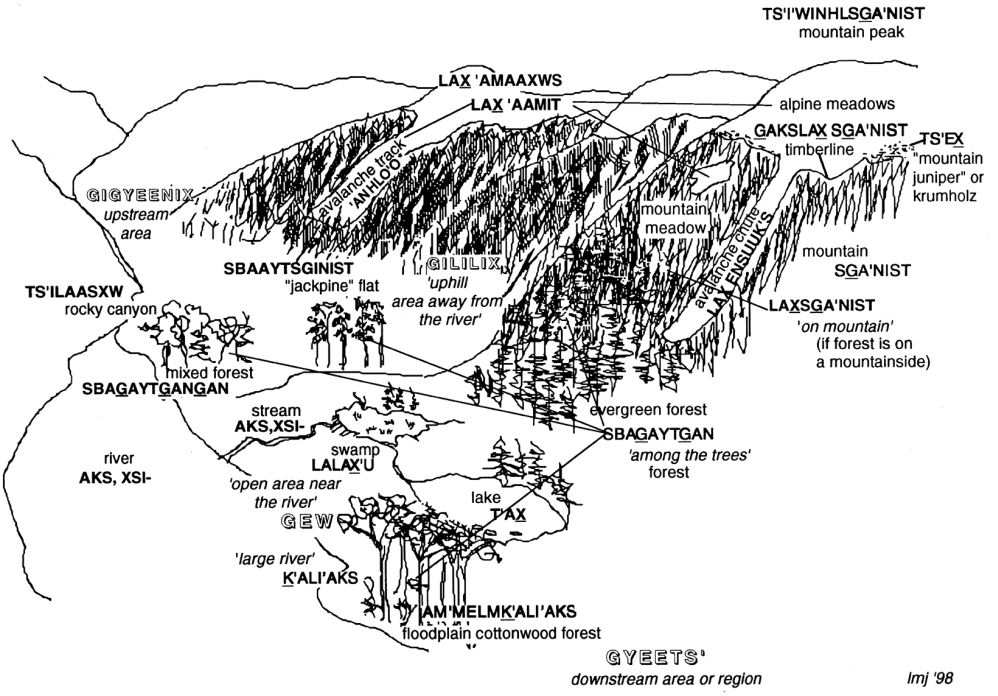

Figure 1. Idealized Gitxsan landscape showing directional terms and a range of landscape terms (reproduced from Johnson 2010a).

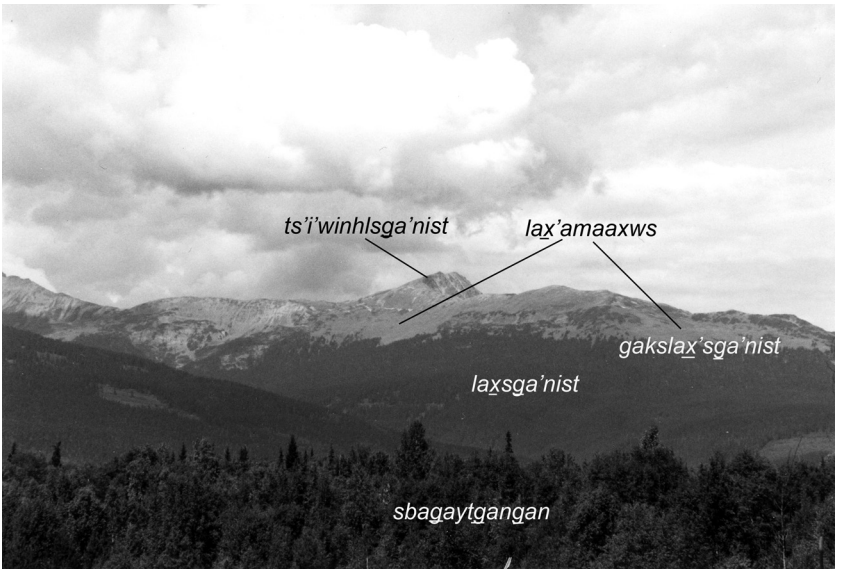

Figure 2. Parsing habitats in a Gitxsan landscape. This view from Carnaby, near New Hazelton, shows features of forest and mountain: mixed forest in the foreground (*spagaytgangan*), a forested slope on the mountainside across the valley (*laxsga'nist*), timberline (*gakslax'sga'nist*), open alpine meadow areas above timberline (*lax'amaaxws*), and, finally, the mountain peak itself (*ts'i'winhl sga'nist*).

Figure 3. This photograph depicts a low elevation opening on a hillside on the north bank of the Skeena River east of Gitwingak near the old site of Andimaul. It was identified by Art Mathews Jr. (Tenim Gyet)[4] as *lax'amaaxws*.

[4] This is the spelling in the *Delgamuukw* court case documents. I have previously used "Dinim Gyet," the orthography provided by linguist Bruce Rigsby.

Wetlands are another highly significant ecotope or suite of ecotopes, and they comprise several subtypes, which may not be explicitly named (see Johnson 2010a, 2010b, and 2011 for Kaska and Witsuwit'en examples). Often wetlands are glossed "swamp" in English and may include rich fens, dominated by sedges and other graminoids, and poor fens, dominated by mosses, especially *Sphagnum* spp., and ericaceous shrubs (especially Labrador tea [*Rhododendron groenlandicum*] and bog cranberry [*Vaccinium oxycoccos*]). Variable densities of lowbush cranberry (*Vaccinium vitis idaea*), crowberry (*Empetrum nigrum*), and cloudberry (*Rubus chamaemorus*) are found in boreal forest moss-dominated wetlands. The relationship of botanical communities to Indigenous terms for wet places is complex, with wetland terms mapping variably on ecologically recognized vegetation types and vernacular English terms. Sphagnum moss was an important material in many regions for diapers and women's menstrual needs (Johnson-Gottesfeld and Vitt 1996). In addition, several medicinal, plant food, and animal resources are found in various "swamp" type habitats. These areas can be dynamic, especially the richer fen types, as the activities of beavers can transform water levels and vegetation considerably, but unpredictably, in short periods of time. For the Gitxsan, "swamp" is simply *lalaax̲' u*; wetlands are less prevalent in their mountainous and riverine environment and their wetland terminology is less well developed than elsewhere.

The transition between continuous upland forest and open alpine has complex and particular ecological characteristics, and this ecotone was utilized as part of seasonal rounds by Indigenous peoples all over British Columbia. These parkland environments were often managed by landscape burning or were tilled in the process of harvesting root crops (Turner, Deur, and Mellott 2011; Peacock and Turner 2000; Lepofsky et al. 2005; Trusler and Johnson 2008). Gitxsan and Witsuwit'en named these significant places "timberline" or "mountain juniper." In the southern Interior, over many generations the rich, lush mountain meadows (with their distinctive array of species) – such as *Pt-en'i* (Botanie Valley) of Nlaka'pamux territory in the southern Coast Mountains – were regionally very important places for root and berry harvesting, social gathering, and trading (see Turner, Deur, and Mellott 2011; Peacock and Turner 2000).

Some landscape terms are directly coded by reference to plant cover. For Witsuwit'en, Sekani, Kaska, and some other Athapaskan groups, the concept of "willows" occupies a significant place in their understanding of landscape. Willow areas have many entailments not only

as wildlife habitats but also as impediments to cross-country travel. "Willows" is a general term, indicating both scrub (generally deciduous) and specific species of (usually) *Salix*. It sometimes extends to other species that lack edible fruit, conspicuous flowers, or conspicuous thorns (e.g., aspen, alders, scrub birch, or red-osier dogwood but not wild rose or raspberry or tree-sized birch, which has distinctive bark and other un-willow-like features). In Kaska, "willows" as a habitat type can be called *gūle' chōtah*, "among big willows," and in Witsuwit'en, *këndlih co tah* (Johnson 2008). Western ecologists also recognize the "willow" habitats of northern British Columbia with the designation Spruce Willow Dwarf Birch Biogeoclimatic Zone.

Places where successional processes are evident, such as post-fire sites or clearings growing up to brush, are recognized as distinct though shifting landscape types and are described in various languages (e.g., Gitxsan: *ts'inaast*, "too much brush on the berry patch"; *lumks tseegantx*, "all the timber growing up again"; or *lax̲ an 'miihl*, "a burned-over area") (Johnson 2011; Trusler and Johnson 2008; see Ignace 2008 for comparable Secwépemc terms). These processes were utilized in vegetation management through landscape burning (see below).

Animal habitat is also a crucial aspect of landscape-vegetation interactions – for example, the association of lush vegetation on avalanche areas with grizzly bear habitat or the association of alpine meadow sites with hoary marmot habitat. Other alpine areas with stony escape sites adjacent to brushy areas suitable for feeding may be known as mountain goat habitat (Johnson 2010a). Willow thickets and swamps may be associated with fall and winter moose habitat, small lakes and ponds with summer moose habitat (Johnson 2010a, 2010b; M. Donnessey, field notes, 2000).

INTERACTING WITH LANDSCAPE THROUGH PLANT MANAGEMENT

Thus far I have described toponyms and narratives about plants and land as well as the identification and naming of habitats. The engagement of British Columbia's First Nations with the land goes beyond passively moving over it or identifying plant habitats to a deep knowledge of how to manipulate it to enhance the health and productivity of key plants and habitats. A great deal has been written about landscape management in British Columbia (e.g., Deur and Turner 2005; Peacock and Turner 2000; Turner 1999; Turner and Peacock 2005; Johnson 1999; Trusler and

Johnson 2008), especially with regard to Aboriginal burning. Certain culturally valued plants, especially berry and root vegetable species, become less productive or are unable to survive in the absence of episodic disturbance, and people have learned to manage key locations through landscape burning. Named managed berry patches have been documented for a number of groups. Black huckleberry is very widely managed by periodic firing (Mack and McClure 2002; Turner 1999; Turner et al. 2011; and others). In the absence of such management, this plant does not persist in a healthy fruiting condition. Trusler and Johnson (2008) suggest that, in Witsuwit'en and Gitxsan territories, the very location of berry patches on the landscape was dictated, at least in part, by management of sites on the part of specific house and clan groups who owned bounded territories and incorporated them into their seasonal rounds. McDonald (2005) shows that the Tsimshian of the lower Skeena River constructed and maintained a network of trails allowing access to a number of specific high-elevation berry patches. Habitats for numerous other berry species and traditional root vegetables were also maintained by fire in habitats from sea level to subalpine elevations by many other BC groups (Ignace 2008; Turner 1999; Turner et al. 2011).

Another way in which people interacted with plants and landscape was by tending and transplanting desirable plants, thus influencing both the quality of harvestable plants and the localities in which they grew (see Deur and Turner 2005; and Turner et al. this volume). I have argued that the distribution of Pacific crabapple, at least on the northern coast and adjacent interior, may be highly anthropogenic (Johnson and Downs 2007); further work remains to be done with regard to characterizing its distribution and association with village sites, fish campsites, and travel corridors. As mentioned previously, northern riceroot, at least in upriver localities along the Skeena and Bulkley drainages, also seems to be associated with meadows maintained by episodic burning and with village or campsites and, as with wood fern rhizome, is perhaps maintained by digging, thinning, and tending (Johnson-Gottesfeld 1994).

At the level of cultural values and broad perceptions of landscape gradients, there is an axis of human presence that, at one extreme, has highly disturbed village sites (where humans, dogs, and their activities are salient) and, at the other, has remote "clean" places in the "backwoods" (*galdo'o*) or "up the mountain." Medicinal plants such as devil's club or false hellebore should be gathered in clean, relatively remote places for maximum healing efficacy (Gottesfeld and Anderson 1988).

CASE STUDY: LINKING PLANTS WITH PLACE THROUGH TIME

Here I present a synopsis of my Gitxsan landscape work in order to provide concrete examples of landscape-level human-plant relationships and understandings of habitats (see also Johnson 2010a; Trusler and Johnson 2008). A block diagram giving a generalized mid-Skeena valley landscape is presented as Figure 1.[5] My initial intent in beginning landscape work was to clarify habitat descriptions. I quickly became aware that my concepts of plant habitats and descriptions of where to find specific plants were not matching up with those of my local teachers (Johnson 2000). As I asked for terms that would describe the various kinds of places I had depicted (with real examples of each type in mind), I found that my consultants could describe vegetation and habitats depicted. If one needed to describe a pine wood, one could talk of *spaayt sginist***.** This construction was used when one of my local teachers described pine stands as "health giving" (Tenim Gyet, Art Mathews transcript, 27 October 1997, p. 11). Earlier, in my initial attempts to systematically elicit vegetation terms, I recorded the following in my notes (LMJ, interview with Peter Muldoe, Si'moogit Gitludaahl, notes, 19 July 1994):

> *Spagadegantx* is being out in the bush. This is the closest Pete can think of to a word for forest. He says that they don't have words for different kinds of forest, just words for different trees like poplar, pine, hemlock, cottonwood, birch.

In Figure 1, various terms provide basic orientation on the land – "up slope," "bottom land by the river," "upstream," and "downstream" – and describe its basic features: "stream," "lake," "mountain peak." Some terms have direct significance as plant habitat: *lalax̲'u*, "swamp," and *lax̲'amaaxws* (Figure 2) and *lax̲' aamit*, two terms for openings, as in alpine meadows or mountain meadows, or vegetated avalanche tracks (for which the sliding, not the vegetation, is the significant factor). One term, *anhlo'o*, means "place of sliding," while the other, *lax̲'ensuuks*, refers to the downed logs on an old slide area. I was given descriptive terms for several forest types: mixed forest was rendered *sbagaytgangan*, "among the trees/trees" (reduplication of term for wood/trees to indicate

[5] I originally drew this diagram in pen, labelled with English-language terms for various habitats and features, intending it as a prototype for discussions of where to find culturally significant plants in the local environment. It was to appear in a proposed local handbook on Gitxsan plant uses.

plurality). When I asked about cottonwood stands by the river, the Gitxsan translation was *am 'melmgaliaks*, "cottonwood trees by the large river" – an exact translation of the descriptive phrase. I indicated a forested mountain slope (the normal condition in this inner Coast Mountain landscape), which was described as *lax̲ sga'nist*, "on mountain." The forest here is the unmarked condition, while openings are contrastively designated. A last vegetation type, called *ts'ex̲*, "mountain juniper," is used to refer to timberline krummholz vegetation.[6]

Much discussion of plants on the landscape involves a network of specific remembered locales and an intelligent extension of the characteristics of known sites to new places of similar appearance. House territories (*lax̲'yip*) have an array of resource patches from valley bottom to alpine, connected by trails and camps, allowing access to a full range of resources (both plant and animal) during the seasonal round. Trails and camps can be designated by an associated activity: berry patch, berry camp (*ha'niijok̲am sii maa'y*),[7] hunting trail (*ginim siilinasxw*), and so on. Certain plants (e.g., black huckleberry) had specific owned, named, and managed patches, and landscape burning was, until the 1930s to early 1940s, used to maintain patches at peak productivity (Johnson 1999). Burning was integrated within the reciprocal obligations of different clans and houses, being taken care of by the father's or husband's house.

Other plants of interest were encountered in specific places on territories, such as areas in the subalpine that were especially clean and suitable for the gathering of certain medicines. Some medicinal plants, like yellow pond lily (*Nuphar polysepalum*), characterize the margins of smaller lakes. There is evidence that riceroot lily thrived particularly in meadows subjected to episodic burning to retard succession to woody species, and, as I alluded to earlier, there is a possible anthropogenic distribution of riceroot within Gitxsan territory. Wood fern rhizomes of harvestable quality and size require certain rich, moist, and relatively open localities to grow well. Elsewhere, I argue that harvesting these rootstocks and, as with other groups, replanting the small end pieces (Jeff Harris, notes, 1987) helps to maintain the quality of the rhizomes. Fern rhizome patches were often associated with areas of snow ac-

[6] This term is cognate with the ordinary term for juniper (*Juniperus communis*) in Nisga'a (Burton 2012). It is one of two terms used for juniper in Gitxsan; the term *lax̲sa lax̲nok̲* is more often used to refer to the plant when its boughs are being used for medicinal or spiritual purposes in Gitxsanixmax̲ (see Johnson 1997). Interestingly, the term is also borrowed into Witsuwit'en to refer to the timberline vegetation but is not the term for the juniper plant in that language (in which it is *det'san 'il*, or "crow's conifer needles").

[7] Gyeets dialect of Gitksenimk, from "Notes and Annotations for Land section of Gitksan Dictionary, May 22, 1998, Gitanmaaxs Hall," in author's files.

cumulation, frequently montane or subalpine localities (e.g., Blue Lake for Witsuwit'en, sites above Kuldo Creek for Gitxsan), though specific low-elevation localities were also known (Turner et al. 1992).

The harvesting of edible tree cambium certainly had a spatial component, and, as with other groups,[8] people likely knew areas with high-quality trees. For lodgepole pine, a young, quickly growing stand is needed, and the location of such stands is likely to shift with post-fire or disturbance succession. For western hemlock, it is likely that the places with high-quality trees were known and persisted through time. Swat discovered an area with a large number of hemlock food trees on the Shedin in the Upper Skeena, suggesting an earlier extensive trade in cambium (unpublished report and personal communication, Darlene Vegh).

Harvesting cedar bark for mats, baskets, roofing, and other purposes certainly had, and has, a spatial component. Past patterns can be discerned through examination of the age and spatial distribution of cmts, as has been done elsewhere in the province (cf. cmt case study, Eldridge, this volume).

Tables 1 and 2 present selected Gitxsan and Witsuwit'en vegetation and plant habitat-related terms (see also Figure 1; and Johnson 2011).

A similar range of botanical habitat terms has been documented for other regions of British Columbia (cf. Antoine et al. 1974; Burton 2012; Ignace 2008; Moore and Wheelock 1997).

PAST AND FUTURE LANDSCAPE WORK

Innovative and First Nations-driven mapping approaches to landscape can yield useful perspectives that may, under certain conditions, lead to effective co-management of plant resources by First Nations and other tenure holders, especially the provincial Crown. The landmark work carried out by the Scientific Panel for Sustainable Forest Practices in Clayoquot Sound (1995) pioneered effective intercultural communication. Goetze (2005) discusses the conditions under which co-management was able to put some of these understandings into action. Ron Ignace's (2008) detailed and rich PhD dissertation suggests the potential of an integrated understanding of landscape (including history and deep cultural knowledge) for land management and planning and for supporting Aboriginal sovereignty. Carla Burton's (2012) recent PhD dissertation presents some insights into locating and planning

[8] This was explicitly described by Haisla elders Gordon and Phyllis Robinson for hemlock cambium near the IR1 village site on the Kitimat River Delta (May 31, 1988 interview notes LMJ Gottesfeld).

TABLE 1
Terms describing vegetation and plant habitats – Gitxsan

Vegetation types	Meadow and swamp
lax̲'aamit	"meadow" (snow bed areas and other treeless places)
lax̲'amaaxws	"meadow" (alpine and other treeless flats)
laalax̲'u	swamp, wet meadow, muskeg
Vegetation types	**Forest and scrub**
sbaaytgan	forest
sbagaytgan	forest
sbagaytgangan	mixed forest
sbagayt-am'mel	cottonwood forest
sbaayt sginist	pine grove, pine stand
sbaa ts'ex	scrubby coniferous growth (juniper), krummholz (timberline)
sbagadegantx	forest
lax̲sga'nist	forest area if it is up a mountain
am 'melmgaliaks	floodplain cottonwood, cottonwood-along-the-river
luulax̲suuk̲s	dense scrub regrowth in old slide area
gakslax̲ sga'nist	timberline (the actual line dividing forest growth from alpine)
Vegetation types	**Burns and berry patches**
ts'i'naast	burned-over patch (for berries or deer browse); clearing
lax̲'anmihl	burned-over area
lumks tsee gantx	"all the timber coming up again" after the burn
ansimaa'y	"berry grounds"
maaxsgan	too much brush or undergrowth on the berry patch

TABLE 2
Terms describing vegetation and plant habitats – Witsuwit'en

Vegetation types	Timberline, open areas, burns, and berry patch
ts'ikh	"dwarf trees at timberline, krummholz"
scinlegh	"timberline"
wize begh	"timberline"
wik'ink'it	"burned area"
widïnk'in'k'it	"burned area"
niwdïzk'an	"burned area"
nit'ay k'it	"berry-picking ground"
wizulh k'it	"open area, also above timberline; bare ground with nothing on it"
Vegetation types	**Meadow and swamp**
tl'o k'it	"meadow, open grassy area" (e.g., a lawn, a grazed slope, alpine meadow)
tl'otl'is (k'it)	"meadow, marsh" (where large grass grows)
c'iye (k'it)	"swamp" (where moss grows?)
ts'al k'ët	"swamp" (lit. diaper place)
witsil k'it	"damp place"
c'ato', lht'ato'	"swamp"
k'ëndlih c'ato'	willow swamp
Vegetation types	**Forest and scrub**
dic'ah	"(in the) bush"
dicin tah	"(in the) bush," "among the trees/sticks" (for mixed forest)
widits'itl	"it's really brushy," "jungle"
ts'o co tah	"big spruce country," spruce forest area
tighiz co tah	"big poplar country," poplar woods
k'ëndlih co tah	"big willow country," willow swamp, willow thicket; lit. among big willow

for management of devil's club in Nass Valley clear-cuts, building on earlier work targeting ecological parameters of black huckleberry and examining growth conditions in post-logging settings (Burton 1998). She also attempts to elicit ecological terms, following my earlier models (Johnson 2000, 2010a).

Researching local knowledge of habitats, plant distributions, and their management can enrich our relationships with the land and aid in articulating long-term sustainable relationships to land in British Columbia. This effort can also help to contextualize traditional knowledge of plants and animals as well as to aid in language preservation. Landscape terms and related knowledge are evident in place names; names of chiefs, crests, and other cultural entities; and in the oral histories of people. Documenting the meanings and applications of these words and appreciating the significance of places they delineate enriches understanding of history as well as contemporary relationships to land. Incorporating a sense of history and the significance of Indigenous understandings of the relationships of people to plants and landscapes into educational settings is a step towards a more sustainable future in British Columbia.

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