

SILVERHILL FOUNDATION

INDIGENOUS PLANTS FOR ENVIRONMENTAL REHABILITATION

November 24, 2006



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OBJECTIVES

There are three primary objectives of this proposal:

1. To identify the **indigenous** plants, including trees and shrubs, that can quickly and effectively rehabilitate areas disturbed by natural resource extraction,
2. To identify the **indigenous** plants that are of the most value to the aboriginal cultures and lifestyles for traditional, educational, and economical uses, and
3. To encourage natural resource extraction companies to pursue a process for **indigenous** rehabilitation of disturbed areas.

There is an additional, secondary, objective of this proposal:

To encourage the use of **indigenous**, **ungulate**-resistant plant rehabilitation along roadsides to improve safety for animals and drivers along the roads and highways.

RATIONALE

This research project is rooted in the extensive resource extraction activity in British Columbia and the need to rehabilitate mined areas and seismic lines to a natural, pre-activity, environmental condition. The various mining and exploration companies undertake rehabilitation, but it is often with quick-growing plants (e.g. clovers) to help rejuvenate the area and these efforts do not reflect the needs of affected First Nations and Métis communities.

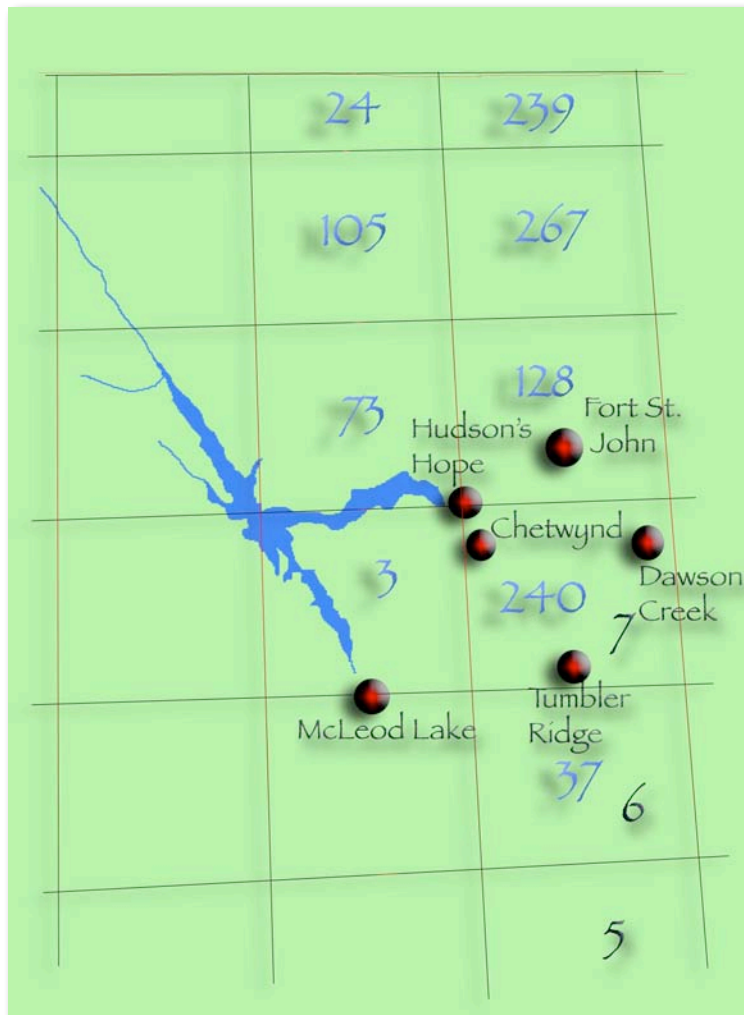
This research will identify the various plants, including trees and shrubs, that could be used for rehabilitation projects to ensure that the rehabilitated areas are populated with vegetation that most effectively meets the needs of aboriginal peoples. Of particular importance are the plants that contribute to aboriginal food sources, medicinal and cultural needs and to attract back desired animal species.

*Note: Words typed in **blue** are defined in the glossary.*

Illustrations and photos, unless otherwise indicated, by Pakki Chipps.

CONTEXT

There were approximately 1,116 wells approved in the Fort St. John area in 2006, with many more approved prior to this and even more are expected to be approved in 2007. In addition, there are also 18 coal explorations and coal mines in this area. There are, in addition, a number of timber licenses covering many hectares. The following map shows the **number of wells (blue numbers)**, and **coal mines or explorations (black numbers)** within each square of the grid.



Scale

1 cm = ca. 40 km

This map gives a fairly clear idea of the scope and need for restoration in this area. The map was prepared from data gathered from various government offices.

ECOLOGICAL CONDITIONS

Most of the Boreal White and Black Spruce zone (BWBS) in British Columbia occurs on an extension of the Great Plains (The Alberta Plateau) into the northeastern corner of the province.

The northern continental climate, with its frequent outbreaks of arctic air masses, features long, very cold winters and short growing seasons. The temperature is above 10°C for only 2-4 months. Annual precipitation averages between 330 and 570 mm, with 35-55% of this falling as snow. The ground freezes deeply for a large part of the year, and discontinuous permafrost is common in the northeastern parts of the zone.

White Spruce, Trembling Aspen, Lodgepole Pine, Black Spruce, Balsam Poplar, Tamarack, Sub-Alpine fir, Common Paper Birch, and Alaska Paper Birch are the major tree species in the forested sections of the BWBS. Forest fires are frequent throughout the zone, maintaining most of the forests in various succession stages.

Plateau, foothill, and cordilleran areas:

Forests predominate in the better-drained plateau, foothill, and [cordilleran](#) sections of the zone, where mixed Trembling Aspen – White Spruce forests on [Gray Luvisols](#) dominate the landscape.

Drier, open level to gently sloping north-facing areas:

Relatively open pine-lichen forests occur on the driest sites, which are usually on rapidly drained outwash deposits. Mixed pine and Black Spruce stands are common on level or gently sloping, north-facing sites on compacted [morainal](#) or [lacustrine](#) soils. Dense Spruce – moss communities develop on imperfectly drained sites.

Poorly drained lowland and wetland areas:

The poorly drained lowlands (especially the Fort Nelson Lowland) are a mosaic of forest and wetland ecosystems. Here, [Organic Cryosols](#), [Luvic Gleysols](#), and [Organica](#) are the most common soils. The build-up of organic matter from [bog](#) vegetation tends to insulate frozen ground, resulting in lenses of permafrost. Black Spruce and occasionally Tamarack are the main trees on organic terrain. They are, however, reduced in size compared to their stature on upland sites.

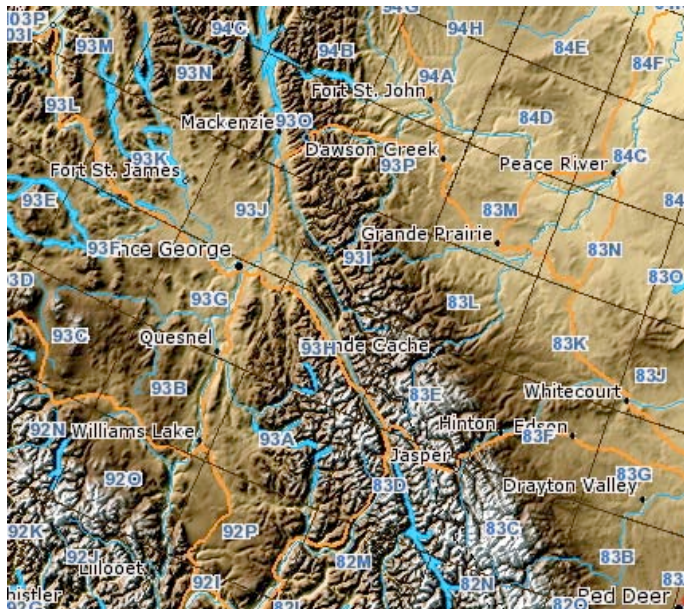
Wetland areas:

Tamarack forms pure stands only in nutritionally rich ([minerotrophic](#)) fens and swamps, and occurs mainly north and east of the Rockies (basically on the Alberta Plateau and the Liard Plain).

SATELLITE MAPS

(Right) Satellite map of the area roughly shown on the mines and oil well map a few pages back.

The square patterns are caused by the individual satellite photos that are pieced together to form a whole picture. You can see the roads (highways in orange, roads in red), the waterways, and the larger cities.



(Left) This map shows the terrain with the waterways, plains, rising slopes, and the steep mountain sides that restoration would need to cope with. To create a general plant list from such a varied terrain required the listing of the types of terrain and the plants that live in each. Some plants can live in more than one terrain and are listed accordingly. From this list, you can go to the following alphabetically organized list of plants with their descriptions, the traditional uses, and planting information. At the end of that section is a table showing the best planting methods.

TERRAINS AND PLANTS

Wetlands

(Bog, Fen, Floodplain, Lake, Marsh, Muskeg, Pond, River, Slough, Stream, Swamp)

Agropyron smithii (Western Wheatgrass) **Introduced**

Amelanchier alnifolia (Saskatoon, Serviceberry or Juneberry)

Andromeda polifolia (Bog-Rosemary)

Artemisia campestris (Northern Wormwood or Field Sagewort)

Aulacomnium palustre (Glow Moss)

Betula glandulosa (Scrub Birch)

Betula neoalaskana (Alaska Paper Birch)

Betula papyrifera (Common Paper Birch)

Betula pumila (Swamp Birch)

Carex canescens (Grey Sedge)

Carex gynocrates (Yellow Bog Sedge)

Carex viridula (Buxbaum's Sedge)

Chamaedaphne calyculata (Leatherleaf)

Cornus canadensis (Bunchberry)

Cornus stolonifera (Red-Osier Dogwood)

Drosera rotundifolia (Round-leaved Sundew)

Larix laricina (Tamarack)

Ledum groenlandicum (Labrador Tea)

Lonicera involucrata (Black Twinberry)

Menyanthes trifoliata (Buckbean)

Myrica gale (Sweet gale)

Nuphar lutea ssp. *polysepala* (Yellow Pond Lily)

Petasites frigidus var. *palmatius* (Palmate Coltsfoot)

Picea mariana (Black Spruce)

Pleurozium Schreberi (Red-Stemmed Feathermoss)

Populus balsamifera (Balsam Poplar)

Ribes triste (Swamp Red Currant)

Rubus pubescens (Trailing Raspberry)
 Sphagnum ssp (Sphagnum Mosses)
 Spirea alba (Narrow-leaved Meadowsweet)
 Tomenthypnum nitens (Golden Fuzzy Fen Moss)
 Typha latifolia (Cattail)
 Vaccinium alaskaense (Alaska Blueberry)
 Vaccinium oxycoccos (Bog Cranberry)

Montane

(Bluff, Dry slope, Higher mountain slopes, Lower mountain slopes, Upper south/south-west-facing slopes)

Abies lasiocarpa (Subalpine Fir)
 Amelanchier alnifolia (Saskatoon, Serviceberry or Juneberry)
 Betula glandulosa (Scrub Birch)
 Betula neoalaskana (Alaska Paper Birch)
 Betula papyrifera (Common Paper Birch)
 Betula pumila (Swamp Birch)
 Cornus canadensis (Bunchberry)
 Epilobium angustifolium (Fireweed)
 Koeleria macrantha (Junegrass)
 Larix laricina (Tamarack)
 Mertensia paniculata (Tall Bluebells or Lungwort)
 Picea glauca (White Spruce)
 Picea mariana (Black Spruce)
 Pinus contorta (Lodgepole Pine)
 Populus tremuloides (Trembling Aspen)
 Rosa acicularis (Prickly Rose)
 Rosa woodsii (Wood's Rose)
 Rubus pubescens (Trailing Raspberry)
 Stipa comata (Needle-and-Thread Grass)
 Vaccinium membranaceum (Black Huckleberry)

Forest

(Coniferous forest, Moist forest, Open forest. Rocky forest, Sandy forest, Woodland)

Abies lasiocarpa (Subalpine Fir)

Achilles millefolium (Yarrow)

Agropyron smithii (Western Wheatgrass) **Introduced**

Amelanchier alnifolia (Saskatoon, Serviceberry or Juneberry)

Artemisia campestris (Northern Wormwood or Field Sagewort)

Aulacomnium palustre (Glow Moss)

Cornus canadensis (Bunchberry)

Epilobium angustifolium (Fireweed)

Galium boreale (Northern Bedstraw)

Hylocomium splendens (Step Moss)

Koeleria macrantha (Junegrass)

Ledum groenlandicum (Labrador Tea)

Linnaea borealis (Twinflower)

Lonicera involucrata (Black Twinberry)

Mertensia paniculata (Tall Bluebells or Lungwort)

Petasites frigidus var. *palmatius* (Palmate Coltsfoot)

Picea glauca (White Spruce)

Picea mariana (Black Spruce)

Pinus contorta (Lodgepole Pine)

Pleurozium Schreberi (Red-Stemmed Feathermoss)

Populus tremuloides (Trembling Aspen)

Ptilium crista-castrensis (Knight's Plume)

Pyrola asarifolia (Pink Wintergreen)

Ribes triste (Swamp Red Currant)

Rosa acicularis (Prickly Rose)

Rosa woodsii (Wood's Rose)

Rubus pubescens (Trailing Raspberry)

Sphagnum ssp (Sphagnum Mosses)

Spirea alba (Narrow-leaved Meadowsweet)

Vaccinium membranaceum (Black Huckleberry)

Vaccinium vitis-idaea (Lingonberry)

Viburnum edule (Highbush-Cranberry or Mooseberry)

Bushland and Thickets

Chamaedaphne calyculata (Leatherleaf)
Cornus stolonifera (Red-Osier Dogwood)
Linnaea borealis (Twinflower)
Petasites frigidus var. *palmatum* (Palmate Coltsfoot)
Symphocarpus occidentalis (Western Snowberry)

Open Lands

(Field, Forest Clearing, Meadow, Moist meadow, Parkland, Pasture, Prairie, Tundra)

Achilles millefolium (Yarrow)
Agropyron smithii (Western Wheatgrass) **Introduced**
Artemisia campestris (Northern Wormwood or Field Sagewort)
Artemisia frigida (Pasture Sage)
Carex canescens (Grey Sedge)
Carex gynocrates (Yellow Bog Sedge)
Carex viridula (Buxbaum's Sedge)
Chamaedaphne calyculata (Leatherleaf)
Drosera rotundifolia (Round-leaved Sundew)
Galium boreale (Northern Bedstraw)
Koeleria macrantha (Junegrass)
Petasites frigidus var. *palmatum* (Palmate Coltsfoot)
Populus tremuloides (Trembling Aspen)
Pyrola asarifolia (Pink Wintergreen)
Rosa acicularis (Prickly Rose)
Rubus pubescens (Trailing Raspberry)
Sphagnum ssp (Sphagnum Mosses)
Spiraea alba (Narrow-leaved Meadowsweet)
Stipa comata (Needle-and-Thread Grass)
Tomenthypnum nitens (Golden Fuzzy Fen Moss)
Vaccinium vitis-idaea (Lingonberry)

Rocky Terrain

(Gravel bar, Open rocky land, Rocky hillside, Rocky soil, Sandy soil)

Artemisia campestris (Northern Wormwood or Field Sagewort)

Epilobium angustifolium (Fireweed)

Koeleria macrantha (Junegrass)

Pinus contorta (Lodgepole Pine)

Populus balsamifera (Balsam Poplar)

Spireae alba (Narrow-leaved Meadowsweet)

Symphocarpus occidentalis (Western Snowberry)

Vaccinium vitis-idaea (Lingonberry)

Disturbed Sites

(Burned areas, Ditches, Logged areas, Roadsides)

Aulacomnium palustre (Glow Moss)

Epilobium angustifolium (Fireweed)

Populus tremuloides (Trembling Aspen)

Rosa acicularis (Prickly Rose)

Typha latifolia (Cattail)

Vaccinium alaskaense (Alaska Blueberry)



PLANTS (IN ALPHABETICAL ORDER)

Abies lasiocarpa (Subalpine Fir) ^{1, 4}

Photo credit: www.botit.botany.wisc.edu/courses/img/bot/401/

Habitat:

Common in moist woods, often mixed with white spruce.

Traditional Use:**Medicine:**

Inner bark - General tonic, colds, influenza.

Sap - Asthma.

Bark - **Poultice** for infected wounds, arthritis, infections, swelling, boils, pain relief, after childbirth, chest colds, emetic.

Roots - Tuberculosis.

Pitch - Menstrual irregularity, cuts, scabies, boils, sore back, internal bleeding from an injury.

**Technological:**

Wood - Canoe frames, paddles.

Boughs - Temporary shelters.

Needles – Tinder.

Description:

This evergreen grows to 25 m at a slow rate. The seeds ripen in September. The flowers are **monoecious** and are wind-pollinated. The tree can grow in nutritionally poor soils but prefers acidic to neutral, moist soils and can grow in full sunlight, partial shade or full shade. This tree is intolerant to atmospheric pollution.

Planting:

Seeds: Sow seeds in early February in a greenhouse or outdoors in March. Germination is often poor, usually taking from 6 to 8 weeks. It is usually best, though, to sow the seeds in a cold frame as soon as the seeds are ripe in the autumn. The seed is viable for up to five years if stored well. When large enough to handle, transplant the seedlings into individual pots and grow them there for their first winter. Plant them out into their permanent positions after the last expected frost. If there is enough seed, it can be planted in an outdoor seedbed in the sun or shade at a density of about 550 plants per square meter.

Achillea millefolium (Yarrow) ¹

Habitat:

Common in moist meadows and openings in boreal woods of the parklands throughout the northern hemisphere.

Traditional Use:

Medicine:

Flowers – Headaches, bee stings, cuts, sores, burns, nosebleeds, spring tonic, loss of appetite, menstrual cramps, heavy menstruation, labour pains, hemorrhaging, cough, liver ailments, sinus or chest congestion, skin rashes, sores, teething infants.

Leaves and Flowers – Diabetes, headache, sickroom fumigation.

Leaves - Burns, cuts, coagulant, bee stings, pimples, mosquito bites, infected sores

Aboveground plant - Sore chest, headaches, migraines, sore back, pain.

Whole plant – Diarrhea, painkiller.

Roots - sore, aching bones, swellings, pain relief, fever or teething sickness, toothache.

Seeds and roots - Sore eyes.

Technological:

Leaves - trap bait for lynx.

Description:

The tiny white flowers form an umbel (like an umbrella shape) at the ends of the stems and generally grow to nearly a meter in places. The leaves are feather-like and soft. Yarrow does best on poor soils; avoid fertilizers. The plant prefers full sun and well-drained soil, but still needs water until it is well established.

Planting:

Division: The best way to grow yarrow is to divide the clumps of existing yarrow and replant one part at the source and transplant the other parts to new locations.

Seeds: These can be purchased but are seldom the pure native species.



Agropyron smithii (Western Wheatgrass) ^{1, 7}

Habitat:

Fairly common in moist woods and meadows and along river and lake shorelines. It was introduced from Eurasia.

Traditional Use:

Medicine:

Seeds - Hair rinse to make the hair grow thicker and longer.

Description:

This is an excellent grass to plant for erosion control because of its spreading [rhizomes](#) as well as for revegetation of saline or alkaline areas. This plant is also used frequently for surface mine reclamation. It is a long-lived with coarse blue-green leaves and is a sod former. This grass alone should not be planted merely to cover a mine surface for reclamation, as it is important to try to reintroduce native plants to their habitat.

Planting:

Seeds: Should be planted .5 to 1 inch deep and seeding rates should be 5 to 15 pounds per acre but if they are being sown on the surface or used on harsh sites, the seed rate should be doubled. This grass is slow to establish itself and spread. The plants are moderately compatible with other species and are moderately aggressive.



Amelanchier alnifolia (Saskatoon, Serviceberry, or Juneberry) ^{1, 5}

Habitat:

These plants are common along river edges, on bluffs and in open woodland.

Traditional Use:

Food:

Berries - Eaten fresh, canned, dried, or mixed with dried, powdered meat and lard to make [pemmican](#).

Branches - Debarked and split sticks are boiled in sturgeon oil to keep the oil fresh during storage.

Medicine:

Roots and stems - lung problems, tuberculosis.

Roots – Lung infections, coughs, chest pain, back spasms, pinched nerves, diarrhea or teething sickness.

Stems –fever, flu, or bad colds.

Buds – Diarrhea.

Technological:

Stems - Arrows, bows, sweat lodge frames, walking canes, or birch bark basket rims.

Berries - Blue dye.

Description:

This is a [deciduous](#) shrub that grows in dense, clumps up to 1 – 4 m (but may be small and sparse at higher altitudes or rocky ledges). The flowers show from early May to early June and are insect or self-pollinated. This plant is intolerant of shade. Saskatoon leaf is one of the most important browse species for wild [ungulates](#), and the berries provide food for mammals and birds. However, in the spring, the leaves may be fatal to deer if they live predominantly on this plant; however this is rare. Saskatoon is extremely useful for revegetation of disturbed land as it stabilizes loose, disturbed soils, especially on slopes. Flower buds are developed one year and bloom the following year.

Planting:

Seeds: Need two seasons to develop and grow. The plant can be grown from seed or root or stem cuttings and spreads by the second year.

Rhizomes: New plants grow faster and better after a low-intensity fire.



Andromeda polifolia (Bog-rosemary) ^{1, 3}

Photo credit: www.myco-cheype.chez-alice.fr/Pages/Fleurs.htm

Habitat:

Circumboreal species found in **bogs**, **muskeg**, or swamps. Grows around Black Spruce, Tamarack, Bog Birch, Leatherleaf, Bog Laurel, Bog Cranberries, Round-leaved Sun Dew, and Sphagnum moss.

Traditional Use:

Medicine:

Stem and root – stomachache, body aches, and cough.

Description:

A low, evergreen, **rhizomatous** shrub with blue-green leaves that prefers cool, acidic soil (pH 4.5 – 5). The plants reproduce sexually by seed as well as by spreading along **rhizomes**. The plant is primarily bee or bumblebee pollinated. Seeds are dispersed by wind.

Planting:

Seeds - Need cold **stratification** in order to break the dormancy.

Division - May be planted directly by **rhizome**-clump division or rooted cuttings. The plants need sun.



Artemisia campestris (Northern Wormwood, Field Sagewort) ^{1, 4}

Photo credit: www.leda.lycneum.org/

Habitat:

Common in sandy woods, shores, and openings in the boreal forest and parkland.

Traditional use:

Medicine:

Roots - Sore throat, [emetic](#), lower back pain.

Flowers - Liver problems.

Description:

This [perennial](#) grows to 1.5 m. The flowers come out from August to September and the seeds ripen between September and October. The flowers are [monoecious](#) and are pollinated by wind. This plant prefers light sandy to medium loamy non-acidic soil. The plant is drought tolerant and needs little or no shade. **This plant is deer resistant.**

Planting:

Seeds: Sow from late winter to early summer in a greenhouse and plant the seedlings out in the summer.



Artemisia frigida (Pasture Sage) ^{1, 4}

Habitat:

Pasture and prairie sages are common in meadows and pastures.

Traditional Use:

Medicine:

Leaves - Insect repellent, skin problems, burns, intestinal worms, urinary tract infections, toxins, promote healing, sore throat, wounds, blurred vision, sore feet, rheumatism, arthritis, fresh breath, fever and headache.

Technological:

The aromatic leaves can be used in trap lures.

Spiritual:

Sage is an important incense used alone or with sweet-grass by many First Nations. It may be burned in a ceremonial pipe or in a small dish and then the smoke can be washed over the patient to cleanse the person spiritually before other treatment. Sage leaves may be chewed to bring luck.

Description:

This [perennial](#) grows to about a third of a meter tall and is a hardy plant. The flowers are [hermaphrodite](#) and are wind pollinated. The plant prefers light sandy to medium loamy soils and it will tolerate drought but not shade. The plants live longer, are hardier and more aromatic when grown in poor dry soil. **This plant is deer resistant.**

Planting:

Seeds: Surface sow from late winter to early summer in a greenhouse in free-draining soil. The seed usually germinates within one or two weeks in a warm greenhouse. When large enough, transplant them into individual pots and plant them out in late spring or early summer.

Cuttings: Half-ripe wood can be started in a cold frame in July or August.



Aulacomnium palustre (Glow Moss) ²

Habitat:

Muskeg, swamps, fens, wet forests, cold, wet disturbed sites.

Traditional Use:

Technological: Mosses have been used in different ways by different First Nations, but generally speaking, they have been used for their insulating and texture properties such as lining caches, chinking between logs, and to create a soft surface.

Description:

The leaves are yellow-green contrasting sharply with the reddish-brown stems.



Betula glandulosa (Scrub Birch) 4

Habitat:

Stream banks, [marsh](#) margins, lakes and [bogs](#). Also found on alpine slopes.

Traditional Use:

Food:

Young leaves and catkins - eaten raw.

Buds and twigs - used to flavour stews.

Medicine:

Bark - [antirheumatic](#), [astringent](#), [lithontripic](#), salve and sedative.

Technical:

An [infusion](#) - Hair conditioner, dandruff treatment.

Description:

[Deciduous](#) shrub growing to 2 m. Flowers are [monoecious](#), but both sexes can be found on the same plant. The flowers are wind pollinated. It is shade-tolerant.

Planting:

This plant makes a good ground cover. It can be planted in well-drained loamy soil in a sheltered position and grows well in heavy clay soils.

Seeds - best sown as soon as they are ripe in a light position in a cold frame for at least one winter. Barely cover the seeds and place in a sunny position. Plant them in late spring or early summer.



Betula neoalaskana (Alaska Paper Birch) ^{8, 4}

And

Betula papyrifera (Common Paper Birch) ^{8, 4}

Photo credit: www.jardin.free.fr/arbre/

Habitat:

Bogs, swamps, fens, and lower mountain slopes.

Traditional Use:

Food:

Cambium - Eaten fresh as a treat or starvation food or boiled as a drink or syrup.

Leaves and root inner bark - boiled to make a drink.

Medicine:

Leaves - Wasp stings.

Bark - Aching bones, splint, teething pains, tuberculosis, tonsillitis, sore throat, and colds.

Inner bark - Burns and wounds, sores and rashes.

Buds - Gonorrhea, skin sores and infections.

Wood - Infected wounds, back pain, teething sickness, sweating, lactation.

Roots - Menstrual cramps, heart medicine.

Technological:

Bark - Baskets, bowls, canoes, sleds, tepee covers, boxes with lids, moose callers, writing and drawing material, net weaving shuttles and spacers, toy canoes, torches, kindling, and art.

Inner bark - Yellow-red dye.

Wood - Snowshoe frames, Tent poles, toboggans, sleds, paddles, canoe carrying boards, bows, arrows, drum frames, axe handles, snowshoe webbing needles, canoe ribs, wooden nails or pegs, dog whip handles, grease lamp bowls, spoons, hammers, berry mashers, hide stretching frames, sweat lodge frames, smoking fish, baby powder, and a reddish-brown dye.

Spiritual:

Wood - Ceremonial rattles.

Description:

Flowers in April and seeds ripen in October. The flowers are monoecious and are wind pollinated. These are fast growing but short-lived trees. Although the trees may be killed by fire, they often regenerate from the roots.

Planting:

Seed: Sow as soon as ripe in a light position in a cold frame. Grow the seedlings in a cold frame for their first winter, and then plant out after the last expected frost. Seeds can also be sown in an outdoor seed bed in early spring and keep them growing here for the first two years, after which they can be moved to their permanent positions in the early winter.



Betula pumila (Swamp Birch) ^{1, 4}

Betula nana; Betula pumila, and hybrids: Betula xsargentii

Habitat:

Fairly common in marshes, sloughs, and bogs across the boreal forest and in the mountains.

Traditional Use:

Medicine:

Twigs - Coagulant.

Stems and leaves - weight-loss.

Technological:

A bundle of branches can be used as a broom.

Description:

Deciduous growing to 0.3 – 0.45 m. The tree flowers in May and the seeds ripen in July. The flowers are monoecious and are wind pollinated. The plant requires well-drained soil but can grow in nutritionally poor soils and can grow in semi-shade or no shade. The plant tolerates strong winds. The plant also grows well in a heather environment.

Planting:

Seeds - Gather the seeds in late July, save till spring and surface sow in a sunny place. If this is not successful, plant them in a cold frame and transplant them into the environment in late spring or early summer.



Carex canescens (Grey Sedge), Carex gynocrates (Yellow Bog Sedge), and Carex viridula (Buxbaum's Sedge) ^{1, 4}

Habitat:

Common along edges of sloughs and in fens, marshes and wet meadows.

Traditional Use:

Medicine:

Roots – delayed menstrual period, intestinal problems

Technological:

Dye for porcupine quills.

Leaves – wrapping food for cooking and straining moose brains for tanning solution.

Description:

Evergreen perennial 1-1.5 m. In flower in July and seeds ripen July to August. Wind pollinated. Semi-shade to no shade. Will grow in almost any soil, but needs moist or wet soil.

Planting:

Seeds: This plant is easily grown in damp to wet soil. The seeds are gathered in late summer and sown in early spring or can be started in a cold frame until they are rooting and then transplanted out later that summer or the following spring. The seeds germinate in 2-6 weeks. Larger clumps can be replanted directly into their new location. Traditionally, when the leaves are gathered, all seed heads collected would be pushed back into the mud for next year's growth.



Chamaedaphne calyculata (Leatherleaf) ^{2, 4}

Photo credit: www.atlas-roslin.pl/gatunki/

Habitat:

Often forming dense thickets in the [peat lands](#) of the north, primarily in the Peace and Liard watersheds.

Traditional Use:

Food:

Leaves – Tea. Must be boiled and steeped to remove the harmful toxin, “[andromedotoxin](#)”.

Medicine:

Leaves – Inflammation, fever.

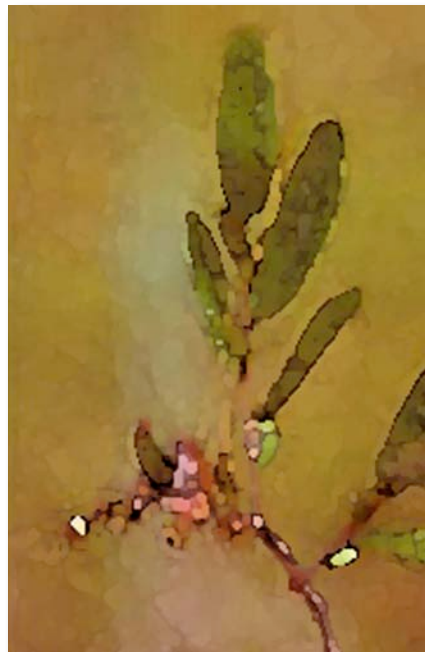
Description:

This is an evergreen shrub that grows up to 1 m. tall. The shrub flowers from April to June. The flowers are [hermaphrodite](#) and are pollinated by insects. The plant needs well-drained acidic soil and can grow in both semi-shaded and sunny areas.

Planting:

Seeds - Plant in a greenhouse. Cover lightly with soil, keep the soil moist and keep the plant in shade. The seeds take between 1 to 12 months to grow. Keep them in a greenhouse for at least a year and transplant them in late spring or early summer after the last frost.

Cuttings - almost ripe side-shoots, 4 – 5 cm long with a heel, can be planted in August in a greenhouse with varying success.



Cornus canadensis (Bunchberry) ^{1, 4}

Habitat:

Common in shady woodlands.

Traditional Use:

Food:

Fruit – Eaten fresh. They are delicious when fresh and full of juice but become dry as the seeds grow bigger.

Medicine:

Bunchberry - Tea for sore throat.

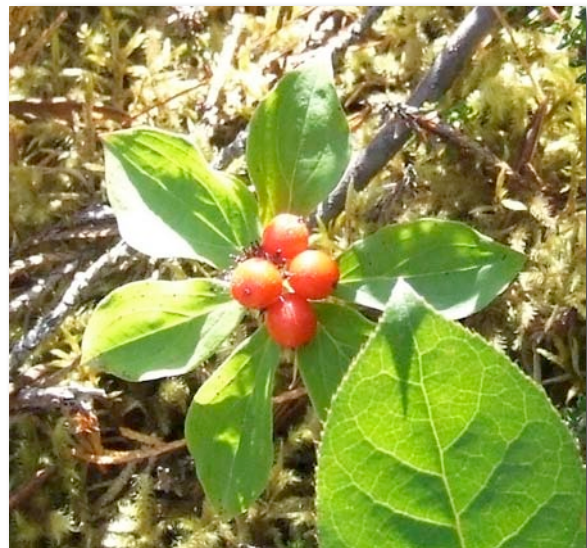
Description:

This [perennial](#) grows at a fast rate. The beautiful, dogwood-like, [hermaphrodite](#) Flowers show up in June and are pollinated by insects. The plant prefers moist, neutral to acid soils and grows with little or no shade. This plant also grows well in peaty soil in shade or partial shade and in heavy clay soils but grows best in damp, sandy soil. It is not suitable for alkaline soils.

Planting:

Seeds: Best sown as soon as they are ripe in a cold frame or in a sheltered outdoor seedbed. The seed must be separated from the fruit flesh as it contains germination inhibitors. Germination, especially of stored seeds, can be very slow. Plant the seedlings out in the late spring, early summer.

Division: In the springtime, carefully work out divisions from the sides of clumps, without disturbing the main plant clump. Make sure each division has already produced some roots. Pot them in light shade in a greenhouse and don't allow them to become dry. Once they are growing well, which can take up to a year, they can be replanted into their permanent positions.



Cornus stolonifera (Red-Osier Dogwood) ⁴

Habitat:

Grows along shores and thickets along streams, rivers, and marshes.

Traditional Use:

Food:

Fruit - Raw or cooked and mixed with other berries and dried for winter. This fruit is quite bitter and can cause nausea.

Medicine:

Bark - [Astringent](#), tonic, diarrhoea, fever, skin problems, pain relief, headaches, coughs, colds, eye wash, styes, poison ivy rash, ulcers, and rabies.

Technological:

Bark - Cordage and rope, toothpowder to preserve the gums and keep teeth white. Red dye.

Seeds - Oil used for light.

Branches - Rims of baskets.

Description:

Flowers from May to June. Flowers are [hermaphrodite](#) and are pollinated by bees. The shrub prefers a moist soil with sun or slight shade. It succeeds well in poorly drained soils.

Planting:

Seed: Best sown as soon as ripe in a cold frame or in an outdoors seedbed. The seeds must be separated from the fruit as the latter contain germination inhibitors. Stored seeds must be [stratified](#) for 3 – 4 months and sown as early as possible in the year. Germination of stored seeds can take up to 18 months. Grow over first winter in a greenhouse and plant out after last expected frost. This plant produces a large number of suckers that may be planted.



Drosera rotundifolia (round-leaved sundew) ^{2, 4}

Habitat:

Sphagnum bogs, fens, and wet meadows.

Traditional Use:**Medicine:**

Fresh leaves - used in Europe to make cheese and junket. Among Europeans and First Nations it is used to remove warts.

Sap – Tuberculosis, asthma, bronchitis, and coughs.

Description:

The flowers are hermaphrodite and the plant is self-fertile. Actually, the flower, which grows on a fairly tall stem above the leaves, attracts insects that, after eating the nectar, fall down onto the leaves where they are absorbed. This process feeds and pollinates this carnivorous plant. The source (4) states that this plant is evergreen, but in the locations I know, the plant goes dormant and usually sinks below the sphagnum or other mosses for the winter. The plant requires sunlight and can survive in boggy, nitrogen-poor soils because it derives nutrients from the insects.

Planting:

Seeds: The ripe seeds are best sown thinly into pots of a free-draining soil mixed with some charcoal and topped with a layer of finely chopped sphagnum moss. The seed germinates in 1 – 2 months. Keep them in pots for the first growing season and plant them out into their permanent positions in late spring.



Epilobium angustifolium (Fireweed) ^{1, 4}

Habitat:

Common in open woods, gravel bars, recently burned woodlands, and other recent clearings (i.e. roads).

Traditional Use:

Food:

Young leaves, stems, and flowering tops - Eaten raw or cooked, as a beverage, and as a tobacco substitute.

Medicine:

Plant - Intestinal worms.

Young tops – Blood tonic.

Leaves - bruises.

Root – Boils, abscesses, wounds.

Technological:

Plants – Fish cleaning surface.

Fibers – Thread.

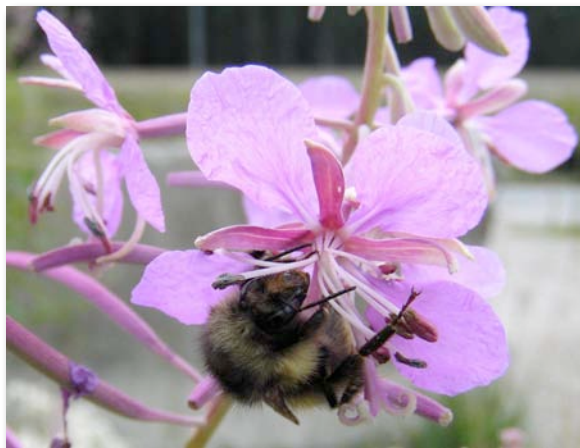
Flowers – When in full bloom indicate that moose are fat enough to be hunted.

Description:

This [perennial](#) grows to 2 m at a fast rate. It is a hardy plant and flowers from July to September. Seeds ripen from August to October. The flowers are [hermaphrodite](#) and are bee-pollinated. It is noted for attracting wildlife and is a very important plant for [Indigenous](#) peoples. The plant requires well-drained soils and can grow in partially shaded to unshaded areas.

Planting:

Seeds: Should be sown in early spring in their permanent positions. The large clumps can be divided in spring or autumn and can be replanted directly into their permanent positions. Plant them out in the spring.



Galium boreale (Northern Bedstraw) ^{1, 4}

Photo credit: www.malag.aes.oregonstate.edu/

Habitat:

Common in woodland openings and moist meadows.

Traditional Use:

Food:

Leaves – Tea, eaten raw or cooked.

Flowering Stems – Tea.

Medicine:

Plant – [diaphoretic](#), [diuretic](#), contraceptive.

Description:

This [perennial](#) grows to nearly half a meter tall. It is a hardy plant and is not frost tender. Flowers show up from July to August, are [hermaphrodite](#) and are pollinated by flies and beetles. The plant prefers neutral to alkaline soils and can grow in semi-shade such as light woodland. Although it can grow in dry soil, it prefers loose, moist leafy soil and the leaves will quickly scorch if growing in full sun.

Planting:

Seeds: Best sown in the permanent position as soon as they are ripe. The seed can also be sown in spring, although they can then be slow to germinate. This plant really needs no help to reproduce itself.

Division: Larger clumps can be divided in spring throughout the growing season and replanted directly into their permanent positions.



Hylocomium splendens (Step Moss) ²

Habitat:

Soil, humus, decaying wood; wide range of forest habitats.

Traditional Use:

Technological:

Moss - Chinking log homes and sheds, lining [caches](#) to store food.

Description:

This moss is olive green, yellowish or reddish green with creeping stems 2 - 20 cm long. The stems and branches are reddish, often with branches on branches; current year's growth arises from near the middle of the previous year's branch, producing feathery 'fronds' in step form; forms springy mats.



Koeleria macrantha (Junegrass)²

Habitat:

Junegrass is common in dry prairie, open woods, rocky hillsides, and on sandy soils.

Traditional Use:

Food:

Seeds - porridge or flour for making bread.

Medicine:

The plant can be used to treat cuts.

Description:

Junegrass is a short, tufted, erect [perennial](#) and is one of the first grasses to start growing in early spring. [Culms](#) develop after the appearance of the first leaves and develop fully within 4 to 6 weeks. Junegrass flowers from late April to early May. Seeds ripen in July. Junegrass panicles produce 160 to 300 spikelets, each with 2-3 florets per spikelet. Junegrass does not flower until 3 years of age.

Planting:

Seeds: Production by Junegrass is variable from year-to-year. Junegrass seeds are relatively small with about 4,000,000/kg. Although seed is often produced in large numbers, the overall viability is low.



Larix laricina (Tamarack) ⁴

Photo Credit: www.rook.org by Kenneth J. Sytsma

Habitat:

Bogs, swamps, fens, and lower mountain slopes.

Traditional Use:

Food:

Shoots - Young shoots are used as an emergency food.

Roots - Made into a tea.

Branches and Needles - Made into a tea.

Medicine:

Bark - **Diuretic**, laxative, general tonic, jaundice, anaemia, rheumatism, colds, skin ailments, **poultice** for sores, swellings and burns.

Leaves - **Astringent**, piles, diarrhoea, and coughs.

Buds and Bark - **Infusion** as an expectorant.

Leaves and inner bark – Disinfectant and laxative.

Inner bark - Infections, burns, frostbite, and deep cuts.

Resin - Indigestion, kidney and lung disorders, ulcers and burns.

Technological:

Resin - Wood preservative.

Roots - Sewing material for canoes and durable bags.

Description:

This plant is in flower from March to April and the seeds ripen in October. The flowers are **monoecious** and are wind pollinated. The tree needs well-drained soil, and can grow in nutritionally poor soil and requires sun.

Planting:

Seed: Sow in late winter in pots in a cold frame. Cold **stratification** for one month improves germination. They can be planted out in the summer if given protection from the elements during their first winter; or grow them over the winter in a cold frame before planting them out the following summer.



Ledum groenlandicum (Labrador Tea) ^{1, 4}

Habitat:

This plant is very common in [muskeg](#), [bogs](#), and wet coniferous woods with acid soil.

Traditional Use:

Food:

Leaf – Tea.

Medicine:

Leaves – Stomach flu, diarrhea, chills, bad breath, colds, pneumonia, difficulty urinating, headaches, heart ailments, arthritis, teething pain, as a system cleanser, for whooping cough, kidney ailments, tension, burns or wet eczema.

Above-ground Plant – Arthritis, colds, chest pains, hair loss, migraines, urinary pain, eye infection, eye wash, cleaning wounds, healing the umbilical scab and cracked nipples, baby rashes, burns, itchy skin, sores, or chapped skin.

Root – For colds and to clean out the stomach.

Spiritual:

Spilled over hot rocks in a sweat lodge as an aromatic.

Description:

This evergreen shrub grows to a height of up to 1.5 m but it tends to be shorter at higher altitudes. It can grow in full to no shade and the flowers are [hermaphrodite](#) and are pollinated by bees. It attracts wildlife. The plants flower more freely when growing in a sunny place and require a fungal association in the soil. Take some soil from the original site and place it into the soil for the new plants. This is a good plant for bees.

Planting:

Seeds - Surface sow in a shady part of a greenhouse in February or March or as soon as the seeds are ripe in the fall.

Germination can be quite slow and requires soil from the original site. Grow them for 18 months before planting them out into their permanent positions.

Cuttings - from half-ripe wood, 5 – 8 cm long with a heel. Plant in July or August in a frame and plant them out in the spring. Cuttings from mature wood can be planted in some of their original soil in November or December in a frame and take 12 months.



Linnaea borealis (Twinflower) ^{2, 4}

Photo credit: www.web.unbc.ca/~fsty201/wildflower/

Habitat:

Open or dense, mossy forest or shrub thickets.

Traditional Use:

Food:

Although it is said to be a food plant, no more information is available at this time.

Medicine:

Plant - Tonic in pregnancy, painful or difficult menstruation, [poultice](#) for inflamed limbs, and headaches.

Description:

This is an evergreen shrub. The flowers are [hermaphrodite](#) and are pollinated by insects. The plant prefers moist, acidic soils and semi to full shade.

Planting:

Seeds: Sow as soon as they are ripe in autumn in a cold frame. When they are large enough to handle, replant them into individual pots and store over the winter in a cold frame or greenhouse. Plant them into their permanent positions after the last expected frost in late spring or early summer.



Lonicera involucrata (Black Twinberry) ⁴

Habitat:

Calcareous woods, banks of streams and swamps, and in open coniferous forests.

Traditional Use:

Food:

Fruit - Dried or raw but they are quite bitter.

Medicine:

Bark - Disinfectant, cough, eyewash, milk flow improvement, dressing for burns.

Leaves - Venereal sores, itchy skin, boils, and eye wash.

Fruit - Antidandruff, [emetic](#), laxative, pectoral, chest and stomach complaints, and as a body cleanser.

Technological:

Fruit - A purple or grey dye, depending on the mordant. Hair tonic to prevent grey hair.

Description:

Flowers come out in May and seeds ripen from July to September. The plant is [hermaphrodite](#) and is pollinated by bees. Twinberry succeeds well in good, moist soil in the shade (although it will grow in direct sunlight).

Planting:

Seed: Sown as soon as ripe in a cold frame. The stored seeds need 2 months of stratification. Grow seedlings in a greenhouse over the first winter and plant them out after the last expected frost.

Cuttings: Half-ripe wood is planted in July or August in a frame. Mature wood cuttings are planted in November in a cold frame.



Menyanthes trifoliata (Buckbean) ²

Photo credit: www.s-weeds.net/

Habitat:

Bogs, marshes, fens, as well as lake and pond margins.

Traditional Use:

Food:

Rhizomes - Used as emergency food and bread.

Medicine:

Leaves - A cathartic and emetic, fever, migraines, indigestion, improving appetite, to eliminate intestinal worms, ulcerous wounds, and scurvy.

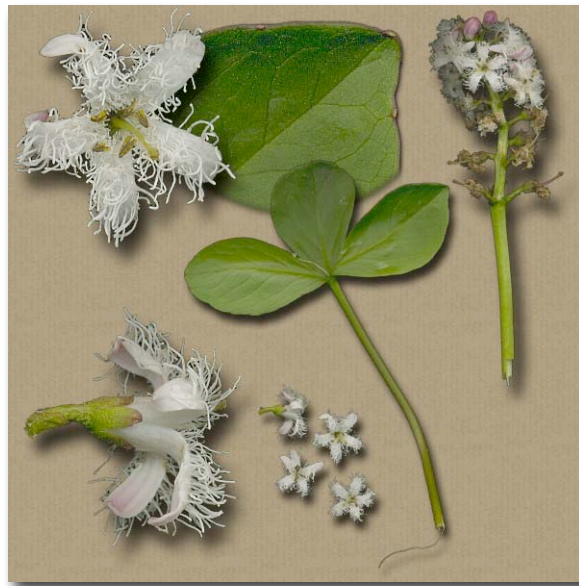
Description:

This is a perennial reaching a height of up to 1 m. The flowers are hermaphrodite and are pollinated by bees, moths and butterflies. Grow the seeds in wet peaty soil or in shallow water at the edge of a pond. The plant prefers acidic conditions, does well in up to 30 cm water and dislikes shade. The plants spread by means of long-creeping thick surface rhizomes and is a very hardy plant.

Planting:

Seeds – Keep seeds moist and sow in late winter or early spring in a pot in a cold frame. Keep the pot just submerged in water. Once the seedlings have grown, pick them out and grow them on trays of water in the greenhouse for their first winter. Plant them in their permanent positions after the last frost.

Cuttings – Gather in summer and insert into the mud at the side of a pond and they will usually root well.



Mertensia paniculata (Tall Bluebells, Lungwort) ^{1, 4}

Photo credit: www.em.ca/garden/

Habitat:

Found in moist woodlands and on shady stream banks.

Traditional Use:

Food:

Leaves - Tobacco extender.

Medicine:

Plant - Heart trouble.

Description:

This [perennial](#) grows to over a half meter in height. The flowers show in July and are [hermaphrodite](#). Tall bluebells prefer well-drained soil, but will grow in moist or wet soil and can grow in semi-shade to no shade.

Planting:

If the plant is cut down after flowering, it will normally produce another flush of flowers.

Seeds: The newly ripened seeds are best sown in a cold frame protected from direct sunlight. Replant the seedlings into individual pots when large enough to handle and grow them in a greenhouse for their first winter. Plant them out in their permanent positions after the last expected frost.

Division: The plants can carefully be divided in early spring or fall.



Myrica gale (Sweet Gale) ^{1, 4}

Photo credit: www.gartenspaziergang.de/

Habitat:

Circumboreal species, found along stream banks and in shallow-water swamps on acid soil.

Traditional Use:

Medicine:

Stem, leaf and catkin –Tuberculosis.

Technological:

Catkins - Trap lures.

Description:

A **deciduous** shrub growing to 2 m. by 1 m. The flowers show from March to May and the seeds ripen in August and September. The flowers are **dioecious** and are wind pollinated but the plant is not self-fertile. Some benefits are that it is Nitrogen fixing and attracts wildlife. The male and female plants must be grown if seed is required, but it is occasionally **monoecious** and can also change sex from year to year.

Planting:

Seeds - Sown when ripe in the autumn in a cold frame. Lightly cover seeds and keep moist. Grow in the cold frame for the first winter and plant in late spring or early summer.

Suckers - plant directly into the soil during the dormant season (winter).



Nuphar lutea ssp. polysepala (Yellow Pond Lily) ⁴

Photo credit: www.giftpflanzen.com

Habitat:

In moist soils in and around ponds, lakes and marshes.

Traditional Use:

Food:

Root - Cooked and used as an emergency food.

Seeds - Cooked or ground into a powder for use in breads, soups, and porridge.

Flower - Refreshing drink.

Medicine:

Roots - Large doses are toxic. Used for blood diseases, chills, swellings, inflammations, cuts, and infertility.

Description:

Flowers from June to August and seeds ripen from August to September. The flowers are [hermaphrodite](#) and are pollinated by flies and beetles. The plant prefers acid to basic soil; can grow in semi - shade or no shade, and will grow in water.

Planting:

Seeds: Sow as soon as they are ripe in a greenhouse in pots submerged in 25 mm of water. Grow in water for at least 2 years and plant out in late spring.

Division: Each division must have at least one "eye" and division should take place in May.



Petasites frigidus var. palmatus (Palmate Coltsfoot) ^{2, 4}

Photo credit: www.stewo.no/stauder_p.htm

Habitat:

Moist to wet forest, thickets, swamps, openings, and clearings.

Traditional Use:

Food:

Young flower stalks – Boiled.

Flower buds – Cooked.

Leaf stalks – Peeled and eaten raw.

Ash – Salt substitute.

Medicine:

Roots – Grippe, consumption, boils, swellings and running sores, and sore eyes.

Description:

This is a short, [perennial](#) plant that flowers from February to April with the seeds ripening in April. The flowers are [dioecious](#) and are pollinated by insects. The plant is not self-fertile. The Coltsfoot prefers deep fertile humus-rich soil that is permanently moist but not stagnant and it prefers a shady position.

Planting:

Division: Succeeds at almost any time of year. Larger divisions can be planted out directly into their permanent positions and, since they are quite invasive, they require little help to spread.



Picea glauca (White Spruce) ^{1, 4}

Photo credit: www.arbolesornamentales.com/

Habitat:

A common tree of dry, rich soils in the coniferous forests.

Traditional Use:

Food:

Pitch – Spruce gum.

Cambium – emergency food.

Medicine:

Inner bark – Decayed teeth, skin sores, and burns.

Pitch – Skin infections, cuts, rashes, burns, persistent sores, chapped or cracked skin, and sore throat.

Branches – Colds or influenza.

Rotted spruce wood - Baby powder, rashes, and arthritis.

Technological:

Wood - Canoe frames, paddles, arrow shafts, fish net floats, basket frames, snowshoe frames, bowls, lean-to shelters, caribou-hide tepee poles, windbreaks, tent-based wind barriers, carpets, [caches](#), meat drying racks, and hide stretchers.

Roots – Stitching birch bark canoes and coiled sewing baskets.

Melted spruce pitch - Seal joints in birch bark canoes and baskets, to stick together the strands of willow bark twine, and to waterproof rawhide ropes and twine. The boiled pitch was mixed with lard or moose fat to make a less brittle sealant.

Spruce bark - Canoes, mats, tent flooring, and shingles.

Description:

Large, shapely conifer with stiff sharp needles. This is a very important tree for [Indigenous](#) people. This tree grows at a fast rate up to 15 m. The flowers are [monoecious](#) and are wind-pollinated. The tree requires plenty of moisture at the roots but does tolerate poor peaty soils. It dislikes shade and is not tolerant of acid rain or air pollution. This tree is not suited for “Christmas trees” because the needles fall off very quickly. Seed production takes place at around 20 years but reliable seed crops may take up to 40 years.

Planting:

Seeds: Sow fresh seed in autumn in a cold frame and replant seedlings into individual pots when they are large enough to handle. Keep the seedlings over the winter and plant them after the last expected frost.

Cuttings: Up to 5-8 cm should be planted in August in a cold frame. It forms roots in the spring. Cuttings from mature terminal shoots, 5 – 10 cm long should be

planted in a cold frame in September to October, but take 12 months to grow.



Picea mariana (Black Spruce) ^{1, 4}

Photo credit: <http://de.wikipedia.org/wiki/>

Habitat:

Common on acidic [muskeg](#) and water-saturated soils, and on drier sites at higher altitudes in the coniferous forests.

Traditional Use:

Food:

Pitch is chewed as a confection (Spruce gum).

Medicine:

Pitch – Endurance, heart, infected wounds, sore ear, stomachache, cysts, and for chicken pox.

Tip or bud – Endurance, heart problems, and high blood pressure.

Branches - Sore eyes, and to chase away mosquitoes.

Cones - Mouth infections, toothache, sore throat, phlegm, “sore heart”, and venereal disease.

Wood - Dried rotted spruce wood - baby powder. Charcoal can also be used as a baby powder.

Technological:

Logs – Deadfall traps for mink, marten, or wolverine, and shelters.

Saplings - Spring-pole snares, ribs of spruce bark canoes.

Pitch – To preserve traps.

Branches – Used to wash the scent of humans from steel traps, tent frames, lean-tos, meat drying racks, carpets, and dolls.

Wood - Hide cleaning and stretching frames and boards.

Rotted wood - Smoke and dye hides.

Cones - Reddish dye for fishnets or quills.

Roots – Storage baskets and fishnets.

Black spruce killed by forest fires but still standing are one of the main sources of firewood for many northern communities. The small dead branches at the base of the tree, covered with lichens, are an important source of kindling. Charcoal can be used for tattooing.

Description:

Black Spruce is an extremely important evergreen. The seeds ripen from October to November. The flowers are [monoecious](#) and are pollinated by the wind. This tree can grow well in neutral to acidic soils but it can't grow in the shade and doesn't tolerate air pollution. This is a short-lived, slow-growing tree. The tree begins to bear cones when it is around 10 years old.

Planting:

Seeds: Do not allow seeds to dry out or to get warm during storage. Sow the fresh seeds in the autumn in a cold frame and grow the seedlings in a greenhouse or cold frame over the winter in individual pots. The small seedlings should be planted into their permanent positions when small, between 30 and 90 cm early the next summer.

Cuttings: Semi-ripe end shoots about 5 – 8 cm in length can be planted in August in a frame. Protect them from frost and they will begin to show buds in the spring.



Pinus contorta (Lodgepole Pine) ¹

Photo credit: www.wnps.org/plants/

Habitat:

Sandy or rocky soils throughout the boreal forest.

Traditional Use:

Food:

Pine **cambium** can be eaten fresh.

Medicine:

Inner bark - **Poultice** for deep wounds.

Pine needles - **Poultice** for frostbite.

Pine gum - Cold medicine.

Root – To clean wounds and promote healing.

Technological:

Dry cones – Tanning hides,

Logs – Cabins.

Branches - Windbreaks around tents.

Wood - Chipewyan toboggans, boat planks, fishnet floats, mesh measures, and firewood.

Knots – Fishhooks.

Pitch – Caulking.

Roots – Coil baskets.

Description:

This evergreen grows to 15 m at a fast rate. It flowers in May and seeds ripen in January or February. The flowers are **monoecious** and are wind-pollinated. The plant is not self-fertile.

Planting:

Not much is known about the cultivation or seed propagation, although if you follow the general rules for black and white spruce, you may get results.



Pleurozium schreberi (Red-stemmed Feathermoss) ²

Habitat:

Moist forested habitat; particularly abundant in dry open forests. Uncommon in the open ([bogs](#), shrub-steppe). Common around White and Black Spruce, Labrador Tea, Mountain Cranberry, Mountain Fern Moss and Sphagnum Mosses.

Traditional Use:

Technological:

Moss - Chinking log homes and sheds, [cache](#) lining.

Description:

This [perennial](#) relatively large and robust moss grows in mats rather than tufts. This moss is often abundant on nitrogen-poor, acidic soils and is sometimes used as an indicator of acidic soils, but it doesn't like to grow in high-calcium soils. If the surrounding canopy of trees is destroyed by fire, it can take several decades before this moss can recover. This plant is an indicator of heavy metal deposits and is often used to locate polluting sources and determining levels of pollution. It absorbs metals over its entire surface.



Populus balsamifera ssp. balsamifera (Balsam Poplar) ⁸

Photo credit: www.linnaeus.nu/bibliotek/

Habitat:

In deep, moist, sandy soils along streams, rivers, floodplains and sometimes on borders of lakes and swamps.

Traditional Use:

Food:

Inner bark - Usually in spring, dried and used as a powder as thickener for soup or added to bread dough.

Catkins - Eaten raw or cooked but are quite bitter.

Medicine:

Leaf buds - Antiscorbutic, antiseptic, [diuretic](#), expectorant, stimulant, tonic, salves, sprains, sores, rheumatism, wounds, inflammation, muscle pains, lung ailments, coughs, and [cathartic](#).

Bark - Anodyne, anti-inflammatory, febrifuge, rheumatism, fevers, pain, eye wash, and scurvy.

Technological:

Shoots - Extract of shoots can be used as a rooting hormone for all plant cuttings.

Resin - Waterproofing canoes, insect repellent.

Bark - Insect repellent.

Description:

This plant prefers deep rich well-drained soil but will grow on wet, poor and acidic, or thin dry soils. It dislikes shade. The flowers are [dioecious](#) and are wind pollinated.

Planting:

Seeds: These have a very short period of viability and needs to be sown within a few days of ripening. Surface sow in a cold frame. When seedlings are large enough, plant them out in late summer.

Cuttings: Planted in a sheltered outdoor bed or directly into permanent positions.

Suckers: Plant in early spring.



Populus tremuloides (Trembling Aspen) ^{1, 4}

Habitat:

Common on moist to dry soils, logged and burned areas in the parklands and boreal forest.

Traditional Use:

Food:

Cambium - The inner bark and cambium can be peeled off with a knife and eaten in the springtime and tastes much like honeydew melon.

Sap - Syrup.

Wood - Dry or rotting wood used to smoke meat and fish.

Ashes - Aspen wood ashes used as salt a long time ago.

Medicine:

Leaves - Bee or wasp stings, mosquito bites or cuts.

Bark – Stomachache, spitting up of blood, heart medicine, for relief of food poisoning, diarrhea, cancer, diabetes, emetic, diarrhea, fever, venereal disease, coughing, and diabetes.

Inner green bark - Wounds and coagulant.

Crustose lichen on the bark – (White “dust” on the bark) Used for wounds, cuts, as a coagulant, and for venereal disease.

Buds – Toothache.

Seeds - Abortion.

Technological:

Wood - Used to make canoe paddles, tepee poles, deadfalls, snow shovels, temporary snowshoe frames, and plates. The rotted wood is burned to smoke hides.

Knurls - Hollowed out to make bowls and as firewood.

Stems - Used to make whistles.

Young branches - Stripped of leaves and split in half to make cooking sticks.

Ashes – Used to make soap or to soften moose hides during tanning.

Description:

This tree grows best in rich porous soil with plenty of lime. This is a deciduous tree growing to 20 m at a fast rate. It is very hardy. Flowers show up in April and the seeds ripen from May to June. The flowers are dioecious and are wind-pollinated. The tree requires sun and can tolerate drought. This tree is grown quite easily but grows fastest and largest in deep rich well-drained neutral soil. Although the tree is sturdy and tolerates some wind, it does not do well on exposed upland sites. It does not do well where there is a lot of root competition

from other trees. The trees should not be grown within 12 m of buildings as the roots quickly dry out the soils.

Planting:

Seeds: Sown as soon as ripe in spring. Poplar seeds have a very short period of viability and need to be sown within a few days of ripening. Surface sow in trays in a cold frame and pick out seedlings and place in individual pots. If there is enough growth, this plant can be planted into their permanent positions in late summer; otherwise they need to be kept in a cold frame till late next spring. These seeds are best gathered from the wild, as commercial seeds are often hybrid.

Cuttings: Mature wood cuttings can be planted in a sheltered outdoor bed in November or December but cuttings don't grow as well as the seeds.

Suckers: Gathered and planted in early spring.



Ptilium crista-castrensis (Knight's Plume) ¹

Photo credit: www.lamedon.de/moosbilder/

Habitat:

Continuous ground cover in the boreal forest. This type, usually grows in moist depressions between hummocks or on logs.

Traditional Use:

Technological:

Moss - Dish scrubber, leather ball stuffing, chinking cracks in log cabins, cooking, "bush fridge" as a liner.

Description:

This is a green to golden-green moss.



Pyrola asarifolia (Pink Wintergreen) ^{1, 4}

Photo credit: www.em.ca/garden/native/

Habitat:

Fairly common **circumboreal** species found in moist woods and woodlands, in dappled shade, along shady edges or in deep shade, and as a groundcover.

Traditional Use:

Medicine:

Leaves – Bleeding, promoting healing, toothache, **diuretic**, sore eyes, and coughing up of blood.

Description:

Pink Wintergreen is an evergreen **perennial** herb growing up to 30 cm tall. The **hermaphrodite** flowers appear from June to July and the plant is self-fertile. The Wintergreen prefers moist, light to medium, acid to neutral soils and any lighting from full sun to full shade.

Planting:

Seeds: This plant is difficult to grow from seed.

Division: The clumps can be divided with great care not to disturb the main clump. Pot the divisions using soil from around the parent plant as this soil contains the necessary **micorrhiza**. Grow in a lightly shaded part of a greenhouse or cold frame and do not plant out until the plants are growing well. Do not plant out until the last expected frost is over.



Ribes triste (Swamp Red Currant) ⁴

Photo credit: www.nps.gov/lac/completeplants.htm

Habitat:

Bogs and cool, moist woods.

Traditional Use:

Food:

Fruit - Raw or cooked or dried for later use.

Medicine:

Stems - Remove bark and make a decoction for sore eyes.

Description:

The flowers are [hermaphrodite](#) and are pollinated by insects. The plant needs well-drained soil and can stand shade, although they don't produce as much fruit as when growing in sun. Do not grow around white pine as they can harbour a stage of White Pine blister rust.

Planting:

Seed: Best sown as soon as ripe in a cold frame. Stored seeds need [stratification](#) but can be stored for up to 17 years. Keep seedlings in a cold frame over the first winter then plant out after the last expected frost.

Cuttings: Half-ripe wood cuttings in July or August in a frame. Mature cuttings are planted from November to February in a cold frame or outdoor sheltered seed bed.



Rosa acicularis (Prickly Rose) ^{1, 4}

Habitat:

Common in woods, fields, and roadsides.

Traditional Use:

Food:

Rose hips - Eaten fresh or made into a jelly, syrup or tea. The seeds must be removed first because, if swallowed, they irritate the throat or intestinal tract.

Flowers – The petals are eaten fresh.

Medicine:

Branches - Excessive menstruation.

Root – Diarrhea, coughs, menstrual irregularity, eye drops, and chest colds.

Rose hips - Colds and fevers.

Flowers - Heart tonic and bee stings.

Technological:

Rose hips – Toy pipe head or beads.

Description:

This **deciduous** shrub grows to 2.5 m tall. It flowers from May to June and the seeds ripen in September. The flowers are **hermaphrodite** and are pollinated by insects. The plant requires well-drained moist soil with neutral pH (7). It grows well in heavy clay soils. This plant is the floral emblem of Alberta. If planted near or with lupines, wild onions or even garlic, they protect the plant from disease and insect predation.

Planting:

Seeds: Can take two years to germinate. Dry and fully mature seeds need stratification to mature the embryo and reduce the seed coat. This process can be speeded up by placing it in damp peat moss for 2-3 weeks at a warm temperature of 27 - 32° c before keeping cool for 4 months by which time it should be germinating. Fresh green fruit can be sown immediately and might germinate in late winter.

Cuttings: Half-ripe wood with a heel cut in July can be grown in a shaded frame. They need to spend the winter there, but should be planted in late spring. Mature wood cuttings from shoots should be about a pencil thickness in diameter and about 20 – 25 cm long then planted outdoors in a sheltered position. The cuttings can take 12 months to establish themselves but the success rate is high.



Rosa woodsii (Wood's Rose) ^{2, 4}

Habitat:

Dry slopes, woodlands, sunny edges and dappled shade.

Traditional Use:

Food:

Rose hips - Eaten raw with seeds removed or made into jams, jellies, and teas.
Leaves – Also made into tea.

Medicine:

Rose hips - Preventing or treating colds.

Roots - Sore eyes.

Technological:

Wood - Arrows.

Description:

This [deciduous](#) shrub grows to 2 m tall. The flowers come out between June and July and the seeds ripen from August to October. The flowers are [hermaphrodite](#) and are pollinated by bees. The soil needs to be moist and well-drained but can contain clay. The plant prefers light to no shade. It dislikes waterlogged soils.

Planting:

Seeds: Can take two years to germinate. Dry and fully mature seeds need stratification to mature the embryo and reduce the seed coat. This process can be speeded up by placing it in damp peat moss for 2-3 weeks at a warm temperature of 27 - 32° c before keeping cool for 4 months by which time it should be germinating. Fresh green fruit can be sown immediately and might germinate in late winter.

Cuttings: Half-ripe wood with a heel cut in July can be grown in a shaded frame. They need to spend the winter there, but should be planted in late spring. Mature wood cuttings from shoots should be about a pencil thickness in diameter and about 20 – 25 cm long then planted outdoors in a sheltered position. The cuttings can take 12 months to establish themselves but the success rate is high.



Rubus pubescens (Trailing Raspberry) ¹

Photo credit: www.tcr.gov.nl.ca/nfmuseum/images/

Habitat:

Common in moist woods or meadows, **bogs**, and **tundra** from northern Alaska, south through British Columbia to Oregon.

Traditional Use:

Food:

Berries - Eaten raw or cooked, made into small cakes and dried and stored for later use.

Medicine:

Leaves – **Astringent, stomachic**, vomiting of blood, blood spitting, and irregular menstruation.

Technological:

Berries – Purple to dull blue dye.

Description:

This **deciduous** shrub bears **hermaphrodite** flowers and are pollinated by insects. This plant is easily grown in good well-drained loamy soil in sun or semi-shade.

Planting:

Seeds: Require a warm and cold spell and are best sown in early autumn in a cold frame. Pick out the seedlings and replant in individual pots and grow them in a cold frame until the following spring.

Cuttings: Half-ripe wood can be planted in July or August in a cold frame. Divisions can be made in early spring or before losing their leaves in the fall.



Sphagnum spp. (Sphagnum Mosses) ¹

Habitat:

Common in damp woods, [muskeg](#), and [bogs](#) throughout the [circumboreal](#) forest and parklands.

Traditional Use:

Food:

Moss was sometimes mixed with tobacco as an extender.

Medicine:

Red peat moss – Antiseptic for cuts, skin infections, and diaper rash.

Technological:

Green peat moss – disposable diapers, toilet paper, sanitary napkins, paper towels, and baby wipes, floor scrubbers, chinking log walls, and for smoke-curing meat or leather.

Red peat moss - Never used as diapers because it is believed to irritate the skin.

Description:

These porous mosses have the ability to acidify their surroundings and can hold 20 times or more their weight in water. There are over 40 species of sphagnum moss in Western North America. Sometimes they form hummocks and sometimes they form a flat, spongy floor in a peat [bog](#).

Sphagnum angustifolium is a slender, yellow-green species that is always found above water level.

Sphagnum girgensohnii grows in forested habitats, on shallow peat, or on cliff shelves. This type of sphagnum is always green.

Sphagnum warnstorfii is a small, purplish-red moss and often grows in boreal [muskegs](#).

Sphagnum fuscum is a brownish hummock-forming moss that grows either in true [bogs](#) or on isolated hummocks in rich [fens](#).

Planting:

Mosses can be generalized, to some extent. The best way to grow it is to transplant it. The ground needs to be raked free of any other matter and to loosen the upper layer. It is important to check the soil and environment of the source moss, as the conditions need to be very similar in order to transplant it. If need be, it may be possible to lay down a thin layer of the soil from the source site; however, it is also important to consider the loss of the moss from the source site and its implications. Moss can be cut out in rectangles, loosened and rolled for storage and transported to the end site. Do NOT use plastic around the rolls of moss as it encourages fungus and mold growth. Moss can be purchased by the roll, but it is seldom the [indigenous](#) mosses but rather mosses from other areas and often used for gardening. Mosses do not spread or grow as quickly as one might imagine, and a harvested area may remain empty until other plants grow there. It is unlikely the mosses will spread quickly enough to fill the area.

Some mosses, take years to grow back – if nothing else grows there first.

The most important consideration is to try to protect the sphagnum and other mosses as they are important in their environment. Their loss would alter the landscape considerably.



Spirea alba (Narrow-leaved Meadowsweet) ⁴

Photo credit: www.macd.org/nativeplants/

Habitat:

Moist meadows, marshes, moist open woodlands, and sandy soils.

Traditional Use:

Food:

Leaves - Tea.

Medicine:

Leaves - Tea as a tonic.

Description:

Hermaphrodite flowers come out from July to August and are pollinated by insects. The plant requires abundant moisture and full sunlight.

Planting:

Seed: Sow seeds as soon as they are ripe in a cold frame and grow over the winter. Plant them out after the last expected frost.

Cuttings: Half-ripe wood cuttings in July or August in light, sandy soil in a frame. Mature wood cuttings are planted in an outdoor frame in September.

Division: These can be planted out into their permanent positions from suckers in early spring.



Stipa comata (Needle-and-thread Grass),

Habitat:

This grass usually grows on upper, south or southwest facing slopes and on open meadows.

Description:

Needle-and-thread is an erect, densely tufted [perennial](#). The flowers are nodding and loosely spreading. Needle-and-thread is a native, cool season [perennial](#). Growth begins in mid-April and flower stalks appear mid-June. Flowering begins 10 days later. Seeds ripen in mid-July and shatter about two weeks later. Plants can grow in the fall if there is enough rainfall. Needle-and-thread often produces plenty of seeds. Needle-and-thread is excellent food and cover for sage grouse, birds and small mammals. Needle-and-thread constitutes a minor component of antelope and elk diets in summer, but it can also be important forage in fall.

Planting:

Seeds: Needle-and-thread is useful for long-term restoration. The tussocks and lateral, spreading roots holds the soil together and reduces erosion. Needle-and-thread has over a quarter million seeds per kg and the best seeding rate is around 9 kg/ha. Heavy manure applications will increase basal cover of needle-and-thread.



Symphoricarpos occidentalis (Western Snowberry) ^{1, 4}

Photo credit: www.botany.wisc.edu

Habitat:

Common in bushy areas, sunny edges, dappled shade, shady edges, deep shade, and open rocky bush lands.

Traditional Use:

Medicine:

Berries - Sore eyes.

Root and Stem – Teething pain, fever associated with teething, skin rashes, and venereal diseases.

Branches and Leaves - [diuretic decoction](#), kidney problems, and as a love potion.

Description:

This [deciduous](#) shrub grows up to 1.8 m at a medium rate although it is smaller when growing on rocks, which it does very well. The flowers arrive in June or July and the seeds ripen from September to November. The flowers are [hermaphrodite](#) and are pollinated by bees. It is noted for attracting wildlife. The shrub can tolerate marine exposure and atmospheric pollution. The shrub tolerates most soils and conditions, including poor soils and among the roots and under the drip of trees. The shrub will tolerate temperatures down to -40° c.

Planting:

Seeds: Sown in a cold frame as soon as it is ripe. Stored seeds require stratification. Pick the seedlings out and plant in pots and grow them in a greenhouse the first winter and plant them into their permanent positions after the last frost.

Cuttings: Half-ripe wood cuttings can be planted in July or August in a frame. Cuttings of mature wood, 15-25 cm long and with a heel, can be planted in a sheltered bed outdoors in winter.

Suckers: Planted directly into their permanent positions.



Tomenthypnum nitens (Golden Fuzzy Fen Moss) ²

Habitat:

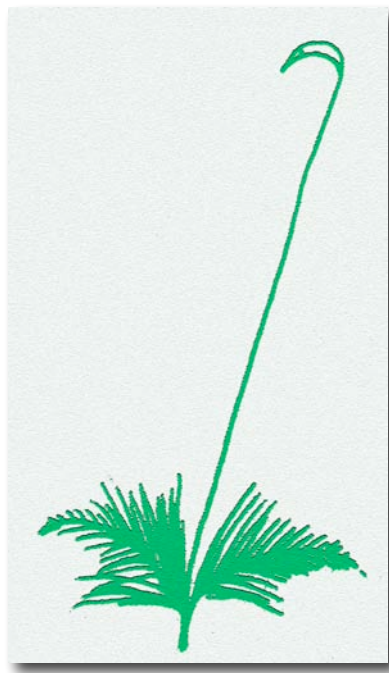
Wet, calcium-rich sites, muskegs, swamps, fens, tundra seepage.

Traditional Use:

Technological: Mosses have generalized uses that may vary from one First Nation group to another. They were used widely for their insulating and cushioning qualities in chinking and in caches.

Description:

This moss is a golden colour and forms hummocks.



Typha latifolia (Cattail) ⁴

Habitat:

Shallow water in ponds, lakes, ditches, slow streams.

Traditional Use:

Food:

Roots - Raw or cooked like potatoes. Dried into a powder and mixed with flour.

Young shoots - Raw or boiled – look like leeks but has little taste.

Mature Stem - Base peeled and cooked.

Immature flowering spike - Raw, boiled, or toasted.

Seed - Ground into flour and the oil extracted.

Pollen - Raw or cooked. Flour additive or as a flour.

Medicine:

Leaves – [Diuretic](#) and [poultice](#).

Pollen - [Astringent](#), [diuretic](#), anticoagulant, kidney stones, haemorrhage, painful menstruation, abnormal uterine bleeding, post-partum pains, abscesses, cancer, tapeworm, diarrhoea, and injuries.

Stems - [Decoction](#) to treat whooping cough.

Roots - [Diuretic](#), [poultice](#), cuts, wounds, boils, sores, carbuncles, inflammations, burns, and scalds.

Flowers - Abdominal pain, urinary problems, cystitis, vaginitis, and diarrhoea.

Technological:

Stems and leaves - weaving mats, making paper, thatch, and rush lights,

Flowers – kindling and tinder.

Leaves - Paper, thread, and insulation.

Growing plants - Water filtration and purification.

Description:

Plants flower from June to August, are [monoecious](#) and are wind pollinated. This plant attracts wildlife. This plant requires wet soil and can grow in water and does not like to grow in the shade. This is an easily grown plant and does well in boggy margins of ponds or in shallow water up to 15 cm deep. It can grow in virtually any wet soil.

Planting:

Seed: Surface sow in a pot and stand in 3 cm of water. Increase the water level as the plant grows and plant in the summer.

Division: Divide in spring. Harvest the young shoots when they are about 10 – 30

cm tall. Make sure some root is attached, then plant them right into their permanent spots.



Vaccinium alaskaense (Alaska Blueberry) ⁴

Photo credit: www.depts.washington.edu/propplnt/

Habitat:

Marshes, fens and bogs as well as along roadsides under the right conditions.

Traditional Use:

Food:

Fruit - Raw or cooked or dried into cakes for the winter.

Description:

Alaska blueberry requires moist, peat-rich soil and prefers acidic soil. Grows in partial or full sunlight. The flowers are hermaphrodite and are pollinated by insects.

Planting:

Seed: Sow late in winter in a greenhouse as soon as ripe. Grow in a greenhouse over the winter and plant outside after the last expected frost.

Cuttings: Half-ripe cuttings should be planted in August in a cold frame. This is a slow and difficult process.

Division: Divide suckers in spring or early autumn.



Vaccinium membranaceum (Black Huckleberry) ^{2, 4}

Habitat:

Common understory shrub in coniferous forests, on dry to moist sites.

Traditional Use:

Food:

Fruit - Eaten raw or cooked. This fruit is amongst the largest and best flavoured of all the wild blueberries. The fruit is often dried for use in the winter.

Medicine:

Roots and stems - Heart troubles, arthritis and rheumatism.

Description:

This hardy [deciduous](#) shrub grows to a meter tall and flowers from June to July. The flowers are [hermaphrodite](#) and are pollinated by insects. The plant prefers acidic soil and semi-shade and tolerates drought. The fruit is better in sunny positions and the plant needs shelter from strong winds.

Planting:

Seeds: Sow the seeds in late winter in a greenhouse and just cover the seeds with soil. Other reports suggest sowing the seeds in a greenhouse as soon as they are ripe. When the seedlings reach a height of about 5 cm they can be replanted into individual pots and grown in a slightly shady spot over the winter. Put them out into their permanent positions after the last expected frost.

Cuttings: Half-ripe wood about 5 – 8 cm with a heel can be planted in August in a cold frame, but this is apparently slow and difficult.

Division: Suckers can be divided in spring or early fall.



Vaccinium oxycoccos (Bog Cranberry) ¹

Habitat:

Frequent in [muskeg](#) and [bogs](#).

Traditional Use:**Food:**

Fruit - Eaten fresh, preferably after a frost, or cooked.

Description:

This tiny-leaved evergreen grows across acidic [bogs](#) with or without shade. The plant flowers from June to August, is a [hermaphrodite](#), and they are bee-pollinated. This plant requires a moist or wet peat-rich soil with an acidic range of pH 4.5-6. The plant fruits better in full sun. The fruit often stays on the plant all winter without rotting.

Planting:

Seeds: Sow in a greenhouse in lime-free potting mix and just barely cover them. Once the seedlings are about 5 cm tall, put them into pots and grow them in slight shade for the first winter. Plant them out in their permanent positions in late spring or early summer.



Vaccinium vitis-idaea (Lingonberry) ¹

Photo credit: www.main2.amu.ed.pl/

Habitat:

Common in dry **bogs**, rocky **tundra**, and sandy woodlands throughout the boreal forests.

Traditional Use:

Food:

Berries – Eaten raw, mixed in pemmican, fried in lard, canned, strained as jelly. Cranberries can be stored a whole year in birch bark baskets in a **cache** under the **muskeg**.

Leaves – Tobacco extender.

Medicine:

Berries – To clean out your stomach or to relieve a bad spring fever.

Roots and stems – Bladder problems.

Technological:

Berries - Red dye, necklace.

Description:

Lingonberry is a low evergreen shrub up to 20 cm tall that flowers from May to June with seeds ripening from August to October. The flowers are **hermaphrodite** and are self-fertile when pollinated by bees. This plant is noted for attracting wildlife. The plant prefers light to medium well-drained lime-free acidic soil and can grow in semi-shade or no shade. This plant needs shelter from strong winds.

Planting:

Seeds: Sow seeds in as soon as they are ripe in a greenhouse and only just cover the seeds. When the seedlings are about 5 cm tall, transplant them into individual pots and grow them in a lightly shaded area of a greenhouse over their first winter. Plant them out into their permanent positions after the last expected frost.

Cuttings: Half-ripe wood, 5 – 8 cm with a heel, can be planted in August in a cold frame. This is slow and difficult. Division of suckers can take place in spring or early fall.



Viburnum edule (Highbush-cranberry) (Mooseberry) 1, 4

Photo credit: <http://web.unbc.ca/~fsty201/wildflower/>

Habitat:

Common in moist, heavily wooded areas.

Traditional Use:

Food:

Berries - Eaten fresh or cooked to make a jelly.

Bark - Smoked.

Medicine:

Twigs – Sore throat.

Buds – Sore throat and lip sores.

Roots – Teething pain, gargle for sore throat, and blood purifier.

Berries – Cough medicine.

Technological:

Branches - Pipe stems.



Description:

This is a **deciduous** shrub growing up to 2 - 2.5 m tall. It flowers in June and the seeds (berries) develop in October. The flowers are **hermaphrodite** and are insect-pollinated. The plant does self-fertilize. The plant will grow in virtually any slightly acidic soil, but doesn't do as well in poor or dry soils in semi-shade. It may need to be planted near a genetically distinct plant of the same species in order to produce fruit and fertile seeds.

Planting:

Seeds: Sown in a cold frame as soon as they ripen. Germination can be slow, up to 18 months, but if the seeds are sown immediately when they are fully developed but before they are fully ripened they should germinate in the following spring. Stored seeds need 2 months of warmth, then 3 months of cold and 18 months to germinate.

Cuttings: Softwood can be planted in early summer in a frame and replanted out in early summer. Cuttings of half-ripe wood can be planted in a cold frame in July or August. Keep them in the greenhouse or cold frame until the next early summer. Since the Highbush-cranberry is difficult to germinate, it can be placed in water with willow cuttings. The meristem hormones in willow are so strong that they help other plants with lower levels of meristem hormones¹⁰. Once rootlets appear on the Highbush-cranberry cuttings, the willow can be removed and the cranberry cuttings can be planted in a cold frame over the winter.

ENVIRONMENTAL CONSIDERATIONS

When roads are cut, seismic lines are created, and land is cleared for mines, forestry, and oil discovery, one of the first effects on the environment is erosion. Silt enters the water system and suspended silt is one of the primary destroyers of fish habitats. When trees are cut, water tables are altered and this leads to a free flow of water across the landscape carrying with it soil and causing a loss of plant habitat. When water or land habitats are damaged, it affects wildlife in a very negative way.

Grizzly bears are territorial, so when a site is cleared within its territory, it will usually lead to the death of that Grizzly or one in a neighbouring territory, as the bear moves away from the site. Grizzlies are endangered, and any change to their territory should be recognized as being in contravention of the protection of Grizzly bears.

Blueberries seemingly grow in abundance, but they also tend to grow in level areas most likely to be selected for clearing. As these areas are cleared, First Nations have to look to other, often less prolific, sources of berries.

Whenever possible, it would be wonderful if nature's needs and the effects of interfering were taken more seriously; however, until then, it is important to carry out restoration of the native plants in order to stop erosion and to provide safe havens and food for wildlife and First Nations. Native trees need to be replanted in an attempt to recreate water tables and create homes and food for wildlife and First Nations. Water habitats need to be restored to protect fish and wildlife that depend on clean and clear water for survival.

The Ministry of Forests recommends the following seed reclamation mix for the Peace River area:

Alfalfa (Iran), Red Clover (Europe, western Asia, and northwest Africa), Birdsfoot Trefoil (Eurasia and North Africa), Creeping Red Fescue (Eastern Alps), Timothy (Europe), and Crested Wheatgrass (Russia).

Although these grasses and clovers can be effective in reclamation of damaged sites, they are all foreign, and according to the Ministry of Forests, "Native grass seed may be prescribed for some sites, especially at high elevations. Native seed should originate from within the Peace region." They go on to list noxious weeds, of which one is a very important Native plant, Cleavers, or *Galium boreale*.

I would suggest that every effort be taken to plant native seeds at all times and to try to match the seeding with the native plants around the site. For the most part, the seeds recommended by the Ministry of forests are forage plants often used to feed cattle. Since the wildlife of the Peace River area in B.C. are not cattle, and they traditionally rely on totally different types of plants for survival, it would be advisable to avoid the recommended plants whenever possible. Moose and Elk rely heavily on lichens and mosses that grow only in the native habitat to survive the winters. Planting forage grasses could eradicate the environments that normally support these lichens and mosses and the forage grasses would not be available during the long winter months and deep snow. The mosses and lichens grow on trees, fallen logs and on rocks that are all accessible during the winter months.

RECLAMATION BASICS

There are many steps to reclamation and many factors to consider. The soil must be tested to determine the acidity or alkalinity because this may have been altered by the use of the area (salt draining off roads into ditches), and any spilled or leaked materials. Many of the Native plants have a wide range of preferences for acidity, calcium, and alkalinity so it is important to select those plants that are native to the region that can best survive and thrive in the site. It is important, also, to consider planting a range of plants that like to live around each other because in nature, you seldom find a single plant species in one location. You may want to choose trees to provide water collection and shade, shrubs around the terrain, and patches of groundcover and flowering plants. The need for food is great in the environment, so whenever possible, try to select fruiting plants such as berry plants or roses.

Other considerations are such things as the amount of time it takes for a plant to grow to maturity. When you plant one type of plant, they will mature around the same time. When you plant trees, shrubs, and groundcover, the time it will take for each species to grow to maturity will differ but you will have an ongoing growth, you will have variety, and if one plant does not grow well or at all, you have a smaller area to replant with less impact on the newly restored environment.

When collecting seeds, even where one plant produces a lot of seeds, it is best to take seeds from a number of that kind of plant to ensure that the seeds have a natural variety, quality, and a broader gene pool. Selecting from a single gene source and planting these seeds in an area can actually lead to a weakening of the plants.

When you gather seeds, fruits, divisions, or cuttings, you will need to keep an accurate record of the location, elevation, and date. When these are planted, it is important to also record the location, elevation, date and how the plants did in the new setting (how long it took to grow and steps taken to help them grow). This will help you decide which seeds to use in future plantings and will help you keep an invaluable database of your work.

Once testing and decisions have been made of the plants to be sown, the site needs to be made ready for planting. This is often done by deep-raking the soil to soften the surface and to give the seeds a softer soil to send their roots into as many damaged sites have compacted soil.

Seed Preparation Methods

This is a process whereby fleshy berries have the seeds safely removed from them. This can be done with a variety of tools from food processors (with the blades wrapped in electrical tape) to rubbing through a screen. If you are processing large amounts of fleshy berries or fruits, a Dybvig separator is available (at a price) that separates the seeds and cleans them in one operation; unfortunately, this machine does not work with smaller seeds such as blueberry seeds. Once seeds have been removed, they need to go into a water bath to further separate the seeds from the pulp and unsound seeds (healthy seeds sink and debris tends to float). The seeds next need to be dried naturally in a well-ventilated area. The reason for needing to clean all the pulp from the seeds is that some species have germination inhibitors in the flesh and this will keep the seeds from sprouting.

SCARIFICATION

Scarification is the breakdown of the hard seed coats of some stored plants. It involves pouring the seeds into an acid bath, usually concentrated sulphuric acid (nasty stuff to store and dispose). The seeds are bathed twice while stirring for an even erosion of the hard seed coats, removing to a screen and rinsing with cool running water to stop the process. This process is very delicate, as the seed coat is thinnest where the first sprout will emerge and if part of the plant is damaged, or if the acid eats into the seed, it could damage your entire seed harvest.

Scarification can also be done by hand with sandpaper, needles or files. If you are scarifying larger amounts of seed, a sandpaper-lined can or rock tumbler can be used. Again, care must be taken whichever method is used.

There are also methods of cold or hot water soaking or a combination of these methods to scarify the seeds.

STRATIFICATION:

Stratification is used when you are working with stored seeds that need to go through a process similar to nature's cycles of heat and cold. The seeds are planted in either a greenhouse or a coldframe and are artificially put through a cold cycle, then a hot cycle, or vice-versa. The requirements vary from plant to plant.

PLANTING OTHER THAN SEEDS

Often, it is possible to gather planting materials by division or cuttings. Division is when you have a clump or cluster of a plant, and at the right time of year, you simply separate the clump or cluster, leaving a healthy plant and taking away parts of the clump or cluster to replant. When this method works for a plant, it is often the best way because usually these can be transplanted immediately to their new site.

Cuttings have to take place at very specific times (usually late fall after the first frost or winter or early spring before buds appear) and must be carefully done to prevent damage to the source plant and to have viable cuttings. The age of the plant must be considered too. Sometimes it is best to take cuttings from different parts of the plants – in some plants, you can take a root cutting whereas in others, you need to take a cutting from a branch. The best branches are those that are about a year old and, if possible, about the thickness of a pencil. Sharp pruning shears should be used to protect the cutting and the source plant.

There are a number of good books and websites available with more information. This book is quite general and can be used as a general guide for planning, but accurate and detailed information for each plant and type of restoration method you use will be required for the real work.

Some plants rely on [micorrhiza](#) found in the soil, and it is important to consider what kind of soil you are using with the new plantings. You may have to bring in soil from around the source plant; you may have to ensure that there is no calcium in the soil; that it is either acidic, neutral or alkaline, moist or dry.

The following table gives a rough outline of the best methods of propagating plants (whether from seed, cutting or division) in this book and roughly how long it takes before you can transplant the seeds, cuttings or divisions from first gathering them.

BEST PLANTING TABLE

Plant	Seed	Cutting	Division	Sucker	FN
<i>Abies lasiocarpa</i>	3	0	0	0	3
<i>Achillea millefolium</i>	5	0	5	0	2
<i>Agropyron smithii</i>	5	0	0	0	1
<i>Amelanchier alnifolia</i>	1	2	0	2	4
<i>Andromeda polifolia</i>	3	0	5	0	1
<i>Artemisia campestris</i>	3	0	0	0	1
<i>Artemisia frigida</i>	3	3	0	0	2
<i>Betula glandulosa</i>	3	0	0	0	1
<i>Betula neoalaskaense</i>	3	0	0	0	4
<i>Betula pumila</i>	3	0	0	0	1
<i>Carex canescens</i>	3	0	5	0	2
<i>Chamaedaphne calyculata</i>	2	3	0	0	1
<i>Cornus canadensis</i>	3	0	2	0	1
<i>Cornus stolonifera</i>	3	0	0	5	2
<i>Drosera rotundifolia</i>	4	0	0	0	1
<i>Epilobium angustifolium</i>	5	0	5	0	3
<i>Galium boreale</i>	5	0	5	0	1
<i>Koeleria macrantha</i>	5	0	0	0	1
<i>Larix laricina</i>	3	0	0	0	3
<i>Ledum groenlandicum</i>	1	2	0	0	2
<i>Linnaea borealis</i>	3	0	0	0	1
<i>Lonicera involucrate</i>	3	3	0	0	2
<i>Menyanthes trifoliata</i>	3	5	0	0	1
<i>Mertensia paniculata</i>	3	0	5	0	1
<i>Myrica gale</i>	3	0	0	5	1
<i>Nuphar lutea</i>	1	0	5	0	1
<i>Petates frigidus</i>	0	0	5	0	2

<i>Picea glauca</i>	3	2	0	0	4
<i>Picea mariana</i>	3	3	0	0	4
<i>Pinus contorta</i>	3	3	0	0	4
<i>Populus balsamifera</i>	3	5	0	5	4
<i>Populus tremuloides</i>	3	3	0	3	5
<i>Pyrola asarifolia</i>	0	0	3	0	1
<i>Ribes triste</i>	3	3	0	0	1
<i>Rosa acicularis</i>	5	3	0	0	3
<i>Rosa woodsii</i>	5	2	0	0	2
<i>Rubus pubescens</i>	3	2	5	0	1
<i>Spirea alba</i>	3	3	3	5	1
<i>Stipa comata</i>	5	0	0	0	0
<i>Symphocarpus occidentalis</i>	3	3	0	5	2
<i>Typha latifolia</i>	3	0	5	0	5
<i>Vaccinium alaskaense</i>	3	3	5	5	2
<i>Vaccinium membranaceum</i>	3	0	5	0	2
<i>Vaccinium oxycoccus</i>	3	0	0	0	1
<i>Vaccinium vitis-idaea</i>	3	3	5	0	2
<i>Viburnum edule</i>	2	2	0	0	3

Legend: Time before planting out into permanent position:

5 = Immediate

4 = 1 – 3 months

3 = 3 – 6 months

2 = 6 months – 1 year

1 = More than 1 year

FN = Importance for food, medicine, technological and spiritual use

1 = Useful in up to 3 ways

2 = Useful in up to 6 ways

3 = Useful in up to 9 ways

4 = Useful in up to 12 ways

5 = Useful in more than 12 ways

CONSIDERATIONS

It would most likely be beneficial to start a seed bank, plant nursery and a restoration project or company in order to provide everything needed. Seeds can be purchased from companies who specialize in this; however, the purchased seeds are not always reliable not to contain hybrids, and they are expensive. If a seed bank was created that would regularly gather the seeds, seedlings, cuttings, and divisions from the native plants that were deemed important to replant, then a safe and plentiful supply of plants for use in restoration would be in place. The seed bank and nursery, could, if the restoration needs are met, eventually also produce seeds for sale.

The restoration project would assess the local, native plants in an area to be restored and would prepare a list of the plants to be purchased from the nursery and allow time for the plants to be ready for transplanting. The time of year is very important, so assessments and orders could take place in late summer, fall and winter (weather permitting) while actual restoration would take place in spring and summer.

With the three projects or businesses working hand-in-hand, the restoration should be quite successful.

One fairly good source of Native seeds is Wallace W. Hansen's Native Plant Nursery and Gardens in Salem, Oregon: www.nwplants.com. He sells seeds, containerized plants, or bare-root plants but, again, he does not guarantee the purity of his seeds. He has a large selection, but he doesn't always have the catalogue plants available. Other sites can be found by searching on "Native plant seeds".

It is important to visit a web site such as "Plants for the Future" (reference in the back) for more detailed planting information once you decide which plants to work with.



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Plants for a Future – Species Database – Extremely useful web site!

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www.pfaf.org/cgi-bin/pfaf/ (UK)

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GLOSSARY

- Andromedotoxin - A crystalline principle, poisonous to humans and other animals, found in various ericaceous plants, such as species of Andromeda, Azalea, Kalmia, and Rhododendron. In sheep and other livestock that graze on the plants, it causes salivation, nasal discharge, emesis, and central nervous system symptoms that may include paralysis, coma, and death. Honey made from these flowers is poisonous.
- Annual – A plant that flowers, produces seeds, and dies in one growing season.
- Antirheumatic – A medicine that combats or eases the pain and swelling of rheumatism.
- Astringent - A substance used on the skin to draw tissue together.
- Bog – an area of wet marshy ground, largely consisting of accumulated decomposing plant material. It supports vegetation such as cranberries and moss and may ultimately turn into peat.
- Cache - A hidden store of food and sometimes supplies.
- Cambium - a cylindrical layer of cells in plant roots and stems that produces the new tissue responsible for increased girth, particularly sap-conducting tissues, xylem and phloem and bark. The Cambium is the moist inner bark of a tree.
- Cathartic - Used to describe a medicine that causes emptying of the bowels.
- Circumboreal – Comprising or throughout far northern regions.
- Cordilleran - The Canadian Cordillera, the name for the mountains of western Canada, includes not only the mountainous and plateau regions, but also the submerged regions on the continental shelf and slope. The Cordillera is a region where earthquakes, recently active volcanoes, deformation of the sediments on the continental slope west of Vancouver Island and regional uplift over the last 10 million years, show that mountain-building is continuing.
- Culms - The jointed hollow stem of a grass or similar plant.
- Deciduous - Trees and shrubs that shed their leaves in the fall.
- Decoction - The extraction of an essence or active ingredient from a substance by boiling.
- Diaphoretic - Used to describe drugs, herbs, or other substances that induce sweating.
- Dioecious – flowers are either male or female but do not grow on the same plant, or needs another plant to produce seeds.
- Diuretic - A medication or other agent that increases urine output.
- Emetic - A medication or substance that causes vomiting.
- Fen – low-lying, inland marshy area, now often drained and cultivated because of its nutrient-rich soil.
- Gleysols - Gleysols are formed under waterlogged conditions produced by rising groundwater. In the tropics and subtropics they are cultivated for rice or,

after drainage, for field crops and trees. Gleysols found in the polar regions

Gray luvisols - Gray Luvisols usually occur under Boreal forest or forest-grassland transition zones in wide range of climatic conditions. They are generally found in the subhumid central to northern part of the Interior plains and in the humid and perhumid areas of eastern Canada. There is an estimated area of 762,217 km² of Gray Luvisols within the cooler Boreal, Cryoboreal and Subarctic regions, 654,305 km² under relatively cold Cryoboreal perhumid to subhumid conditions, 52,435 km² under cool, humid Boreal conditions and 55,477 km² in very cold Subarctic regimes.

Hermaphrodite – flowers have both male and female organs.

Indigenous - Natural or inborn; originating in and typical of a region or country.

Infusion - The act of soaking something in a liquid in order to extract something soluble.

Lacustrine - Growing, living, or formed in or at the edge of a lake.

Lithontriptic - Removes stones from kidneys, bladder, etc.

Luvic Gleysol - A great group of soils in the Gleysolic order developed under wet conditions, under grass or forest or both.

Marsh – an area of low-lying waterlogged land, often beside water, that is poorly drained and liable to flood, difficult to cross on foot, and unfit for agriculture or building

Micorrhiza - a symbiotic association of the mycelium of a fungus with the roots of certain plants.

Minerotrophic – Descriptive of a habitat where nutrients are intruded from ground water flow as opposed to exclusively rainwater (ombotrophic)

Monoecious – flowers are either male or female and grow on the same plant.

Morainal - Of a mass of earth and rock debris carried by an advancing glacier and left at its front and side edges as it retreats.

Muskeg - an area of swamp or boggy land covered in sphagnum moss, leaves, and a mass of dead plant matter resembling peat; the dead plant matter resembling peat that covers areas of muskeg

Organic Cryosols - Organic Cryosols contain at least 40 cm of soil that is at least 30% organic material by weight. They occur on poorly drained flats, often associated with low-centre or high-centre polygons, and are found on lacustrine sediments. They are the result of poorly decomposed peat accumulating in association with the growth of ice wedges.

Peat lands – a bog with a groundcover of peat moss, also known as sphagnum moss

Pemmican - A traditional First Nations traveling food made of lean dried meat pounded into a paste and mixed with melted fat and dried berries or fruits and pressed into small cakes.

- Perennial – A plant that lasts for more than two growing seasons, either dying back after each season, or growing continuously.
- Periderm - The outer layer of plant tissue in woody roots and stems.
- Poultice - A warm moist preparation placed on an aching or inflamed part of the body to ease pain, improve circulation, or hasten the expression of pus.
- Rhizomatous - Pertaining to or having a rhizome.
- Rhizome - An underground horizontal stem that produces roots and shoots that develop into new plants. Also called a rootstock. A rhizome growing above the ground is called a stolon.
- Slough – a hole or low area in the ground filled with mud or water; a stagnant area of water connected to a larger body of water such as a marsh, inlet, or backwater; a saltwater estuary, or on the prairies, a low area filled with water, especially from melting snow
- Stomachic - A medicinal preparation that stimulates gastric activity or improves appetite.
- Stratification - The storing of seeds in a chilled moist environment or material in order to induce germination or to preserve them.
- Tundra - the level or nearly level treeless plain between the ice cap and the timber line of North America and Eurasia that has permanently frozen subsoil
- Ungulate - A mammal with hoofs, in this case referring to elk, deer and moose.