Conservation Value of the North American Boreal Forest from an Ethnobotanical Perspective

CANADIAN BOREAL INITIATIVE

David Suzuki Foundation

BOREAL SONGBIRD INITIATIVE

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About the Canadian Boreal Initiative
The Canadian Boreal Initiative (CBI) is a national convener for conservation in Canada's Boreal Forest. We work with conservation organizations, First Nations, industry and others – including members of the Boreal Leadership Council – to link science, policy and conservation solutions across Canada's Boreal Forest. For more information visit: www.borealcanada.ca

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The David Suzuki Foundation works with government, business, and individuals to conserve our environment through science-based education, advocacy, and policy work, and acting as a catalyst for social change. The Foundation's main goals include ensuring that Canada does its fair share to avoid dangerous climate change; protecting the diversity and health of Canada's marine, freshwater, and terrestrial wildlife and ecosystems; and making sure that Canadians can maintain a high quality of life within the finite limits of nature through efficient resource use. For more information visit: www.davidsuzuki.org

About the Boreal Songbird Initiative
The Boreal Songbird Initiative (BSI) is a non-profit organization dedicated to raising awareness, through science, education, and outreach, of the importance of the Canadian Boreal Forest to North America's birds, other wildlife, and the global environment. For more information visit: www.borealbirds.org

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Highbush cranberries (Viburnum edule) -Nancy Turner

Cloudberries (Rubus chamaemorus) -Amanda Karst

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Introduction

The Boreal region in North America covers a vast area (almost six million km^2) composed of a patchwork of unique habitats (Johnson et al 1995; CBI 2005; Trelawny 1988). The traditional territory of many indigenous[1] people is within the Boreal region; there are hundreds of Aboriginal communities in the Canadian Boreal (Senate subcommittee 1999). Indigenous connections to the Boreal landscape go far beyond utilitarian purposes. Not only have indigenous people obtained all the resources necessary for survival from this environment, they have also developed a sacred cultural connection to the Boreal. Specifically, the Boreal has significant ethnobotanical (relationship between people and plants) importance to indigenous people from this region. This ethnobotanical importance along with the collective traditional knowledge that is unique to and intrinsically tied to this region and the rich variety of plants from which this knowledge stems, lend tremendous weight to the significant conservation value of the Boreal region. This paper will outline the variety of ways that indigenous people use the plants in the Boreal region, the significance of plants to their cultures and the major threats to Boreal plants today.

Traditional ecological knowledge can be defined as a "cumulative body of knowledge, practice, and belief, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment" (Berkes et al. 2000). These indigenous knowledge systems have resulted in the use of a wide range of Boreal plants for food, medicine, shelter, transportation, and art (Andre et al. 2006, Arnason et al. 1981, Kuhnlein and Turner 1991, Marles et al. 2000, and Moerman 1998). Plants also hold spiritual and ceremonial significance, important in maintaining cultural well-being and identity.

It has been estimated that the current value of the Canadian Boreal to Aboriginal people in terms of subsistence (plant and animal) foods alone is between 261.4 million and 575.1 million dollars (Anielski 2005). This estimate does not encompass aspects of the indigenous relationship to the Boreal landscape in which no monetary value can be placed, for example, as a source of spiritual and cultural inspiration and wellbeing. However, this estimate provides an indication of the economic importance of this region to indigenous people living there.

Boreal plants have always played a significant role in the cultural fabric of indigenous people living in the region. Food and beverage plants provide significant nutritional benefits, especially to predominantly meat-based diets in the Boreal region. The knowledge of plant medicines and applications were and continue to be a fundamental component of the holistic healing practices of indigenous people. Comprehensive use of the Boreal landscape in early times would not have been possible without transportation and other technological materials that were made from plant products. It is not only the detailed knowledge of plant resources but the cultural values and social practices, communicated through stories, legends, and place names that were and continue to be essential to

Mountain River, a tributary of the Mackenzie River IRENE OWSLEY

1 The use of "Indigenous" throughout this paper represents Aboriginal people (i.e. Inuit, Métis and First Nations people) in Canada and indigenous people (Alaska Natives and Native Americans) in the United States.

Indigenous People

Plants have been an important part of indigenous Boreal cultures for thousands of years.

Traditional Dene beadwork in the Northwest Territories GARTH LENZ

Indigenous people in the Boreal region

Indigenous people who reside in the Boreal region are comprised of two main language groups: Athapaskan (Dene) in the northwest and Algonquian in the southeast (Marles et al. 2000). The two main branches of the Algonquian language family are Cree and Ojibway (Rhodes and Todd 1981). Dialects of Cree (e.g. Woods Cree, East Cree, Attikamek) are spoken by Aboriginal people living in Alberta across to Quebec. Dialects of Ojibway (e.g. Saulteaux, Central Ojibwa, Algonquin) are spoken from Saskatchewan across to Ontario. Languages from the Northern Athapaskan language group are spoken by indigenous people from the subarctic interior of Alaska (e.g. Koyukon, Tanana, Dena'ina) across to Yukon and Northwest Territories (e.g. Gwich'in, Tutchone, North Slavey, Dogrib, Chipewyan) and south to Northern British Columbia (e.g. Tahltan, Carrier, Sekani, Beaver) and Alberta (e.g. Chipewyan). Many of the names listed previously represent names that were used in anthropological literature, but may not necessarily represent the names preferred by indigenous people. Some groups have defined or reclaimed their own names for their people and languages. For example, many Ojibway speakers prefer to identify themselves as Anishnaabe. Many indigenous groups in Labrador and Quebec that were previously known as Naskapi and Montagnais (languages belonging to the Cree language family), now identify as Innu. The Métis, people with a mix of European and First Nations/ Inuit ancestry, reside in areas across the Boreal region. The Inuit people occupy areas North of the Boreal region, but occasionally travel south into forested areas (Marles et al. 2000).

Although there is substantial cultural diversity among the indigenous people in the Boreal region, there are some commonalities. In the recent past, most Boreal indigenous people were generally nomadic hunter-gatherers, astute observers, who moved seasonally to follow resources (McClellan and Denniston 1981; Rogers and Smith 1981). During the long winter seasons, when the land is covered in snow and water bodies are frozen, people would often split into smaller groups to harvest the fewer available resources. The main mode of transportation in the winter was by foot, snowshoe and toboggan. During the short warm summers, larger groups would often gather together, along shores of rivers, lakes and waterways to trade resources, harvest fish and renew social ties. The main form of travel during the summer period was by canoe. Subsistence was predominantly by hunting big game, trapping, and fishing. Meat sources include caribou (Barren ground and woodland), moose,

SOURCE: CANADIAN BOREAL INITIATIVE

bear, sheep, goat, lynx, partridge, waterfowl, beaver, rabbit/snowshoe hare, otter, porcupine, and fish (e.g. salmon, whitefish, trout) (McClellan and Denniston 1981; Rogers and Smith 1981).

Plants have been an important part of indigenous Boreal cultures for thousands of years (Andre et al. 2006). A number of archaeological findings support this. In 1999 the remains of Kwädáy Dän Ts'ìnchi ('person of long ago that was found'), who lived 550-600 years ago, was discovered along with numerous plant and animal remains. Discovered in a melting glacier in the Saint Elias Mountains of Tatshenshini-Alsek Park, British Columbia (approximately 1,600 m elevation), present day Southern Tutchone territory, Kwädáy Dän Ts'ìnchi was found with a twined conifer-root hat, mountain hemlock (*Tsuga mertensiana*) needles, and the fruit of mountain sweet-cicely (*Osmorhiza berteroi*, a herbaceous plant) (Andre et al. 2006; Beattie et al. 2000; Dickson et al. 2004). Other archaeological excavations, such as the Saskatoon Mountain site in northwestern Alberta, can provide indirect evidence of plant use (Andre et al. 2006). At this site, a hearth located at the base contained charcoal dated from more than 9,000 years ago. At this hearth there were a number of carbonized seeds found from species (e.g. *Rubus* sp. [raspberry], *Prunus* sp. [chokecherry], *Rosa* sp. [wild rose], *Fragaria* sp. [wild strawberry], and *Arctostaphylos uva-ursi* [kinnikinnick or bearberry]) that are still used by indigenous people in the Boreal today (Andre et al. 2006).

The next sections will outline the details of plant use by Indigenous people in the Boreal. Of course, as expected, there have been changes in plant use over time, for example, shifts in intensity of use, but in general, the reliance on and applications of Boreal plants remain high.

Two old Sahtu Dene canoesin Fort Good Hope, NWT

IRENE OWSLEY

Plant Foods

Berries are the plant food type most frequently gathered by contemporary indigenous people in the Boreal region.

Cree children picking blueberries NATASHA MOINE

Crowberries (Empetrum nigrum) NANCY TURNER

Plant foods

Plants used for food by indigenous people have always been essential components in a predominantly meat-based diet since they contribute important vitamins and nutrients, such as Vitamin C, A, calcium, and fibre (Arnason et al. 1981; Marles et al. 2000; Kuhnlein and Turner 1991). Indigenous people learned to take advantage of a variety of plant foods, which are generally divided into categories of green vegetables, "root" vegetables, fruits, and other plant foods, including the inner bark of trees and plants used for beverages and flavourings (Andre et al. 2006).

Berries are the plant food type most frequently gathered by contemporary indigenous people in the Boreal region (Andre et al. 2006). They serve as a sweet flavouring agent for foods and also provide necessary nutrients, such as Vitamin C and sometimes Vitamin A and calcium (Kuhnlein and Turner 1991). Most berries such as crowberries (*Empetrum nigrum*), low sweet blueberries (*Vaccinium angustifolium*), bog blueberries (*V. uliginosum*), saskatoon berries (*Amelanchier alnifolia*), and cloudberries (*Rubus chamaemorus*) are available between July and August (Andre et al. 2006). Some, such as small cranberries (*V. oxycoccus*), bog blueberries (*V. uliginosum*), bearberries (*Arctostaphylos alpina*), rosehips, *(Rosa acicularis)* highbush cranberries (*Viburnum edule*), and lingonberries (*V. vitis-idaea*), are still available into September and in the winter (Andre et al. 2006).

Berry gathering is typically a much anticipated event (Kuhnlein and Turner 1991). Often groups of friends and/or families set up berry picking camps, staying for days or weeks (Jones 1983; Oswalt 1957; Parlee et al. 2004; Russell 1991, 1994; Thornton 1999). Generally women and children were, and still are, the primary berry gatherers (Jones, 1983; Kari, 1987; Russell, 1991) but men sometimes gather as well (Karst 2005; Oswalt 1957; Thornton 1999). Among the Algonquin and Innu whole bands would move to good blueberry picking areas in August and September (Black, 1980; McGee, 1961). Those that did not have close access to wild blueberries would travel great distances (e.g. 90 miles by train) to collect them for their own use and for selling, combining these trips to visit relatives (Black 1980; Parlee et al. 2006).

Traditionally, people carried and stored their berries and other food in birchbark baskets (Andre and Fehr 2001; Kari 1991; Marles et al. 2000). Berries can be eaten fresh, mixed with oil and/or sugar or served in "Eskimo/Indian ice cream" (Eidlitz 1969; Jones 1983; Kari 1987; Kuhnlein and Turner, 1991). This last dish, popular with many indigenous groups, is made by whipping warmed animal fat into a foam by hand. As the fat slowly cools, berries, and sometimes cooked or fermented greens, fish, or meat, are added (Jones, 1983). A number of indigenous people make foods from a combination of plants, meat and fat/oil. The Gwich'in eat *itsuh*, where berries are mixed with pounded dried fish or dried meat (Andre and Fehr 2001). Pemmican, a well known staple among prairie Plains people, was made with dried, powdered caribou meat, berries, and caribou lard by the Chipewyan (Marles et al. 2000).

Each type of fruit would require different conditions for storage, commonly drying or underground storage, before

freezers were available (Andre et al. 2006). Some people would mash some types of berries, like blueberries, and dry them in the sun into cakes; the cakes would be eaten with other foods after being soaked in water (Kuhnlein and Turner 1991; Wennekens 1985). Historically, berries were often kept in underground pits to prevent spoiling, sometimes stored in seal oil or water with other berries or greens (Andre and Fehr 2001; Jones 1983; Wennekens 1985). The containers used to store the berries underground were often baskets or food pokes, which were pouches made of the skin or stomach of a seal or other animal (Heller 1976; Jones 1983; Russell 1991; Shismaref Day School Students 1952). Some favoured Boreal berries include bog blueberry (*Vaccinium uliginosum*), cloudberry (also known as bakeapple, or for some, salmonberry; *Rubus chamaemorus*), saskatoon (also called serviceberry; *Amelanchier alnifolia*) and lingonberry, or lowbush cranberry (*Viburnum edule*; see Table 1). Some of the less flavourful berries (e.g. bunchberry; *Cornus canadensis*) were generally harvested less intensely in the past, except during times of famine.

Greens (stems, shoots, leaves of edible plants) provide essential nutrients such as vitamin C, carotene, folates, iron, calcium, and magnesium (Kuhnlein and Turner 1991; Szczawinski and Turner 1980). Plants are often gathered while they are young because when they mature their taste often becomes too strong and they become toxic or difficult to digest (Andre et al. 2006; Kuhnlein and Turner 1991). Common greens include fireweed, cattails (*Typha* spp.), and mountain-sorrel (*Oxyria digyna*). The plants can be eaten immediately, either fresh, cooked, or they were fermented in the past. Historically, if greens were stored for winter, they would be put in barrels or pokes with animal oil or berries, and place in underground pits (Jones 1983; Wennekens 1985).

Roots (roots, corms, bulbs, rhizomes and tubers) serve as an important source of carbohydrates in traditional diets of indigenous people in the Boreal (Andre et al. 2006). Alpine sweetvetch (*Hedysarum alpinum*; also known as Eskimo potato, licorice root, Alaska carrot, or bearroot) is one of the most popular root foods and was gathered either just before freeze-up in the fall or as soon as the ground thaws in the spring (Andre and Fehr 2001; Kuhnlein and Turner 1991). Water parsnip (*Sium sauve*) was also a popular root that was dug in the spring and summer, and it was eaten raw, fried, steamed, or roasted. Both alpine sweetvetch and water parsnip are very similar in appearance to poisonous species (boreal sweetvetch [*Hedysarum boreale*] and water hemlock [*Cicuta* spp.], respectively), which underscores the importance of adeptness at recognizing the proper species. The survival of indigenous people and their continued use of plant resources depended on their ability to skillfully identify the proper plant species.

Wild rice (*Zizania aquatica*) was a vital food source to the Ojibway and Cree in the eastern part of the Boreal (Kuhnlein and Turner 1991) and has more recently become a specialty item. It is harvested from late August to late September. The traditional method of harvesting is by canoe, in which plants are initially tied together in bundles. Two people work together, one poling through the bundles of wild rice, the other hanging the bundles over the canoe and beating the rice off the plants into the canoe.

Cree prepping roots NATASHA MOINE

Roots (roots, corms, bulbs, rhizomes and tubers) serve as an important source of carbohydrates in diets of indigenous people in the Boreal.

Lichen on rocks and trees AMANDA KARST

Historically the rice would be stored in sacks or underground caches after it was cured and the awns were thrashed off. Wild rice is the only cereal crop that grows wild in Canada and is currently being marketed by some indigenous groups.

Some indigenous people in the Boreal region ate the inner bark or cambium (the growing layer between the bark and wood) of some tree species in the spring and early summer. The inner bark was often grated into fluffy layers and eaten or dried and pounded into flour. The Eastern Gwich'in and Inupiat ate the cambium of a number of willow species, which are rich in vitamin C (Andre and Fehr 2001; Jones 1983). Western hemlock and mountain hemlock (*Tsuga heterophylla, T. mertensiana*) were also used for their cambium by the Chugach and others who had access to these trees. The Ulkatcho Carrier, Chilcotin (Tsilhqot'in), and others ate the inner bark of lodgepole pine (*Pinus contorta*) (Hebda et al. 1996). The Innu ate the inner bark of balsam fir (*Abies balsamea*) and paper birch (*Betula papyrifera*) and they were known for their regular consumption of inner bark (Arnason et al. 1981; Chamberlain 1891).

People living in the Boreal region consume a number of plants for beverages and often the plants used to make drinks are considered medicinal as well. Labrador tea *(Ledum groenlandicum)*, a popular beverage for indigenous groups across Canada, is available and gathered year round (Black 1980; Kuhlein and Turner 1991; Marles et al. 2000; Speck 1917). Rosehips (*Rosa acicularis*) and wintergreen, or teaberry (*Gaultheria procumbens*) are widely gathered beverage plants (Black 1980; Kuhnlein and Turner 1991; Turner and Szczawinski 1978). Some indigenous groups collected the sap from paper birch and drank it as a beverage or added it to soups (Kuhnlein and Turner 1991). Wild chives *(Allium schoenoprasum)* are widely used to flavour foods. Wild ginger (*Asarum canadense*) was often used by the Innu and Ojibway as seasoning in cooking. It was also common to chew on the pitch (the older hardened sap) of conifers, especially white spruce (*Picea* spp.), like a chewing gum (Andre et al. 2006; Andre and Fehr 2001; Hebda et al. 1996; Jones 1983; Kuhnlein and Turner 1991; Marles et al. 2000; Wennekens 1985). Chewing pitch is said to help the teeth and gums as well as deter children from eating berries while out berry picking, since the pitch "spoils the taste of any food for hours and hours" (Jones 1983).

Lichen was a regular food source to some and a reliable famine food to other indigenous people in the Boreal (Andre et al. 2006). Due to the indigestibility of complex polysaccharides contained in lichens, preparations of lichen that neutralize acids prior to consumption is critical. The most widespread method of eating lichen is partially digested, from a caribou stomach or rumen (Andre et al. 2006; Andre and Fehr 2001; Eidlitz 1969; Marles et al. 2000). The caribou stomach sometimes also contains mushrooms, horsetails, birch, willow, shoots of sedges, cottongrasses, berries, and herbs and all the contents would be fermented or cooked and eaten with meat (Andre and Fehr 2001; Eidlitz 1969). This food provides a number of nutritional benefits, such as vitamins C, B12, A, and D, carbohydrates, and some protein (Kuhnlein and Turner 1991). The complex carbohydrates and proteins that are generally indigestible to humans are partially broken down in the caribou stomach (Kuhnlein and Turner 1991). Other methods of eating lichen species are to soften it in hot water and mix with berries, fish eggs or grease (e.g. *Cladonia*

rangiferina, Alectoria spp.) or make a stew or gravy (e.g. rock trip lichen). The process of thoroughly washing, boiling or soaking lichen helps remove the mildly toxic secondary compounds that are typically found in lichens (Crawford 2007). In general, it is assumed that northern indigenous people did not eat mushrooms in the past, but there is evidence of minor use (Andre et al. 2006).

The knowledge and use of wild food plants not only benefited indigenous people (Andre et al. 2006). Some early European explorers and traders made use of a number of edible plants (e.g. berries, conifer teas, alpine sweetvetch [*Hedysarum alpinum*], rock tripe lichen [*Umbilicaria* and related genera]) and in some cases they relied on these plants for their survival (Andre et al. 2006). Additionally there are a number of European plants that became naturalized in North America, such as lamb's-quarters (*Chenopodium album*) and common dandelion (*Taraxacum officinale*) that were adopted by Boreal indigenous people (Andre et al. 2006).

Due to the indigestibility of complex polysaccharides contained in lichens, preparations of lichen that neutralize acids prior to consumption was critical.

Labrador tea and reindeer lichen

AMANDA KARST

Medicinal Plants

Labrador tea (Ledum groenlandicum) NANCY TURNER

Medicinal plants

Plants also play a central role in traditional healing practices and wellness of indigenous people in the Boreal region, through both the treatment of injuries and ailments and maintenance of general health. Medicinal plants come from all plant types: trees, shrubs, herbaceous flowering plants, ferns and fern allies, mosses and lichens, as well as fungi (Andre et al. 2006). Shrubs and trees (e.g. *Abies balsamea, Larix laricina, Picea* spp, *Pinus* spp, *Tsuga canadensis*, *Thuja occidentalis*) are the plant type used most intensively for medicine (Andre and Fehr 2001; Arnason et al. 1981; Garibaldi 1999).

Medicines are prepared and applied in various ways, depending upon the disease, injury, or ailment to be treated (Andre et al. 2006). An extract or infusion, where plant parts are immersed in hot water, is often made to treat internal ailments or as a general tonic. A poultice or plaster, where the plant 'is mash up or ground into a powder and applied to the body, or a powder made from the plant, is often used to treat external ailments. Colds and respiratory ailments are sometimes treated by having the patient inhale steam from boiling the medicine (Andre and Fehr 2001; Garibaldi 1999; Marles et al. 2000; Ryan et al. 1994). Other methods of preparation include: bath (an herbal soak for part of or whole body), powder or snuff (plant material ground into a powder, often inhaled through the nose), and salve (thick herbal paste applied to skin) (Garibaldi 1999).

Indigenous people traditionally have a holistic approach to health, in which both the physical and emotional aspects are addressed (Andre et al. 2006). Cultural values, beliefs, and rituals as well as the role of the family and other community members are all necessary components of healing (Andre et al. 2006; Andre, Welsh, and Turner 2003). Social activities like medicinal plant collecting or berry-picking excursions provide a number of health benefits: the nutritional/medicinal benefits of the plant, the physical activity involved in gathering as well as the opportunity to bring families and community members together. For many indigenous people in the Boreal, the natural world and spiritual world are connected, which plays an important part in traditional medicine (Andre et al. 2006).

Often there are specific protocols for the collection, preparation and application of medicinal plants, which are fundamental to the healing process (Sherry and Vuntut to Gwitchin First Nation 1999; Wennekens 1985). In many cases, offerings of material things (e.g. tobacco, matches, shells, money, tea) or prayers are provided before a medicine is harvested (Andre 2006; Garibaldi 1999). Some indigenous people caution the use of medicinal plants by individuals not traditionally or properly taught by a knowledgeable person or elder. Doing so may bring harm to them, either from the potential misidentification or application of a plant or out of not following the appropriate protocols.

Some protocols for plant collection pertain to the effectiveness of the medicine or the resulting health of the plant or environment. The Innu believed that when bark is collected from a tree it should always be peeled downward and if it was peeled upward, the effect of the infusion would be "annulled" (Tantaquidgeon 1930). Many groups maintain the necessity of not stripping

Other Uses

bark (called 'girdling') from the entire tree trunk when collecting inner or outer bark, since this stripping kills the tree (Andre et al. 2006; Andre and Fehr 2001). These protocols were sometimes communicated through storytelling. For example the Gwich'in narrative about spruce gum informs people that spruce gum applied to a wound must fall off on its own (and not be pulled off before this) in order for the medicine to work (Andre 2006).

Other uses

Most indigenous people in the Boreal historically relied on animal products to meet all their clothing, manufacturing, and construction needs (Andre et al. 2006). However, plant materials, namely tree products, were and still are used in a variety of different ways, some of which were fundamental to the survival of Boreal indigenous people in the past. As nomadic people, the ability to travel across the landscape was essential to existence. The main modes of transportation for most indigenous Boreal people were the canoe, snowshoe and toboggan or sled, which were made using plant products. By making use of the vast waterways and extensive snow cover indigenous people in the Boreal were able to cover great distances, which was necessary in order to follow the spatially and temporally variable resources in this region.

In the Boreal region, the snow often does not pack down right away and remains soft for long periods, which means any person trying to travel over this snow requires the means to support their weight. Since all winter hunting was carried out on foot, snowshoes were an integral item. There were a variety of snowshoe styles, from more oval shapes in the East to the more narrow style in the West (Rogers and Smith 1981). Snowshoes are made using a frame from larch (tamarack) or birch wood and some people continue to make snowshoes today. The toboggan or sled was necessary for moving supplies and belongings in the winter. Toboggans are often made from two long boards of larch or birch, attached to each other with cross bars.

The canoe allowed for comprehensive use of expansive waterways in the Boreal region. Canoes were often made from birch bark with cedar, spruce, or fir for the frames. Some groups also used spruce-bark canoes. The construction of a birch bark canoe was a labour-intensive process that required the cooperation and expertise of a network of individuals (Evans 2008). Canoe building would typically take place in the spring or early summer, when the bark was more easily removed. The canoe invented by indigenous people in North America is the only bark canoe in the world that continued its use even after European contact (Jennings 2002). European water craft was adapted from the North American canoe due to its superior design and engineering and it became the primary means for communication and trade across the continent.

Many Boreal indigenous people traditionally had hide-covered lodging but some used boughs or birch bark as a covering and all used trees for the structural foundation (McClellan and Denniston 1981; Rogers and Smith 1981). Spruce boughs were also used to line the floor of houses and as bedding (Rogers and Smith 1981; Marles et al. 2000). Historically, food containers were

Cree men carving paddles NATASHA MOINE

North Shore of Lake Superior GARTH LENZ

A number of conifers (e.g. black spruce) and deciduous trees (e.g. birch, balsam poplar, willow) are used for fuel. Each species is selected for different purposes, such as smoking hides or kindling fires, based on the characteristics of the fuel.

commonly made from birch, spruce or pine and sometimes made from coiled spruce-root (McClellan and Denniston 1981). A common traditional method for cooking food was in a birch bark container using water and hot stones. Food containers or baskets were not only utilitarian but they served other purposes as well, for example, the decorative designs sometimes served as identifying marks for a person or family. Today some indigenous people continue the tradition of making containers and baskets, primarily as an art form. Spruce roots and gum were important materials in the construction of canoes, containers and other products. Spruce roots can be split into thin fibres and used to stitch items such as birch bark baskets or make coiled sewing baskets (Marles et al. 2000). The roots, one end held in the hand, the other held in the teeth, are split into thin fibres. Spruce gum is mixed with animal lard or fat and applied as a sealant to canoes and baskets.

Birch bark bitings are an art form practiced predominantly by indigenous people from the Algonkian linguistic group (Oberholtzer and Smith 1995). Algonquin named it 'picture-biting' (mizi'nikatowa) and the Cree refer to it as 'bitings.' This art form was created by folding up a piece of birch bark multiple times, inserting it between the teeth, and biting down on the bark as it's moved around with the hands to form intricate patterns. Birch bark biting was an activity shared by women and used as a pastime around the fire, a teaching tool by parents and grandparents or as templates for decorating baskets

Social Significance

or moccasins using beadwork and quillwork. While this practice has declined, there are still some who carry on the tradition. Pat Bruderer, a contemporary birch bark biter, describes all the teachings that birch bark biting provides for her: "patience, respect, kindness, creativity, medicine, imagination, and sharing."

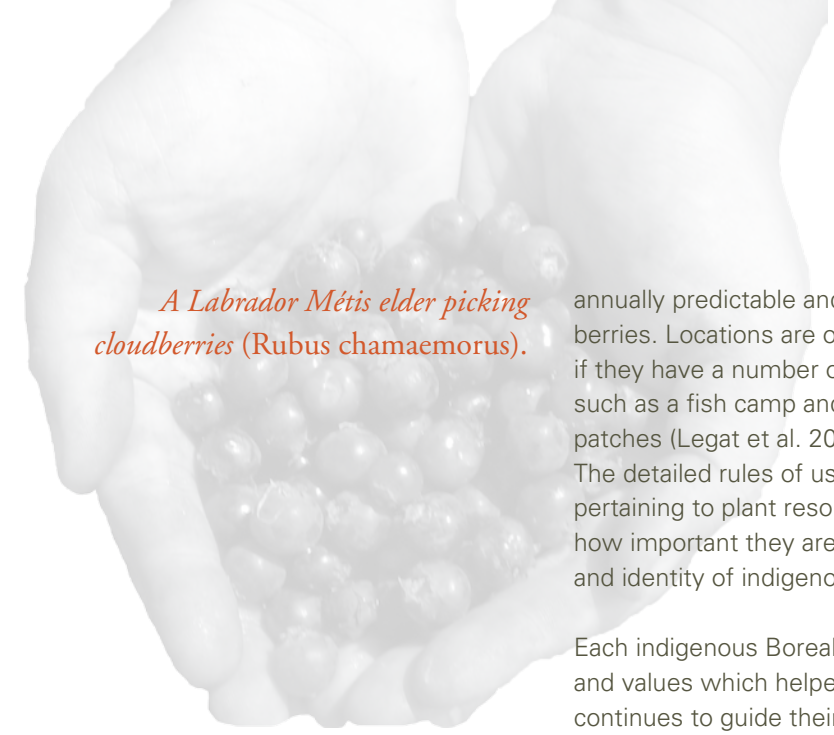
A number of conifers (e.g. black spruce) and deciduous trees (e.g. birch, balsam poplar, willow) are used for fuel. Each species is selected for different purposes, such as smoking hides or kindling fires, based on the characteristics of the fuel (Andre et al. 2006). Materials from shrub and tree species were historically used to make a variety of products including fishing nets (made from willow bast or nettle fibre), bow and arrows, snares, cradleboards, hide stretching frames, snow goggles, digging sticks, drum frames, implement handles, and moose callers (Marles et al. 2000; Rogers and Smith 1981). Sphagnum (moss) has been used extensively by indigenous people due to its antiseptic and absorbent properties. It can be used for purposes such as toilet paper, sanitary napkins, diapers, and floor scrubbers (Marles et al. 2000).

Management, social significance and values of plants

Landscape burning was a common practice in the Boreal region to maintain a diversity of habitats (Davidson-Hunt 2003; Johnson Gottesfeld 1994a; Lewis 1982; Lewis and Ferguson 1988, Natcher et al. 2007); this was most often done to enhance the growth of berries (Black 1980; Grenfell 1910). Indigenous people may have also influenced the ranges of certain plant species, since there are records of people moving plants and animals from one locality to another (Black 1978). Indigenous use of plants was also tied to the animals in the region (Andre et al. 2006). In some cases, animals have shown people safe (i.e. not poisonous) plants to eat and in other cases, plants have aided in hunting by indicating whether an important animal was in an area (Hebda et al. 1996; Kari 1991).

The significance of plants to indigenous Boreal communities is illustrated by the complex social practices related to plant use. Historically, plants played a very important role in the local economy of indigenous people, from trade with neighbouring bands to sharing or trading between members in the same community (Leighton 1985; Kuhnlein and Turner 1991; Parlee et al. 2006). For some people there are rules that govern access to certain plant resources, such as berries. The areas where individuals harvest berries are dependent on family ties and friendships or personal knowledge; some individuals pick in the same location where their parents and grandparents picked berries (Karst 2005; Parlee et al. 2006). In some areas where individuals or families were known to 'own' berry patches, others had to ask permission if they want to pick in that area. This practice continues in some places to this day. Some individuals can be secretive about their berry picking areas and might only share information about berry harvesting locations with family and close friends (Karst 2005; Parlee et al. 2006). The ecological qualities of the berry or plant can also influence use. For example, for the Teetl'it Gwich'in, individuals are more likely to be secretive about harvesting areas when these areas produce more

Tradtional Dene drum dance in the Northwest Territories GARTH LENZ



A Labrador Métis elder picking cloudberries (Rubus chamaemorus).

annually predictable and long lasting berries. Locations are often highly prized if they have a number of resources, such as a fish camp and berry picking patches (Legat et al. 2000; Parlee 2006). The detailed rules of use and knowledge pertaining to plant resources indicates how important they are to the culture and identity of indigenous people.

Each indigenous Boreal group has beliefs and values which helped guide and continues to guide their relationship to the plants and their whole environment (Freeman and Carbyn 1988; Johnson Gottesfeld 1994a, b; Ryan et al. 1994). Many belief systems promote the value of reciprocity: you take care of the land through respectful use of resources and the land will take care of you (Andre 2006; Autsyl K'e Dene First Nation and Stephen Ellis 2002; Johnson 2000; Marles et al. 2000; Parlee 2006). This promotes a sense of stewardship among indigenous people (SENES Consultants Ltd. 2008). In the Northwest Territories, Gwich'in berry pickers describe their rules of use as 'ways we respect each other and the berries' (Parlee et al. 2006). Another common value is the need for balanced or moderate use of the land. Gwich'in, Tanaina and many other groups are taught to just take what is needed, not to overharvest a whole area, not to waste anything or destroy a plant if it is not necessary (Andre and Fehr 2001; Andre, Welsh, and Turner 2003; Garibaldi 1999; Kari 1991; Marles et al. 2000). However, the Tanaina also believe that the edible plants that are available would become less and less available if they are not gathered regularly. Another common theme is the importance of sharing what you gather. It is a common practice to share the harvest with friends and family, especially those who cannot gather themselves, or to trade plants for another type of resource, such as fish (Andre 2006; Karst 2005, Parlee et al. 2006). These values and traditional beliefs were developed through the intimate relationship of indigenous people and their environment.

The detailed ecological knowledge of plants, cultural values and social practices are encoded in indigenous people's languages and are passed on through stories and place names (Cruikshank et al. 1990; Heine et al. 2001; Johnson 1992; Sherry and Vuntut to Gwich'in First Nation 1999). Often there are words and phrases within each indigenous language that are specific to their plant resources, for example, the plant names, categories, developmental stages, habitat, and processing. Indigenous culture and history is 'written on the land', as the Boreal landscape is covered with stories and place names (Davidson-Hunt and Berkes 2003; Heine et al. 2007; Johnson 2000). These stories provide cultural teachings, detailed knowledge of resource use, as well as a historical record of past events. In many cases, place names or areas used by an indigenous group are related to the available resources in the area. For example, the Gwich'in identified 'black currant island' in the Husky River area, and a hill along the Arctic Red River whose place name translates into 'rosehips ripened by the sun' (Andre 2006). The Dogrib call Mesa Lake in the Northwest Territories Gots'ôkatì, which translates as cloudberry lake (Legat et al. 2000). In Labrador, residents of Charlottetown have many stories for nearby islands about past berry picking experiences; some areas or islands are named after people who were known to pick berries there (Karst 2005). The 'place-based' nature of indigenous knowledge illustrates the importance of

Threats to Boreal Plants

experiential learning in these cultures. Indigenous understandings of the environment cannot be perpetuated by only recording this knowledge in written form. This knowledge must continue to be lived and learned out on the land and through this, will strengthen the resiliency of indigenous communities (Davidson-Hunt et al. 2005; Davidson-Hunt and Berkes 2003).

Threats to Boreal plants

Although very few plants species in the Boreal region are currently classified as threatened or endangered under the Federal *Species at Risk Act* or provincial/territorial species legislation, they currently face widespread human-induced pressures. These pressures include habitat loss and fragmentation, climate change, and invasive species. Even if certain plants have a large distribution across Canada and are at low risk of being threatened on a national scale, some face local extinction due to human pressures, which has significant impacts for indigenous people who are intimately tied to these local places. Additionally, in areas where the plant species are still found, the 'health' of these plants may be compromised by human activities, especially industries such as mining, logging, and oil and gas. If plant foods or medicines are contaminated they could have a significant impact on the health of indigenous people (NorthWatch and MiningWatch 2008). This could be detrimental in terms of their personal consumption of plants or consumption of the animals that rely on these plants, but also because the integrity of the land is tied to the wellbeing of the people.

Climate change and its effects on Boreal ecosystems, including the plants and animals the people depend upon, is a significant concern (IPCC 2007; Rosenzweig et al. 2007). Since plants and animals require specific climatic and environmental conditions, changes to these conditions due to climate change could have negative impacts on species. These changes would be especially harmful if species are unable to move into areas where the climate is suitable because of barriers to movement, slow migration rates, unsuitable growing substrate, or lack of habitat. Studies have already shown phenological changes (e.g. leaf unfolding, flowering, leaf fall) in plants in response to climate change. Indigenous people have observed plants blooming earlier and berries being 'burned up' by the sun before the time when they are typically harvested (CIER 2007; Nickel et al. 2005). Climate change is also predicted to lead to increased frequency and intensity of forest fires as well as increased incidents of insect outbreak (e.g. mountain pine beetle, spruce budworm) in tree species, which require cold winters to keep their populations in check (Rosenzweig et al 2007). In addition, the increased average temperature in the Boreal region could result in a greater likelihood of invasive species from more southern regions, which may displace local plant species. Boreal systems have been found to be susceptible to invasive species (Rose and Hermanutz 2004). Climate change impacts will further exacerbate stresses on the Boreal ecosystem that result from human activities or development.

There are a number of human activities that have an impact on Boreal systems, one of which is forestry. In addition to the actual clearcutting of trees, the development of roads through forested

Studies have already shown phenological changes (e.g. leaf unfolding, flowering, leaf fall) in plants in response to climate change.

NANCY TURNER

Alpine sweetvetch (Hedysarum alpinum; also known as Eskimo potato, licorice root, Alaska carrot, or bearroot)

Emerging Issues

The replacement of traditional foods with alternative "convenience foods," which are highly processed, high in sucrose, and lower in nutrients has led to increased diseases such as diabetes.

Labrador tea (Ledum groenlandicum) NANCY TURNER

areas could support the introduction of invasive species (Chornesky et al. 2005). Clearcutting can have impacts on the frequency or abundance of understory herbs that are found in these areas such as Goldthread (*Coptis trifolia*), prickly current (*Ribes lacustre*) and wild sarsaparilla (*Aralia nudicaulas*), which are important edible and medicinal plant species (Moola and Vasseur 2008). The chemicals sprayed following a clearcut to inhibit growth of undesirable species can have a negative impact on blueberry plants, through reduced fruit availability (Moola et al. 1998). Some indigenous people have expressed concerns that this spraying is making the plants that are used in the area less 'healthful' (Moola et al. 1998; Senate subcommittee 1999). For example, Elders from Prophet River First Nation were concerned the herbicides were contaminating their moose, since they ate the sprayed vegetation (Bannister 2006b). Regardless of whether the spraying has been shown to significantly negatively affect plants and animals, this fear discourages traditional lifestyles of living off the land.

Industrial development such as mining and oil and gas can also have a negative effect on the system. The scale of some current projects, such as the Alberta Tar Sands, the proposed Mackenzie Gas Pipeline, and the proposed Alaska Pipeline Project, are such that they cause long-term and widespread impacts on the landscape (Andre et al. 2006). These projects would not only have an impact through their direct operations but the roads and other infrastructure required to support these projects would also further fragment the landscape and support the potential introduction of invasive species. In addition to landscape fragmentation, mining activity can also lead to soil contamination (NorthWatch and MiningWatch 2008; SENES Consultants Ltd. 2008). Even if plants are still present in an area that is contaminated, they may no longer be fit for consumption by humans or by the animals that humans rely on for subsistence; this is especially true when confronted with cumulative effects of industrial activity from multiple companies in a region. Industrial contaminants (e.g. polychlorinated biphenyls and heavy metals) in the food chain are already a problem in northern ecosystems and the foodways of indigenous people (Berti et al. 1998; Kuhnlein, Receveur, and Chan 1999; Kuhnlein et al. 2003; Kuhnlein and Chan 2000; Stout, Dionne and Harp 2009; van Oostdam et al. 2005). Some indigenous people have voiced concerns that pollution has 'weakened' the plants and decreased the effectiveness of the medicines (Inkpen 1999; Senate Committee 1999). Since indigenous people are inherently tied to the land, it is not an option for them to simply move away from the contamination when it takes place in their traditional territory.

Emerging issues in ethnobotany

The increasing pressure on Boreal ecosystems from climate change, logging, mining and oil and gas exploration necessitates greater conservation efforts in the Boreal region. Historical approaches to conservation have sometimes been to the detriment of indigenous people and their continued use of the land and waters, which has resulted in the development of new approaches to conservation. In the past, some conservation efforts, such as the creation of parks and protected areas, have excluded indigenous people from their traditional territories, and as a

result, deprived them of the opportunity to carry out their traditional practices (Gladu et al. 2003). More contemporary approaches to conservation recognize indigenous rights to land and water and include the active involvement of indigenous people.This year, Parks Canada signed a co-management agreement with The Sahtu Dene community of Deline for the Saoyu and Ehdacho National Historic Site of Canada. The people of Deline had been working for over a decade to protect this area, which has significant cultural importance to them. Indigenous people are finding new approaches or frameworks to help protect their traditional territories, which are relied on for activities such as plant gathering. For example, Pimachiowin Aki, a non-profit organization comprised of five First Nations in Manitoba and Ontario as well as government representatives, is applying to have their traditional territory designated as a UNESCO world heritage site (Voora and Barg 2008). Fisher River Cree Nation is actively seeking provincial park status for the Fisher Bay Park Reserve. Other indigenous groups (e.g. Takla Lake First Nation, Kitchenuhmaykoosib Inninuwug) are struggling to protect their traditional territories and the habitats and species within.

Bear Rock and Mackenzie River GARTH LENZ

Rising interest in the commercial potential of traditional medicines by the herbal and pharmaceutical industries over the last two decades has led to a heightened awareness by Indigenous people of issues related to "intellectual property rights" (Bannister 2005). Some people have concerns that their knowledge will be taken and used by companies (e.g. pharmaceutical) without properly acknowledging or involving them or their community. Additionally there is concern that these plants may be overharvested or disrespected by outside parties. Concerted international effort has gone into defining what constitutes ethical and equitable conduct for ethnobotanical research (ISE 2006). International consensus supports respect for Indigenous cultural and intellectual property and the direct involvement of indigenous people in applications of their plant knowledge (Laird 2002).

Since the health of indigenous people is inherently tied to the land, some

Moving Forward

Riviere Saint Marguerite, Highway 172 scenic corridor GARTH LENZ

indigenous people have suffered health impacts of decreased access to or use of plants and other components of the land (Richmond and Ross 2009). In some cases, cultural teachings and practices were not passed on as a result of the residential school system or through a loss of access to traditional areas due to forced relocation or contamination of traditional lands and waters. The replacement of traditional foods with alternative "convenience foods," which are highly processed, high in sucrose, and lower in nutrients has led to increased diseases such as diabetes in many indigenous communities (Berkes and Farkas 1978; Kuhnlein et al. in press; Kuhlein and Receveur 1996; Receveur and Kuhnlein 1998; Receveur et al. 1997). In addition to the nutritive and medicinal qualities of traditional foods and medicines, indigenous people in the Boreal also lose the health benefits of physically going out on the land to harvest plants and the opportunity to strengthen relationships with family and community members and pass on traditional beliefs, practices and the language associated with these activities (Kuhnlein in press). The conservation of the Boreal will be crucial in supporting the efforts of some indigenous people to renew biocultural ties and ethnobotanical practices.

Indigenous people are using a number of methods to maintain, strengthen or revive this knowledge and traditional activities. For example, some indigenous people have developed their own plant guides for community use in educational programs or to inform land management planning (e.g. Bannister 2006, Bruce et al. 2002; Jones 1983). Another emerging practice is organizing elder-youth camps for learning and teaching cultural practices. Some groups have developed organizations, such as the Gwich'in Social and Cultural Institute, whose mandate is "to document, preserve, and promote Gwich'in culture, language, traditional knowledge and values." Some communities have started to monitor their lands and waters using community-defined indicators, for example the abundance of berries in traditional berry patches, to watch for any environmental changes (Lutsel K'e Dene First Nation and Stephen Ellis 2002) and support land-based activities.

There are also opportunities to support indigenous people who choose to market non-timber forest products, as a way to continue to practice their traditional activities while supporting the local economy (Berkes et al. 2002; Davidson-Hunt et al. 2001; Marles 2000). Supporting a market for these products, which rely upon sustainable harvesting and use of indigenous people' traditional resources, would provide an alternative to purely industrial opportunities for economic development (Andre et al. 2006).

Moving Forward

After reviewing the essential role Boreal plants play in the culture and identity of indigenous people in this region, it is clear that the loss of this relationship and the associated knowledge would have a significant effect on these communities. The conservation of the Boreal region in large unpolluted intact areas is fundamental to the cultures of indigenous people. If these areas no longer exist, all the knowledge, values and history tied to these areas will eventually diminish, and be lost forever, which would be a loss to all humankind. The importance of plants to these

cultures as well as the importance of maintaining these unique knowledge systems and understandings of the Boreal landscape clearly necessitates the conservation of the Boreal region.

There are current proactive measures by governments to conserve the Boreal, for example, the commitments of both the Quebec and Ontario government to protect 50% of their Boreal regions. But these efforts must have the full and meaningful participation of indigenous communities and must respect their Aboriginal and treaty rights. Programs or funding that support efforts to connect indigenous youth and elders to each other and to the land should be promoted. New approaches developed by indigenous people for protecting their traditional territories need to be encouraged and supported. Additionally, efforts by indigenous people today (e.g. the efforts of Kitchenuhmaykoosib Inninuwug to oppose development of mining in their traditional territory) to protect the Boreal in their traditional territories need to be acknowledged and assisted. Respectful and innovative approaches should be sought in order to conserve the tremendous beauty of the Boreal and the invaluable knowledge systems that are tied to this region.

There are current proactive measures by governments to conserve the Boreal, for example, the commitments of both the Quebec and Ontario government to protect 50% of their Boreal regions.

Bearberries (Arctostaphylos alpina)

NANCY TURNER

List of Selected Food Plants

GROWTH TYPE	SCIENTIFIC NAME	COMMON NAME	FAMILY	USES	NATURESERVE LISTING
Tree	Picea glauca,P. mariana	White and black spruce	Pinaceae	Cambium eaten	Secure
Tree	Pinus banksiana	Jack pine	Pinaceae	Cambium eaten	Imperiled BC, critically imperiled Labrador (NL)
Tree	Abies balsamea	Balsam fir	Pinaceae	Cambium eaten	Secure
Tree	Populus balsamifera	Balsam poplar	Salicaeae	Cambium eaten	Secure
Shrub	Corylus cornuta	Beaked hazelnut	Betulaceae	Nuts	Secure
Shrub	Betula nana ssp.	Dwarf birch	Betulaceae	Leaves as beverage	Secure
Shrub	Viburnum edule	Highbush cranberry, squashberry	Caprifoliaceae	Fruits	Secure
Shrub	Empetrum nigrum	Black crowberry, "blackberry"	Empetraceae	Fruits	Secure
Shrub	Arctostaphylos alpina, A. rubra, A. uva-ursi	Bearberry	Ericaceae	Fruits	A. alpina secure; A. rubra vulnerable SK and QC, critically imperiled Newfoundland (NL); urva ursi – imperiled NL
Shrub	Ledum palustre, L. groenlandicum	Marsh Labrador tea	Ericaceae	Leaves as beverage	L. groenlandicum Secure; L palustre vulnerable AB and QC, Imperiled SK
Shrub	Gaultheria procumbens	Teaberry, wintergreen	Ericaceae	Fruits eaten, leaves used for tea	Vulnerable MB, critically imperiled NL
Shrub	Vaccinium vitis-idaea	Lingonberry, low-bush cranberry, "redberry"	Ericaceae	Fruits	Secure
Shrub	Vaccinium caespitosum, V. myrtilloides	Dwarf blueberry	Ericaceae	Fruits	V. myrtilloides - Secure; V. caespitosum – Vulnerable YT, NL, imperiled MB
Shrub	Vaccinium oxycoccus	Small cranberry, bog cranberry	Ericaceae	Fruits	Secure
Shrub	Ribes hudsonianum	Northern black currant	Grossulariaceae	Leaves and berries or stems for beverage	Imperiled QC
Shrub	Ribes triste	Red currant	Grossulariaceae	Fruits	Secure
Shrub	Ribes lacustre	Prickly current	Grossulariaceae	Fruits	Imperiled NL
Shrub	Amelanchier alnifolia	Saskatoon or service berry	Rosaceae	Fruits	Vulnerable QC
Shrub	Dasiphora floribunda	Shrubby cinquefoil	Rosaceae	Leaves and stems to make beverage	Secure
Shrub	Prunus virginiana	Chokecherry	Rosaceae	Fruits	Secure
Shrub	Rosa acicularis	Prickly wild rose (rosehips)	Rosaceae	Fruits, rosehips used for beverage, flower petals eaten by children	Secure
Shrub	Salix alaxensis, S. pulchra	Alaska willow, sura willow	Salicaceae	Leaves and shoots	S. alaxensis – imperiled AB, MB, QC; S. pulchra – vulnerable BC
Herb	Sagittaria spp. (S. latifolia, S. cuneata)	Arrowhead	Alismataceae	Tubers (dried and boiled for winter)	S. latifolia – critically imperiled AB and NL; S. cuneata – imperiled YT
Herb	Sium suave	Hemlock water-parsnip	Apiaceae	Roots; similar species are toxic	Imperiled YT
Herb	Asarum canadense	Wild ginger	Aristolochiaceae	Root (sometimes as a season)	Vulnerable MB, QC
Herb	Schoenoplectus heterochaetus, syn. Scirpus lacustris	Pale great bulrush	Cyperaceae	Rhizomes	Critically imperiled AB, MB imperiled QC, vulnerable ON
Herb	Cornus canadensis	Bunchberry	Cornaceae	Fruits	Secure
Herb	Hedysarum alpinum	Alpine sweetvetch	Fabaceae	Root	Critically imperiled NL
Herb	Mentha arvensis	Wild mint	Lamiaceae	Leaves as beverage	Secure
Herb	Allium schoenoprasum	Wild chives	Liliaceae	Leaves, flowers, bulbs	Secure

GROWTH TYPE	SCIENTIFIC NAME	COMMON NAME	FAMILY	USES	NATURESERVE LISTING
Herb	Fritillaria camschatcensis	Kamchatka fritillary(riceroot, chocolate lily)	Liliaceae	Bulbs	Critically imperiled YT
Herb	Chamerion angustifolium; syn. Epilobium angustifolium	Fireweed	Onagraceae	Young shoots, stems, flowering tops	Secure
Herb	Zizania aquatic	Wild rice	Poaceae	Rice eaten	Secure
Herb	Oxyria digyna	Alpine mountain sorrel	Polygonaceae	Leaves	Imperiled NL
Herb	Polygonum viviparum	Alpine bistort	Polygonaceae	Rhizomes	Critically imperiled SK
Herb	Rumex arcticus	Arctic dock	Polygonaceae	Leaves and stems	Vulnerable BC, critically Imperiled MB
Herb	Claytonia tuberosa	Tuberous spring beauty	Portulaceae	Corms	Imperiled BC
Herb	Fragaria virginiana	Wild strawberry	Rosaceae	Fruits	Secure
Herb	Rubus chamaemorus	Cloudberry, bakeapple	Rosaceae	Fruits	Secure
Herb	Rubus idaeus	American red raspberry	Rosaceae	Fruits	Secure
Herb	Not yet assessed ssp. acaulis	Dwarf raspberry, Arctic blackberry	Rosaceae	Fruits	---------
Herb	Saxifraga nelsoniana ssp. nelsoniana	Heart leaf saxifrage	Saxifragaceae	Leaves	Secure
Herb	Pedicularis langsdorfii	Langdorf's lousewort	Scrophulariaceae	Root	Imperiled AB
Herb	Typha latifolia	Broadleaf cattail	Typhaceae	Rhizomes, stem base	Imperiled YT
Herb	Urtica dioica	Stinging nettle	Urticaceae	Plant eaten as green	Vulnerable YT
Fern ally	Equisetum arvense	Common horsetail	Equisetaceae	Shoots	Secure
Lichen	Umbilicaria spp.	Rock tripe lichen	Umbilicariaceae	Eaten as a vegetable	Unknown
Lichen	Cladonia spp	Reindeer lichen	Cladoniaceae	Eaten partially digested in caribou rumen	Unknown
Fungus	Inonotus obliquus	Cinder conk fungus	Hymenochaetaceae	Boiled to make a beverage	Unknown

SOURCES: Andre and Fehr 2001; Arnason, Hebda and Johns, 1981; Berkes and Farkas 1978; Eidlitz 1969; Jones 1983; Griffin 2001; Hebda et al. 1996; Kuhnlein and Turner 1991; Marles et al. 2000; Parlee 2004; Porsild 1953; Russell 1991, 1994; Thornton 1999; Wennekens 1985.
Go to www.natureserve.org/explorer/methods.htm for information on the NatureServe listing status.

List of Selected Medicinal Plants

GROWTH TYPE	SCIENTIFIC NAME	COMMON NAME	FAMILY	USES	NATURESERVE EXPLORER LISTING
Tree	Thuja occidentalis	White cedar	Cupressaceae	Tea from leaves to treat headache; steambath with twigs to treat colds, fever, after childbirth, cough; twigs steeped to sweat, poultice of twigs to treat heart pain and rheumatism,	Secure
Tree	Betula papyrifera	Paper birch	Betulaceae	Bark used to make cast for broken limbs; roots, buds to treat snow blindness; bark given to teething babies; bark used to treat chapped skin, diaper/skin rash	Secure
Tree	Betula spp.	Birch	Betulaceae	Inner bark, ashes, leaves, buds, wood for burns, bites, boils, wounds, inner bark, sap for coughs, colds, asthma, inner bark for menstrual cramps	---------
Tree	Picea spp. (P. glauca, P. mariana)	Spruce	Pinaceae	Gum and tea from gum chewed and drunk to maintain good health; gum/pitch applied to wounds or slivers as salve; tea from inner bark applied to irritated skin, tips boiled in the house and branches used on floor to keep sickness away, as a disinfectant	---------
Tree	Pinus banksiana	Jackpine	Pinaceae	Tea from bark drunk for shortness of breath, tea from bough drunk for to ease aches, pains; also used as wash	Imperiled BC, critically imperiled NL
Tree	Larix laricina	Larch	Pinaceae	Inner bark boiled for sores and swelling, young branches made into a tea as a laxative, inner bark and gum to treat burns, leaves, inner bark to treat sore throat	Secure
Tree	Populus balsamifera	Balsam poplar, or cottonwood	Salicaceae	Bud resin for cuts, sores, baby teething, toothache; leaves to draw out infection, extract from buds boiled with aspen branch bark drunk for diabetes	Secure
Tree	Populus tremuloides	Quaking aspen	Salicaceae	Roots used rheumatism, steep bark to treat worms, inner bark used as heart medicine, inner bark used as splint, bark poultice for cuts and wounds	Imperiled NL
Shrub	Juniperus communis	Common juniper	Cupressaceae	Berrylike cone eaten as "cure-all" medicine, tea from branches, roots drunk as laxative; tea from berry-like cones drunk to ease back pain; bark poultice for wound	Secure
Shrub	Alnus spp.	Alders	Betulaceae	Leaves, bark, buds	---------
Shrub	Alnus rugosa	Speckled alder	Betulaceae	Bark boiled to treat liver, anemia; root extract to treat difficult labour, sore eyes, toothache	Secure
Shrub	Alnus viridis ssp. crispa	Mountain alder	Betulaceae	Bark boiled as tea for urinary and stomach problems	Secure
Shrub	Viburnum edule	Highbush cranberry	Caprifoliaceae	Tea from berries for constipation; tea used as gargle for sore throat; berries boiled for cough	Secure
Shrub	Shepherdia canadensis	Russet buffaloberry, soapberry	Elaeagnaceae	Tea from stems, roots drunk for stomach ache and diarrhea; also to relieve constipation, tea from leaves, stems used as a wash to treat aching limbs or joints; bark used in plaster casts	Secure
Shrub	Empetrum nigrum	Black crowberry	Empetraceae	Tea from berries, stems, roots, drunk for stomach ache, diarrhea, and bad colds	Secure
Shrub	Ledum palustre	Marsh Labrador tea	Ericaceae	Tea from leaves and stems drunk daily for good health, tea from leaves and stems drunk, gargled, or used as inhalant	Vulnerable AB and QC, Imperiled SK
Shrub	Ledum groenlandicum	Labrador tea	Ericaceae	Tea with leaves and twigs as a general tonic, taken for chills, to purify blood, asthma, cold, headaches, kidney trouble; chewed leaves applied to wounds, burns	Secure
Shrub	Vaccinium vitis-idaea	Lingonberry, low-bush cranberry	Ericaceae	Berries eaten to "clean out your stomach," to relieve a spring fever; whole plant for urinary tract problems; juice drunk for kidney problems	Secure
Shrub	Vaccinium uliginosum	Bog blueberry	Ericaceae	Tea from berries or whole plant to treat diabetes; root boiled to make extract taken for headaches	Vulnerable AB
Shrub	Ribes oxyacanthoides	Canadian gooseberry	Grossulariaceae	Infusion from stems drunk by mothers after childbirth to stop excessive bleeding; root infusion drunk for delayed menstrual period	Critically imperiled QC
Shrub	Ribes triste	Red currant	Grossulariaceae	Tea from whole plant used for stomach ailments); eye problems	Secure
Shrub	Ribes hudsonianum	Northern black currant	Grossulariaceae	Tea from leaves drunk in winter for general good health	Imperiled QC
Shrub	Salix spp.	Willows	Salicaceae	Tea from bark drunk as pain reliever and for headaches; inner bark as pain-killing poultice	---------

GROWTH TYPE	SCIENTIFIC NAME	COMMON NAME	FAMILY	USES	NATURESERVE EXPLORER LISTING
Herb	Acorus americanas; A. calamus	Sweet flag	Araceae	Root chewed or taken as tea for colds, coughs, bronchitis, sore throat, heart disease	A. americanas Imperiled BC, Vulnerable AB, critically imperiled NL
Herb	Aralia nudicaulis	Wild sarsaparilla	Araliaceae	Tea from root as general tonic, to treat weakness, root poultice applied for earache	Imperiled YT
Herb	Artemisia tilesii	Tilesius's wormwood, caribouweed	Asteraceae	Tea from plant drunk for colds, sore throats; used as inhalant for congestion	Imperiled AB, MB, ON; Critically imperiled QC
Herb	Artemisia frigida	Fringed wormwood, sagebrush	Asteraceae	General tonic, root extract for convulsions or wounds	Imperiled ON
Herb	Achillea millefolium	Yarrow	Asteraceae	Leaf poultice applied to burns, blisters, spider bites, headaches, tea from leaves to treat fever, headache	Secure
Herb	Cornus canadensis	Bunchberry	Cornaceae	Plant steeped to treat paralysis, colds; root tea for colic	Secure
Herb	Linnaea borealis	Twinflower	Caprifoliaceae	Poultice of plant used to treat inflammation in the limbs, plant tied around head to relieve headache	Secure
Herb	Chimaphila umbellata	Prince's pine, pipsissiwa	Ericaceae	Tea made for stomach troubles, root extract for sore eyes, boiled plant to induce sweating,	Vulnerable SK
Herb	Kalmia angustifolia	Sheep laurel	Ericaceae	Plant boiled for stiff limbs, steeped leaves taken for colds, backache, headache; crushed leaves applied as poultice to treat headache, leaf extract taken for stomach trouble	Secure
Herb	Iris versicolor	Blue flag, muskrat root	Iridaceae	Root boiled as an emetic, root poultice applied to swelling, burns, wounds; plant poultice applied for pain; infusion gargled for sore throat	Critically imperiled SK; imperiled NL
Herb	Mentha arvense	Wild mint	Lamiaceae	Infusion to treat fever, tea from plant as blood remedy, for fevers, stomach trouble	Secure
Herb	Clintonia borealis	Northern clintonia	Liliaceae	Infusion of plant applied as mosquito repellent; leaves boiled for sores, burns, ulcers; root extract for gravel, leaf poultice for infections, wounds	Secure
Herb	Nuphar spp.	Pond lily	Nymphaeaceae	Tea from rhizomes drunk for cold symptoms, rhizome slices chewed, grated or made into a tea drunk to treat arthritic pain or used to bathe affected joints; applied directly on sore joints	---------
Herb	Myrica gale	Sweet gale	Myricaceae	Roots pounded, soaked in hot water for inflammation; infusion/ extract as a wash for skin troubles and as a tea for tuberculosis	Vulnerable AB
Herb	Epilobium spp.	Willowherb, riverbeauty	Onagraceae	Tea from leaves drunk for good health and blood tonic; outer rind of root used as poultice to draw inflammation from boil, boiled roots applied to skin problems, leaf poultice applied to bruises	---------
Herb	Cypripedium acaula	Lady's slipper	Orchidaceae	Root used for menstrual disorders, an infusion of the roots used to treat stomachache	Vulnerable AB
Herb	Polygala seneca	Seneca snakeroot	Polygalaceae	Root powder steeped for heart; root extract for colds, coughs; leaf infusion for sore throat; roots in concoction for muscular aches, pains, headaches, stomachaches	Vulnerable AB, SK; imperiled QC; critically imperiled BC
Herb	Caltha palustris	Marsh marigold	Ranunculaceae	Roots applied as poultice for sores, root tea made for colds	Critically imperiled NL
Herb	Coptis trifolia/ groenlandicum	Goldthread	Ranunculaceae	Roots extract or infusion as to aid digestion and treat mouth sores, sore gums, sore eyes and eyes.	Vulnerable AB
Herb	Rubus idaeus	American red raspberry	Rosaceae	Tea from leaves drunk by women giving birth for strength, tea from stems drunk for fever; extract of roots used as eye drops for snow blindness	Secure
Herb	Rubus chamaemorus	Cloudberry	Rosaceae	Crushed leaves for burns; berries placed on wounds, sores, extract of roots, stem drunk for barrenness or hard labor, tea from boiling flowers applied to sore eyes	Secure
Herb	Sarracenia purpurea	Pitcher plant	Sarraceniaceae	Leaf tea to assist with childboirth,leaves steeped for smallpox, chickenpox, wounds, sores, rashes; root tea for urinary problems	Imperiled AB
Fern/ fern ally	Equisetum arvense	Horsetail	Equisetaceae	Root tea for teething infants, whole plant tea for dropsy, stem extract for dysuria	Secure
Fungus	Fomes fomentarius	Tinder fungus	Coriolaceae	Conk for smudging, pieces burned to treat arthritis	Unknown

SOURCES: Andre et al. 2006, Andre and Fehr 2002; Arnason, Hedba and Johns 1981; Garibaldi 1999; Hebda et al. 1996; Marles et al. 2000; Ryan et al. 1994.

List of selected plants used for purposes other than food or medicine

GROWTH TYPE	SCIENTIFIC NAME	COMMON NAME	FAMILY	USES	LISTING
Tree	Betula papyrifera and related species	Paper birch	Betulaceae	Baskets, wrapping food for storage, wrapping deceased, wood for snowshoe frames, tent poles, toboggans, paddles, canoe carrying boards, bows, arrows, drum frames, ax handles, hide scrapers, berry mashers, hide stretching frames and sweatlodge frames, bark as tinder, bark sheets for canoes, containers, sleds, tepee covers, moose callers, writing or drawing materials	Secure
Tree	Abies lasiocarpa Abies balsamea	Balsam fir	Pinaceae	Wood for canoe frames, paddles, shelters	Secure
Tree	Picea glauca	White spruce	Pinaceae	Wood for canoe frames and paddles, arrows, basket frames, snowshoe frames, shelters, tent frames, racks, hide stretchers, roots for stitching birchbark canoes, baskets, for coiled baskets; bark sheets for canoes, flooring, shingles, pitch for sealing canoes and baskets	Secure
Tree	Picea mariana	Black spruce	Pinaceae	Logs for deadfall traps, canoe frames, drying racks, snowshoe frames, firewood, roots for baskets, fishnets, boughs for bedding, carpets, girls' dolls	Secure
Tree	Pinus banksiana, P. contorta	Jack pine	Pinaceae	Logs for cabins, planks for toboggans, boats; knots for fishhooks, dry cones used to tan hides; logs for firewood, roots for baskets, arrow shafts, boughs to line houses	Imperiled BC, critically imperiled NL
Tree	Picea sitchensis	Sitka spruce	Pinaceae	Wood for bows, arrows, tongs, clubs, implement handles, ladders, drying racks, hollowed-out containers, fish traps, deadfalls, shelters, roots for fishing lines, snares, binding and tying; bark sheets for roofing, pitch for caulking canoes, adhesive	Secure
Tree	Larix laricina	Tamarack	Pinaceae	Wood for toboggans, snowshoe frames, paddles, rotted wood and bark for smoking hides, roots for stitching birchbark canoes; twigs and roots for basketry	Secure
Tree	Populus balsamifera	Balsam poplar	Salicaceae	Wood for plates, bowls, and dugout canoes, bark carved into toy boats; used for roofing, bowls; buds used in trap lures	Secure
Tree	Populus tremuloides	Trembling aspen	Salicaceae	Wood for canoe paddles, tepee poles, deadfalls, temporary snowshoe frames, bowls, stems for whistles, cooking sticks; ashes used in soap making, with caribou grease, and used to tan hides	Imperiled NL
Shrub	Juniperus communis	Common juniper	Cupressaceae	Berry like cones for brown dye	Secure
Shrub	Alnus viridis ssp. crispa	Mountain alder; green alder	Betulaceae	Wood for carving pipes, bows, canes, ladles, wood for smoking meat, hides, and as mosquito smudge, bark used for red-brown dye	Secure
Shrub	Betula nana B. pumila	Dwarf birch, bog birch	Betulaceae	Twigs used in bundles for broom	Secure
Shrub	Cornus sericea	Red-osier dogwood	Cornaceae	Stems as ribs for spruce bark canoes; bark to trim birch bark baskets, and for brown dye for hides	Secure
Shrub	Arctostaphylos urva-ursi	Kinnikinnick or bearberry	Ericaceae	Dense heartwood of root for pipe bowls; leaves smoked	Imperiled NL
Shrub	Amelanchier alnifolia	Saskatoon or serviceberry	Rosaceae	Digging sticks, wood for arrows, bows, canes, sweatlodge frames, birchbark basket rims	Vulnerable QC
Shrub	Rosa acicularis	Prickly rose	Rosaceae	Hollowed rose hip used as a toy pipe; Hips used as bead for toy necklace	Secure
Shrub	Salix bebbiana and other spp.	Bebb willow	Salicaceae	Wood for bows, canoe ribs, emergency snowshoes, pipestems, nails, basket rims, sweatlodge frames, twisted bark for rope, twine, fishnets, protecting rawhide nooses	Secure
Herb	Heracleum maximum, syn. H. lanatum	Cow parsnip	Apiaceae	Hollow stalks used as snorkels; root used in bear trap bait mixture	Secure
Herb	Solidago canadensis	Canada goldenrod	Asteraceae	Grubs in stem galls used as fish bait	Secure

GROWTH TYPE	SCIENTIFIC NAME	COMMON NAME	FAMILY	USES	LISTING
Herb	Achillea millefolium	Common yarrow	Asteraceae	Leaves used in lynx trap bait	Secure
Herb	Petasites frigidis	Arctic sweet coltsfoot	Asteraceae	Leaves to cover barrels of berries	Secure
Herb	Schoenoplectus acutus	Roundstem bulrush, tule	Cyperaceae	Stems for weaving mats, mattresses, bags	Vulnerable YT
Herb	Chamerion angustifolium, syn. Epilobium angustifolium	Fireweed	Onagraceae	Fibre for thread, layered as surface for cleaning fish	Secure
Herb	Galium boreale	Northern bedstraw	Rubiaceae	Roots are a red dye for porcupine quills	Secure
Herb	Urtica dioica	Stinging nettle	Urticaceae	Stem fibre for cordage, nets	Vulnerable YT
Fern ally	Equisetum spp.	Horsetails	Equisetaceae	Stems as pot-scrubbers	Secure
Fern ally	Lycopodium annotinum	Stiff club moss	Lycopodiaceae	To strain raw fish eggs from membranes	Secure
Moss	Dicranum groenlandicum	Greenland dicranum moss, cushion moss	Dicranaceae	Soaked in melted caribou fat to make candles	Unknown
Moss	Pleurozium schreberi	Schreber's big red stem moss, feather moss	Hyclocomiaceae, Hypnaceae, Brachytheciaceae	Used with other moss to chink log cabins, camouflage caribou fences, line storage pits, and as dish scrubbers	Unknown
Moss	Sphagnum fuscum and other spp.	Peat moss	Sphagnaceae	Fuel for smoking hides, meat, for diapers, wiping fish, stuffing mattresses	Unknown
Fungus	Fomes fomentarius	Tinder fungus	Coriolaceae	Conk for tinder; children's ball, carved for jewellery and grave figures	Unknown
Fungus	Inonotus obliquus	Cinder conk fungus	Hymenochae-taceae	Tinder for transporting fire	Unknown

SOURCES: Garibaldi, 1999; Marles et al. 2000; Russell 1991; Turner 1998

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