

# *MacKinnon Island*

## *Green*

Botanical Notes and Activities for Manitoba Pioneer Camp and  
Surrounding Area

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## Notices

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Picture from MPC 60<sup>th</sup> Anniversary Publication – view from above at the end of 1940s

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## Introduction

The first inkling of this document started to develop back in the spring of 2007 when I was teaching canoeing skills at Manitoba Pioneer Camp. I had taken a short break from watching circles and stops, everyone was frustrated and tired. I went for a walk around the island; heading out from the back end of the playing field and discovered that MacKinnon was bigger and much more interesting than I realized. There are a few rock outcrops but overall it is pretty much a moist Cedar and Fir forest with wetlands around the edge. I fell in love with the interior of the island that day and I would have stayed much longer if I didn't have to get back to the canoeing course. The tall cedars and periodic stately pine are wonderful; everything down to the green carpet of mosses called to me, asking me to stay awhile and chat.

Each time I return to the camp I take a little time to explore the interior and listen (quietly) to the woodland voices. There is a spirit on MacKinnon that everyone should hear and feel – it is alive and vibrant. I put this document together to introduce the camp visitors to a little part of Gaia. It may be a failed attempt but if it serves as an introduction and encourages you, or your kids, into the forest to sit on a stump or a log, or lie back on a soft green carpet, and listen, then it has served its purpose.

During Canoe School (2010) Chris Milne asked me for some resources that might help the camp add some additional natural history material to the program. I sent him a small list of books that I thought would be useful. One evening at Canoe School (2012) we talked late into the night about the background of the camp, camp philosophy, and natural history. We returned to the topic of the camp environment and the plants on the island, probably starting by a request from one of the Canoe School participants for some lichen identification. I said I would be willing to come out later in the summer and put together a list of species found around the camp, maybe some ecological notes, and some activity ideas. When I got home the thought just continued to grow and this document is the result. Since that initial discussion the document has grown from a simple list of plant species to a guide of sorts, it has then been re-edited substantially several times.

I have provided a list of plant species that might be seen on or around the island at the end of the document. It may not be useful for the programs at camp directly but it may provide useful information if an environmental assessment is required again for the island and adjoining area. This is a long list based on a number of resources, including my own observations and collections, it covers: Shoal Lake, Northwest Angle, Kenora Resource area. This list may include species that you will never see, and you may see species in the area that are not on the list – if you do see additional species please let me, and the camp, know. While researching material for this document I discovered that the local traditional identification of plants is based on both use and location – even if it is the same species. This is a very sensible approach by putting the plant in its environment you will get a feel for the relationship it has to everything around it. This means to properly identify a plant you have to go to the plant not the other way around. Plants are considered 'beings' that share the planet with us and should be respected as such. The knowledge of use resides in the relationship between both the plant and the person. Finding the right plant is as much a part of the plant's 'wants' as it is of ours. I have been

told that Sweet Grass, for example, will be found when it is right for you to find it. There is story at camp that is passed from councillor to camper about finding the Labrador Tea Bog with peat moss and Old Man's Beard only when you are ready.

This document will provide an overview of some interesting plants with regard to growth patterns, ecology, commercial and traditional uses, and cultural importance. It is, by its nature and my background, an eclectic look at the plants and their ecology. It is not a guide to plants or even a complete list but set of ideas that might be of interest. To help with context I have included some environmental and cultural background material as well as a small bit of geological information for the area.

Although the island is located in what is known as the Great Lakes-St. Lawrence forest region there are influences from other areas making this transition zone highly diverse: Boreal forest species are found from the north; Great Plains grasses and other deep rooted dry land species appear from the west; and Aspen parkland species have also arrived from the west as well. Some species that are rare in Ontario are found in this area including Bur Oak, Prickly Pear cactus, and a number of prairie species. The National Ecological Framework of Canada includes the area in the Lake of the Woods ecoregion within the Boreal Shield ecozone.

The area is dominated by Eastern White Cedar, Red and White Pine, Jack Pine, Balsam Fir, and Aspen. Intermixed throughout the wooded areas are dry rock outcrops, wet bogs and marshes.

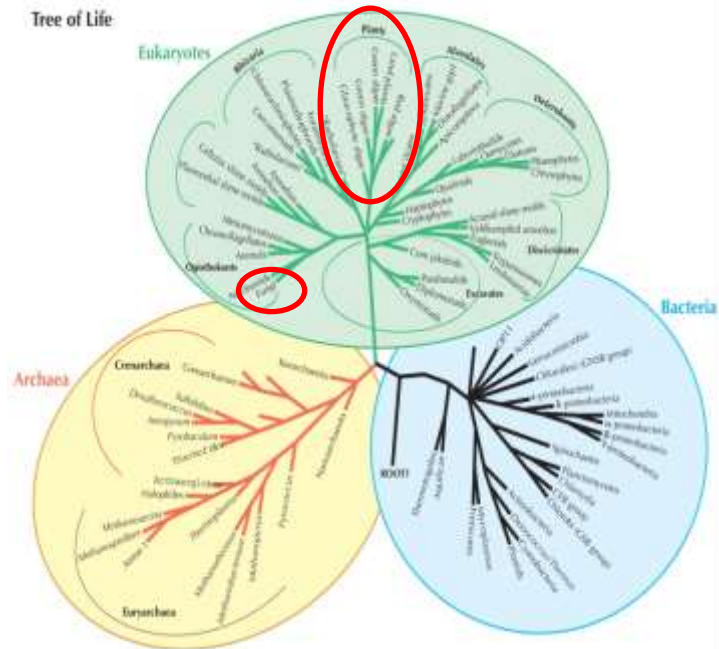


## Plants and Friends

The living world can be a complicated place and in this document I have attempted to look only at a couple of little tiny branches of the tree of life – the larger plants and visible fungi.

How can you tell if something is a plant or fungus (in the context of this document)? A few simple observations are all that are needed:

- Can you see it without squinting or using a magnifier of some type?
- Does it stay in one place (except when dug up, blown around by the wind, washed away in a flood, rolled down a hill, or just falling over)? We are in Canada so you can just ignore those pesky *Socratea exorrhiza* or Walking Palms as they are only found in tropical areas.
- Is it alive (Oy! now there is a difficult concept that has troubled philosophers throughout history and I am just throwing it out there with no explanation). To make things simpler - it grows, reproduces, and is softer than a rock. There is a rock key at the end of this document just to add some spice to things and help you figure out if something actually is a rock.

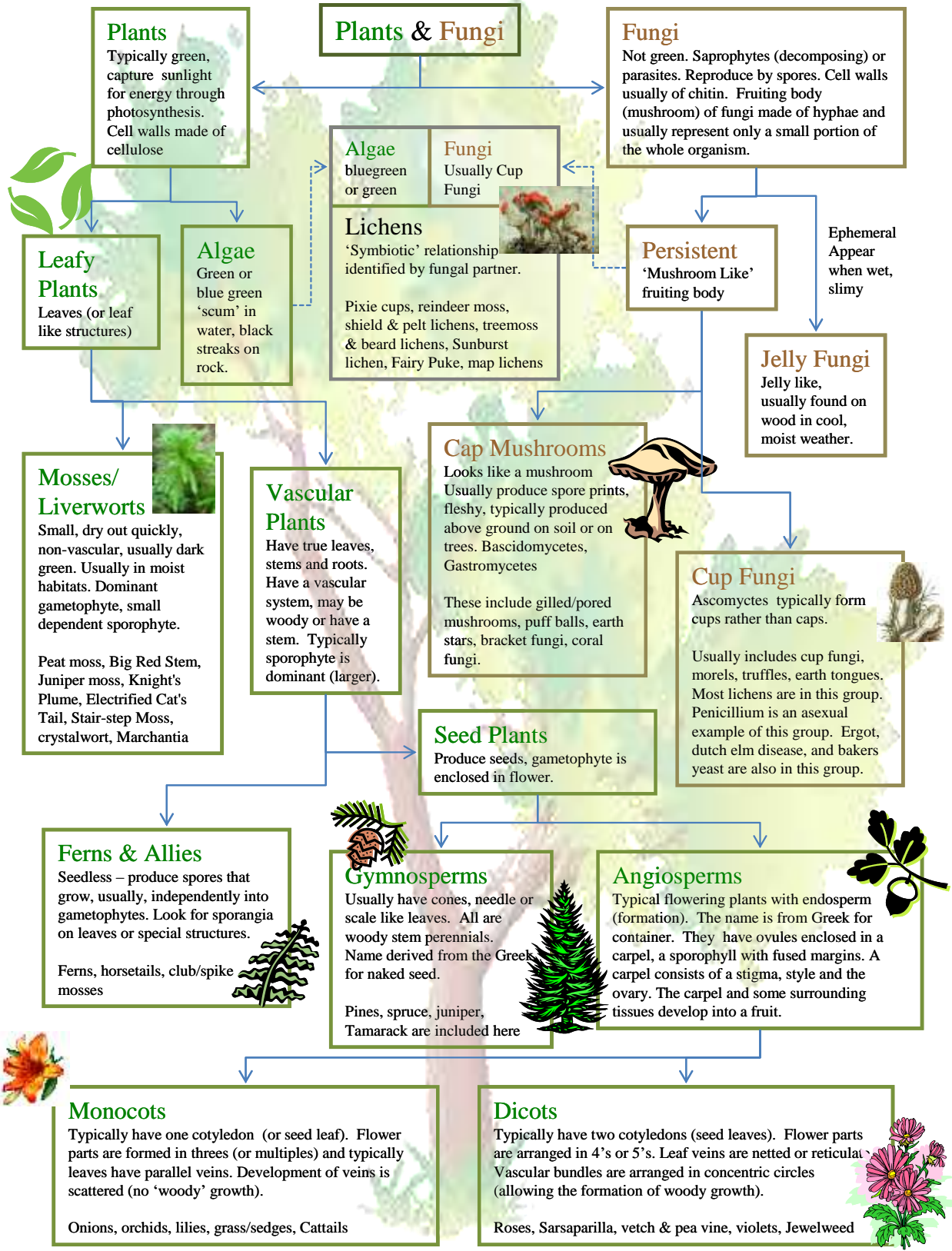


I know this might include some very slothful animals but usually if you poke those a couple of times, or turn off the television, they wake up, complain, and move to another couch. These animals are of no concern to the kids or adults visiting camp.

Now that you know what you might be looking at I am going to complicate things just a little by telling you that plants and fungi can be broken down into several large but manageable groups. When trying to work out exactly what you are looking at (or trying to explain to the triage nurse at the Kenora hospital what it was that you, or your ward, ate) these broad groups will help give you a starting point and might determine which book to pick up and look through first.

### Is it a Plant or Fungus?

Follow the branches in the simple tree on the next page to identify a broad group of plants or fungi. The tree is very simplified since there may be [uncommon] exceptions at each division but at least it provides a start.



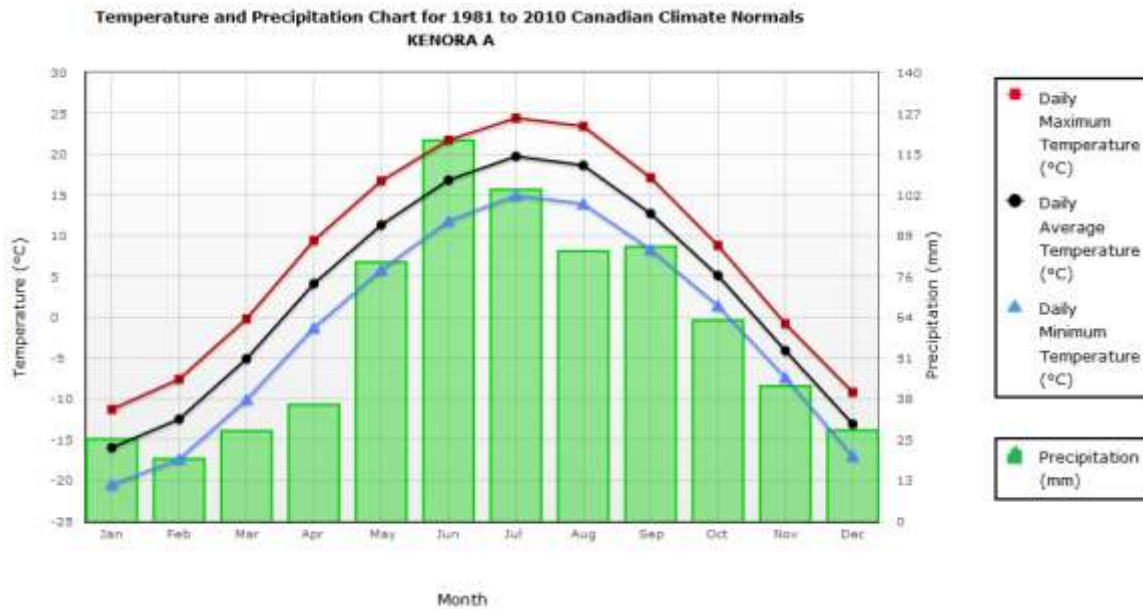


## Climate

The climate for the Shoal Lake area is typical central continental with cold dry winters and hot summers. The mean annual temperature is approximately 3.1°C with a mean summer temperature of 15°C and mean winter temperature of -13°C. Mean annual precipitation is in the range of 715 millimetres (~164mm as snow). Snow accumulates throughout the winter months and melts in a short period of time giving the impression that a lot more volume has fallen over the winter. The average number of frost free days (canoeing season) is 144 with an average of 2,200 hours of sunshine each year (Winnipeg has 2,372). The average wind speed is 14km/hour prevailing from the south (curious that one). There is an average of 24 days with thunderstorms during the year.

The following data and graphs represent the average monthly temperature and precipitation for Kenora, Ontario 1981 to 2010 from Environment Canada.

| Months    | Jan  | Feb   | Mar  | Apr  | May  | Jun   | Jul   | Aug  | Sep  | Oct  | Nov  | Dec   |
|-----------|------|-------|------|------|------|-------|-------|------|------|------|------|-------|
| Prec (mm) | 25.6 | 19.4  | 28.1 | 36.3 | 80.8 | 118.7 | 103.4 | 84.2 | 85.6 | 62.6 | 42.1 | 28.3  |
| Temp(°C)  | -16  | -12.5 | -5.2 | 4.1  | 11.3 | 16.8  | 19.7  | 18.6 | 12.7 | 5.1  | -4.2 | -13.1 |



## Geology

The Shoal Lake watershed is underlain by typical Precambrian Shield rock. This area in particular is representative of Greenstone Belt geology with a high likelihood of precious metal ores being found. Just to the south east of MacKinnon, from Gateway point to Dominique Island and across to Martineau Island, there are several significant deformation zones with a large number of Mafic intrusions – which explains all of the mining.

The bedrock in this area ranges in age from 2.1 to 3.1 billion years. The main rock types you will see include: granite and gabbro both are igneous intrusive rocks; gneiss, a metamorphic rock; mafic (equiv. to gabbro) and felsic (equiv. to granite) volcanic rocks; and sedimentary rocks. More recent geological activity has left an overburden (unconsolidated materials) such as sand, gravel and boulders, as well as glacial landforms. The last period of glaciation in this area was the Laurentide Ice Sheet. Glaciers started advancing over the area approximately 100,000 years ago and reached thicknesses of approximately 1 kilometre. The ice sheet advanced as far south as central Wisconsin before retreating. The glacial ice finally receded from the area approximately 10,000 years ago. Unlike the prairies, which have deep soils formed from clay and other material deposited at the bottom of glacial lakes and rivers, the Canadian Shield was scraped of all of the soil by the glaciers; very little soil and overburden (except locally) was left and there has been little opportunity to build more. Soil formation in this area takes a very long period of time: the rock substrate (mostly granite and gabbro) is very hard and only erodes slowly and there are limited nutrients from the rock for biological processes.

The Kenora area was a significant mining centre for many years after gold was discovered in 1878. Peak gold production occurred between 1890 and 1910 with the area extracting over half of the Ontario gold production. Silver, copper, nickel, platinum, cobalt, talc, soapstone and granite have all historically been mined in the area leaving many old and abandon sites. There are still a number of very large mining claims and ongoing prospecting around Shoal Lake; this has been of some concern as the lake is the primary source of water for the city of Winnipeg, the home to several First Nation communities, and many cottages.

## ***Shoal Lake***

Shoal Lake has a surface area of over 260km<sup>2</sup> with over 95% located in Ontario and the remaining 5% in Manitoba. The watershed is split almost evenly between Manitoba (46%) with input from Falcon and High Lakes, and Ontario (54%). The average depth of the lake is only 9m; Indian Bay is much shallower with a maximum depth of 10m.

Shoal Lake is connected to Lake of the Woods at Ash Rapids (Labyrinth Bay). The channel at Ash Rapids was deepened and widened from its natural state, through blasting, around the turn of the last century (1900). This expansion was reportedly done to provide a water-based transportation route to serve both timber and mining operations in the Shoal Lake area. While opening up the lake to unrestricted small boat access from Lake of the Woods, the channel modifications also allowed for two-way water exchange between the lakes. At its narrowest point, the navigable channel at Ash Rapids is about 10m wide and the mid-channel water depth is about 1.5m at low water datum. Any one that has taken the PIII through the channel knows there is very little clearance.

Construction of a control dam at the Winnipeg River outlet of Lake of the Woods between 1892 and 1895 raised the level of the lake by about a metre from its natural condition. This brought water levels in Shoal Lake into an approximate balance with

levels of Lake of the Woods over extended periods of each year. Along with providing electricity the dam was built to raise the water level in the lakes to assist with moving log booms (logging continues to be a significant industry in the area).

Shoal Lake is the primary source of Winnipeg drinking water which is drawn from the east end of Indian Bay. Shoal Lake was recommended as a source for Winnipeg water by the public utilities commission in 1912. Construction started on the service rail line in 1913 and the actual aqueduct construction started in 1915; water started to flow March 20, 1919. Water flows 155km by gravity down a ~100m drop to Winnipeg. The Falcon River, draining Falcon Lake, originally discharged into Indian Bay but was diverted in 1916 to Snowshoe Bay so the highly coloured (peat stained) water did not enter the Winnipeg water supply (This may be the reason that the 'creek' into Falcon Lake was difficult to find by at least one early wilderness trip from Manitoba Pioneer Camp).

## ***People***

Indigenous people have been living in the immediate area for at least 6000 years, the current population is of Anishinabe or Ojibwe descent. Treaty 3 with the Saulteaux Tribe of the Ojibbeway Indians was signed in 1873. There has been some dispute with regard to the implementation and interpretation of this treaty where the Anishinabe First Nations hold the view that Treaty 3 did not convey exclusive ownership of the lands to the Crown but rather provided for shared jurisdiction over these lands by both the Crown and the signatory First Nations. Two First Nation communities, Iskatewisaagegan #39 and Shoal Lake #40, are located on Shoal Lake near the camp and are represented by over 800 band members. Unfortunately I am not able to provide adequate information in this document about the traditional populations and land holdings, and subsequent discussions related Treaty 3 or the two communities specifically.

The first European settlers started arriving in the late 1600s with the Hudson's Bay Company, they were sporadic and transient. Logging and mining operations in the late 1800s brought more permanent settlement. Beyond boat access a rail line from Winnipeg was built in 1913 and provided initial access; the all season road to the Iskatewisaagegan community was built in 1965. There have been ongoing discussions about building bridge access to the Shoal Lake Band #40. Road access has also been built to the north east side of the lake. There are approximately 180 cottages on Shoal Lake, most along the north east shore and islands in the northern section of the lake. Road access is either along the Shoal Lake road (to Iskatewisaagegan) or the Clytie Bay Road. Falcon Lake, which is part of the Shoal Lake watershed located in Manitoba (Whiteshell Provincial Park), is also a significant cottage community representing almost 400 permanent residents with many more seasonal inhabitants. Falcon Lake has a significant campground with over 130 sites, town site, several resorts including a downhill ski area, and golf course.

## ***Land use and Commerce***

Drinking water supply, fisheries, recreation, tourism, hydropower production, and cultural and spiritual sustenance represent the primary land use activities around Shoal Lake.

Traditional uses and activities are extensively practiced by members of both local First Nation communities including: fishing, trapping and hunting, gathering or harvesting of berries, wild rice, and medicinal plants. Related to some of these activities, berry harvesting in particular, there was a tradition of burning areas to maintain berry crops and access points. The preservation and use of sites of special significance, such as spiritual sites, ceremonial sites, community-gathering areas, and traditional burial grounds are also important cultural land use activities.

Fishing represents a significant commercial, traditional, and tourist activity in the Shoal Lake area. The lake is part of Zone 5 and is included in the International Border Water Regulations. Walleye catch has been closed since 1983 (still closed 2015) to allow for stock recovery. Commercial fishing licenses have continued to be issued for whitefish and northern pike. Sport fishing is a significant draw to the area with as many as five commercial lodges and guiding operations along with many private visitors each year into the area.

Logging has been a major part of the cultural and economic landscape of the area since it was opened up by boat traffic in the late 1800s. Shoal Lake is part of the Kenora Management Unit in Ontario and Pineland Forest Management area in Manitoba. Major harvest species include Spruce, Pine, and Fir primarily for paper products and a number of local saw mills. Historically many trees were taken for building materials, rail lines, and the nearby community of Kenora. In 1906 Kenora (Rat Portage) was the primary source of lumber material being shipped to Manitoba.

Although the amount of mining activity has declined dramatically since the early 1900s there are still some significant claims and active prospecting in the area. The cost for extraction of most of the minerals, a strong environmental lobby, and restrictive mining regulations means that actual mining activity is minimal.

Trapping is primarily an ongoing traditional activity with roughly ten registered trap lines that encompass parts of the Shoal Lake. The species taken in the area include beaver, fisher marten, otter, muskrat, and fox. Smaller numbers of lynx, bobcat and mink are also taken.

Tourism is a primary commercial and land use activity of the area and includes: sport fishing, camping, boating.

## ***Manitoba Pioneer Camp***

Manitoba Pioneer Camp (MPC) is one of several Pioneer Camps across Canada that are owned and operated by Inter-Varsity Christian Fellowship of Canada. Although the camp started in 1942 it was not until 1946 that it was moved to the current location on MacKinnon Island under the direction of Hough Lorne Duncan MacKinnon with the help and direction of Herb Redsky, of Band No. 40. The 8.3 acre MPC property (LOC E B 693 SHOAL L PT OF IS MH 49) is located on the west side of MacKinnon Island near the north shore of Shoal Lake Ontario (Bill Mason Place is located at: NAD83 N49°36'30.53" W095°04'26.11"). MacKinnon Island is 300 acres and except for the camp property the island is undeveloped Crown Land. The camp owns a further 14.5 acres on Cache Island (bought 1956, only 4.5 acres is in use) and 0.9 acres for overnight/day use on Long Island (bought late 1960s). The camp operates for approximately 5 months of the year (May to September). The first staff usually arrive during the last week of April, or the first couple weeks of May, in preparation for the arrival of school groups in May and June. The months of July and August are devoted to summer camps for children aged 8 to 17. Summer programs include the classic camp experience, as well as specialty programs in sailing, fishing, longer canoe trips, and Leaders-in-Training. September brings a return to outdoor education, including the Outta Town program hosted by Canadian Mennonite University.

The 'then-and-now' images over the next few pages were taken with roughly the same view and show the changes in vegetation around the camp: note the lack of ever-greens and the large number of birch trees. The under story was quite open and shore lines were clear of vegetation in the earlier pictures. A lot has changed!

The current cabins along the cabin line were built between 1961 and 1967. In 1962 the area between the dining hall and the waterfront was terraced and later the stone wall along the beach was installed. In 1965 the office, showers, and washrooms were built next to the dining hall. During a period of only a few weeks the lagoon was built in 1970, miraculously the right type of clay was found at the end of the Back Bay. In 1985 electricity was brought to the island through a submerged cable. In 1989 six new showers were added along with a new infirmary. A helicopter pad for medical evacuations was built (and called the playing field); the area is now too small to land a helicopter except in the most favourable conditions.

Bill Mason Place was dedicated in 1995 having been started in 1992 with a special permit from the Ontario Department of Natural Resources to build close to the water. During the subsequent years the old lodge was re-modeled into the Arts and Crafts centre and Fireplace Lounge, the kitchen was expanded, wheel chair ramps were added, and boardwalks created. Lagoon heights was started in 1998 but not completed until 2002. The year 2001 experienced a fifty year high in lake water levels causing damage to the docks which were subsequently replaced (2001) with upgrades and additions in 2010. Including expanded out tripping centre and new canoe racks. Expansion to the workshop was started in 2004 and continued over several years.

*Bunny Point*



1950s



2011

*Cabin Line Shore*



1950s



2011

*Dining Hall and Beach*



1960s



2011



## Plants of Interest

The following section is an eclectic look at some of the plants found around MacKinnon. I hope this entices you to look further, talk to elders, do some reading, and explore. The most interesting background books that I use are: Canoe Country Flora by Mark Stensaas, Discovering Wild Plants by Janice Schofield, An Eclectic Guide to Trees by Glen Blouin, and The Uses of Wild Plants by Frank Tozer, and Plants have so much to give use all we have to do is ask: Anishinaabe Botanical Teachings but Mary Siisip Geniusz. Although these books are not specific to the Shoal Lake area they do provide lots of useful information. Check the references section for more potential resource books and articles.

Before eating or drinking any concoction made from plants that you have collected make sure you are comfortable with the identification. There are a number of poisonous species that can make you sick, or worse kill you, found in this area. Try small amounts of anything new to see if the taste is to your liking or if you have a reaction – no point in picking more if it is ‘yucky’. If you do collect any plants make sure they are locally abundant; do not remove more than ¼ of the stems or plants in the area. Some plants such as wild rice require a harvest permit and others may be rare in Ontario where any collection is not permitted. I do not condone or recommend any use for medicinal purposes if you want to experiment with alternative or traditional healing techniques work with a trained homeopath or elder with a background in traditional methods.

## Trees

### Eastern White Cedar

This tree, which can grow up to 20m tall and may live as long as 300 years, is very common across the island. The branches are a flat spray with scale like leaves tight to the surface. It has woody egg-shaped seed cones. When clean leaves and branches are placed in a chest or wardrobe they help keep out moths. It has a pleasant aroma and branches were traditionally used as a broom deodorizer. The aromatic cedar oil has potential uses against amoebas and other parasites, bacteria, fungi and viruses.



The other common name is ‘Arbor Vitae’ Latin for Tree of Life. Jacques Cartier brought back seeds of this tree to Europe in 1535 after his crew were saved by the Iroquois. Boughs of a medicinal tree were brought to the ship and a tea was made to save them from scurvy. Cedar leaves are high in vitamin C so it is one possible candidate and the name has stuck. It is still unclear if it was cedar, spruce, hemlock (the tree *Tsuga canadensis* not the poisonous plant), or pine that actually saved the crew since all of them have vitamin C.

The tree grows from south eastern Manitoba across to New Brunswick with some outposts found at the top of Lake Winnipegosis, and in Nova Scotia and PEI.

Cedars reproduce from seed but they will also grow from branches that are touching the ground.

Although often found in moist/wet areas it is the pH of the substrate that is of most importance; Cedars like to grow in neutral to higher pH levels. They are not always found in wet areas. Eastern White cedars are found in abundance on dry rock ledges along the Niagara escarpment where they are basically living in a desert. The Cedars growing on these dry ledges are some of the oldest plants on earth reaching several thousand years in age.

Of course, this is MPC, and I would be negligent if I did not mention the use of cedar wood for making canoes. The wood does not shrink or warp, it is very light providing an excellent material for canoe planking. The wood of cedar is also resistant to decay so it is often used for decking and fence boards. It is soft and will split easily along the grain so making boards and shingles is relatively easy.

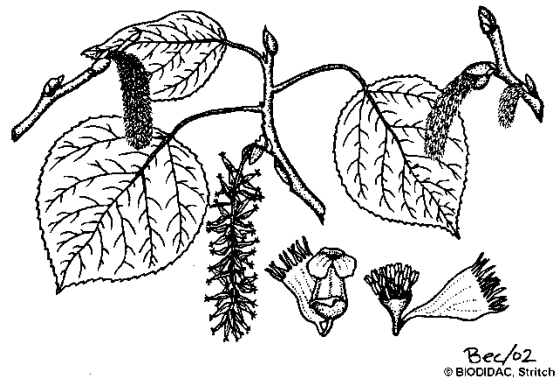
Take a look at a fallen Cedar in the woods – what is growing on the stump and log. These fallen trees act as ‘nurse’ trees hosting and supporting all kinds of other plants and fungi.

## Aspen Poplar (Trembling Aspen)

A giant and ancient tree!?

Aspens have the widest range of all trees in North America stretching from Alaska to Baja, and from 10,000 feet in the Rockies to near sea level in Newfoundland and Labrador.

On the prairies where the soils are heavy and moist they only grow as a scrubby little tree, but in dryer sandy soils with good nutrients they can grow to 20m tall. Many people do not realize the scrub bush of southern Manitoba is the same Aspen species that towers above the hiker in Riding Mountain and some of the nutrient rich soils of the northern Ontario clay belt.



Aspen predominantly grow from suckers since germinating seed is a touch and go business – the seed is small and quickly rots if the conditions are not just right. Through suckering they spread quickly forming clones of a few trees to thousands covering many hectares. It is often easy to define a single clone in the spring or the fall since the whole group will leaf out, flower, or turn color at the same time. Because all of the stems are a single (genetically identical) plant Aspens can grow into one of the largest growing organisms on earth. Any single stem (tree) lives an average only 60 years but the whole

clone lives on (and on, and on). Some clones in nearby Wisconsin have been living almost 10,000 years (since the last glaciation ended) making them one of the oldest living organisms, as well as the biggest, on the planet.

Aspen are very resistant to fire because even if the tops burn off they re-grow (sucker) quickly in dense thickets from the remaining roots. The dense woodlands self-thin as larger stems shade out smaller ones – some people suggest that the larger stems also produce a chemical that suppresses further suckering.

Chop sticks! The wood is light, splinter free, and has no taste making it an excellent choice for making ice cream spoons and chop sticks.

Aspen trees are a favourite food of beaver (I wonder if they like Chinese food or ice cream). An adult beaver can consume almost 2kg of the soft bark in a day. The longest beaver dam (mostly made of aspen) has been reported as 652m (over half a kilometre long!); I have hiked across the top of dams that have been more than twice my height – several meters in height. The natural range of both beaver and aspen overlap almost completely suggesting a strong relationship between the two species.

The Trembling name comes from the way the leaves rustle in the slightest breeze. The petiole or leaf stem is flat allowing the leaf to easily flutter back and forth.

On the island you will also see a few Balsam Poplars with longer tapered leaves and a pointed tip. The leaves are darker than their Aspen brethren with whitish/tan colouring on the bottom; the trees also have a strong balsam smell. Occasionally you will also see Large Tooth Aspen in the area, these look pretty much the same as regular aspen but the leaves are much (much) larger and they have large rounded teeth running down each side of the leaf..

## **Green (Red) Ash**

Green Ash are common on MacKinnon Island along with Black Ash. The two tree species can be distinguished by the leaves, seeds and bark. Green Ash have 7-9 short stalked leaflets where Black Ash have 7-11 leaflets without stalks. Black Ash leaflets are somewhat narrower and darker than their Green counterparts. The bark of mature Green Ash trees forms into almost irregular diamond shapes where Black Ash bark becomes scaly.



Ash trees typically grow along riverbanks and lake shores where there is good moisture and nutrients. On MacKinnon you often find it in fairly moist almost swampy areas – beside the playing field is a good example of the conditions for growth. Ash trees live 80-100 years growing to a typical height of 12-18m. Ash are very resistant to pollution and have few

diseases or associated pests for these reasons they are often planted in cities for this reason.

Sometimes the wood is mixed with white ash as it has very similar properties. Along with Black Ash this species has been widely used for making musical instruments such as guitars. It has also been used for the trim and gunwales on canoes, making baseball bats, and tool handles – although White Ash is usually preferred.

## **Tamarack**

Tamarack is the only coniferous (needle growing) tree in Canada that loses its leaves every year. In the fall the trees turn a brilliant gold color which makes a beautiful picture with the dark green backdrop of pines and cedars. I have often been asked by fellow paddlers in the fall ‘what killed all of those evergreens?’ I smile and let them know that they are not dead but will come back in the spring with light green soft needles.



Although Tamarack grow best on well-drained upland soils it is usually pushed into bogs and fens in the wild as it does not compete well with other upland species.

The wood is very decay resistant and strong and has been used for fence posts and other places where long lasting wood is required.

The fine rootlets from Tamarack and black spruce were separated and used to sew together birch bark for making traditional canoes.

## **Fir**

Balsam Fir is easily identified by the soft flexible blunt ended flat needles, and smooth bark with sap blisters. It is considered the best Christmas tree because it lasts without dropping many needles and has a wonderful aroma.

I find a tea made with the needles very pleasant – especially with a little honey and lemon. The tea can be used as an astringent/antiseptic wash for dressing wounds and for treatment of coughs.

The resin makes excellent optical cement (natural epoxy) that has a very similar refractive index to glass when melted and applied alone. It was used for many years for fixing cover slips on microscope slides. Unfortunately this ‘epoxy’ is also quite brittle when used alone.

To make a good backwoods glue mix 5 parts pitch from fir (although any conifer will do) melted over a fire with 1 part charcoal and 1 part ground plant fibre. This will form a dark tar like glue that can be applied hot and sticks well when cooled. When melting pitch be very careful since it is very flammable. A little fat can be added to keep the glue

flexible. Making pitch glue will pretty much wreck a pot, or container, for any other use – use an old tin can for melting and mixing.

Some people chew the dried sap like gum (spruce gum) but I have found the taste too strong for my likes.

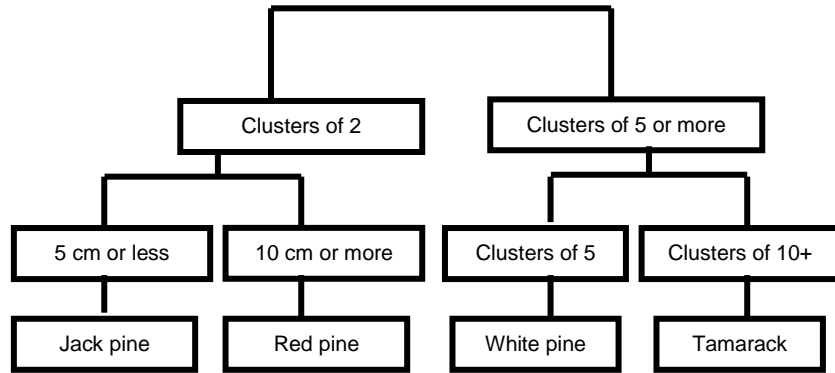
Use balsam fir tree sap (resin) as a fire starter by collected the sap on a stick (by popping the blisters) and rubbing it into a natural wick such as tree lichen (old man’s beard) or dry grass. It takes a spark from a ferro rod very easily (in case your matches are wet and you lost your lighter); it burns a long time. Be careful when collecting the sap or lighting the wick that you don’t get covered in sap – it is very sticky.

Along the north side of the circle trail, just out from the playing field, there are a few fir trees that have appear to be infected with Dwarf Mistletoe (it may be another kind of infection, the broom was too high). These trees appear to have a large ‘glob’ of fine branches forming what is known as a witches’ broom. Dwarf mistletoe is a parasitic flowering plant that grows into the branches of its host and gets the majority of its nourishment from its host. The root system grows underneath the bark and the plant appears as olive green aerial shoots on infected branches – it typically infects Spruce, Tamarak and Fir.



## **Pines**

Identifying Pines in the Shoal Lake area is pretty easy since there are only three. Pines have multiple leaves growing from a very short stalk and typically grow in dry or mesic upland areas.



*Jack Pine*

This pine is usually smaller, gnarly, and grows in large monoculture stands; it sometimes grows mixed in with Aspen. It has shorter (up to 5cm) doubled leaves. Some traditional lore thought of Jack pines as an ill-omened evil tree and would bring miss-fortune on anyone that passed close to the tree.

Jack pines are dependent on fire to reproduce requiring heat to open the cones, the seeds then require open or clear mineral soil to germinate and grow. Jack Pines tend to be found in near monocultures of even aged stands for this reason. This species grows to maturity quickly and has a typical lifespan of 100-150 years –the typical time frame between natural wildfires in this area of the boreal forest. The cones are closed fast with their own epoxy and remain that way until heated. This kind of cone, which opens with heat, is known as serrotinous and it fits with the fire requirement. Place some Jack pine cones around or near the fire and watch them slowly open and see the seeds fall out.

Pines and spruce flower in the spring and are wind pollinated producing a prodigious amount of yellow pollen. In some years there are yellow lines seen along lake shores more than a month after pollination takes place.



Pine needle tea is a rich source of vitamin C – although I have not gotten over the taste of Pine-Sol.

*Red Pine*

This large stately pine is easily recognized in the area with long double leaves and bark that forms large red plates or scales. The dark leaves and red trunk with few large lower branches make this tree easy to identify. This tree can grow to 30m and live as long as

400 years. The oldest confirmed Red Pine in Ontario was 500 years, it grew near Granite Lake just west of Kenora. It was cut down in 1992 to make way for a power line into cottages.

In the spring dark purple male flowers grow in dense spikes near the end of the twig. The male cones can be eaten raw or cooked (boiled) for a little snack.

When Red Pines grow pure in stands it becomes open woodland that is pleasant to walk through but has very low diversity. Dropped needles form a deep acidic duff that other plants don't grow through. Lower branches are shaded and drop off as the trees mature creating an open under story. By changing the soil and limiting the amount of light getting Red Pine forests typically are fairly open.

### *White Pine*

These are the largest of all of the pines east of the Rocky Mountains growing up to 50m tall and living up to 400 years. From a distance this tree has a light colour and a soft look that comes from the multiple (7) needles. This large tree was used for everything from ship spars to match sticks. So valuable was the white pine, and short sighted were the colonizing Europeans, that the large trees were almost obliterated across its southern and mid latitude native range – the devastation and removal was on the same scale as the buffalo eradication across the prairies.

A tea made from the inner bark (or leaves and resin) has been used for coughs, sore throats, and colds. I happen to like the tea with a little honey.



White Pine is prone to a disease called White Pine Blister Rust which kills the tree – it was introduced around 1908 from Europe. Young pines are the most susceptible with infection happening in the lower 2 meters where humidity is fairly high. The infection can't spread from tree to tree but must go through a secondary host (the lowly currant). This means that currants and White Pines make poor companions where the rust is found.

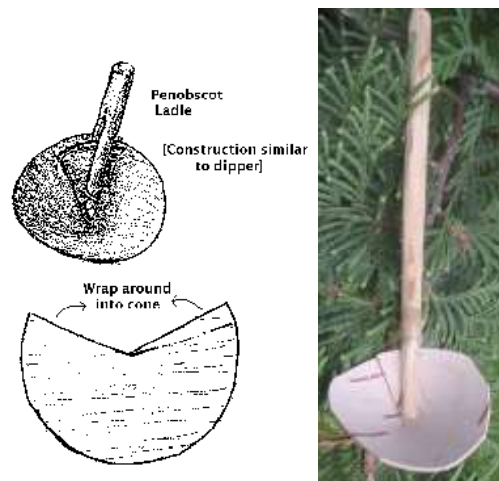
### **Paper Birch**

Paper Birch is one of the easiest mature trees to identify and ranks as one of the most distinguished of our native trees with its striking white bark in among the grays and browns of its neighbours. The white papery bark is the giveaway but it also has catkins and long female cones of seeds. The leaves are oval and taper to a sharp point. The tree

is an excellent pioneer species coming in quickly after fire from germinated seeds. It does not have a long life span at 100-120 years. As an interesting side note there are actually a number of other related birch species found in the area – these other species are smaller usually non-descript shrubs without the paper-bark and are usually found growing in wetlands and bogs.

The bark of the paper birch is waterproof and decomposes slowly. Often the bark of a tree will remain after the wood inside as rotted almost to powder. There are many stories circulating of this condition, my favourite was one that Stuart McLean told as part of his Vinyl Café show on CBC, of an old woodsmen punching an apparently solid [birch] tree and having it disintegrate before a group of wide eyed and surprised youngsters.

Although we think of canoes when talking about birch bark but the bark can be used for many other purposes – bowls and dishes, chests and boxes, weatherproof maps, posters, and a host of other things.



Here in the west you don't see many birch trees large enough to easily make birch canoes anymore – there has been some suggestion of a birch borer or disease that has limited the number and size of large trees. But you can make a little canoe out of the bark of a downed tree pretty quickly. When using birch bark for crafts look for a recently downed tree; peeling the bark from a live tree leaves it susceptible to insects and other pathogens and cuts off the food/water supply to the top of the tree; the tree dies.

In the spring birch can be tapped for making syrup just like maples. The sap is more watery than Sugar Maple, or even the Manitoba Maple, so it must be cooked down for a longer period.

## Bur Oak

MacKinnon is an outpost for Bur Oak; some people believe that Bur Oak acorns were carried here and planted by the First Nations people as a source of food. Where the trees are found may have been a camp or longer term residence, or the acorns could have been



collected and planted like an orchard. The tree is easy to grow from seed – just push an acorn into the ground and wait (a year). This tree species may live as long as 300 years.

Tannins extracted from oaks are used for preserving leather and other goods. The wood is dense and hard and makes excellent firewood with long burning coals, little ash, and little smoke – don't cut and burn live trees from this area. Although the Bur Oak does not appear to grow to a large tree in our area it may be used in place of white oak and makes excellent material for building or furniture.

Try collecting a few acorns, remove the shells, and grind them up into a meal. 'Good' acorns should sink and bad, rotted, or bug riddled seeds should float. There are multiple ways to leach the tannins out of the meal but the fastest method is to boil the ground meal in several changes of water - until the water runs clear. Use the prepared meal to thicken soup, mix with flour to make bread (biscuits), or eat like porridge – add a little fruit and brown sugar to taste.

## ***Shrubs***

### **Speckled Alder**

Alders, along with Hazel Nuts and Mountain Maple, represent the most common shrubs on the island. The shrub forms dense tangles of bushes in wet areas. Alders also have cones similar to birch (but shorter and round). The roots produce their own fertilizer by associating with nitrogen fixing bacteria on its roots just like peas (legumes). There are two species found in the area (Speckled Alder and Green Alder). Speckled Alder live in moist/wet areas or along swampy margins of streams and lakes. Green Alder tend to live in moist but well drained sites.

Some people make a tonic tea from the leaves and bark but this should be used with caution as the fresh bark is an emetic and may induce vomiting. A blue dye has been made with alder roots but the trick to getting the dye is beyond what can be done at camp.

### **Bearberry (Kinnikinnick)**

These little plants grow in dry areas along the edges of rock outcrops. It is a low sprawling plant with red berries. The leaves are beavertail-paddle-shape, thick, and glossy. The berries are mealy and tasteless but have been used as an extender for other berries when absolutely necessary. Cook the berries and mix with cinnamon and cloves to make a mock apple sauce.

Native Americans smoked kinnikinnick either alone or mixed with other leaves – the conclusion from people I know that have tried it have said it is not worth the effort.



Don't confuse with Checkerberry (*Gaultheria procumbens*) which has larger leaves and stands more upright. Checkerberry has a wintergreen (toothpaste) smell and taste; the red berries have a clear + (cross) on the end. The other commonly confused plant in some places is dry ground cranberry (also called Lingonberry). The leaves on *V. vitis-idaea* have a light cream coloured underside with dark dots. Don't worry you probably will not make this mistake here as Lingonberry is relatively uncommon in the Shoal Lake area.

## Bittersweet

Bittersweet is a climbing vine that can be seen on one of the Birch trees in front of the dining hall near the sun deck. It has colourful orange berries with a rind that rolls back in the fall; the berries are poisonous. There is no relation to the herbaceous poisonous garden herb with purple flowers also called bittersweet. Really the only reason that I have added this climbing shrub is several people have asked me about the vine and if it will kill the tree. Since it is a very loose twinning vine it is not likely to kill the birch tree before the end of the trees' natural life span.

## Hazelnut

These small shrubs have a reputation of whacking us in the face and causing all kinds of problems when walking through the bush. But all is forgiven once the nuts are ripe. These high protein/fatty nuts are a favourite of squirrels and some worms so the race is on later in the summer. There are two different species found in the area – Beaked Hazelnut and American Hazelnut. Pick a handful (or small bag) and take them home to dry for a couple of months. Hammer the shell off and coat the nuts with oil and salt then roast on a cookie sheet at 350°F until crispy light brown.

The light durable wood has been used for making arrow shafts and walking sticks.

## Bunch Berry

I think one of the most common mid-summer questions I get is 'Can I eat those red bunch of berries?' The reference is to a low growing plant with a 'bunch' of bright red berries on the top. With a little smile the answer is yes – but the taste is pretty bland with a mealy texture (better than Bearberry though). Since they are fairly bland the berries make an excellent fruit extender when you are just a little short. A tea from the plants is reputed to be an appetite-stimulant. This plant is one of the most common open woodland plants in the forest.



Earlier in the summer these plants appear with white 'flowers' that carpet the ground in many places. These flowers are not actually flowers but [leaf] brackets that surround the small non-descript flowers.



## Juniper

Common Juniper (*Juniperus communis*) bushes are the bane of my portaging experience. They are low shrubs with pokey leaves and purple berries. The shrubs are very uncomfortable to walk through if you don't have thick enough pants or skin. That being said not everything is bad – the purple fruits add a spicy flavour to many foods, try a few berries per 250gm of meat or tofu. A pleasant beverage is made by steeping boughs (with no berries) in an uncovered pot for 5-10minutes.

Of course no comment on juniper can be made without mentioning that Juniper is also the primary flavour in Gin.

### *Juniper Marinade*

3 tablespoons juniper berries

$\frac{3}{4}$  cup oil

4 tablespoons soy sauce

$\frac{1}{4}$  cup vinegar

$\frac{1}{4}$  cup cooking wine.

Crush juniper berries, then combine all ingredients in a bowl and mix well. Soak meat (or tofu) for turning periodically.

Roast over a campfire, bbq, or in a stove basting with the marinade.

## Labrador Tea

Recently I read something I thought was funny but memorable about identifying Labrador Tea – hairy armpits and drooping arms. The shrub is found in peat bogs, the back side of the drooping leaves are very hairy (almost felt like). This plant has also recently been used to help find gold by prospectors – apparently Labrador-Tea concentrates gold in its stems. Unfortunately not enough gold is stored to collect and sell to your neighbourhood jeweller but enough is absorbed that it can be detected by neutron activating analysis (whatever that is).

Now about the tea – there are lots of tall tales about how to steep the tea and it is something that people either like or hate; you will need to try for yourself. Collect a handful of fresh leaves and place in boiling hot water, let steep in a tea pot or Billy-can for five minutes (no longer). My preference is to mix a little honey in the tea. Don't drink too much or steep for too long as the tea will contain small amounts of andromedotoxin which may cause headaches, cramps, paralysis, and other intestinal problems.

## Sweet Gale

This is a small shrub commonly found along lake shores, bogs and wet areas. Although it is supposed to make a pleasant tea my preference for Sweet Gale is to use the leaves in place of Bay leaves in stew. It goes especially well with meats and poultry. Such a short note for a very useful spice.

## Poison Ivy

I have seen poison ivy on the island in a couple of places and it was found in abundance near the old dock at the landing on the mainland. Poison Ivy is not as common in this area as around southern Manitoba but that does not mean you can let your guard down. Poison ivy is found on edges of dry to mesic forested areas. It is quite variable in size, colour, and leaf shape. It is a short woody stemmed plant with few or no branches typically standing less than 30cm high. The leaves, 3-12cm+ in length, are borne near the top of the stem, have long petioles, and are divided into three parts. Leaf margins may be lobbed, dentate, or entire. The flowers are tiny white/yellow and grouped in auxiliary panicles. Berries are clustered off-white (ivory) and usually remain on the stem after the leaves have fallen. In general remember: "Leaves of three let it be; berries white, danger in sight."



Poison-Ivy Dermatitis is a delayed hypersensitivity, allergic reaction, caused by contact with the oil urushiol which is released when the plant is damaged (even slightly). Sensitivity to the oil increases with additional exposure - if you have never had the rash count yourself lucky but watch out since you might still get it. Approximately 85 percent of the population will develop an allergic reaction. Sensitivity develops over time so the first few times you may not react and then, boom, rash-ville. The rash can appear within a few hours (typical 12-48hrs) or in as much as 10 or more days after contact and last as long as 3-4 weeks. Apparently only humans react to poison ivy.

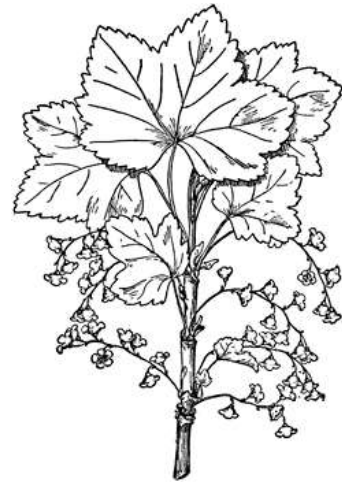
The oil can last a significant period of time on other objects such as garden tools, pet fur, sports equipment, fishing/hunting gear, and clothing. Even handling dried plant material, leaves, roots, etc... can still cause a rash. Smoke from fires burning poison-ivy also cause a reaction in many people.

Oozing liquid from rashes does not spread the rash (yes that is a period). New rashes are often caused by contacting items that had not been cleaned after the initial exposure. A friend of mine repeatedly suffered from the rash because he had gotten the oil on the steering wheel of his car after working in the field. Every time he drove the car he spread more oil around until he realized what was happening and washed the inside of his car.

The best way to avoid the rash is to recognize the plant and avoid it. If you do contact or damage the plant wash with soap and lots of water as soon as possible (within 10 minutes) to remove the oils. Some sources say that washing with lots water is enough and that using soap may just spread the oil; swimming or wading in a fast moving stream works well. One of my friends says the only treatment for him, he has a severe reaction, is Zanfel. There are a number of barrier creams made specifically for protection from poison ivy. The effectiveness of the creams is quite variable (59%-9% protection) so do some homework before you buy. The American Academy of Dermatology suggests using creams that contain bentoquatam. If you are in an area where you are likely to contact the plants wear long sleeves and pants - remember to wash your clothes. Wet clothing (including sweat soaked) does not make a good barrier.

## **Currant**

There is a whole group of currants that grow in the area including gooseberry, black currant, skunk current, northern red current, northern black current, red currant, and golden currant. All are small shrubs with an almost maple-leaf shaped leaf. They are found in moist woods, stream banks, meadows, and logged areas. All of the currants may be nibbled raw although some people would prefer to avoid the skunk currant. I have made a very nice vinaigrette salad dressing with currants.



Currant leaves make a nice herbal tea or blend with black tea. If you are making tea with currant leaves make sure that the leaves are fresh or completely dried. Toxins are present in leaves of many species when in the wilted state.

There is a dark side to the wild currant – they are the alternate host for White Pine rust. Many foresters will attempt to eradicate, without prejudice, any kind of current they encounter.

## **Willow**

Willows are a large and very diverse group of plants and I am not going to give them the space and coverage they probably deserve – pretty much all the willows that you will come across are found along riverbanks/streams, moist meadows, and marshes. They are difficult to tell apart and hybridize frequently just to confound us when we think we have figured out the identification. Mostly they have narrow smooth lanceolate leaves, modified leaves (stipules) at the base of the petiole (leaf stem), and catkins lacking stalks. Some species may be felt on the leaf backside.



Willows contain salicin, a chemical similar to aspirin (acetylsalicylic acid), and they have long been associated with pain relieving properties. A 4,000 year old Sumerian papyrus document was found that outlined the use of willows for treatment of pain. Roman leaders sipped willow tea to relieve headaches.

All willows, fortunately, are edible so you can try out the tastes of those around the camp. Unfortunately not all are very palatable. Try early fresh leaves in the spring. The inner bark is edible – but I have not yet found one that I can actually chew and swallow (emergency food only).

If you are stung by a wasp or hornet try chewing a fresh willow leaf or young bark and apply the paste to the stung area. Make a tea of young twigs and leaves and apply this as an antiseptic for splinters, scrapes, and insect bites. Boil 2 cups of water with 1 cup of willow leaves and stems until 1 cup of fluid remains, let cool. I would not recommend drinking this tea but use it as a wash once it has cooled appropriately. Apparently this wash will also repel mosquitoes – I have never tried but it couldn't hurt.

Young willow branches of sandbar willow are very flexible and can be used for making woven mats and baskets.

## **Canadian Yew**

The Canadian (or American) Yew is a small shrubby relative of the Yew tree used by medieval English archers for making long bows. The yew is toxic except for the outer flesh that surrounds the seed (the seed is poisonous). The only reason I am mentioning this species here is because it is so common on MacKinnon Island that kids may ask about the plant and the red fruit; you should make sure they don't tempt fate by eating the berries (and seeds). One interesting tidbit is that Taxol from the bark has been found to be effective in treating breast and ovarian cancers and is now widely extracted and prescribed. The tree used to extract this cancer fighting agent is the Pacific Yew (*Taxus brevifolia*) rather than the smaller local cousin.

## Blueberry

Do I really need to say anything here? Yummy.... In pies, hot/cold cereal, fresh from the plant, however you want them. There are a whole set of different kinds of blue berries fortunately they all look similar (low shrubs with blue berries – go figure). One thing that you may not have considered for eating is the bell shaped flowers. Try making a tea of the flowers and leaves for a pleasant change. Don't drink too much since drinking a substantial amount can spark minor poisoning symptoms.

## Raspberry

Growing up from perennial roots the stems mature in two years to produce white flowers that form an aggregate drupe (raspberry). Dry, logged, burned, and open areas are all suited to wild raspberry. They flower in June and by July it is collection season. Like many related species in the rose family if you are making a tea from the leaves use them fresh or completely dried.

## Rose

There are a number of species of roses found around Shoal Lake. The most common are the Smooth and Prickly Roses. Fortunately the important parts – the pink flowers and red rose hips are pretty much the same. Rose petals make a very pleasant tea and garnish for some meals, they also can be used for making a very subtle pink dye. Rose hips are where the food action really is – there is very little flesh and nibbling the mealy fruit down to the seed is the most expedient route for eating. Do not eat the whole rose hip as the seeds are barbed and will not pass comfortably through your digestive system. Rose hips are the best source of vitamin C in the world so you can forgive the taste (a little). They also have significant amounts of vitamin A, B, E (in seeds), and K, calcium, iron, nicotinamide, etc... a veritable health food pharmacy.



Rose hips are best picked after the first hard frost; cut length wise and scoop out the seeds then make a healthful tea by crushing a handful of the remaining fruit.

## Forbs

### Yellow Pond Lily

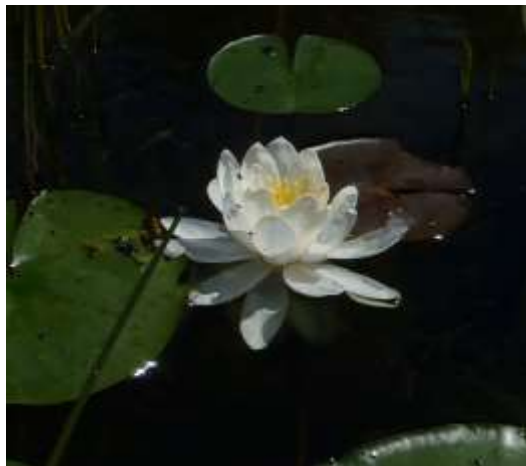
I have put in the yellow water lily because of the number of resources that talk about the rootstalks and how full of starch they are and how they can be eaten. Admittedly I have only had the



gumption to swim down and extract the roots a few times. They are large, as big as my forearm and quite long. They float naturally but are attached to the lake bottom with a gazillion roots so releasing them is quite difficult even with a digging knife and swim-mask. Once at the surface, if you have managed to get one that was not half rotten, cut the rhizome into fairly thin cross section slices. Boil the slices in lots of water with a tablespoon of baking soda, change the water two or three times; by then it might just be palatable.

Much nicer and easier to eat and collect are the seeds squeezed out of the ripe flowering heads. These are nice raw or cooked (steamed) into a porridge like mixture. The flavour is very bland but that can be spruced up with some fruit and brown sugar. Some sources recommend letting the seed heads dry for a few days before breaking them open and then baking the seeds until they swell and crack open.

In the same marshy areas you will also find the beautiful white fragrant water lily.



## **Yarrow (Milfoil)**

The finely divided leaf of yarrow is easy to spot in meadows and dryer sandy areas. Yarrow's botanical name, *Achillea*, honours the ancient Greek hero Achilles whose mother dipped him into the river Styx to make him invincible. Apparently Achilles used poultices of crushed yarrow to staunch soldier's wounds on the battle field. A somewhat less romantic version, but probably closer to reality, is the name commemorates a Greek doctor named Achilles who recorded the medicinal uses of the plant. Although not meant for large lacerations crushed yarrow does have astringent properties.

The flowers on this plant are typically white or just slightly cream in colour but there is a very minor genetic variation that can be found with pink tinted flowers.

I occasionally drink a very mild Yarrow tea to help with colds and congestion.



## Wild Sarsaparilla

This is one of my favourite under-story plants. In mature deciduous woodlands it creates a knee high sea of dark green (Ostrich and Bracken ferns create a similar look in other areas). The leaf, since that is what you are seeing, grows from an underground shrub.

The underground stems, or rhizomes, are easy to pull up from the forest duff, rub off the soil and peel the rhizome, nibble on the inner bark and wood. Apparently bundles of the rhizomes were traditionally carried to chew and give strength – although I find this claim a little dubious. I use the rhizomes to make a ‘root beer’ flavoured drink - wash and cut the rhizomes up then steep for 20-30 minutes, add brown sugar to taste. It certainly is not the same as the stuff from A&W but with a little honey (or brown sugar) and a drop of lemon it is quite nice.

## Jewelweed (touch-me-not)

This is a beautiful plant with lovely yellow-orange or orange spotted flowers. The flowers are almost snap-dragon looking with a long tail. The name of the plant comes from how drops of water form on the surface of the leaves in a jewel-like way. It can be found on many beaver dams, in damp shady areas, and on stream banks. The seeds float and they end up on beaver dams by floating around in the beaver pond and getting caught up on the open mud of the dam. The other common name (touch-me-not) comes from the explosive way seeds are ejected when ripe seed pods are touched.



The best known use of jewelweed is to relieve poison ivy itch. I take a fairly large handful of jewelweed and crush it into a small pot of boiling water. When the water cools use it as a wash, or freeze it and use the ice-cubes, on poison ivy rash. I don't react to poison ivy yet but I am told that it helps relieve the itch even if it does not shorten the length of time the rash lasts. There are a number of scientific journal articles that say that the treatment of Rhus dermatitis with jewel weed is all rubbish but who are you going to believe me or those unknown, but respected, science people?

## Blue Bead Lily (Clintonia)

This plant is common throughout the area and thrives in shady mesic areas with moderate soil depth. It is up to 30cm tall with two (or three) lily shaped leaves growing from the base. From the middle of the leaves a flowering stalk grows up that has three to ten drooping yellow flowers. By mid-July the flowers have given rise to berries with a deep blue colour (hmm – I wonder if they could be used for a blue dye?). Before the plant flowers and sets fruit the basal leaves have a cucumber taste making a nice addition to a spring and early summer wild salad. Just as a warning to would be blueberry pickers – the berries are poisonous.

## Strawberry

Sometimes I believe this little berry is all I need to confirm my faith in God. At the dawn of time God put a certain amount of flavour into every strawberry. We, as humans, have taken those little jewels and made them bigger through selective breeding but the flavour has remained constant, to the point that large commercial strawberries sometimes taste like slightly flavoured cardboard. I don't think I will ever find enough wild strawberries to make jam, and even if there were enough I am not sure I could put enough in my collection pail rather than my mouth.

## Dewberry

OK – you might ask why I put this tiny uncommon berry that only grows in wet places in this list of plants. Well the answer is because I love the taste and so many portages that I make are in just the right environment for dewberries – wet and mucky. What could be better than picking a few of these July jewels after slogging through a kilometre of mud and muck?

## Stinging nettle

There is not much nettle growing around MacKinnon but take a look around the dryer side of the wetland marshy areas. A good bet will be finding some around the lagoon. I have also seen some on the point (with Oak) on the north east side of the island. The typical places to find this plant elsewhere are along beach ridges and beaver dams.

The stems and leaves have glass like needles that inject formic acid/histamine into you when brushed. With this annoyance you might ask yourself what good are they except for causing grief when portaging along the top of an old beaver dam? Young nettles, or young tops off of older nettles, make a very pleasant pot herb. Although you have to use gloves (or care) when collecting, the sting is



destroyed by cooking or drying. The nettles are right up there with spinach for a healthy green and the left over water from cooking is a good invigorating tonic. Try serving the cooked greens topped with a little garlic (or wild onion), lemon and olive oil.

Old nettles also have very long and strong fibres that can be used for making cord.

## **Cattail**

Some people call cattails the one-stop food shop in the marsh and swamp. I am not sure I would go that far but starting in May and ending in September/October they certainly have a lot to offer.

In the spring you can collect the fresh sprouting stalks and peel them to get at the white core. Although the cores can be eaten raw try placing them in a Billy-can and cook like asparagus, serve with a little hollandaise sauce.

Later in the spring when they start to flower collect the pollen for a highly nutritious flower additive. I find the flavour a little strong but still palatable in biscuits. The green female flower stalks can be nibbled raw or lightly cooked. At the same time pull up the starchy ball (heart) at the base of the leaves, peel and use like you would water chestnuts. Save the leaves to make mats and baskets.

In the autumn dig up the rhizomes to collect next years' rootstalk sprouts. The Rhizomes themselves can be peeled then pounded in a pail of water to extract the starch which can be used like flour or cornstarch. Depending on the marsh I have had problems finding rhizomes that were not partially rotten.

## **Clover**

Clover is an introduced species to the island and is found in the grass near the dining hall. One of the great things about clover, especially in this area, is the roots have a bacterial association that fixes nitrogen and improves the fertility of the soil.

Young leaves can be eaten raw but are better if they are cooked or steamed for 5-10 minutes and mixed with other greens. Flowers are also edible and can be used as a garnish for other meals.

Braiding the long stems of multiple flows will allow you to make a very nice temporary floral wreath or bracelet for your friends.

## **Dock and Sorrels**

There are a variety of species of Dock (*Rumex*) found throughout the area. These are often found



in waste areas, gravel road sides, wet and disturbed areas. The leaves of these species, to at least some degree, have a tart flavour. The taller species are usually called Dock and the smaller ones are Sorrels. In the spring collect the leaves and young stems for a pot herb or steamed. In the [later] summer collect the seeds.

## ***Grass Like***

### **It's not all grass – but is that important?**

Often a long portage starts or ends in an old beaver pond that had been drained years before. You see a sea of 'Grass' and proceed to walk through the marsh to the landing on the other side. What most of us don't realize that these areas are a mixture of grasses and sedges. I think we have all experienced 'Cut' grass on these occasions when we unfortunately wore shorts and arrived with thousands of little cuts on our legs. Don't blame the grass it was probably a wet meadow of sedges that inflicted the pain.

When walking through an open woodland with a dark green sod of long leaved plants. It is a beautiful feeling in these contemplative places, most of us will probably not realize that the sod we are enjoying is likely a sedge rather than a grass.



Sedges have long narrow leaves and look like grass – is it really important to know the difference? In many cases probably not, they look the same and feel (a bit) the same. Why not all lump them into those grass like things? Some places the difference is important.

Grasses belong to the Gramineae (a.k.a. Poaceae) family and are common worldwide, although more species are found in tropical and warm temperate regions than in colder regions. This family brings us our most important grains – wheat, oats, barley, etc.... Grasses are most abundant naturally dry open habitats. The sedge family (Cyperaceae), which also has worldwide distribution, is more common in colder, wetter areas. Rushes comprise the smallest family, the Juncaceae, which is confined mostly to the colder, wetter, northern parts of the world.

Grasses, sedges, and rushes can all be used to provide a unique texture, color, and 'look' to any landscape. As a general rule of thumb grasses prefer sunny locations with well-drained soils. Sedges and rushes, on the other hand, are at their best in shady, moist locations.

If you are interested in the breadth (diversity) of life in many areas you must count the sedges and grasses separately. When looking at the biodiversity of grass like things in Canada most of the diversity is on the sedge side of the fence – there are many more species of sedges in Manitoba/North Western Ontario than there are grasses. If you took away the water sedge (*C. aquatilis*) you probably would have virtually no ‘grassy’ marshes. By removing the Assiniboine Sedge (*C. assiniboinensis*) or Long stalk sedge (*C. pensylvanica*) you would not have any green sod in most open forests.

A very nice twine can be made from many sedges; grasses don’t have the same fibrous strength and the twine made from grass leaves is not as strong.

Pretty much all grass seed is edible although many wild seeds are so small that collecting and preparing (de-husking) can be time consuming and difficult. Sedges in Canada have edible roots, again like grass, collecting is often not worth the effort except in the larger bulrush relatives.

### **Wild Rice (Manomin)**

Grains are the most valuable of all sources of plant food – they make cereals, flour, and meal. They contain lots of proteins and traces of vitamins and minerals. Most of us think of grain as wheat, rye, oats, barley, corn but there are many wild species of grain that can be collected and utilized. Wild rice is probably the most important and well known of the wild grains in Canada and has played an important cultural and economic role in the history of North American First Nations. This grain, which is not actually rice, is abundant in the cold rivers and lakes of Canada, and was the staple in the diet of the First Nations people of this region. Wild rice is also known to Aboriginal peoples as Manomin – gift of the Creator. The name Manomin does not refer to the plant merely as a natural resource, but as a gift of Manitou – a gift of the Creator - for the wellbeing of the people. In contrast, the popular term ‘wild rice’ connotes a natural resource – a much more restricted concept. To call Manomin a natural resource, or a subsistence food, is a sterile and shallow interpretation of this plant’s role in traditional community life.



Wild rice can be found in shallow open bays and small lakes where there is some moving water around much of Shoal Lake; this grass is one of the few grasses that grow in water. Early in the season the leaves float on the surface of the water, later in July the flowering stem emerges and stands above the water. Water depths need to be between 10 and 100cm for optimum growth during the floating leaf stage. The seed ripens over a period of time and when ripe the seed shatters (falls off) easily. The seed has a long, narrow shape that is heaviest at one end. This facilitates its rapid movement to the river bottom where it penetrates the

muddy soil. The end has barbs that assist the seed to hold on to the river soils, and prevent it from being washed away.

Collecting wild rice when it ripens in the early fall (September/October, sometimes as early as late August) pretty much involves paddling a canoe in to a stand and bending the flowering stalks over the canoe with a paddle, the ripe seeds just fall into the canoe. There are commercial harvesters that are used from air boats but that is all I will say about those noisy contraptions here. When collecting wild rice make sure that none of the seeds have been replaced by purple/black spurs of Ergot (*Claviceps fungus*) which is poisonous and can cause seizures and some pretty weird nightmares/hallucinations (Saint Anthony's Fire).

Collected seed cannot be eaten right away but needs to be processed to remove the husk. I have used the following process to process wild rice seed: use a BBQ to parch the seed (~350°F) for a couple of hours, then beat or rub the seeds between your palms to loosen the husk/chaff, winnow (toss in the wind) to separate out the seed from the husk. Wash and dry the grain, store the dried seed or use immediately.

#### **Cooking Plain Wild Rice**

250 mL wild rice  
750 mL boiling water  
5 mL salt.

Wash the rice well in cold water, drain, stir into boiling water. Cook without stirring until split and tender – about 40 minutes, strain if necessary.

Wild rice is a commercially harvested crop by the First Nations people in the area. Collection of wild rice requires a permit in Ontario and is regulated under the Wild Rice Harvesting Act. The easiest way to get wild rice is to buy it from a licensed source.

The grains are longer than conventional rice and when cooked they split and curl back. Mix wild rice with regular brown rice to stretch it out or dilute the smoky flavour which some people don't like. Add some mushrooms and almonds for an additional taste sensation.

Pretty much all grass seed is edible but it can be difficult and time consuming to collect.

### ***Lichens***

Lichens are an association (really close friendship) between algae and fungi. The association allows both groups to live in places that would not be possible for either. Together they form beautiful and wonderful shapes and configurations.

In many parts of the world (especially in the north) lichens hold an important role in the ecosystem. They protect the ground from drying out – their ability to capture fog and dew in deserts is important in moisture conservation. In nutrient-poor soils they accumulate and release nutrients. They are important sources of fixed nitrogen. Crustose lichens actually grow into rocks and play a role in weathering and breaking down rocks into soil.

Lichens are an important source of food for many animals from tiny invertebrates (which get eaten by larger animals) to large animals like caribou and reindeer. Spruce grouse feed on lichens and many birds and squirrels use lichens as nesting material.

Because of the way lichens absorb water and dry out they tend to collect toxic metals and other pollutants. This makes them sensitive to even low levels of pollution; researchers have used lichens for bio-monitoring because of this property. Next time you are in Winnipeg look at the trees (Maples for example) as you progress from the suburbs to the core area – what changes?

The following list is only a small sampling of the most common or easy to identify lichens found in the area of MPC.

### **Pixie Cups**

These are one of the most widely spread lichens in North America spreading from Alaska across to Newfoundland and down through Florida and the Texas. There are many different kinds of pixie cups the one pictured here has the common name of mealy pixie-cup and pretty much grows everywhere – wood, bark, rock, soil, in full sun to partial shade. Other pixie cups might be taller, bumpier, convoluted ... there are at least 15 other kinds. The picture on the left represents one of 14 different chemical types.



This red topped lichen is known as British Soldiers (*Cladonia cristatella*). It is easy to spot in amongst the other lichens on dry to somewhat mesic rock outcrops with thin soil.



### **Old Man's Beard**

This is a group of yellow/green lichens (*Usnea*) that hang from the branches of trees. There are 14 or so very similar species that can be found but they have a few common features – they grow from tree branches, usually pine/spruce, and contain usnic acid. The acid is known to have antibiotic properties and the lichens have been used to treat various skin diseases from diaper rash on babies to foot diseases in adults.

In traditional medieval beliefs this lichen looked like hair so it was used to treat disorders of the scalp and possibly used to encourage hair growth.



You might be forgiven if you mistake this for Spanish Moss but it is quite different. Spanish Moss, which is not a moss at all but a flowering plant, does not grow near here.

There is another similar looking lichen, in form, that is dark brown (*Bryoria*). This other type is commonly called horse hair lichen because it looks like hair that has fallen or been pulled off a horse (or bear).

### Orange/Yellow lichens

On trees and rocks you will find orange sunburst lichens and yellow candle flame lichens. These lichens are ubiquitous and the orange ones (*Xanthoria*) are relatively resistant to pollution so you will continue to see them even after most of the other shield and hanging lichens have given up.



### Green and gray leafy shield lichens

‘Shield lichen’ is pretty much a catch all term for any foliose lichen that grows on rocks or wood that is fairly easily separated from the substrate, has relatively large lobes, and is kind of round (shield like) in form. They may be green (*Xanthoparmelia* on rock, and *Flavoparmelia* or *Melanelia* on wood) or gray in color (*Punctelia*, *Parmelia* or *Phycia* on wood).





## Foam Lichens

I always enjoy finding foam lichens because they look like foam. What could be better than something that looks like it is called, easy to remember. These lichens mostly grow on rock or dry thin soil and are often spotted in the same area as reindeer moss.



## Crust Lichens

Crust lichens can be found on trees and rock. In many cases they don't just grow on the surface but actually into the rock starting the first process of converting rock into soil. When looking at a nice rock outcrop many people are surprised to find that they are not looking at rock at all but a living layer of lichens. When visiting a geologist friend many years ago he complained about those 'damned' lichens because they hid all of the interesting rocks!



## Reindeer Moss (Caribou Lichen)

These lichens form large patches on thin soil over bedrock – especially in dry open Spruce/Pine forests. It is a little disturbing to think when you hear crunching under your

feet that each little branch may represent a year of growth. When they are moist they are as soft as moss, when dry they will crumble to powder. Take a closer look there are a whole variety of these with different colours and shapes.



## Rock Tripe

Rock tripe is a leafy group of lichens that range in colour from brown to gray with velvety black back. The lichen is attached to the rock substrate from a middle ‘umbil’. When dry it is crusty and cracks easily, after a rain it becomes soft and rubbery.

Some people believe that this lichen can be eaten (I am one of them) but care must be taken when preparing the lichen as it has a variety of chemicals that can cause stomach upsets. If you want to eat this stuff it needs to be washed in a running stream for a day or, what I do, is cook it in several changes of water with the first change having a teaspoon of baking soda added. Once that is done it still has a nice mushroom flavour and makes an interesting addition to hot and sour soup.



## Pelt lichens

Found scattered from the tops and sides of moist shady stumps to the edges of rock outcrops you will see leafy looking lichens hidden in the mosses and other lichens. These are the pelt lichens. They are often mistaken for leaf litter.



## Mosses

I am not sure what to say about mosses to keep it short and yet convey the breadth and depth of the topic. I have only given a short list of the most common and interesting mosses to look at. If you like mosses I think the book [Gathering Moss: A Natural and Cultural History of Mosses](#) by Robin Wall Kimmerer is a must read.

### Stair Step Moss

This beautiful stepped moss is one of the most common in the boreal forest. It is hard to confuse since it is the only moss that grows in the stepped fashion with a new ‘step’ being added each year. It is found on soil, humus and decaying wood all around the world in the boreal region. The specific name (*splendens*) is Latin for ‘shining’ and although stair-step moss is seldom glossy is indeed splendid.



## Electrified Cat's Tail

I must say that this is one of the most fun named mosses that I have collected and found. When wet the leaves stand straight out and are bunched at the ends making it look like a scared (electrified) cat's tail. It is one of the more common, yet commonly overlooked, mosses in the area.



## Knights Plume

What more needs to be said – Knights Plume. I am off to a miniature jousting match and I need a plume to put in my helm to woo a lady. The genus name (*Ptilium*) means 'plume-like' and the species name *crista-castensis* comes from the Latin *crista* or plume and *castensis* 'of the camp' or 'military. Both refer to the elegant regularly branched plants which are likened to the plume on a knight's helmet.



## Red Stem

Ahh - Big Red Stem. This is probably the most common moss on the forest floor, it is distinguished by the clearly visible red stem through the pale yellow-green leaves. This

moss often grows as a continuous mat of moss across the floor of mature coniferous forests.

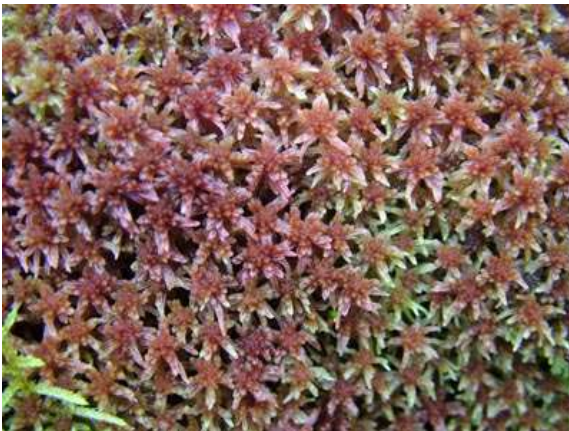


### **Sphagnum (Peat Moss)**

This is the shag carpeting of the Canadian Shield. It grows thickly in any place where there are few nutrients and water collects – it can fill in ponds (over the centuries) or grow in massive carpets up hill and down. In most places it lowers the pH to quite an acidic level. It is the quintessential ‘bog’ moss. When looking down from the top all sphagnum mosses have a star shaped look and from the side they have a clear tufted ‘head’ with dropping fine tentacles. Sphagnum changes its own environment by increasing the acidity of the water excluding many other mosses and plants.

The wonderful thing about Sphagnum is its ability to absorb water. It can hold up to twenty-seven times its weight in water – let’s see the best paper towel do that! It has large dead cells that serve as water absorption and holding tanks. This ability to hold moisture has given it a place in our modern gardens and more traditionally for diapers and feminine hygiene needs.

The acidic nature of the moss makes it naturally aseptic; this property along with a small amount of natural steroids speeds healing. The moss has been used for generations for wound dressing and other places that a sterile absorptive compress is needed. It typically has no human pathogens.



Test how much water sphagnum holds. From an out of the way location pick up a large handful of peat moss and dry it out in the sun (it might take a while). Test how much it weighs. Put it in a pan or jug and soak up as much water as you can then pick it up again – wring out the water and see how much comes out. Weigh it again and see how much water still remains.

## **Juniper Moss**

Juniper moss always reminds me of Juniper bushes, I am not sure why since they are quite different to look at but it might be due to the stiff leaves standing out around the moss stem. This moss is common on the tops of dry hummocks and often in dryer areas. The other common name is Hair Cap Moss from the hairy cap on the saprophytes (hmm I guess I should have gotten a picture of those too).



## ***Fungi***

I am not going to talk about the multitude of fungi other than to say they serve one of the most important decomposing functions in the forest ecosystem. If we didn't have fungi we would be buried in leaves and other organic material. Fungi are neither plants or animals but a different kind of organism that feeds on rotting material and breaking it down into rich soil or parasitize other living organisms (e.g. trees). The parts that we see (mushrooms) are only a small part of the fungus that are involved in reproduction. Underground threadlike filaments spread out to form a colony of mycelium – some of these are the size of many football fields and may be thousands of years old. Most fungi are saprophytes (live off rotting material) but some live off other living plants (and sometimes animals) these are called parasites.

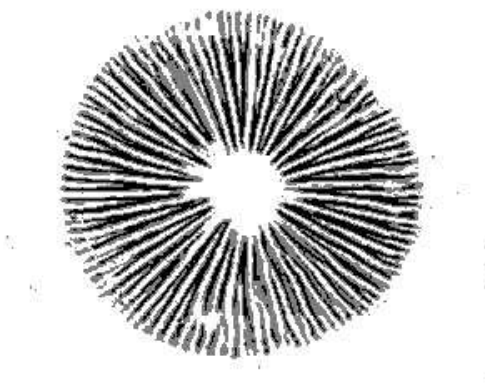
## Greenish-Blue Night Light

Next time you are sitting around the campfire late at night, just when the fire has burnt down to embers, look around a bit. If you saw an old rotten stump earlier, or better downed log in a moist area, go and find it. You might be lucky enough to experience a wonderful visual experience – Foxfire. This is a display of the phenomenon of bioluminescence; the production and emission of light by a living organism as the result of a chemical reaction. I have often seen this just as a green/blue glow on moist split or broken rotting logs, once I was lucky enough to see an actual glowing mushroom (probably a Jack O’ Lantern or *Omphalotus* sp.) near Shoal Lake. I woke in urgent need of ... well you know. I was only 13 and on a canoe trip out from camp, I am sure we spent part of the night telling ghost stories; it was both a freaky and cool experience.

## Spore Prints

When first learning to identify mushrooms you will need to make spore prints – it is fun and easy. Almost every mushroom and mushroom like fungi eject spores as part of their reproduction. Collecting the spores on a piece of paper will allow you to see the pattern of the mushroom gills and the spore color – there are a variety of colours. The colour and arrangement are important markers when trying to identify mushrooms but just making prints is a cool art all alone.

All you need is a mushroom cap, a bowl or cup that fits over the cap, and a piece of paper. When I am identifying mushrooms I use a white piece of paper but really you can use any colour paper to collect the spores. Cut off the stem and place the mushroom cap gill (or pore) side down and cover with the cup. A fresh mushroom will put off enough spores to make a print in less than an hour. If you want to save your print spray it with hair spray or a clear spray-on varnish.



## Black Knot

Around Bunny point and a few other places on the island (in 2011) you will see black swollen stems on many of the chokecherry trees. This stuff, which I call ‘poop-on-a-stick’, is called Black Knot a fungal disease that primarily infects shrubs in the Prunus

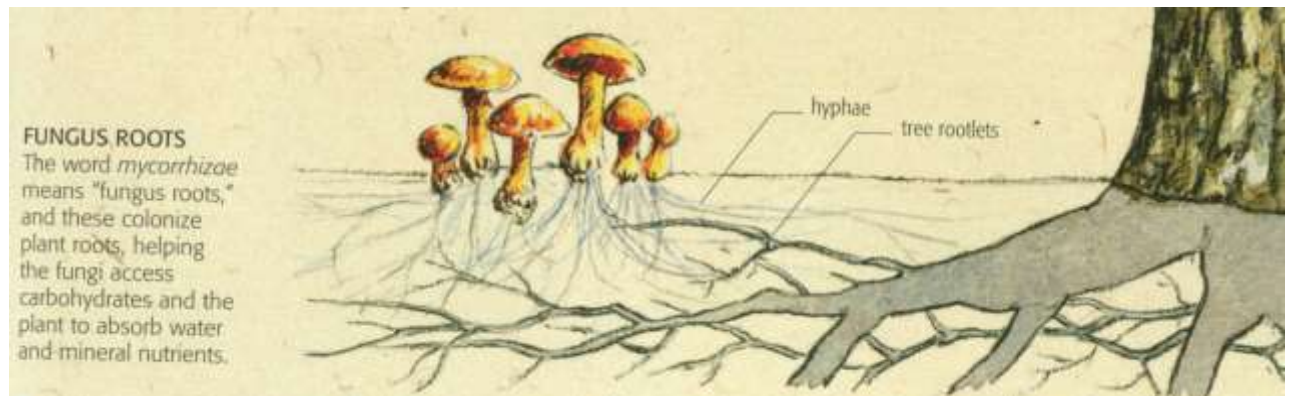
family (chokecherries are very sensitive). Eventually this infection will kill the tree and I mention it in this booklet because it will likely be seen more widely in the future on the island and it usually raises lots of questions.

Treating Black Knot is not easy since the fungus may have infected the tree before any knots appear. Remove the knots in the winter by cutting the branches 10cm below the knots. Dispose of the knots by burning or sealing them in a plastic bag since spores will continue to be released even after trimming the tree. If you can find it apply *Trichothecium roseum*, a biological control agent, to the section of branch or shoot showing symptoms of black knot. Symptoms include thick, black, oddly shaped swellings on tree twigs.



## Beneficial Relationships

Many fungi live in a close beneficial partnership called mycorrhizal symbiosis with plants (including some algae). There are estimates that more than 90% of the plants living need some level of fungal association for their own survival. The fungi help the plants take up nutrients, and sometimes water, from poor soils. Most trees in the boreal forest would not survive without this relationship – something foresters have started to recognize when replanting trees after cutting for lumber or pulp.



modified from: Audubon Society, the Practical Naturalist, Explore the wonders of the natural world, 2010.



## Thoughts on Succession

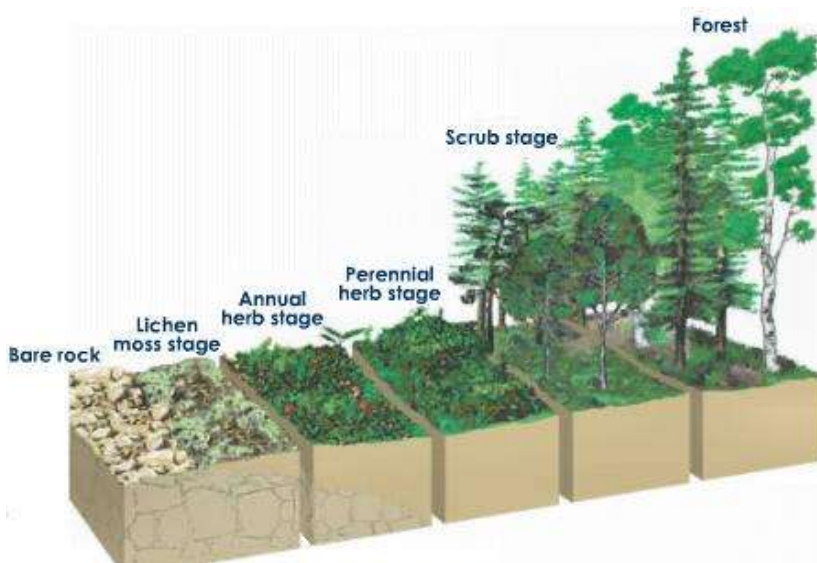
The plant landscape around us is constantly changing due to pressures from other plants, soil condition and depth, moisture, fire, temperature, wind, herbivory, and humans. We often think of succession as a one way street ending in a 'climax' community but this is really a false belief. Succession may appear to stop or stagnate at some point but it has many loops, trips, setbacks, and waves.

### Forest Succession

In a simple world with no major disturbances the forest in this area would have developed after the last glacier retreat (10,000 years ago) changing from bare rock, to lichens & mosses, then short lived grasses and forbs, perennials & shrubs, moving to pioneer tree seedlings, mature pioneers (Aspen, Jack pine), longer lived seedlings like red/white pine/cedar, mature long lived trees, and finally shade tolerant long lived species like oak. Now think about this a little - the typical life span of Oak is up to 300 years. At any point along this line each stage can be a mature or old growth community and may be stable (not climax in my opinion) for long periods of time.

This process can be broken by many disturbances. Some forests such as Jack pine and Aspen rely on these disturbances to stay healthy. What other kinds of disturbance can happen?

Take a look at the forest around the camp – what stages is the forest at? Can you think of anything that is driving the direction of the change in the forest. How about the playing field, intermediate hill?



## ***Succession in Action on MacKinnon***

When I first started to work on the species lists and plant communities around MacKinnon Island I was struck by the amount of young Balsam Fir stands. Initially I thought this might have been re-growth after a fire but there have been no fires on the island since the camp started. The existence of large, old, Aspen and Ash trees towering above the fir suggested that something else has been going on with the trees.

There are only a few White Pines found on the island and knowing that these trees live a very long time (several hundred years) and were actively sought after in the logging and lumber boom of the late 1800s (the first timber permit in Kenora was issued in 1875 and the Kenora dam was built in part to stabilize water levels allowing logging transport between the lakes). I suspect that the island was harvested of White Pine and possibly other trees in the early 1900s. Aspen poplar, which will sucker from roots, would have proliferated with the removal of Pine and other lucrative trees. A fire could also have removed the existing trees around the same time with a similar outcome but even a few remaining seed trees would have effectively recolonized the island after a burn, even under partial Aspen re-growth.

Aspen trees are self-thinning and live only 60 years on average; under good conditions they may live longer. Fir trees will grow up in the shade of Aspens forming a replacement forest. The dense Fir stands appear to be only 30 years old which would be consistent with regrowth under Aspens. The Fir trees have formed a thick re-growth stand shading out any other smaller trees unless a break is caused, by a falling Aspen for example.

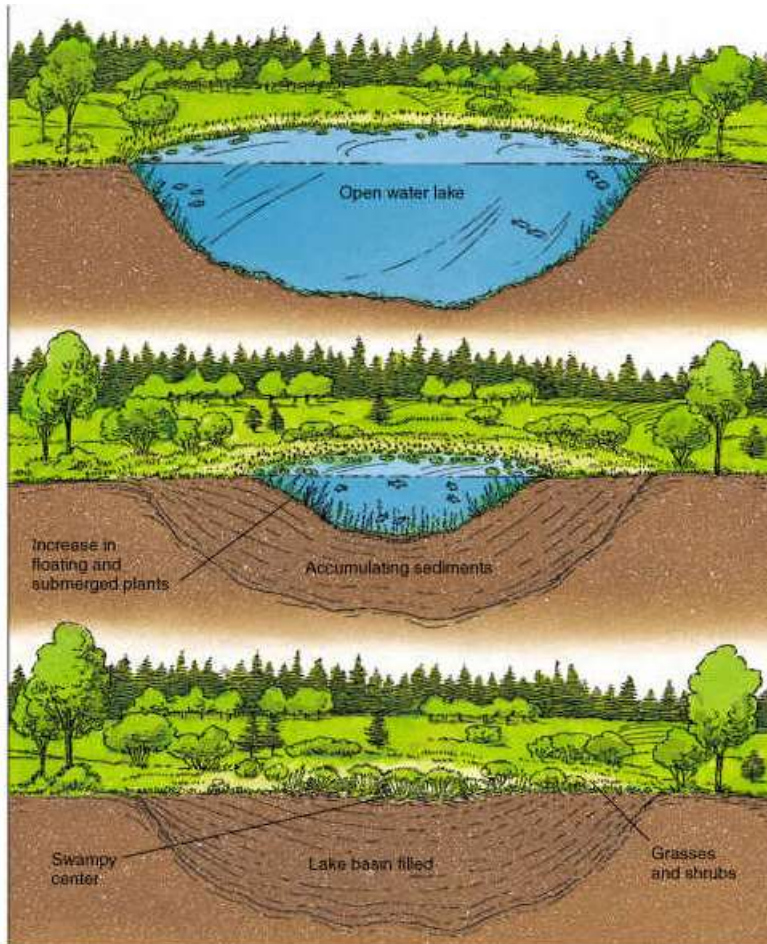
The number of Aspen and Birch seen in the images from the 1940s suggest that this sequence may actually be what has happened. The Cedar stands which are also quite old may have been left in the original cutting because they were less sought after trees. Cedar will propagate fairly easily from seed but need light to get going – this may explain the old growth Cedar with younger trees scattered around the island. Ash trees, which will propagate easily from seed but are a little slower than Birch and Aspen to get going, would have germinated and established in the wet swampy areas where they are still found.

I wonder if the MacKinnon site was a temporary logging camp in the early 1900s that remained partially cleared and making development of the camp particularly attractive since little clearing would have been needed.

Unfortunately I have not been able to check if the story I created fits all of the facts. Much of the above information is just speculation – but it makes a nice story.

## Pond and Lake Succession

A pond that formed just after the last glaciation will have continued to change over time. Starting from an open lake it could have slowly filled in from organic material and washed in soil and minerals. Algae and submerged vegetation start the process with emergent plants following eventually forming a marsh or wetland. If nothing changed the wetland may have filled in and become a meadow then forest. Do you think that this succession only goes one direction? Is there anything that could disturb this process and take the process back to an earlier stage?



## Common Edible Plants

The following list provides some of the more common and easy to identify edible plants found in the Shoal Lake area along with some brief notes. For more information refer to one of the references provided for more complete information. Unless you are absolutely sure what you have picked – DO NOT EAT IT! Many teas from wild plants have strong flavours, before picking make sure that you will use what you have picked. Wild vegetable, salad, and flour/fruit extenders are often bitter and many people find the taste un-acceptable.

Do not collect wild food for eating in areas that may be contaminated with industrial (mine tailings) or human waste (sewage effluent). Only collect what you will use and only where the plant is plentiful – leave a significant amount for re-colonizing or reproduction. Some plants might be locally rare or the collection is limited by agreement or legislation – respect the environment, and private property.

Many people find the additional roughage and unfamiliar constituents of wild foods hard on their digestive system and may experience stomach upset and/or diarrhoea. Until you are comfortable eating some wild foods, especially vegetable and salad additions, only small amounts should be taken.

### Terms:

- \_\_ extender* – added to other fruits or flour to extend or flavour
- cool drink* – used like lemonade or ice tea (refreshing)
- flavouring* – added to food for flavour
- jelly* – can be made into jelly or jam
- nibble* – can be nibbled on the trail or kept for later.
- salad* – used in salad (fresh/cold)
- seed* – seed used in porridge or gruel.
- tea* – pour boiling hot water over material and steep
- vegetable* – cooked pot herb either steamed or in boiling water

### Plants:

- Blue Berries – *nibble, jelly*. You know what to do – pies, muffins, pancakes, sprinkle on cereal, etc....
- Chokecherries – *syrup/jelly*. You can eat them raw (but not the pits) but be prepared to pucker.
- Rose hips – *nibble, jelly, tea salad*. Scoop out the seeds from the middle of the hip before using. Make a delicate tea from dried leaves or petals. Add pink petals to salads for some added colour and pizzazz.
- Bunch berry – *nibble, fruit extender*

- Bearberry – *fruit extender*. Probably not the greatest fruit out there but they remain on the shrub for a good long time.
- Yew berry – (remove poisonous seed) *nibble*
- Strawberry – *fruit, tea*. The leaves can be used for a very mild tea if they are absolutely fresh or completely dried. The fruit is there just to eat – if you have the time and can find a big field collect some and make jam (good luck).

Raspberry – *fruit, tea*. The leaves can be used for a very mild tea if they are absolutely fresh or completely dried.

Gooseberry – *fruit*

Currant – *fruit*

Dewberry – *fruit*. Like straw berries these are best eaten when walking a long wet portage in July.

Smooth sumac – *cool drink*. Use fruit when dark red and hairs on fruit have white crystals. Rub berries and soak for 10 minutes then strain. Shrub found on south facing boulder/rock outcrops.

Wood sorrel – *tea, cool drink, salad*. Steeped 10 minutes in hot water and then cooled or added to salad for a sour addition. Limit the amount taken since oxalic acid (what makes it taste nice) can cause problems. Found in mesic woodlands, leaves look kind of like three leaf clover with yellow flowers.

Mint – *tea, flavouring*. Usually found near lake shores, wet meadows, and beaver dams.

Sarsaparilla – *tea*. Add cleaned and chopped roots to boiling water. Add brown sugar to taste.

Checkerberry – *tea, nibble*. Usually found in open Jack pine forests. Red berries with cross at end. Use leaves/berries for tea – chip finely steep to taste.

Golden rod – *tea*

Yarrow – *tea*. Introduce the yarrow to boiled water – do not steep long.

Shepard's purse, pepper grass, mustard (seed) – *flavouring*, young leaves can be used in salads, older leaves boiled as a pot herb. Mature roots have ginger like flavouring.

Labrador tea – *tea*. Steep less than 5 minutes, do not boil.

Pine needle (spruce, fir) – *tea, male cones vegetable*

Sweet flag – *flavouring, candied root*.

Found mixed with cattails and bulrushes in marshlands and lake shores. It is an acquired taste....enough said.

Sweet gale – leaves are used as *flavouring* for stews (like bay leaf).

Found along lake shores

Juniper berry – *flavouring* for red meats and gin.

Cow parsnip (seed) – *flavouring, vegetable*. The seeds have a cardamom like taste. Dried leaves that have been roasted or burned can be used as a salt substitute. The roots can be added to soup or stew. The sap can cause skin irritation after exposure to sunlight. Often found in ditches and where there is a deep disturbed soil with reasonable moisture. Giant Hogweed has been found in Eastern and south-eastern Canada. Don't confuse these!

Wild ginger – *flavouring*. This plant may be difficult to find as it is uncommon; found in wet forested areas.

Sweet cicely – *flavouring* like liquorice or anise. Usually found in mesic broadleaf (shady) woodlands.

Onions – *flavouring, vegetable*. Look for on boulder slopes and cracks in rock outcrops.

Cattails – *vegetable, flour*. In the spring use leaf bases and green female flowering stalks as vegetable. Pollen can be used as flour extender.

Summer-fall use rhizome tips as vegetable. Pound starch out of rhizomes for flour extender

Bulrushes – *vegetable, seed*. Use rhizome tips as vegetables

Arrow leaf – *vegetable* (root tubers).

Collected in the fall from wetlands and shallow lake shores. Care must be taken not to mix in with some other wetland plants.

Nettles – *pot herb, tea*. Found on beaver dams and wet meadows. Use only young leaves.

Fireweed – *vegetable, salad*. When plant is young before flowering.

False Solomon's seal – *vegetable*. When plant is young before flowering.

Lamb's quarters leaves – *vegetable, salad*

Dock (any Polygonum) – *vegetable, salad*. Sour dock – *tea*.

Thistle – *vegetable, salad*. Roots may be peeled and boiled/broiled. Leaves and inner stalk in *salad*. Cut off the spines before cooking or adding to salad

Violet leaves and flowers – *vegetable, salad*. Look for hairy strongly heart shaped leaves in shady mesic broadleaf woodlands.

Blue bead lily – *vegetable, salad*. Pick leaves before flowering.

Reindeer moss (gray only) – ground/powered lichen flour extender/thickener. Found on rock outcrops – make sure only gray lichen is picked (avoid yellow/green).

Rock tripe (umbelicaria lichen) – *vegetable*. These are typically found on dry cliff faces. Before eating cook in more than one change of water – the first change should have some baking soda added.

Jewelweed – *vegetable*. Found in wetlands and moist woodlands. Often on beaver dams. If boiled (put

herb) save the cooled liquid for applying to skin rashes (it can't hurt to try).

Clover – *leafy vegetable, salad*, roots may be peeled and boiled/broiled

Dandelions – *vegetable*. Pick leaves before flowering. Roots may be peeled and boiled/broiled. I have found Dandelions and Plantain usually fairly bitter.

Plantain – *vegetable* Pick leaves before flowering or plant matures.

Wild rice – *seed*. Found in sheltered bays and slow moving streams with water ±1m deep. Ripens late summer through mid-fall. Watch Look for hard black/purple fungi where seed should be – these are ergots and are poisonous and if spotted discard collected seed and search elsewhere.

Giant reed grass – *seed, vegetable*.

Found along sheltered lake shores and dry side of marshes. Often forms dense stands 2m in height. See note on ergots above.

Hazel nut – *nut/seed*. Found in dryer bushy woodland. Eat nut meat raw or roasted, or grind into flour.

Yellow water lily – *seed*. Deeper water. Many sources indicate that the roots can be eaten – they are very difficult to dig up and usually taste like swamp unless sliced thin and cooked in multiple changes of water.

Acorns – *flour extender, porridge meal*.

Collect the seed, shell, and clean in standing water – good acorns sink. Run hot water over ground or finely chopped nutmeat until water is clear and meal is not bitter.

### **Edible Plant Resources:**

Cvancara, Alan M. Edible Wild Plants and Herbs. Ragged Mountain Press/Graw-Hill. 2001.

Gardon, Anne. The Wild Food Gourmet. Firefly Books Ltd. 1998

- Gibbons, Euell, Stalking the healthful herbs. Alan C. Hood & Company, Inc. 1966.
- Gibbons, Euell, Stalking the wild asparagus. Alan C. Hood & Company, Inc. 1962.
- Lincoff, Gary H. The Audubon Society Field Guide to North American Mushrooms. Alfred A. Knopf, Inc, 1981.
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- Peterson, Lee Allen. A Field Guide to Edible Wild Plants Eastern/Central North America. Houghton Mifflin Co. 1977.
- Springmeyer, Fritz. Willow Bark & Rosehips. Falcon Press Publishing Co. 1996.
- Szezawinski, Adam F., Nancy J. Turner, Wild Green Vegetables of Canada. National Museums of Canada. 1980.
- Tozer, Frank, The Uses of Wild Plants. Green Man Publishing. 2007
- Turner, Nancy J., Adam F. Szezawinski, Edible Wild Fruits and Nuts of Canada. National Museums of Canada 1979.
- Turner, Nancy J., Adam F. Szezawinski. Wild Coffee and Tea Substitutes of Canada. National Museums of Canada. 1984.

**Things to avoid** - poisonous look alike or other dangers

- Peas – some are edible like the purple Beach Pea but others that look very similar are not.
- Water parsnip or anything that looks like carrot top. It is easy to confuse with water hemlock. Water hemlock had double pinnate leaves.
- Most mushrooms/lichens. There are many that are edible and delicious but there are many that are poisonous and/or deadly.

## Activities

The best kinds of activities are fun for both children and leaders, and when there is some learning involved. If the activity can be run without the children realizing that they are learning something [about the environment/nature] and they are just enjoying themselves that is even better – camp is supposed to be carefree and fun. A recent editorial in *Nature* (vol 464 pp813) looked at research in experiential learning of scientific information outside the classroom. There is evidence that a significant amount of science knowledge is picked up through informal (non-school) routes, and that these informal learning experiences are often more effective at getting people excited about science. The outdoor and seemingly carefree camp environment provides an excellent venue to enjoy the learning experience. I don't want to imply that all learning should be experiential but in the camp environment it is a very powerful learning tool.

We are part of the world, thus part of the wilderness. When creating activities that explore 'the wild' try to instill a sense of our being part the natural world and that we have a responsibility to live in, and in harmony, with that which we call 'The Wilderness'. Activities should focus on our interaction with nature, where we fit and belong, and how to 'see', explore, and be part of our environment.

There are many activities that you can do at camp that involve an understanding of nature, ecology, chemistry, and other fun things. The following activities are just a few little examples of things that counselors might want to try over the summer months. Before subjecting your campers to any of these activities try them out yourself or with a group of counselor or counselor in training. Come up with a plan on how to approach the activity. Some of the activities are meant to be spontaneous during other larger sessions (e.g. an island hike). Try to bring in material found elsewhere in this manual (e.g. when making birch spoons talk about waterproof decay resistance nature of the bark, fire starting, canoes, birch syrup, etc....). Encourage campers to talk about their experiences and get them involved, ask them why, have them feel free to ask you questions. If you don't know an answer let them know and then have them join you on a quest to find the answer. The camp has a considerable number of additional activity resources available – search them out.

### **Quick & Easy Ideas**

#### **One Meter World**

Here is a fun little activity to do with lichens and mosses (what I call where the little people live). Each person gets a 3m string which is placed in a loop giving roughly 1m<sup>2</sup>. This becomes the little people's world and the task of the participant is to make a miniature interpretive trail with interesting sites and locations. Once they are done have get a tour through the tiny world.

#### **Age the Tree**

Look for a tree that has been cut down and off the stump or cut end and count the number of rings from the centre to just inside the bark. The count is roughly the age of



the tree since every year a new ring is added. You might need a magnifying glass to count the rings on some trees, cooking or finishing oil may be used to help bring out the contrasting rings. I have seen trees in bogs, shaded areas, or dry cliffs that were only a few meters tall but the tiny rings told me that they started life almost 100 years ago. Other monstrous trees, like some Cottonwood, are relatively young. Thick bands mean there was a good summer with lots of water and sunshine. Thin bands usually mean cool or dry summers. If the bands are thicker on one side can you guess what might have happened?

### **Shady World/Sunny World**

Lie down in a patch of forest and look up. What kinds of trees do you see, how much sky can you see. Look side to side, how many under-story plants are there? Can you think of why?

### **Scratch and Sniff**

Some things are easy like mint and balsam and others are harder (such as cedar or pine). Lightly scratch the bark of a tree, a leaf, or other object right with your nose nearby and see what things smell like. How are they different?

### **Leaf Rubbing**

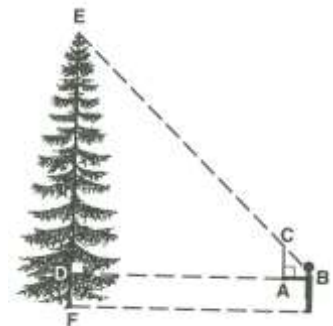
Collect a nice leaf or two and place it under a thin piece of paper (vein side up). Using a crayon or soft pencil make a rubbing of the leaf – stroking the crayon in one direction. An alternative is to iron some nice plants between wax paper sheets, or set between clear Mac-Tac, to make a nice card or gift – a memory of camp.

Most coniferous trees (fir, pine, spruce) have needle like leaves which stay green all year long. They have a very thick waxy coat (cuticle) which helps it retain moisture through the cold dry winters but they start catching sun for energy whenever it is warm enough – even in the winter.

Deciduous plants (drop leaves in the fall) have many shapes that do many things: teeth, notches, points, and lobes encourage water to gather and/or run off; stalks and different shapes allow the leaves to move and catch the most amount of light; waxy surfaces save water, rough hairy surfaces may keep the leaf warm or catch water. Many leaves have lumps and bumps usually caused by insects such as the Oak Gall wasp.

### **Height of the Tree**

Find a stick (or paddle) that is the length of your arm and hold it upright in your hand (at the length of your arm). Walk backward, carefully, until you can just see the top of the tree over the top of the stick. The distance to the tree is roughly the height of the tree (plus your shoulder height). One long step is about 1m.



### **Cattail mats and baskets**

Use the leaves from cattails to make woven baskets and mats.

### **Water from Shrubs**

Place a clean clear plastic bag over a bunch of shrub leaves during the day. Tie the end of the bag around the branch and wait – see how much water comes out of the leaves over the day. This is an easy way to collect clean drinking water and see how much water shrubs and trees give off through their leaves.

### **Scavenger Hunt**

After talking about the interesting plants in the area come up with a scavenger hunt for everyone. Include things like Aspen leaves – with flat stems, lobed oak and maybe an acorn, pixie cups, mint, electrified cat's tail, sweet flag or cattail head, etc....

### **Birch Bark Paper**

Don't collect bark from living trees; the bark protects the tree and removing it will cause the tree to die. You can cut birch bark into card size pieces and use it to make stationary and cards to give as gifts. It may need to be soaked in warm water and pressed, when wet, to keep it flat.

### **Meet a Tree**

Pair girls off in groups of two. One girl is blindfolded and her partner leads her to a tree. The partner helps the "blind" child to explore her tree and to feel its uniqueness. Specific suggestions are best. For example, can you put your arms around the tree? Is the tree still living? Animal signs where branches have been? When the blindfolded girl is finished exploring, her partner leads her back to the starting point by an indirect route. Remove the blindfold and let the girl try to find her tree.

### **Grass Squeaker or Whistle.**

Pick a nice wide grass or sedge leaf, quack grass works really well. Press the piece between your thumbs – leaving a small space for the grass to act like a reed. Blow across the blade of grass to create a whistle, scratch, or squeak.

### **Un-nature Hike**

Go for a walk through the area and identify what does not belong – is it natural or was it planted, are there invasive species, is there trash, stepping stones....

### **Spore Print**

A quick and easy activity to do with mushrooms. See Spore prints under fungi.

### **Zoomsticks.**

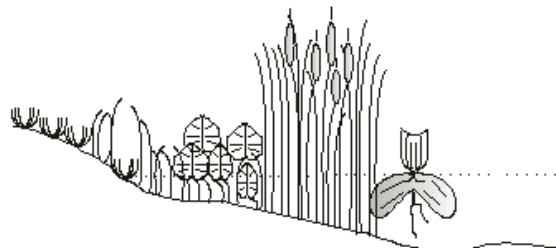
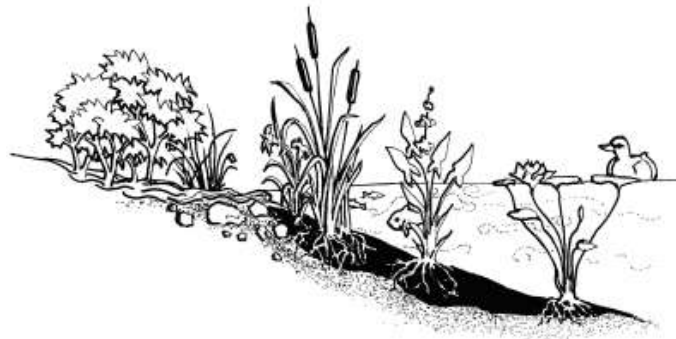
Puncture a resin blister on a Balsam Fir with a small stick or twig. Place the stick on the surface of the water (pond, pail, bathtub) and then watch it zoom around. It will leave a thin multicolored trail of resin in its wake. Laura Reeves says if the water is cold enough this trail will harden and can be lifted out of the water.

## Marsh Walk

Put on an old pair of shoes and head out for a marsh walk. Start on the edge and look at the plants, maybe make a drawing then start to walk. What does the ground feel like? How tall are the plants – grasses, sedges? Keep going as the water starts to come up how have the plants changed. Does it smell? The camp may be able to setup a floating board walk across or through one of the wetlands (like the Back Bay)

Like most wetlands, marshes are dynamic systems that are important to wildlife and also provide other valuable functions. On average, marshes support at least three times more plants and animals than lakes, upland grasslands, and farmland. Their high rate of productivity allows marshes to support complex food chains and a broad diversity of wildlife. Marshes store and collect nutrients and sediments from surface water run-off, and they reduce flooding by temporarily storing water. They provide an excellent filter for pollution and nutrients – they clean the water that passes through. This helps explain how lagoons work for treating waste water.

All wetlands provide food, water, shelter, and living space to many kinds of wildlife. Mammals such as muskrats, raccoons, mink, and deer feed, rest, and hide in marshes. Herons, shorebirds, waterfowl, red-winged blackbirds, sedge wrens, common yellow throats, and other songbirds also seek shelter, nesting habitats, and food. Marshes with dense cattail stands provide choice winter habitat to ring-necked pheasants. Further, they supply food and cover to leopard and chorus frogs, and snapping turtles.



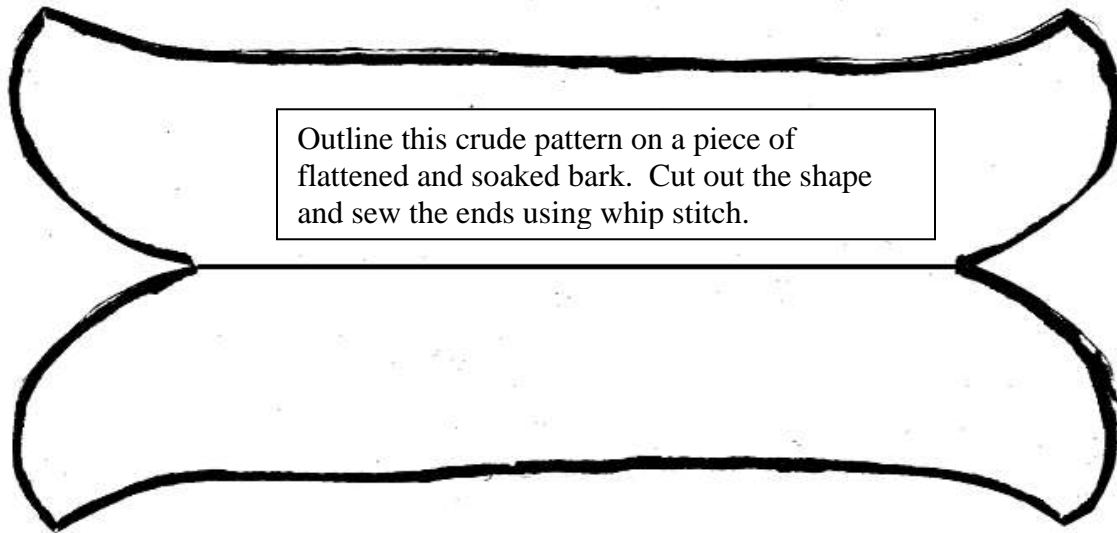
|        |                      |                              |                      |   |
|--------|----------------------|------------------------------|----------------------|---|
| Zone   | Periodically Flooded | Waterlogged or Shallow Water | Emergent Macrophytes | Floating-Leaved and Submersed Aquatics    |
| Plants | Lowland grasses      | Sedges and arrowhead         | Cattails and bulrush | Water lilies, pond weeds, and bladderwort |

## **Little Birch Bark Canoe**

A little birch bark canoe can be made quickly and easily out of bark. Although the best bark is collected from a living tree in the spring (after things start growing) removal of the bark will kill the tree. Since the bark decomposes slowly collecting from downed trees will be sufficient for small projects. The white outer layer of the bark can be removed if it is too thick; the final soaked bark should be flexible and pliable, about the thickness of leather or heavy card stock. The inner 'crumbly' bark if it sticks must also be removed. Soak the bark in water overnight or in warm/hot water for a shorter period to make it pliable, so it does not tear when sewing. Store unused bark gently pressed flat so it does not curl. The darker, orange side, of the bark is put on the outside of most projects.

Sew the ends together using a whip stitch - I use dental floss and a canvas/sail needle. Once you are done add gunwales using fine flexible sticks of soaked wood. Remember the needle holes should be a little distance from the edge so they don't pull through.

Let the canoe dry and then add epoxy or melted pitch to seal the holes. Use match sticks (with ends removed), split popsicle sticks, or carved birch wood for seats and thwarts if necessary.



## **Natural Dye**

Many plants produce natural dyes that can be used to colour cloth material. The colours tend to be pastels and muted but very pleasant. It is possible to get much more vibrant colours but the materials are harder to find and mix so those are not covered here. Dying material takes time, be patient and give yourself a few days to collect plants, prepare material, and actually colour the material. Because making a dye takes a considerable amount of material you must make sure that you are going to use it all and that the collection will not damage the environment or ecology of an area. Make sure that you have permission to collect plant material – some areas have restrictions on collecting plants for cultural or legal reasons.

1. When first preparing to dye material you will need to mordant the material – allowing the dye to be fixed. If more solution is needed adjust the proportions accordingly.

### Mordant Solutions:

- a. Mix/dissolve - 1oz alum, 1/4oz washing soda, with 1 gallon of water
- b. Salt Fixative (for berry dyes) 1/2 cup salt to 8 cups cold water
- c. Plant Fixatives (for plant dyes) 4 parts cold water to 1 part vinegar

Thoroughly wet the cotton before putting it in the mordant bath and squeeze out all the water. Add the cloth to the mordant bath and bring the solution to boil, let it simmer for one hour stirring occasionally. Remove from the heat and allow it to cool naturally, leaving the cotton in the solution overnight. You can either dye the cloth immediately or squeeze out all excess water and store, rolled in a dry towel until needed. Do not rinse before dying.

2. Dying the material.

### Making the Dye:

Collect enough material to create the dye that you want. When collecting never collect more than 50% of the material (berries/leaves/stems) in any area. If there are only a few plants that you want to use go onto another project and leave the plants in their natural state.

Chop plant material into small pieces and place in a pot. Use double the amount of water to plant material. Bring the mixture to a boil and then simmer for about an hour, finally through a sieve or cheese cloth. Now you can add your fabric to be dyed. For a stronger shade, allow material to soak in overnight.

### Dying the Material:

Place wet fabric in dye bath. Simmer together until desired color is obtained. The color of the fabric will be lighter when it is dry. Also note that all dyed fabric should be laundered in cold water and separately.

NOTES: It's best to use an old large pot as your dye vessel. Wear rubber gloves to handle the fabric that has been dyed, the dye can stain your hands. It's also important to note that some plant dyes may be toxic.

Here are some suggestions for colours. Depending on the fix and the various plants used the final colour is not always what you expect – feel free to experiment.

**Dyes and Plants:**

Orange:

Gold lichens

Carrots

Rose hips

Chokecherries

Red onion peels

Cayenne pepper

Brown:

Oak bark

Dandelion root

Juniper berries

Acorns

Pine bark (no Mordant needed)

Black tea (Orange Pekoe)

Coffee

Black (gray):

Iris roots

Oak galls

Green:

Spinach

Grass

Nettles

Red pine needles

Yarrow

Pink:

Strawberries

Raspberries

Roses Petals (with a little mint and some lemon juice to activate the alkaloids pink lemonade)

Peach:

Virginia creeper (all parts)

Purple:

Red Cabbage

Purple grapes

Blueberries

Currant berries

Yellow:

Golden rod flowers

Dandelion flowers

Wood sorrel flowers

Ash leaves

Alder bark

Willow bark

Yellow onion peels

Rumex (Dock) roots

Red:

Dandelion root

Beets

## ***Natural Ink – Write a Letter Home***

Natural inks can be made from almost any coloured plant material (see the dye list above). Generally you will want something that is dark and will show up against a lighter background. To use the ink you will need an old fountain pen, calligraphy pen, or quill pen. Natural inks may be a little thicker than commercial inks so tips should have larger feeds and nibs.

To make coloured ink use one cup of berries or other coloured plant material. Crush the berries through a strainer or in a bowl (mortar and pestle) with a spoon or dowel. Strain the resulting juice through a fine sieve or cloth. Add a teaspoon of vinegar and a teaspoon of salt and stir to dissolve the salt – save in a sealed jar in the refrigerator.

A gray or darker ink can be made from dry charcoal around an old fire and a little gum Arabic. Crush the charcoal to a fine powder in a plastic bag with a rolling pin. Add 5 teaspoons of the crushed charcoal to 2 teaspoons of gum Arabic in a small jar or bowl. Add 4 teaspoons of vinegar and still until completely mixed. This mixture does not need to be refrigerated but should be stored in a small sealed jar.

Dip the quill pen and practice writing and drawing to get a feel – writing with a nib pen or quill takes a little practice.

If you have found a large feather you might be interested in making your own quill. You can find instructions on the internet for doing this at: <http://flick.com/~liralen/quills/quills.html>

## ***Water Colours – Paint by Number***

Remember the colours that you use for inks and dyes don't have to be restricted to dying cloth or writing lover letters. You can also use the same material for doing water colour painting.

Start with the plant material that will give you the colour you think you want and soak it in water at least overnight – stems peels and leaves should be soaked for several days.

Boil the plant in its soaking water until the water becomes the desired color. To test the color, dip a spoon in the water and drag it across a scrap piece of watercolor paper. The longer the plant boils, the more saturated the color becomes. To get several different hues from one plant, collect the paint at different stages of the boiling process.

Once the homemade watercolors are done boiling, the plant parts should be strained out using a colander or cheesecloth and the liquid should be poured into a clean jar or an air-tight food container.

Use watercolor paper so the colours do not bleed – try it out on your home-made paper

Read more at Suite101: All-Natural Watercolor Alternatives:

<http://alinabradford.suite101.com/all-natural-watercolor-alternatives-a217264#ixzz1kgDaLczk>

## **How to Make Paper from Cattails**

By Elizabeth Grace, eHow Contributing Writer

Cattail paper is unique because of its speckled appearance and heavy texture. Like most handmade paper, cattail paper is expensive when purchased at stationary stores, but you can make it at home for pennies on the dollar. It is a great paper for a novice papermaker to attempt to make because there is no bleaching required and all of the supplies are easy to obtain. For best results, use fully mature cattails picked in the late summer. Any earlier and the seeds will be difficult to remove, any later and the seeds may already have been blown away by the wind.

### **Instructions**

#### **Step 1**

Wearing rubber gloves, empty the seeds from all 12 cattails into the pot by running your fingers up and down the furry brown rods at the end of the stalks. You will have a large pile of fluffy white seeds at the bottom of the pot. Discard the remainder of the cattails.

#### **Step 2**

Add six quarts of water and six tablespoons of washing soda to the pot. Washing soda is also known as soda ash or by its chemical name, sodium carbonate, and can be found in the laundry detergent aisle of your local supermarket. Place pot on the burner, bring to a boil, then turn down the heat and simmer for three hours stirring occasionally with a long-handled spoon.

#### **Step 3**

Lay sheer fabric over a sink and carefully pour the boiled cattail on top of the fabric. Pick up the ends of the fabric to form a strainer so that none of the pulp escapes, and run cold water over the seed pulp as many times as needed for the water to run clear.



#### **Step 4**

Spread the cattail pulp across a drying screen until you reach your desired thickness. Allow the pulp to dry completely.

#### **Step 5**

Carefully remove your homemade cattail paper by pulling down diagonally from one corner of the screen to the other. Once the paper is removed, gently iron it on low heat to make it smooth.

### **Tips & Warnings**

- Cattail seed is water-resistant and will not completely submerge in the water until well into the cooking process. For more coarse paper, do not iron.
- Some people break out in hives when handling cattails. Read more: [http://www.ehow.com/how\\_5549619\\_make-paper-cattails.html-ixzz0upvoOxE7](http://www.ehow.com/how_5549619_make-paper-cattails.html-ixzz0upvoOxE7)

### **Things You'll Need:**

- 12 mature cattails
- Rubber gloves
- Large pot
- 6 quarts water
- 6 tablespoons washing soda
- Long-handled spoon
- Burner
- Sheer fabric
- Drying screen
- Iron



## Making Cord

Cord can be made of any plant that has long fibres. The example that I have used here is Stinging Nettles but sedges, some grasses, Indian hemp, etc... all make suitable cord.

Collect a number of older nettle stalks (save the young tops/shoots for eating later). Crush the stalk with your fingers and split them down one side or in half/quarters. Separate the inner pith from the outer fibrous 'bark' by rolling the outer layer back across your fingers. The fibres can further be separated out of the 'bark' by rubbing the material between your palms in water. Allow the bundles to dry at least a bit before making any cord.

If you can't find nettles try using tall sedges and separate the leaves into long strands before twisting.

Divide the fibres into two equal bundles and knot the end. Hold the knot in your left hand and roll (or twist) the bundles separately clockwise between your fingers or along the side of your leg. Let go of the knotted end and the fibres will re-twist together. You may have to 'help' the re-twist a little. I have found holding the knotted end and reverse twisting (counter clockwise) the loose ends of the fibre also works well. Hold the bottom of the newly twisted cord and roll the fibres again, repeat, repeat. Add additional fibre as necessary by rolling new fibre lengths into the cord. Remember to keep the two fibre bundles the same size. It is much easier to have someone else hold the end of the cord but that makes it a two person job - a good bonding type of activity.

An alternative to knotting the starting end is to take a single fibre bundle and twist it until it forms a 'kink'. Fold the bundle back on itself at the kink and that will be the start of the new cord. Continue to twist and add more fibre as above. This method makes a very nice clean end of the cord.

Some resources:

- [Making cordage \(http://www.uwlax.edu/sociology/Archaeology/students/schultz/Cat-Cord.htm\)](http://www.uwlax.edu/sociology/Archaeology/students/schultz/Cat-Cord.htm)

- [More making cordage](http://www.grannysstore.com/Wilderness_Survival/Cordage_Making.htm)

([http://www.grannysstore.com/Wilderness\\_Survival/Cordage\\_Making.htm](http://www.grannysstore.com/Wilderness_Survival/Cordage_Making.htm))

- [Even more cordage \(http://www.primitiveways.com/cordage.html\)](http://www.primitiveways.com/cordage.html)



## *Giant Reed Grass - the Magic Flute*

The traditional or original material used to make flutes was the hollow stem of a large grass species such as cane or bamboo. Grass stems are round, hollow, and filled at the joints (or nodes) which means they can make fine flute or wood wind instruments. There are no grasses the size of bamboo in the area but Giant Reed Grass (*Phragmites*) is just large enough to make a small flute.

These flutes, also called Flautas de Carrizo in Spanish, may have 3, 4 or up to 6 finger holes. The three holed flute is the most common and can produce up to seven tones of a major scale.



Reed grass flutes are believed to play with the message of the wind. Reed grass provides a sense of direction, and teaches that flexibility and adaptability are the keys to survival and longevity. The grass and its music are thought to vibrate in rhythm with the forces of the universe. Reedgrass is tied to both inner strength and inner depth. It conveys the secrets of withstanding life's challenges and imparts the spirit of endurance.

To make a flute you will need to find the largest Giant Reed Grass stem that you can find – you may have to go off the island, but you might be lucky enough to find some in wetland around Back Bay or I have seen some large plants in a few of the bays on the north and east side of the island. Pick several stems that are in good condition with no cracks or breaks and cut it off both above and below two nodes near the ground. You will want to find a piece that is quite long – 10 inches (25cm) long and at least 1/2 inch wide would be optimal but you will be hard pressed to find one any large enough. The flutes that I have made were in the winter with dried stalks, I don't know how they will work with fresh stems.

- Near one node, ~2 inches (5cm), drill or cut a hole about 3/8 inch (1cm) round. This is your mouth piece.
- Further down the stem, starting about 5½ inches (13cm), drill or cut additional holes 1¼ inch (3.2cm) apart for fingering.
- Cut off the stem close to the other node leaving a hollow tube. The end at the mouth whole must be closed off.
- With a fine sand paper smooth the edges of the fingering holes. The mouth piece hole should have clean, not rounded, edges. I have a round file that I use to clean up the inside a bit as well.
- Blow across the mouth piece as you would a flute or pop bottle.



It is possible to make a recorder like instrument as well by cutting a window & ramp and making a beak (mouthpiece). The recorder is much more complicated than a simple flute, but easier to play.

see also: <http://www.primitiveways.com/pt-weed-flute.html>

## *Window to the World – with Wax Paper*

You can create some wonderful window hangings, imitation stained glass, or table settings using wax paper and the colourful plants that you have found.

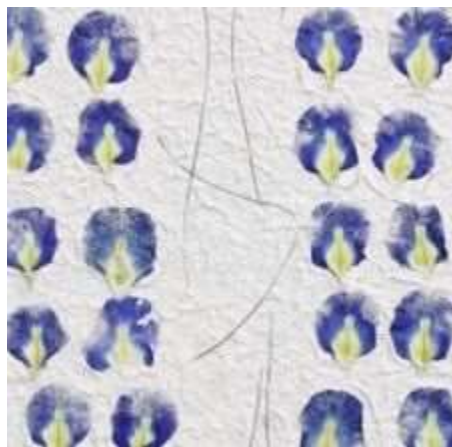
- Cut out some wax paper and arrange the flowers, leaves, etc... on the paper. Make sure the wax side of the paper is facing the material. You might want to press the plant material in newsprint or blotting paper between corrugated cardboard pieces for a couple of days ahead of time to flatten the plants and let them dry.
- Place a second sheet of wax paper (face down) on top of the material, cover with a piece of newsprint or other paper to protect the iron.
- If you have some cheap wax crayons colour on the wax paper or grate some of the crayon over your presented material to add an additional splash of colour. Place a fine piece of tissue paper under your material between the wax paper for some additional colour or texture.
- Iron the paper and plants together with the warm setting on the iron. Trim the edges. Add a border of construction paper for a window hanging.



Instead of using wax paper clear self-adhesive contact paper (MACTac) is a good alternative. This will not work well if you use tissue paper since the adhesive paper will not stick the sides together.

The best flowers for pressing are flowers that are thin. Bulky flowers or those with a thick middle like a daisy do not press well.

Flowers that are bright in color will retain their color the best, white flowers will usually turn brown



## Log a Log

Look around in the forest on MacKinnon Island for trees that have fallen. Can you guess how long the tree has been on the ground? A freshly fallen log offers a habitat for all kinds of wildlife for many years as it decomposes but the plants (fungi, lichens) and animals (insects) change as time goes by. Fallen logs provide a perfect chance to see the changes over time and the fascinating micro community that develops.



modified from: Audubon Society, the Practical Naturalist, Explore the wonders of the natural world, 2010.

## Hikes

### Island Hike

Around the outside of MacKinnon Island a hiking trail has been setup that can be easily followed. It is 4.3km long and generally follows the shoreline. Along the trail you will find representative woodland, water, and rock communities to look at and explore. It will take a good part of the morning or afternoon if you stop to view the plant communities to complete the hike. The description of the following points starts at the Stuga (Gem's Retreat) and continues around to the field/climbing wall.



Key:

|            |                    |
|------------|--------------------|
| O – Oak    | R – Rock           |
| F – Fir    | A – Ash            |
| B – Birch  | C – Cedar,         |
| S – Spruce | M – Mountain Maple |

#### Points of Interest

1. Clearing on the south side of the trail was probably caused by a fallen tree. In 2011 this small open area was surrounded by balsam fir, mountain maple, and some cedar. The area itself was covered with Raspberry plants with a couple of small fir trees starting to grow up.

2. This fallen cedar may form a patch like the last point or it may be shaded by the other surrounding cedar trees. (2011) was when the tree fell clearing an area back into the woods.
3. To the north of the path is a clearing, like the first clearing but it was not caused by a fallen tree. Take a look at the ground, and what do you see? Lots of rocks and boulders – this makes it difficult for trees to become established so the area stays clear (until more soil develops to hold moisture and nutrients). There are similar areas at points 5 and 6. What is different about these new locations? Here there is a rock outcrop near the surface – the earlier point just had a jumble of rocks. Later on in the hike we will see where jumbles of rocks have usually been left.
4. Take a look around. There are a number of open cedar woods around the forest. Notice how shady it is here – can this explain why there is little under and middle story growth in this area? Do you think it would be difficult for other trees (such as fir and ash) to become established?
5. see 3 above
6. see 3 above
7. Much of the MacKinnon Island is covered with this size of fir tree. Notice how the lower branches are all dead. How difficult would it be to walk through the forest? Can you think of why there are so many trees close together? Are there any larger trees around (e.g. poplar, ash) – where could they have gone?
8. Many of the large Aspen trees in this area have been recently cut down by beaver. What do you think the beaver want from the aspen? The fir trees have all been left – why. Have you ever tried to eat a fir?
9. This is a very different area than the last site, even with all of the trees cut. How is it different? There are many more birch trees here and the ground is dryer, with rocks and less soil.
10. This area is interesting with the mixture of ash and birch. Notice the rocks and boulders. There are trees here unlike the boulder hill that we looked at earlier. How is this site different? It may be interesting to note that many of these boulder fields are on the south side of rock outcrops – can you think of any reason that this would be? What happened about 12000 years ago that might have scrapped the rocks in one direction?
11. This opening over the lake looks out at Cache Island over a narrow section of the lake. This provides a protected area were sand and silt can build up next to the shore and more plants can grow in the water. Here you will find sweet flag and cattails in abundance.
12. The forest has changed here to something other than Cedar and Fir - why? Mountain Maple is the predominant under story with few large Birch trees. What has changed?
13. Again here are a few large poplars and birch with a few Cedar. Look around at the ground – there are many stumps of other large trees – some have obviously been cut by beaver but there are others as well (Cedar?). These are much older stumps – where are the tree trunks? What is happening here – are there any nursery trees?
14. This is the half way point around the island. Look at the large cedars around. Just to the west is a very large poplar – what kind of Poplar is this? Why is it still standing here when earlier many had been cut by beaver?
15. Rock outcrop and a climb. Note the steep side facing south with the jumble of rocks. Look behind you and notice the ‘bush’ is all Mountain Maple down toward the lake.

16. Climb to the top of the rock outcrop. This is part of a line of ridges and outcrops that can be followed westward (carefully) through the centre of the island. These rock outcrops have smaller aspen and birch and many rock covering lichens, junipers, grasses (such as poverty oat grass).
17. There are a number of White Pines that can be seen across this outcrop.
18. White Pines are huge trees and they live a very long time. Can you speculate as to why we don't see very many of these long lived trees? Look around near the top of the trees do you see the eagles nest? Down below there is another marsh land with rushes and cattails. The cattails here are mostly of a different kind than those on the other side of the island. The leaves and flowering heads are narrower. Look for yellow and white water lilies growing in the deeper sections of the water.
19. It is easier to see the rushes and cattails here along with sweet flag next to the shore. Nibble on a piece of sweet flag stalk. Look around do you see the pink granite rocks; they are sitting on darker metamorphic gabbro rocks. How did this boulder get here? And where did it come from – most of the bed rock here are all dark in colour. Look about in the marsh here in mid-July and you might see White and Yellow water lilies and a variety of pond weeds as well. Hidden in the cattails further out in the lake are also carnivorous bladderworts.
20. This swampy wetland area is dominated by Ash trees – there are no cedars (until further in) and the ground has lots of sedges, ferns, jewel weed, and irises. Could this be due to more water and nutrients?
21. As you approach this area leaving the ash trees behind what starts to dominate (again). Are there any large trees, how about the middle and under story – what is happening in this area – especially where it appears to be opening up?
22. There are lots of birch here with some ash mixed in – any idea why.
23. There is a large birch stump here – note how the middle of the birch rots out before the bark. You can make tubes with the hollow birch bark that remains.
24. Back into the dense fir with lots of dead branches. There are a few maple and birch around as well.
25. Growing on some birch trees you will see a black circular lesion. This is known as tinder fungus – if you remove the black outside you will find a crumbly, almost red, interior that can be dried and used as tinder. It catches and holds a spark very easily.
26. We are approaching the end of the trail – here we are back into cedar grove that extends from the hill to the south to an ash swamp to the north. Look at many of the cedars – do you see they have a funny twist near the ground and then grow straight upright. This is a very common growth form for cedar – they like growing to the light but sometimes get pushed over due to weight of snow in the winter or other falling trees. If you are walking the trail counter clockwise be sure you walk toward the field and not up the hill on to the rock outcrop. If you go this way you might end up crossing back over the island along Hale's Hike.

### **Hale's (Hell's) Hike**

Running west to east across the north-centre of the island is a series of rock outcrops that can be followed and explored. A number of years ago Hale Cumming cut a trail across the island following these high points – although there are still periodic cairns along the route it is difficult to find now. If developed it would make an interesting alternative to the wetland forest trail

around the edge of the island. The trail starts near the playing field where the trail divides to the fire pit and lagoon. This is the location of the old rifle range, a steel target backing can still be found on the ground near the start of this hike. The trail is not well marked and should only be attempted if you have a compass or GPS to keep you inline; it generally follows the intrusive rock outcrops that run east across the island but there are a number of dips filled with dense fir and cedar stands. Generally the next outcrop can be seen through the trees but there are a couple of locations where the woods are fairly broad and it is easy to get disoriented.

Hale's hike is primarily dominated by smaller aspen and birch with fir and cedar in the moister areas between outcrops and boulder fields. The few white spruce found on the island are mostly found inland along this ridge. Near the east side of the island there are some large drop-offs so hikers will need to be careful to avoid a fall.

### **Central Bog**

Near the middle of the island (15UUQ 50568 97249, N49°36'33.54" W095°04'06.39") you can find a classic bog with a number of peat moss species, Labrador tea, bog cranberry, and bog star flower. Unfortunately there is no set path into the bog but it is fairly accessible south of Hale's hike. I found it accidentally when I walked off of the high rock outcrops. It is a fairly high area on the island - which helps define the area as a bog since it would primarily be fed by rain (not run off). This bog is a little odd in that it has few (if any) black spruce and there are also a few Birch and other broad leaved trees. Around the south and east sides there are Cedar stands, likely the bog drains through these areas. During wet periods small ponds form where turtles have also been seen.

What is a bog? How is it different than a swamp, a marsh, or fen? Does Peat moss have something to do with it?





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Great general site about NW Ontario Boreal Forest

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<http://www.ontariowildflower.com/>

MNR Books and Manuals

[http://www.mnr.gov.on.ca/en/Business/NWSI/2ColumnSubPage/STEL02\\_164602.html](http://www.mnr.gov.on.ca/en/Business/NWSI/2ColumnSubPage/STEL02_164602.html)

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USDA Plant Database <http://plants.usda.gov/java/>

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<http://www.ndsu.edu/pubweb/~esslinge/chcklst/chcklst7.htm>

Northern Ontario Plant Database <http://www.northernontarioflora.ca/>

Rock Key <http://www.rockhounds.com/rockshop/rockkey/index.html>

Ontario Geological Survey Maps [http://www.mndmf.gov.on.ca/mines/ogs\\_earth\\_e.asp](http://www.mndmf.gov.on.ca/mines/ogs_earth_e.asp)

Canadian Poisonous Plants Information System <http://www.cbif.gc.ca/pls/pp/poison>

Three Rocks and their Minerals [http://www.mnh.si.edu/earth/text/3\\_1\\_2\\_1.html](http://www.mnh.si.edu/earth/text/3_1_2_1.html)

65 Years of Canoe Culture at Pioneer Camp

[http://www.manitobapioneercamp.ca/resource/File/MPC\\_Canoe\\_Culture\\_MB\\_Ripple\\_Article.pdf](http://www.manitobapioneercamp.ca/resource/File/MPC_Canoe_Culture_MB_Ripple_Article.pdf)

Outdoor Education, The Outdoor Education Professional's Resource. <http://www.outdoored.com>

# Appendix

## Species

This list of species was developed from various sources including a survey on the island in July 2011. It represents a good cross section of the plants that might be seen in the Manitoba Pioneer Camp area. Not all of these species will be found on MacKinnon Island; some of the species listed are uncommon but were noted in one or more resources, they may not be easily found. Species marked with ‘\*’ were noted on the island during an onsite survey July 22-24, 2011. Many species were missed due to lack of time to collect and identify, the lack of an asterisk does not mean the species did not appear (e.g. there are quite a variety of *Carex* species on the island). Species marked with ‘sp.’ means that one or more species in the group were noted and likely one of those noted in the list under the same genus. The arrangement by ‘type’ of plant is artificial but might make it easier to find various kinds of plants.

## Plants

### Trees (mature trees usually grow taller than 10m)

- \* *Abies balsamea* Balsam fir
- Acer negundo* Manitoba maple
- Arceuthobium pusillum* Eastern Dwarf Mistletoe (included here because it grows in spruce/fir)
- \* *Betula papyrifera* Paper birch
- \* *Fraxinus nigra* Black ash
- \* *Fraxinus pennsylvanica* Green ash
- Larix laricina* (Duroi) K.Koch Tamarack
- Ostrya virginiana* (miller) K. Koch Ironwood
- \* *Picea glauca* White spruce
- \* *Picea mariana* (Miller) BSP Black Spruce
- Pinus banksiana* Jack pine
- Pinus resinosa* Sol. ex Aiton Red Pine
- \* *Pinus strobus* Eastern white pine
- \* *Populus balsamifera* Balsam poplar
- Populus grandidentata* Michaux Largetooth Aspen
- \* *Populus tremuloides* Trembling aspen
- \* *Quercus macrocarpa* Bur oak
- Tilia americana* L. Basswood
- \* *Thuja occidentalis* L. Eastern White Cedar
- Ulmus americana* American elm

### Shrubs (woody stem, usually not over 10m)

- \* *Acer spicatum* Mountain maple
- \* *Alnus incana* ssp. *rugosa* Speckled alder
- Alnus viridis* ssp. *crispa* Green alder
- \* *Amelanchier alnifolia* Saskatoon service-berry
- Amelanchier bartramiana* (Tausch) M.Roemer Oblong-fruited Juneberry
- Amelanchier sanguinea* (Pursh) DC. Red-twigged Serviceberry

*Andromeda polifolia* L. Bog Rosemary  
 \* *Arctostaphylos uva-ursi* (L.) Sprengel Common Bearberry  
*Betula pumila* L. Dwarf Birch  
 \* *Celastrus scandens* L. Climbing Bittersweet  
*Chamaedaphne calyculata* Leatherleaf  
 \* *Cornus rugosa* Lam. Round-leaved Dogwood  
*Cornus sericea* Red-osier dogwood (*Cornus stolonifera* Michaux Red Osier Dogwood)  
 \* *Corylus cornuta* Marshall Beaked Hazelnut  
*Corylus* sp. Hazelnut  
*Diervilla lonicera* Northern bush-honeysuckle  
 \* *Juniperus communis* L. Common Ground Juniper  
 \* *Juniperus horizontalis* Moench Creeping Juniper  
*Kalmia polifolia* Wangenh. Bog Laurel  
 \* *Ledum groenlandicum* Oeder Labrador Tea  
*Lonicera dioica* Mountain honeysuckle  
*Myrica gale* L. Sweet Gale  
*Potentilla arguta* Pursh Tall Cinquefoil  
*Potentilla norvegica* L. Rough Cinquefoil  
*Potentilla pensylvanica* L. Plains Cinquefoil  
*Potentilla recta* L. Sulphur Cinquefoil  
 \* *Potentilla* sp.  
*Prunus nigra* Aiton Canada Plum  
 \* *Prunus pensylvanica* L.f. Pincherry  
*Prunus pumila* L. Sandcherry  
*Prunus pumila* var. *susquehannae* (Hort. ex Willd.) Jaeger Sandcherry  
 \* *Prunus virginiana* L. Chokecherry  
*Prunus* sp.  
*Rhamnus alnifolia* Alderleaf buckthorn  
 \* *Rhus glabra* L. Smooth Sumac  
 \* *Rhus radicans* L. Poison Ivy (*Toxicodendron rydbergii* (Small ex Rydb.) Greene)  
*Ribes americanum* Wild black currant  
*Ribes glandulosum* Grauer Skunk Currant  
*Ribes hudsonianum* Northern black currant  
 \* *Ribes oxycanthoides* L. Bristly Wild Gooseberry  
*Ribes triste* Pall. Swamp Red Currant  
*Ribes* sp.  
 \* *Rosa acicularis* Lindley Prickly Wild Rose  
*Rosa blanda* Aiton Smooth Wild Rose  
 \* *Rubus idaeus* L. Common Raspberry  
*Salix bebbiana* Bebb's willow  
*Salix discolor* Pussy/Diamond willow  
*Salix exigua* Nutt. Sandbar Willow  
*Salix humilis* Marshall Upland Willow  
*Salix pedicellaris* Pursh Bog Willow  
 \* *Salix* sp.  
*Shepherdia canadensis* (L.) Nutt. Soapberry, Buffaloberry

- \* *Spiraea alba* Duroi Narrow-leaved Meadow Sweet
- \* *Symphoricarpos occidentalis* Western snowberry
- \* *Taxus canadensis* Canadian Yew
- Vaccinium angustifolium* Aiton Low Blueberry
- Vaccinium myrtilloides* Michaux Velvet-leaved Blueberry
- \* *Vaccinium oxycoccos* L. Small Cranberry (note *Oxycoccos macrocarpa* Bog Cranberry)
- \* *Vaccinium* sp.
- \* *Viburnum lentago* Nanny-berry
- Viburnum opulus* Highbush cranberry
- \* *Viburnum rafinesquianum* Downy arrow-wood

**Broad leaf herbaceous (Forbs)**

- \* *Achillea millefolium* L. Common Yarrow
- \* *Actaea rubra* (Aiton) Willd. Red Baneberry
- Agastache foeniculum* (Pursh) Kuntze Blue Giant Hyssop
- \* *Allium stellatum* Fraser ex Der Gawler Prairie Onion
- Ambrosia artemisiifolia* L. Common Ragweed
- Amphicarpaea bracteata* (L.) Fern. Hog Peanut
- Anaphalis margaritacea* (L.) Benth. & Hook. f.ex C.B. Pearly Everlasting
- Androsace septentrionalis* L. Northern Androsace
- \* *Anemone canadensis* L. Canada Anemone
- Anemone cylindrica* A. Gray Long-headed Anemone
- Anemone patens* L. Prairie Crocus
- Anemone quinquefolia* Wood anemone
- Anemone virginiana* L. Thimbleweed
- Antennaria neglecta* E. Greene Field Pussytoes
- \* *Antennaria neodioica* Common pussy-toes
- Antennaria parlinii* Fern. Parlin's Pussytoes
- \* *Apocynum androsaemifolium* Spreading dogbane
- \* *Aquilegia canadensis* L. Wild Columbine
- Arabis divaricarpa* Nels. Divaricate Rock Cress
- Arabis hirsuta* (L.) Scop. Hairy Rock Cress
- Arabis holboellii* Hornem. Holboell's Rock Cress
- Arabis lyrata* L. Rock Cress
- \* *Aralia nudicaulis* Wild sarsaparilla
- Aralia hispida* Hispid (hairy) sarsaparilla
- \* *Arctium lappa* common burdock
- Artemisia frigida* Willd. Prairie Sagewort
- Asarum canadense* Canada wild-ginger
- Aster ciliolatus* Lindley Ciliate Wood Aster (note Aster genus is now *Symphyotrichum*)
- Aster ericoides* ssp *ericoides* L. Heath Aster
- Aster ericoides* ssp *pansus* L. Heath Aster
- \* *Aster laevis* L. Smooth Blue Aster
- Aster lanceolatus* Willd. Panicked Western Aster
- Aster macrophyllus* L. Large-leaved Aster
- Aster puniceus* Swamp aster

*Aster sericeus* Vent. Western Silvery Aster  
*Aster umbellatus* var. *pubens* Flat-top white aster  
*Astragalus canadensis* L. Canada Milk Vetch  
*Berteroa incana* Hoary false-alyssum  
\* *Bidens frondosa* Common beggarticks  
\* *Caltha palustris* Marsh marigold  
*Campanula aparinoides* Pursh Marsh Bellflower  
\* *Campanula rotundifolia* L. Harebell  
*Cardamine parviflora* L. Small-flowered Bitter Cress  
*Cardamine pennsylvanica* Pennsylvania bitter-cress  
\* *Cerastium arvense* L. Field Chickweed  
*Cerastium nutans* Raf. Nodding Chickweed  
\* *Chenopodium album* L. Lamb's Quarters  
*Chenopodium pratericola* Rydb. Goosefoot  
*Chenopodium simplex* (Torrey) Raf. Maple-leaved Goosefoot  
*Chimaphila umbellata* (L.) Barton Pipsissewa  
*Cicuta maculata* Spotted water hemlock  
*Circaea alpina* L. Small Enchanter's Nightshade  
\* *Cirsium arvense* Creeping thistle, Canada thistle  
*Cirsium muticum* Michaux Swamp Thistle  
*Cirsium vulgare* (Savi) Ten. Bull Thistle  
*Clinopodium vulgare* L. Wild Basil  
*Clintonia borealis* Bluebead lily, Clinton lily  
*Coeloglossum viride* Long-bract green orchis  
*Collinsia parviflora* Douglas ex Lindley Blue-lips  
*Collomia linearis* Nutt. Glueseed  
*Comandra umbellata* (L.) Nutt. Toadflax  
*Comarum palustre* Marsh cinquefoil  
*Coptis trifolia* Goldthread  
*Corallorhiza maculata* (Raf.) Raf. Spotted Coral Root  
\* *Cornus canadensis* Canadian bunchberry, Dwarf dogwood  
*Corydalis aurea* Willd. Golden Corydalis  
*Corydalis sempervirens* (L.) Pers. Pale Corydalis  
*Crepis tectorum* L. Hawk's Beard  
\* *Chrysanthemum leucanthemum* Ox-eye daisy  
*Cuscuta cephalanthi* Engelm. Buttonbush Dodder  
*Cypripedium parviflorum* Lesser yellow lady's-slipper  
*Diervilla lonicera* Miller Bush Honeysuckle  
*Draba nemorosa* L. Wood Draba  
\* *Dracocephalum parviflorum* Nutt. American Dragonhead  
*Drosera rotundifolia* common sundew or round-leaved sundew  
\* *Epilobium angustifolium* L. Fireweed  
*Epilobium leptophyllum* Raf. Narrow-leaved Willow Herb  
*Erigeron annuus* (L.) Pers. Annual Daisy Fleabane  
*Erigeron asper* Rough fleabane  
\* *Erigeron canadensis*



*Erigeron strigosus* Muhlenb. ex Willd. Rough Daisy Fleabane  
 \* *Erigeron* sp.  
*Erysimum inconspicuum* (S.Watson) MacMillan Lesser Prairie Rocket  
 \* *Eupatorium maculatum* Spotted Joe-Pye weed  
*Euthamia graminifolia* (L.) Nutt. Grass-leaved Goldenrod  
*Euthamia graminifolium* Flat-top fragrant goldentop  
 \* *Fragaria vesca* L. Alpine Strawberry  
*Fragaria virginiana* Miller Wild Strawberry  
*Galeopsis tetrahit* L. Common Hemp Nettle  
*Galium aparine* L. Cleavers  
 \* *Galium boreale* L. Northern Bedstraw  
 \* *Galium triflorum* Sweet-scent bedstraw  
*Gaultheria procumbens* (Checker berry)  
*Geranium bicknellii* Britton Bicknell's Cranesbill  
*Geranium carolinianum* L. Carolina Crane's-bill  
*Geranium robertianum* L. Robert's Geranium  
*Geum aleppicum* Jacq. Common Avens  
*Geum rivale* Purple avens  
 \* *Geum* sp.  
 \* *Halenia deflexa* Spurred gentian  
*Hedeoma hispidum* Pursh Rough Pennyroyal  
*Hedyotis longifolia* (Gaertn.) Hook. Venus'-pride  
*Helianthus pauciflorus* ssp *subrhomboideus* Nutt. Stiff Sunflower  
*Heterotheca villosa* (Pursh) Shinn. Prairie Golden Aster  
 \* *Heuchera richardsonii* R.Br. Alum Root  
*Hieracium canadense* Michaux Canada Hawkweed  
*Hypericum majus* Larger Canadian St. John's-Wort  
 \* *Impatiens capensis* Spotted jewel-weed  
*Iris versicolor* L. Wild Iris  
*Laportea canadensis* (L.) Wedd. Wood Nettle  
 \* *Lappula squarrosa* (Retz.) Dumort. Blueburr, Stickseed  
*Lathyrus japonicus* Willd. Beach Pea  
 \* *Lathyrus ochroleucus* Hook. Pale Vetchling  
*Lathyrus venosus* Muhlenb.ex Willd. Wild Sweet Pea  
*Lechea intermedia* Legg. Pinweed  
*Lilium philadelphicum* L. Wood Lily  
 \* *Linnaea borealis* L. Twinflower  
*Lithospermum canescens* (Michaux) Lehm. Hoary Puccoon, Indian Paint  
*Lonicera canadensis* Bartram Canada Fly Honeysuckle  
*Lonicera dioica* L. Limber Honeysuckle  
 \* *Lycopus asper* Rough bugleweed  
*Lysimachia ciliata* L. Fringed Loosestrife  
*Lysimachia thyrsoflora* L. Tufted Loosestrife  
 \* *Maianthemum canadense* Desf. Wild Lily-of-the-valley  
 \* *Maianthemum racemosum* (L.) Link False Spikenard  
 \* *Maianthemum stellatum* (L.) Link Star-flowered Solomon's Seal

\* *Maianthemum trifolium* (L.) Sloboda Three-leaved Solomon's Seal  
 \* *Melampyrum lineare* Desr. Cow Wheat  
 \* *Mentha arvensis* Wild mint  
 \* *Mertensia paniculata* Tall bluebells, Tall lungwort  
 \* *Mimulus ringens* Square-stem monkeyflower  
*Minuartia dawsonensis* (Britton) House Rock Sandwort  
*Minuartia michauxii* (Fenzl) Farw. Rock Sandwort  
 \* *Mirabilis nyctaginea* (Michx.) MacMill. Wild Four-o'clock  
 \* *Mitella nuda* L. Naked Mitrewort  
*Moehringia lateriflora* (L.) Fenzl Grove Sandwort  
*Monarda fistulosa* L. Wild Bergamot  
*Moneses uniflora* (L.) A.Gray One-flowered Pyrola  
*Myosotis stricta* Link Strict Forget-me-not  
*Myosotis verna* Nutt. Spring Forget-me-not  
 \* *Oenothera biennis* L. Common Evening Primrose  
*Oenothera perennis* L. Small Sundrops  
*Opuntia fragilis* (Nutt.) Haw. Little Prickly Pear Cactus  
*Orthilia secunda* One-side wintergreen  
*Osmorhiza claytonii* Hairy sweet cicely  
 \* *Osmorhiza longistylis* (Torrey) DC. Wild Licorice  
*Parietaria pensylvanica* Muhlenb. ex Willd. Pellitory  
 \* *Parthenocissus inserta* (A. Kerner) Fritsch Virginia Creeper  
*Penstemon gracilis* Nutt. Slender Penstemon  
 \* *Petasites frigidus* var. *palmatus* Arctic sweet coltsfoot  
 \* *Petasites sagittatus* Arrowleaf sweet coltsfoot  
 \* *Plantago major* L. Common Plantain  
*Platanthera obtusata* Small northern bog-orchid  
*Polygonatum biflorum* (Walter) Elliot Smooth Solomon's Seal  
*Polygonatum pubescens* (Willd.) Pursh Hairy Solomon's Seal  
 \* *Polygonum amphibium* L. Water Smartweed  
*Polygonum cilinode* Michaux Fringed Bindweed  
 \* *Polygonum convolvulus* Black bindweed  
*Polygonum douglasii* Greene Douglas's Knotweed  
*Polygonum persicaria* L. Lady's Thumb, Heartsease  
*Polygonum ramosissimum* Michaux Bushy Knotweed  
*Polygonum sagittatum* L. Arrow-Leaved Tear-thumb  
 \* *Polygonum scandens* L. Climbing False Buckwheat  
*Portulaca oleracea* L. Purslane  
*Potentilla norvegica* Norwegian cinquefoil  
*Potentilla palustris*  
*Potentilla tridentata* Sol. ex Aiton Three-toothed Cinquefoil  
 \* *Potentilla* sp.  
*Prenanthes alba* White rattlesnake-root  
*Pyrola asarifolia* Michaux Pink Wintergreen  
 \* *Ranunculus abortivus* L. Kidney-leaved Buttercup  
*Ranunculus flammula* L. Creeping Spearwort

*Ranunculus hispidus* var. *caricetorum* Hispid buttercup  
*Ranunculus longirostris* Godron Curly White Water Crowfoot  
 \* *Ranunculus macounii* Macoun's Buttercup  
*Ranunculus pensylvanicus* L.f. Bristly Buttercup  
*Ranunculus rhomboideus* Goldie Prairie Buttercup  
*Ranunculus trichophyllus* Chaix White Water Crowfoot  
 \* *Ranunculus* sp.  
 \* *Rubus pubescens* Raf. Dwarf Raspberry  
 \* *Rumex crispus*  
*Rumex orbiculatus* A. Gray Great Water Dock  
 \* *Sagittaria rigida* Pursh Stiff Arrowhead  
*Sanicula marilandica* L. Black Snakeroot  
*Sarracenia purpurea* L. Pitcher-plant  
*Saxifraga virginiana* Michaux Early Saxifrage  
*Scutellaria galericulata* L. Common Skullcap  
*Scutellaria leonardii* Michx. Small Skullcap  
*Scutellaria parvula* Michx. Small Skullcap  
 \* *Scutellaria* sp.  
*Sedum aizoon* L. Live-forever  
*Senecio congestus* Marsh ragwort  
*Senecio pauperculus* Michaux Northern Ragwort  
*Silene antirrhina* L. Sleepy Catchfly  
*Sisyrinchium montanum* E. Greene Common Blue-eyed Grass  
 \* *Sium suave* Hemlock water parsnip  
*Smilax lasioneura* Hook. Blue Ridge Carrion Flower  
 \* *Solidago canadensis* Canada goldenrod  
 \* *Solidago graminifolia* Flat topped goldenrod  
*Solidago hispida* var. *hispida* Hairy goldenrod  
*Solidago juncea* Aiton Smooth Goldenrod  
*Solidago nemoralis* Aiton Wood Goldenrod  
 \* *Stachys palustris* L. Woundwort  
*Stellaria borealis* Northern stitchwort  
 \* *Stellaria longifolia* Muhlenb. ex Willd. Long-leaved Stitchwort  
 \* *Streptopus roseus* Michaux Rose Twisted Stalk  
 \* *Symphoricarpos albus* (L.) S. F. Blake Snowberry  
 \* *Taraxacum officinale* G. Weber Common Dandelion  
*Thalictrum dasycarpum* Purple meadowrue  
*Thalictrum dioicum* L. Early Meadowrue  
 \* *Toxicodendron rydbergii* Western poison ivy  
*Trientalis borealis* Raf. Starflower  
 \* *Trifolium hybridum* L. Alsike Clover  
 \* *Trifolium pratense* L. Red Clover  
 \* *Trifolium repens* L. White Clover  
*Trillium cernuum* L. Nodding Trillium  
*Triodanis perfoliata* (L.) Nieuwl. Venus' Looking Glass  
*Triosteum perfoliatum* L. Perfoliate Horse-gentain

\* *Typha latifolia* L. Common Cattail  
 \* *Typha angustifolia* Narrow leaf cattail  
*Typha* sp. Cattail  
 \* *Urtica dioica* ssp. *gracilis* (Ait.) Seland. Stinging Nettle  
*Utricularia macrorhiza* Greater bladderwort  
*Uvularia sessilifolia* L. Merry Bells  
*Verbena hastata* L. Blue Vervain  
*Veronica peregrina* var. *xalapensis* (Kunth) Pennell Purslane Speedwell  
 \* *Viburnum rafinesquianum* Schultes Downy Arrow Wood  
 \* *Vicia americana* Muhlenb. ex Willd. Common Vetch  
*Viola adunca* Smith Sand, Hooked Violet  
*Viola conspersa* Reichb. American Dog Violet  
*Viola labradorica* Labrador violet  
*Viola macloskeyi* Smooth white violet  
*Viola novae-angliae* House New England Violet  
*Viola renifolia* A. Gray Kidney-leaved Violet  
 \* *Vola* sp.

**Grass like (Graminoid)**

\* *Agropyron trachycaulon*  
*Agrostis gigantea* Roth Redtop  
 \* *Agrostis scabra* Willd. Ticklegrass  
*Alopecurus aequalis* Sobol. Short-awned Foxtail  
*Andropogon gerardii* Vitman Big Bluestem  
 \* *Bromus ciliatus* L. Fringed Brome  
 \* *Bromus inermis* Leyss. Awnless Brome  
*Bromus kalmii* A.Gray Wild Chess  
 \* *Calamagrostis canadensis* (Michaux) P.Beauv. Bluejoint Grass  
*Carex adusta* Boott Burnt Sedge  
*Carex aquatilis* Wahlenb. Water Sedge  
*Carex assiniboinensis* Assiniboine sedge  
 \* *Carex atherodes* Sprengel Slough Sedge  
*Carex backii* F.Boott Back's Sedge  
*Carex bebbii* (L. Bailey) Olney ex Fern. Bebb's Sedge  
*Carex bicknellii* var. *bicknellii* Britton Copper-shouldered Oval Sedge  
*Carex brevior* (Dewey) Mackenzie ex Lunell Short-headed Sedge  
*Carex brunnescens* Brownish sedge  
*Carex canescens* Hoary sedge  
*Carex conoidea* Schk. Ex Willd. Prairie Gray Sedge  
*Carex deflexa* Hornem. Depressed Sedge  
*Carex deweyana* Schwein. Dewey's Sedge  
*Carex disperma* Softleaf sedge  
*Carex eburnea* Ebony sedge  
*Carex emoryi* Dewey Riverbank Sedge  
*Carex gracillima* Graceful sedge  
*Carex haydenii* Dewey Hayden's Sedge

*Carex inops* L.H. Bailey Sun Sedge  
*Carex intumescens* Bladder sedge  
*Carex lasiocarpa* Ehrh. Wire Sedge  
*Carex lasiocarpa* var. *americana* Slender sedge  
\* *Carex lenticularis* Michaux Lenticular Sedge  
*Carex merritt-fernaldii* Mackenzie Merritt Fernald's Sedge  
*Carex obtusata* Lilj. Dryland Blunt Sedge  
*Carex peckii* White-tinged sedge  
*Carex pedunculata* Longstalk sedge  
*Carex pellita* Willd. Woolly Sedge  
*Carex pennsylvanica* Pennsylvania sedge  
*Carex projecta* Mackenzie Spreading Sedge  
*Carex pseudo-cyperus* L. Cyperus-like Sedge  
*Carex richardsonii* R. Br. Richardson's Sedge  
*Carex saxatilis* L. Russet Sedge  
*Carex saximontana* (Mack.) Boivin Mountain Sedge  
*Carex scoparia* Schk. ex Willd. Broom Sedge  
*Carex siccata* Dewey Silvery-flowered Hay Sedge  
*Carex sprengelii* Dewey ex. Sprengel Sprengel's Sedge  
*Carex tenera* Dewey Weak Sedge  
*Carex torreyi* Tuckerman Torrey's Sedge  
*Carex trisperma* Dewey Three-fruited Sedge  
*Carex umbellata* Schk. ex Willd. Umbel-like Sedge  
*Carex utriculata* Northwest Territory sedge  
*Carex vulpinoidea* Michaux Fox Sedge  
\* *Carex* sp. I did note many different species but need more time and June return trip.  
*Cinna latifolia* (Trevir. ex Goepfinger) Griseb. in Ledeb. Drooping Woodreed  
*Cinna latifolia* Slender wood reedgrass  
*Cyperus squarrosus* L. Squarrose Umbrella Sedge  
\* *Danthonia spicata* (L.) P.Beauv. ex Roemer & Schultes Poverty Grass  
\* *Deschampsia cespitosa* (L.) P. Beauv. Tufted Hair Grass  
*Eleocharis acicularis* (L.) Roemer & Schultes Needle Spikerush  
*Eleocharis smallii* Britton Marsh Spikerush  
*Elymus canadensis* L. Canada Wild Rye  
*Elymus repens* (L.) Gould Quack Grass  
*Elymus smithii* (Rybd.) Gould Western Wheat Grass  
*Elymus trachycaulus* (Link) Gould in Shinn. Slender Wheat Grass  
*Eriophorum vaginatum* (Fern.) Hulten Dense Cottongrass  
*Festuca saximontana* Rybd. Rocky Mountain Fescue  
\* *Glyceria* sp.  
*Juncus dudleyi* Wieg. Dudley's Rush  
*Juncus interior* Wiegand Inland Rush  
\* *Juncus longistylis* Trail rush  
*Juncus vaseyi* Engelm. Vasey's Rush  
*Koeleria macrantha* (Ledeb.) Schultes June Grass  
*Luzula multiflora* (Retz.) Lej. Many-flowered Wood Rush

*Muhlenbergia mexicana* (L.) Trin. Mexican Muhly  
*Muhlenbergia racemosa* (Michaux.) BSG. Upland Wild Muhly  
*Oryzopsis asperifolia* Michaux Rough-leaved Mountain Rice  
*Oryzopsis pungens* (Torrey ex Sprengel) A.Hitchc. Ricegrass  
*Panicum leibergii* var. *baldwinii* (Vaseyi) Scribner Leiberg's Panic Grass  
*Panicum acuminatum* Sw. Woolly Panic Grass  
*Panicum capillare* L. Witch Grass  
*Panicum depauperatum* Muhlenb. Impoverished Panic Grass  
*Panicum linearifolium* Scribner Narrow-leaved Panic Grass  
*Panicum perlongum* Nash  
*Panicum xanthophysum* A. Gray Yellow Panic Grass  
\* *Phalaris arundinacea* L. Reed Canary Grass  
\* *Phleum pratense* L. Timothy  
\* *Phragmites australis* (Cav.) Trin. ex Steudel Giant Reed  
*Poa compressa* L. Canada Blue Grass  
*Poa interior* Rydb. Inland Blue Grass  
*Poa palustris* L. Fowl Blue Grass  
\* *Poa pratensis* L. Kentucky Blue Grass  
*Schizachne purpurascens* (Torrey) Swallen Purple Melic Grass  
\* *Scirpus acutus* Muhlenb. ex Bigelow Hardstem Bulrush  
*Scirpus cyperinus* Cottongrass bulrush  
*Scirpus fluviatilis* (Torrey) A.Gray River Bulrush  
\* *Scirpus microcarpus* C. Presl Small-fruited Bulrush  
\* *Scirpus validus* L. Softstem Bulrush  
\* *Sparganium* sp.  
*Sphenopholis intermedia* (Rydb.) Rydb. Slender Wedgegrass  
*Stipa spartea* Trin. Needle Grass  
*Zizania aquatic* L. Wild Rice

### **Ferns and Alies**

\* *Athyrium felix-femina* Sub-arctic lady fern  
*Botrychium matricariifolium* (Döll) A. Braun ex Koch Daisy-leaf Grape Fern  
*Botrychium virginianum* Rattlesnake fern  
\* *Cystopteris fragilis* (L.) Bernh. Fragile Fern  
*Dryopteris carthusiana* (Villars) H.P.Fuchs Spinulose Wood Fern  
*Dryopteris cristata* Crested shield-fern  
*Dryopteris fragrans* (L.) Schott Fragrant Cliff Fern  
\* *Dryopteris* sp.  
\* *Equisetum arvense* Field horsetail  
*Equisetum hyemale* Rough horsetail  
*Equisetum pratense* Meadow horsetail  
*Equisetum scirpoides* Dwarf scouring rush  
\* *Equisetum sylvaticum* Woodland horsetail  
*Gymnocarpium dryopteris* (L.) Newman Oak Fern  
\* *Lycopodium annotinum* L. Bristly Clubmoss  
\* *Lycopodium dendroideum* Tree-like clubmoss

*Matteuccia struthiopteris* Ostrich fern  
\* *Polypodium virginianum* L. Rock Polypody  
*Pteridium aquilinum* (L.) Kuhn Bracken  
*Selaginella densa* Rydb. Prairie Spikemoss  
\* *Selaginella rupestris* (Spike moss)  
*Thelypteris palustris* (Salisb.) Schott Marsh Fern  
\* *Woodsia ilvensis* (L.) R.Br. Rusty Woodsia  
*Woodsia oregana* D. Eaton Oregon Woodsia  
*Woodsia scopulina* D. Eaton Rocky Mountain Woodsia

### **Aquatic**

\* *Alisma triviale* Broad water plantain  
\* *Alisma gramaeum* Narrow leaved water plantain  
\* *Ceratophyllum demersum* L. Coontail  
\* *Elodea canadensis* Canada water weed  
*Spirodela polyrhiza* (L.) Schleiden Greater Duckweed  
\* *Lemna minor* Duckweed  
\* *Lemna trisulca* Star duckweed  
*Megalodonta beckii* (syn. *Bidens beckii*).  
*Myriophyllum exalbescens*  
\* *Najas flexilis* Slender najad  
\* *Nuphar variegata* Durand in Clinton Yellow Pond Lily  
\* *Nymphaea odorata* Dryander ex Aiton Fragrant Water Lily  
\* *Potamogeton foliosus* Leafy pondweed  
*Potamogeton gramineus*  
*Potamogeton praelongus*  
\* *Potamogeton natans* Robbin's pondweed  
\* *Potamogeton richardsonii* Richardson's pondweed  
*Potamogeton zosteriformis*  
*Utricularia intermedia* Hayne Flat-leaved Bladderwort  
\* *Utricularia vulgaris* L. Common Bladderwort  
*Zosterella dubia*

### **Liverworts**

*Anastrophylum michauxii* (Web.) Buch ex Evans  
*Aneura pinguis* (L.) Dum  
*Barbilophozia barbata* (Schmid.) Loeske  
*Barbilophozia lycopodioides* (Wallr.) Loeske  
*Barbilophozia hatcheri* (Evans) Loeske  
*Blasia pusilla* L.  
*Blepharostoma trichophyllum* (L.) Dum.  
\* *Calypogeia integristipula*  
*Cephalozia lunulifolia* (Dum.) Dum.  
*Conocephalum conicum* (L.) Lindb Great Scented Liverwort  
*Diplophyllum taxifolium* (Wahlendb.) Dum  
*Frullania eboracensis* Gott.  
*Gymnocolea inflata* (Huds.) Buch

*Jamesoniella autumnalis* (DC.) Steph.  
*Lepidozia reptans* (L.) Dum.  
*Lophocolea minor* Nees  
*Lophozia incise* (Schrad.) Dum.  
*Lophozia rutheana* (Limpr.) M.A. Howe  
*Lophozia ventricosa* (Dicks.) Dum.  
*Marchantia polymorpha* L. Common Liverwort  
*Mylia anomala* (Hook.) S. Gray  
*Pellia epiphylla* (L.) Corda Wide-Nerved Liverwort  
*Plagiochila porelloides* (Torrey ex Nees) Lindenb.  
*Porella platyphylla* (L.) Pfeiff.  
*Ptilidium pulcherrimum* (G. Web.) Hampe  
*Ptilidium ciliare* (L.) Hampe  
*Radula complanata* (L.) Dum  
*Reboulia hemisphaerica* (L.) Raddi  
*Riccia fluitans* L. Floating Crystalwort  
*Ricciocarpos natans* (L.) Corda  
*Scapania irrigua* (Ness) Gott.  
*Scapania paludicola* Loeske & K. Mull  
*Scapania undulate* (L.) Dum.  
*Tritomaria exscitiformis* (Hedw.) Buch

## **Mosses**

*Andreaea rupestris* Hedw.  
*Anomodon attenuatus* (Hedw.) Hub.  
*Anomodon rostratus* (Hedw.) Schimp.  
*Atrichum altercristatum* (Ren. & Card.) Smyth & Smyth  
*Aulacomnium palustre* (Hedw.) Schwaegr.  
*Barbula nguiculata* (Hedw.)  
*Bartramia pomiformis* Hedw. Apple Moss  
*Brachythecium reflexum* (Starke ex Web. & Mohr) B.S.G.  
*Brachythecium rivulare* B.S.G.  
 \* *Brachythecium salebrosum* (Web. & Mohr) B.S.G.  
 \* *Brachythecium* sp. there are several.  
*Brachythecium velutinum* (Hedw.) B.S.G.  
 \* *Bryum* (sp)  
*Bryum argenteum* Hedw.  
*Bryum pseudotriquetrum* (Hedw. Gaertn. Meyer & Scherb.  
*Callicladium haldanum* (Grev.) Crum  
 \* *Calliargon cordifolium* (Hedw.) Kindb.  
*Calliargon giganteum* (Schimp.) Kindb.  
*Calliargon stramineum* (Brid.) Kindb.  
*Campylium chrysophyllum* (Brid.) J. Lange  
*Campylium hispidulum* (Brid.) Mitt.  
*Campylium stellatum* (Hedw.) C. Jens.  
 \* *Ceratodon purpureus* (Hedw.) Brid.  
 \* *Climacium dendroides* (Hedw.) Web. & Mohr. Tree Moss



*Dicranella heteromalla* (Hedw.) Schimp.  
*Dicranella varia* (Hedw.) Schimp  
*Dicranum flagellare* (Hedw.)  
*Dicranum fuscescens* (Turn.)  
*Dicranum ontariense* Peters.  
\* *Dicranum polysetum* Sw.  
*Dicranum scoparium* Hedw. Broom Moss  
\* *Dicranum* sp (Dusky fork moss)  
*Distichium capillaceum* (Hedw.) B.S.G.  
*Ditrichum flexicaule*(Schwaegr.) Hampe  
*Drepanocladus exannulatus* (B.S.G.) Warnst.  
*Drepanocladus fluitans* (Hedw.) Warnst.  
*Drepanocladus uncinatus*(Hedw.) Warnst.  
*Encalypta ciliate* Hedw. Extinguisher Moss  
*Eurhynchium pulchellum* (Hedw.) Jenn.  
*Fontinalis antipyretica* Hedw.  
*Fontinalis dalecarlica* Schimp. ex B.S.G.  
*Fontinalis novae-angliae* Sull.  
*Funaria hygrometrica* Hedw. Cord Moss  
*Hedwigia ciliate* (Hedw.) P. Beauv.  
*Helodum blandowii* (Web. & Mohr) Warnst.  
*Herzogiella turfacea*(Lindb.) Iwats.  
*Hygroamblystegium tenax* (Hedw.) Jenn.  
*Hylocomium splendens* (Hedw.) B.S.G. Stair step moss  
*Hypnum lindbergii* Mitt.  
*Hypnum pallescens*(Hedw.) P. Beauv.  
*Leptobryum pyriforme* (Hedw. Wils.  
*Leptodictyum riparium* (Hedw.) Warnst.  
*Leskea polycarpa* Hedw.  
*Leskeella nervosa* (Brid.) Loeske  
\* *Leucobryum glaucum* (Hedw.) Angstr. Ex Fries Pin Cushion Moss  
*Mnium* (sp)  
*Mnium ambiguum* H. Mull  
*Mnium spinulosum* B.S.G.  
*Mnium stellare* Hedw. – needs to be confirmed.  
*Myurella julacea* (Schwaegr.) B.S.G.  
*Neckera pennata* Hedw.  
*Orthotrichum anomalum* Hew.  
*Orthotrichum obtusifolium* Brid  
*Paraleucobrym longifolium* (Hedw.) Loeske  
*Philonotis fontana*(Hedw.) Brid.  
*Physcomitrium pyriforme* (Hedw. Hampe  
*Plagiomnium ciliare* (C. Mull.) Kop.  
\* *Plagiomnium cuspidatum* (Hedw.) Kop  
\* *Plagiomnium medium* (B.S.G.) Kop.  
*Plagiomnium* sp

*Plagiothecium* (sp)  
*Plagiothecium denticulatum* (Hedw.) B.S.G.  
*Plagiothecium laetum* B.S.G.  
*Platygyrium repens* (Brid.) B.S.G.  
 \* *Pleurozium schreberi* (Brid.) Mitt. Beg Red stem feather moss  
*Pohlia cruda* (Hedw.) Lindb.  
*Pohlia nutans* (Hedw. Lindb.  
*Pohlia wahlenbergii* (Web. & M Mohr) Andr.  
*Polytrichum commun* Hedw. (Common hair cap)  
 \* *Polytrichum juniperinum* Hedw. (Juniper moss)  
*Polytrichum piliferum* Hedw.  
 \* *Polytrichum strictum* Brid.  
*Pseudobryum cinclidioides* (Hub.) Kop.  
 \* *Ptilium crista-castrensis* (Hedw.) De Not. Plume Moss/Knight's Plume  
*Pylaisiadelpha recurvans* (Michx.) Buck  
*Pylaisiella polyantha* (Hedw.) Grout  
*Racomitrium canescens* (Hedw.) Brid.  
*Racomitrium lanuginosum* (Hedw.) Brid.  
*Rhizomnium appalachianum* Kop.  
*Rhizomnium* sp  
 \* *Rhytidiadelphus triquetrus* (Hedw.) Warnst. Electrified Cat's Tail  
*Rhytidium rugosum*(Hedw.) Kindb.  
*Saelania laucscens*(Hedw.) Bomanss. & Broth.  
*Schistidium apocarpum*(Hedw.) B. & S. in B.S.G.  
 \* *Sphagnum capillaceum* (Weiss) Schrank = *Sphagnum capillifolium*  
 \* *Sphagnum girgensohnii* Russ.  
 \* *Sphagnum magellanicum* Brid.  
 \* *Sphagnum* sp (Peat moss) There are more species than listed here!  
*Sphagnum squarrosum* Crome  
*Sphagnum wulfianum* Girg.  
*Taxiptyllum deplanatum*(Bruch & Schimp. ex Scull.) Fleisch.  
*Tetraphis pellucid* Hedw.  
*Thuidium abieinum* (Hedw.) B.S.G.  
 \* *Thuidium delicatulum* (Hedw.) B.S.G.  
*Thuidium recognitum*(Hedw.) indb.  
*Timmia egapolitana* Hedw.  
*Tomenthypnum nitens* (Hedw.) Loeske  
 \* *Tortella fragilis*(Drumm.) Limpr.  
*Tortella tortuosa* (Hedw.) Limpr  
*Tortula ruralis* (Hedw.) Gaertn. Meyer & Scherb.  
*Ulota crispa* (Hedw.) Brid.  
*Weissia controversa* Hedw.

## Lichens

*Ahtiana aurescens* Eastern Candlewax (cedar/pine)  
*Arctoparmelia cenrifuga* Concentric ring lichen  
*Aspicilia cinerea* Cinder Lichen (crustose)

*Baeomyces carneus* Flörke  
*Baeomyces rufus* (Hudson) Rebertus  
*Bryoria capillaries*  
*Bryoria furcellata*  
*Bryoria fuscenscens*  
*Bryoria trichodes* Moose hair lichen  
*Buellia stillingiana* Common button lichen (tree)  
*Caloplaca flavovirescens* Sulphur firedot (yellow crustose)  
*Caloplaca holocarpa* Common tree firedot (tree)  
*Caloplaca saxicola*  
\* *Candelaria concolor* Candleflame lichen  
*Candelariella efflorescens* Powdery goldspeck  
*Candelariella vitellina* Common Goldspeck (yellow crustose)  
*Cetraria arenaria*  
*Cetraria islandica*  
*Cladonia amaurocraea*  
*Cladonia arbuscula* syn: *Cladina arbuscula*  
*Cladonia botrytis*  
*Cladonia cariosa*  
*Cladonia carneola*  
*Cladonia cenotea*  
*Cladonia cervicornis* subsp. *verticillata* syn: *C. verticillata*  
\* *Cladonia chlorophaea*  
*Cladonia coccifera*  
\* *Cladonia coniocraea*  
*Cladonia cornuta*  
*Cladonia crispata*  
*Cladonia cristatella* (British soldiers)  
*Cladonia decorticata*  
*Cladonia deformis*  
*Cladonia digitata*  
\* *Cladonia fimbriata*  
*Cladonia furcata*  
*Cladonia gracilis*  
\* *Cladonia gracilis* subsp *turbinata*  
*Cladonia macilenta*  
*Cladonia macilenta* var. *bacillaris* syn: *C. bacillaris*  
*Cladonia macrophylla*  
\* *Cladonia mitis* syn: *Cladina mitis*  
*Cladonia multififormis*  
*Cladonia parasitica*  
*Cladonia phyllophora*  
\* *Cladonia pleurota*  
*Cladonia pyxidata*  
\* *Cladonia rangiferina* syn: *Cladina rangiferina*  
\* *Cladonia rei*

*Cladonia scabriuscula*  
 \* *Cladonia* sp (Pixie cup lichen/Reindeer lichen)  
*Cladonia squamosa*  
*Cladonia stellaris* syn: *Cladina stellaris*  
 \* *Cladonia* sp. syn: *Cladina* sp. (Reindeer lichen)  
*Cladonia turgida*  
*Cladonia uncialis*  
*Collema faccidum*  
*Collema fuscovirens* syn: *C. tuniforme*  
*Collema nigrescens*  
 \* *Collema subflaccidum* Tree jelly lichen  
*Collema undulatum*  
*Dermatocarpon luridum*  
*Dermatocarpon miniatum*  
*Dimelaena oreina* Golden moonglow lichen  
*Ephebe lanata*  
 \* *Evernia mesomorpha*  
*Flavoparmelia baltimorensis* syn: *Pseudoparmelia baltimorensis*  
 \* *Flavoparmelia caperata* syn: *Pseudoparmelia caperata* Common greenshield (tree)  
*Flavopunctelia flaventior* syn: *Parmelia flaventior*  
*Flavopunctelia soledica* syn: *Parmelia ulophyllodes*  
*Heterodermia hypoleuca*  
*Hyperphyscia syncolla* syn: *Physciopsis syncolla*  
 \* *Hypogymnia physodes* (Hooded lichen)  
*Imshaugia aleurites* syn: *Parmeliopsis aleurites*  
*Lasallia papulosa*  
*Lecanora allophana* Browneyed rim lichen (tree)  
*Lecanora muralis*  
*Lecanora thysanophora* Maple dust lichen  
*Lecidea* sp  
*Lecidella euphorea* syn: *Lecidea euphorea* Bark disk lichen (tree)  
*Lecidella stigmatea* syn: *Lecidella stigmatea*  
 \* *Lepraria lobificans* Fluffy dust lichen (tree some rock)  
*Lepraria neglecta* Zoned dust lichen (granite)  
*Leptogium lichenoides*  
 \* *Lobaria pulmonaria*  
*Melanelia soledica* syn: *Parmelia soledica*  
*Melanelixia subargentifera* syn: *Parmelia subargentifera*  
*Melanelixia subaurifera* syn: *Melanelia subaurifera* Abraded camouflage lichen  
*Melanohalea olivacea* syn: *Melanelia olivacea* Camouflage lichen (birch)  
*Melanohalea septentrionalis* syn: *Parmelia septentrionalis*  
*Nephroma bellum*  
*Nephroma helveticum*  
*Nephroma parile*  
*Parmelia fraudans*  
*Parmelia saxatilis*

*Parmelia squarrosa* Bottlebrush shield lichen  
 \* *Parmelia sulcata* (Wax paper lichen)  
*Parmeliopsis ambigua* Green starburst lichen (tree stump full sun)  
*Parmeliopsis hyperopta*  
*Peltigera apthosa*  
 \* *Peltigera canina*  
*Peltigera didactyla*  
*Peltigera elisabethae*  
*Peltigera evansiana*  
 \* *Peltigera horizontalis*  
*Peltigera leucophlebia*  
*Peltigera malacea*  
*Peltigera neopolydactyla* syn: *P. polydactyla*  
*Peltigera praetextata*\*  
 \* *Peltigera rufescens*  
 \* *Peltigera* sp (Pelt lichens)  
*Peltigera venosa*  
*Phaeophyscia adiastrata*  
*Phaeophyscia ciliata*  
*Phaeophyscia pusilloides*  
*Physcia adscendens*  
*Physcia aipolia*  
*Physcia caesia*  
*Physcia dubia*  
*Physcia phaea*  
*Physcia stellaris*  
*Physconia detersa*  
*Placidium lachneum* syn: *Dermatocarpon lachneum*  
*Psora decipiens*  
*Punctelia bolliana* syn: *Parmelia bolliana*  
 \* *Punctelia rudecta* syn: *Parmelia rudecta*  
*Punctelia subrudecta* syn: *Parmelia subrudecta*  
*Ramalina americana*  
 \* *Ramalina dilacerata*  
*Ramalina intermedia*  
*Rhizocarpon disporum*  
*Rhizocarpon geographicum* Yellow Map lichen  
*Rhizocarpon* sp (Map lichen)  
*Rhizoplaca chrysoleuca* Orange rock posy  
 \* *Stereocaulon paschale* (Foam lichen)  
*Stereocaulon saxatile*  
*Stereocaulon tomentosum*  
 \* *Stereocaulon* sp.(un-identified like *S. condensatum*)  
*Teloschistes exilis*  
*Tuckermanopsis americana*  
*Tuckermannopsis ciliaris* syn: *Cetraria ciliaris*

*Tunkermannopsis orbata*  
*Tuckermannopsis sepincola* syn: *Cetraria sepincola*  
*Umbilicaria* (Rock tripe)  
*Umbilicaria americana*  
*Umbilicaria hirsute*  
*Umbilicaria hyperborea*  
*Umbilicaria mammulata*  
*Umbilicaria muhlenbergii*  
*Umbilicaria vellea*  
 \* *Usnea cavernosa*  
*Usnea ceratina*  
*Usnea fulvovireagens*  
*Usnea hirta*  
 \* *Usnea lapponica*  
*Usnea longissima*  
*Usnea* sp (Old man's beard)  
*Usnea subfloridana* Boreal beard lichen  
*Vulpicida pinastris* syn: *Cetraria pinastris* Powdered sunshine (wolfbane)  
*Xanthomendoza fallax* syn: *Xanthoria falax*  
 \* *Xanthoparmelia cumberlandia*  
*Xanthoparmelia stenophylla* syn: *Xanthoparmelia somloensis*  
*Xanthoria candelaria*  
*Xanthoria elegans*  
*Xanthoria polycarpa*  
*Xanthoria soorediata*  
 \* *Xanthoria* sp (Orange lichen)

## **Mushrooms**

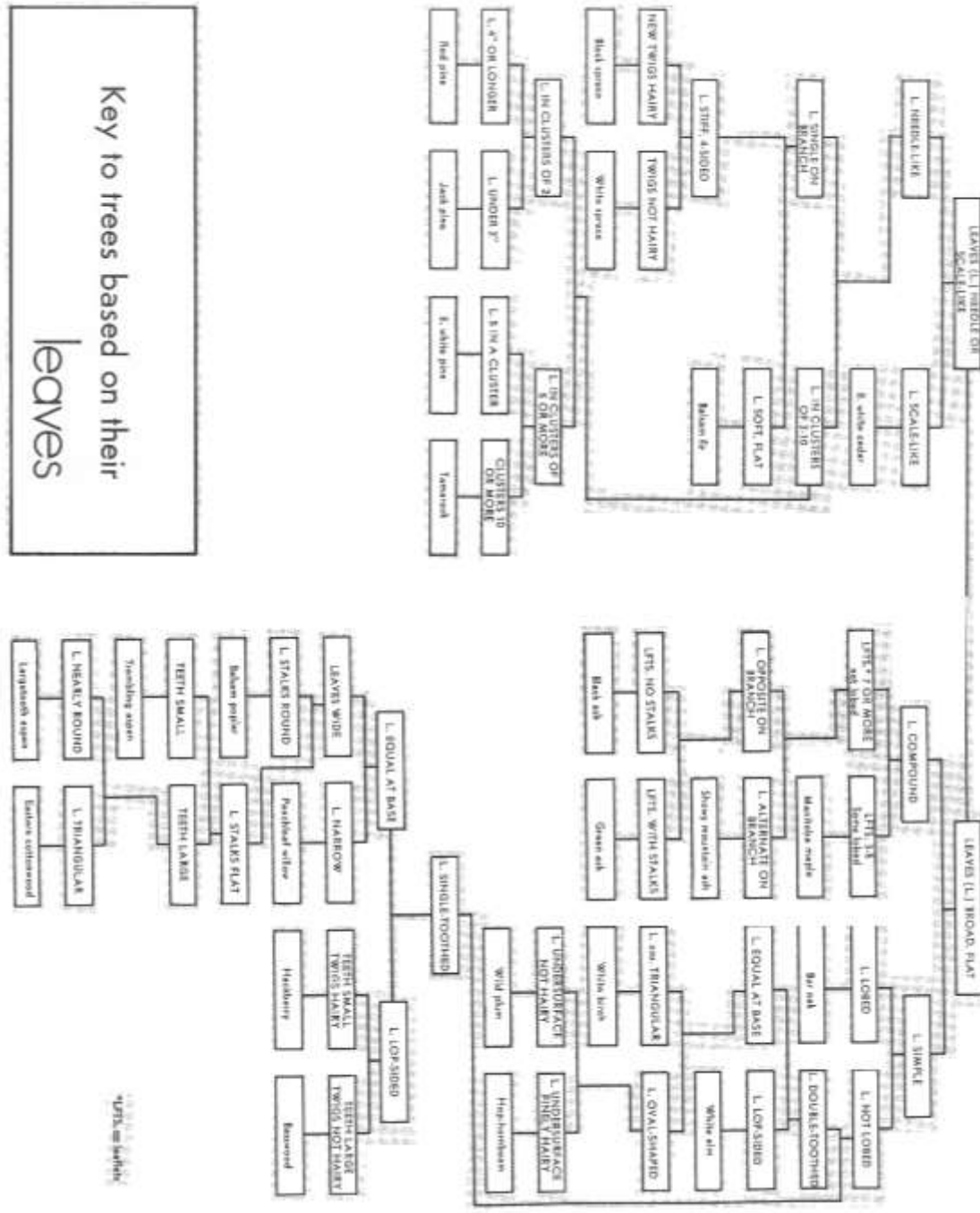
*Aleuria aurantia* Orange Peel  
*Amanita muscaria* var. *Formosa* Fly Amanita (Alice)  
*Apiosporina morbosa* Black knot  
*Bisporella citrina* Lemon Drops  
*Boletus* sp (Edible Boletus)  
*Brefeldia maxima* Tapioca slime  
*Cantharellus cibarius* Chanterelle  
*Chlorociboria aeruginascens* Blue Stain (does not glow)  
*Clavaria zollingeri* Violet coral  
*Clavariadelphus ligula* Strap-shaped Coral  
*Clavicornia pyxidata* Crown-tipped Coral  
*Clavulinopsis laeticolor* Golden Fairy Club  
*Clitocybe gibba* (Funnel Cap)  
*Fomes fomentarius* Tinder Polypore/Hoof fungus  
*Gyromitra* sp (False Morel)  
*Hericium americanum* Bear's Head Tooth  
*Hericium coralloides* (Comb tooth/Bear's Head Tooth)  
*Hydnellum caeruleum*  
*Hydnellum pineticola*

\* *Hygrocybe cantharellus* Orange (chanterelle) waxcop  
*Hygrophoropsis aurantiaca* False Chanterelle  
*Hygrophorus psittacina* Parrot waxy cap  
*Lactarius* (sp)  
*Lactarius deliciosus* Saffron Milk Cap  
*Lactarius piperatus* Pepper milk cap  
*Lycoperdon perlatum* Gem studded puffball  
*Morchella elata* Black Morel  
*Omphalotus olearius* Jack O'Lantern  
*Piptoporus betulinus* Birch Polypore  
*Pluteus cervinus* Deer Mushroom  
*Ramaria Formosa* Yellow-tipped Coral  
*Russula* (sp)  
*Russula brevipes* Short stalked white Russula  
*Russula claroflava* Yellow Swamp Russula  
*Russula emetica* Emetic Russula  
\* *Russula paludosa* Red Russula  
*Suillus americanus* Slippery Jack (White Pine Bolete)  
*Suillus* sp  
*Thelephora terrestris* (Earth fan)  
*Trametes versicolor* Turkey Tail  
*Trichaptum biforme* Violet tooth  
*Xylaria polymorpha* Dead Man's Fingers

## Simple Keys

A key is used to help identify a specific plant or group of plants using simple ‘dichotomous’ questions. Only a few very simple keys have been included here since longer keys are often many pages and contain a lot of technical terminology.

### Trees (by leaf characters)



Oswald, Edward T., Frank H. Nokes. Field Guide to the Native Trees of Manitoba. Manitoba Natural Resources. 1998.



## Grasses & Sedges (and Friends)

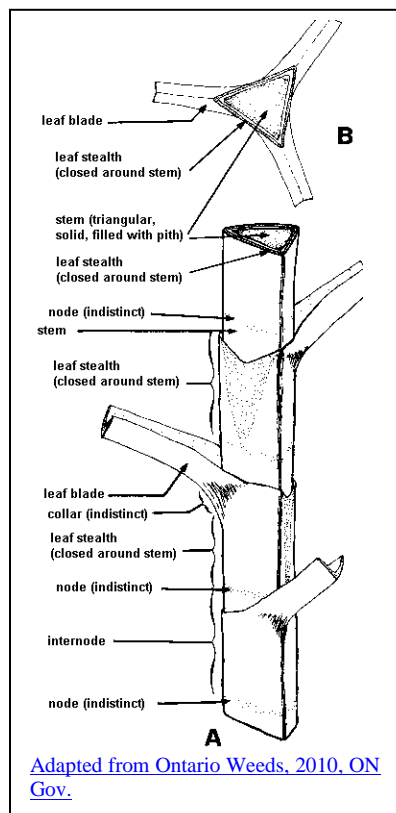
More than any other group of flowering plants I find that people get quickly confused trying to distinguish Grasses, Sedges and Rushes. Using the rhyme '*Sedges have edges; rushes are round; grasses are hollow; what have you found?*' helps sort out most of the differences but there can still be some confusion.

There are a small number of other families with only one or two representative species that can also be confused; it is helpful to be able to recognize these three additional groups: Typha ([Typhaceae - cattail](#)), Sparganium ([Sparganiaceae - bur-reed](#)), Sweet Flag ([Acoraceae - sweet flag](#)). These are aquatic plants with a compact flowering head at the end of a stem (like a corn-dog in Typha, and a mace in Sparganium), or off to one side in Acorus. Typha and Sparganium have two ranked leaves from the base.

All of these groups broadly resemble grasses having long, narrow, parallel-veined leaves and inconspicuous flowers. Looking at the stem structure will generally allow you to separate out each of the groups.

### 1. Poaceae (Grasses)

Stem almost all hollow, round or sometimes flattened, with joints. Joints or nodes are solid and typically swollen. Single seed in each flowering scale. Margins (edges) of the leaf sheath are open, but may overlap. Usually a ligule (membrane or tuft) where the leaf meets the stem.



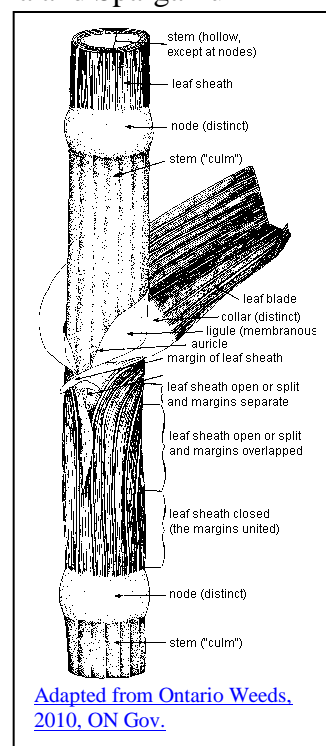
meets the stem.

### 2. Cyperaceae (Sedges)

Stem solid and mostly triangular but some round or square, no joints. Pith of stem may be loose and appear hollow if not carefully cut. Single seed in each flowering scale. Leaf sheath is closed or fused. Often a ligule (membrane or tuft) where the leaf meets the stem in a U or V shape. Leaf often has a W shape or is apparently lacking (e.g. Eleocharis or Schoenoplectus). Genera included: Carex, Eleocharis, Schoenoplectus, Scirpus, Eriophorum, Cyperus

### 3. Juncaceae (Rushes)

Stem solid and mostly round. Several seeds in each pouch. Regular flower made up of 3 outer and 3 inner scales and 1 pouch. No ligule. Margin of leaf sheath is closed. Generally leaf is inrolled. Genera included: Juncus, Luzula.

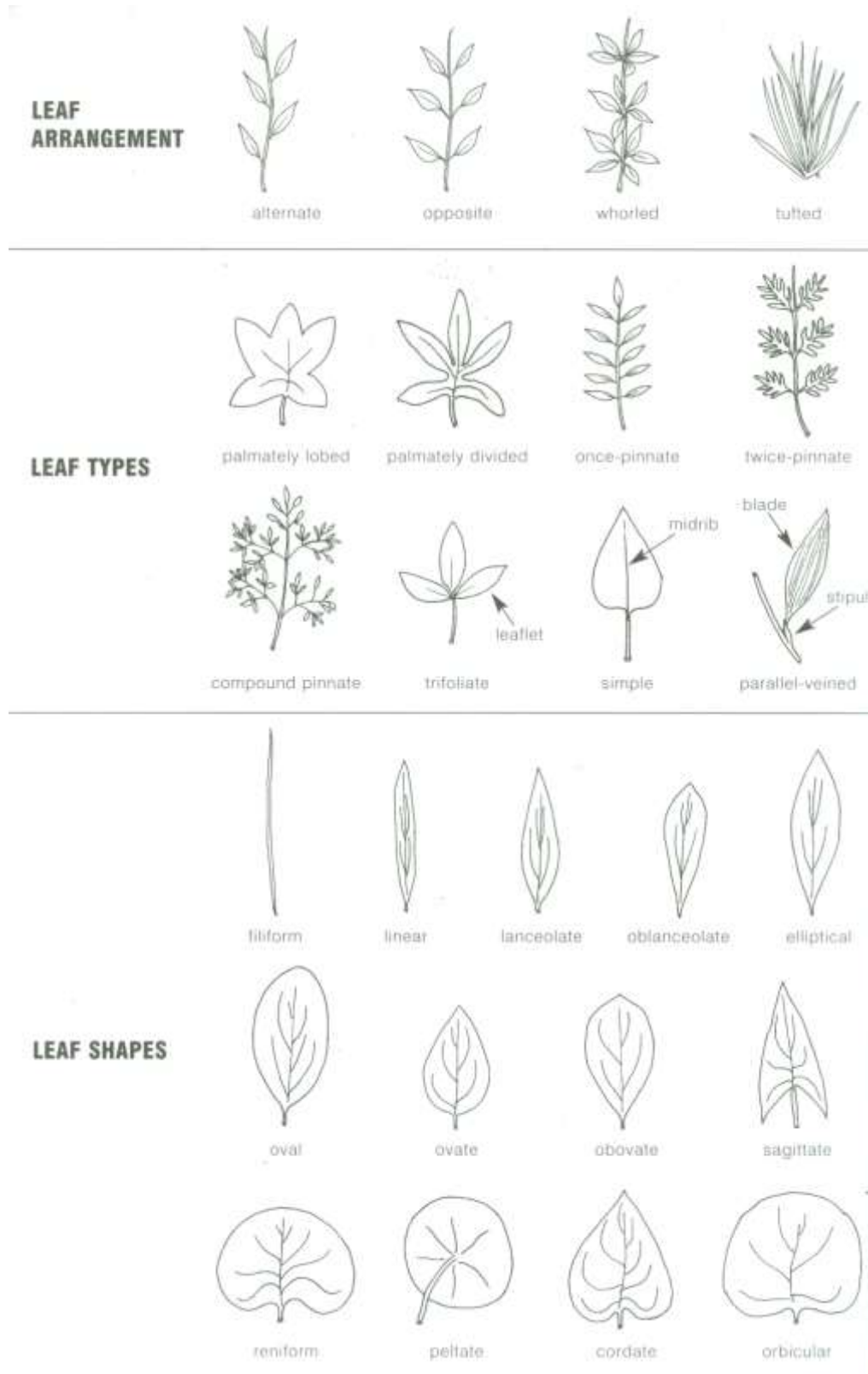


The following characters distinguish grasses from sedges and rushes:

| Character        | Gramineae—grasses<br>(p. 73)  | Cyperaceae—sedges<br>(p. 181)                       | Juncaceae—rushes<br>(p. 246)                 |
|------------------|---|---|--|
| Culm             | Usually hollow;<br>cylindrical or flattened                                       | Filled with pith, rarely<br>hollow; usually 3-sided | Filled with sponge-like<br>pith, cylindrical |
| Nodes            | Conspicuous   | Indistinct  | Indistinct                                   |
| Leaf arrangement | Two-ranked  | Three-ranked  | Principal leaves basal or<br>nearly so       |
| Leaf blade       | Usually flat, often folded,<br>involute or bristle-like;<br>glabrous or pubescent | Flat, plicate, or bristle-like;<br>rarely pubescent | Channeled or round;<br>usually glabrous      |
| Leaf margins     | Smooth, scabrous, or ciliate  | Usually scabrous                                    | Smooth                                       |

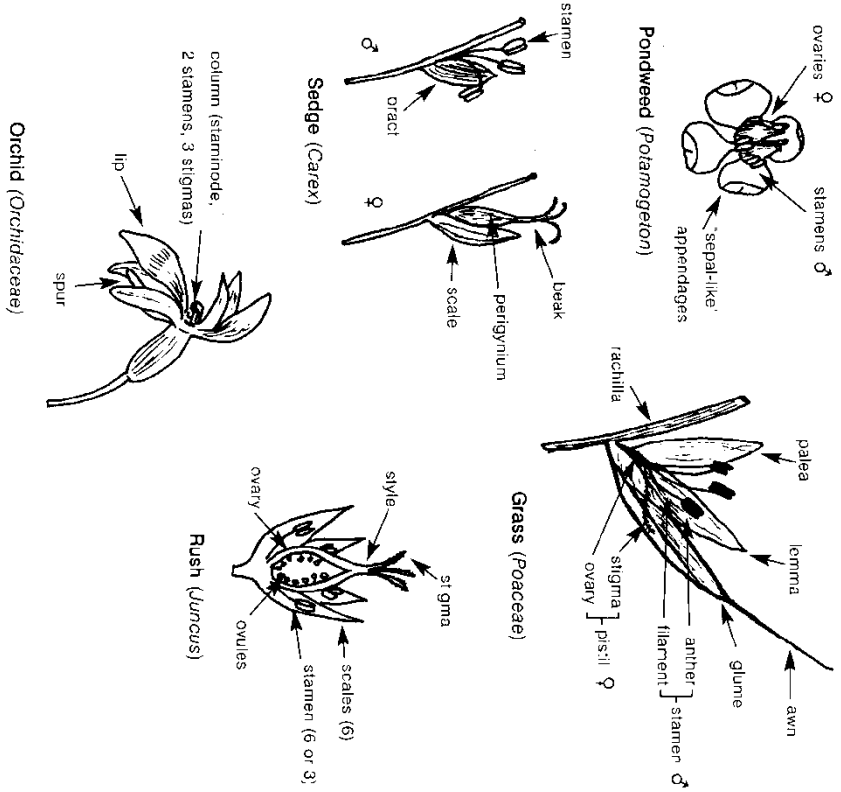
(Adapted from: *Budd's Flora of the Canadian Prairie Provinces*, Looman and Best, 1979)

# Leaf and Flower types

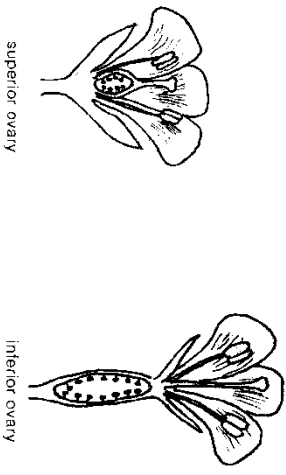


from: *Water and Wetland Plants of the Prairie Provinces*, Lahrng, Heinjo, 2003

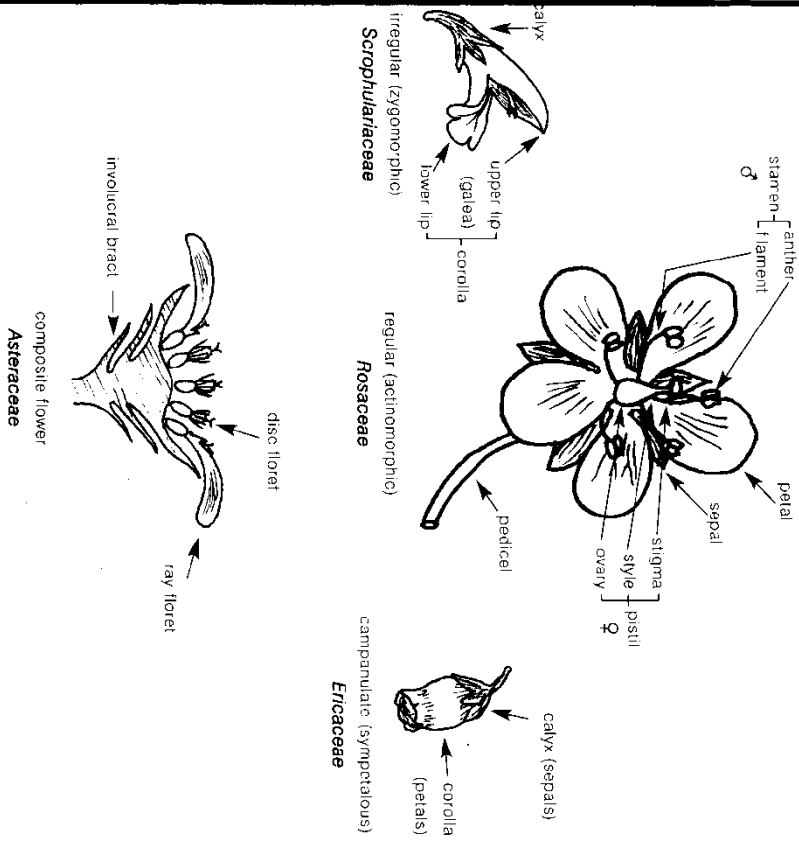
**FLOWERS (Monocots)**



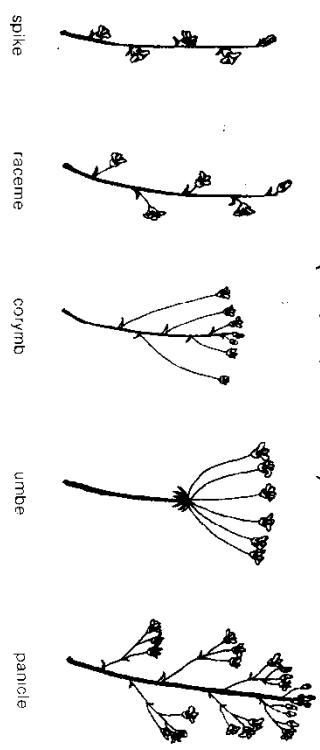
**OVARY LOCATION**



**FLOWERS (Dicots)**



**FLOWER ARRANGEMENT (INFLORESCENCE TYPES)**



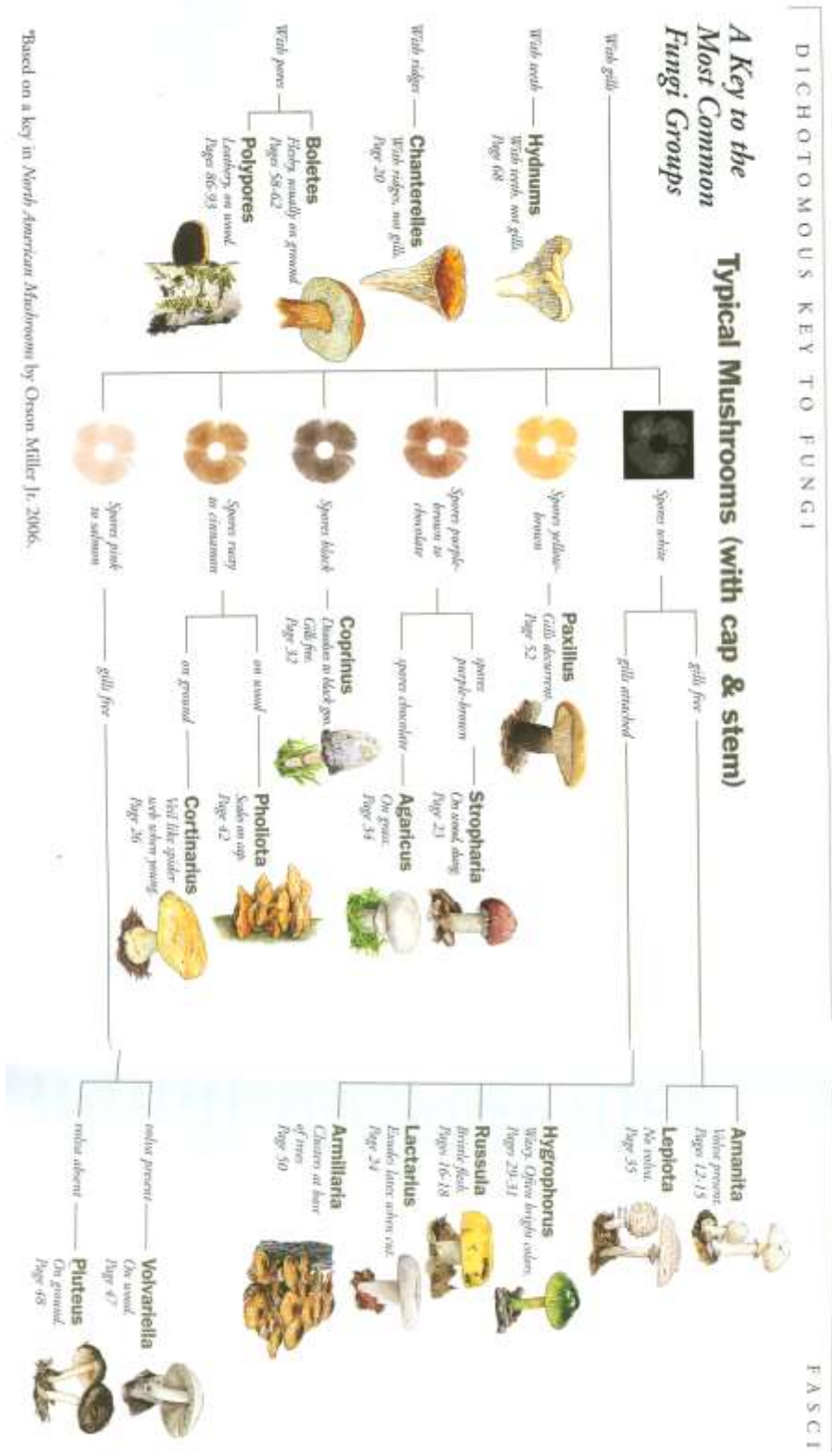
from: *Water and Wetland Plants of the Prairie Provinces*, Lahring, Heinjo, 2003

# Wildflower Bloom Phenology

| page | May                         |   |   |   | June |   |   |   | July |   |   |   | Aug. |   |   |   | Sept. |   |   |   | Oct. |   |   |   |
|------|-----------------------------|---|---|---|------|---|---|---|------|---|---|---|------|---|---|---|-------|---|---|---|------|---|---|---|
|      | 1                           | 2 | 3 | 4 | 1    | 2 | 3 | 4 | 1    | 2 | 3 | 4 | 1    | 2 | 3 | 4 | 1     | 2 | 3 | 4 | 1    | 2 | 3 | 4 |
| 48   | Sweet Gale                  |   |   |   |      |   |   |   |      |   |   |   |      |   |   |   |       |   |   |   |      |   |   |   |
| 107  | Wild Strawberry             |   |   |   |      |   |   |   |      |   |   |   |      |   |   |   |       |   |   |   |      |   |   |   |
| 57   | Leatherleaf                 |   |   |   |      |   |   |   |      |   |   |   |      |   |   |   |       |   |   |   |      |   |   |   |
| 59   | Bearberry                   |   |   |   |      |   |   |   |      |   |   |   |      |   |   |   |       |   |   |   |      |   |   |   |
| 80   | Marsh Marigold              |   |   |   |      |   |   |   |      |   |   |   |      |   |   |   |       |   |   |   |      |   |   |   |
| 61   | Lowbush Blueberry           |   |   |   |      |   |   |   |      |   |   |   |      |   |   |   |       |   |   |   |      |   |   |   |
| 94   | Creeping Snowberry          |   |   |   |      |   |   |   |      |   |   |   |      |   |   |   |       |   |   |   |      |   |   |   |
| 123  | Wild Sarsaparilla           |   |   |   |      |   |   |   |      |   |   |   |      |   |   |   |       |   |   |   |      |   |   |   |
| 106  | Starflower                  |   |   |   |      |   |   |   |      |   |   |   |      |   |   |   |       |   |   |   |      |   |   |   |
| 82   | Red Baneberry               |   |   |   |      |   |   |   |      |   |   |   |      |   |   |   |       |   |   |   |      |   |   |   |
| 140  | False Lily-of-the-Valley    |   |   |   |      |   |   |   |      |   |   |   |      |   |   |   |       |   |   |   |      |   |   |   |
| 144  | Pink Ladyslipper            |   |   |   |      |   |   |   |      |   |   |   |      |   |   |   |       |   |   |   |      |   |   |   |
| 84   | Wild Columbine              |   |   |   |      |   |   |   |      |   |   |   |      |   |   |   |       |   |   |   |      |   |   |   |
| 118  | Bunchberry                  |   |   |   |      |   |   |   |      |   |   |   |      |   |   |   |       |   |   |   |      |   |   |   |
| 136  | Clintonia                   |   |   |   |      |   |   |   |      |   |   |   |      |   |   |   |       |   |   |   |      |   |   |   |
| 54   | Labrador-Tea                |   |   |   |      |   |   |   |      |   |   |   |      |   |   |   |       |   |   |   |      |   |   |   |
| 64   | Prickly Wild Rose           |   |   |   |      |   |   |   |      |   |   |   |      |   |   |   |       |   |   |   |      |   |   |   |
| 127  | Twinflower                  |   |   |   |      |   |   |   |      |   |   |   |      |   |   |   |       |   |   |   |      |   |   |   |
| 109  | Wild Raspberry              |   |   |   |      |   |   |   |      |   |   |   |      |   |   |   |       |   |   |   |      |   |   |   |
| 138  | Rose Twisted Stalk          |   |   |   |      |   |   |   |      |   |   |   |      |   |   |   |       |   |   |   |      |   |   |   |
| 74   | Bullhead Water-Lily         |   |   |   |      |   |   |   |      |   |   |   |      |   |   |   |       |   |   |   |      |   |   |   |
| 100  | The pyrolas                 |   |   |   |      |   |   |   |      |   |   |   |      |   |   |   |       |   |   |   |      |   |   |   |
| 77   | Fragrant White Water-Lily   |   |   |   |      |   |   |   |      |   |   |   |      |   |   |   |       |   |   |   |      |   |   |   |
| 147  | Spotted Coralroot           |   |   |   |      |   |   |   |      |   |   |   |      |   |   |   |       |   |   |   |      |   |   |   |
| 142  | Wild Iris                   |   |   |   |      |   |   |   |      |   |   |   |      |   |   |   |       |   |   |   |      |   |   |   |
| 86   | Pitcher-Plant               |   |   |   |      |   |   |   |      |   |   |   |      |   |   |   |       |   |   |   |      |   |   |   |
| 111  | Thimbleberry                |   |   |   |      |   |   |   |      |   |   |   |      |   |   |   |       |   |   |   |      |   |   |   |
| 95   | Small-fruited Bog Cranberry |   |   |   |      |   |   |   |      |   |   |   |      |   |   |   |       |   |   |   |      |   |   |   |
| 102  | One-flowered Wintergreen    |   |   |   |      |   |   |   |      |   |   |   |      |   |   |   |       |   |   |   |      |   |   |   |
| 115  | Common Evening-Primrose     |   |   |   |      |   |   |   |      |   |   |   |      |   |   |   |       |   |   |   |      |   |   |   |
| 100  | One-sided Pyrola            |   |   |   |      |   |   |   |      |   |   |   |      |   |   |   |       |   |   |   |      |   |   |   |
| 125  | Harebell                    |   |   |   |      |   |   |   |      |   |   |   |      |   |   |   |       |   |   |   |      |   |   |   |
| 113  | Fireweed                    |   |   |   |      |   |   |   |      |   |   |   |      |   |   |   |       |   |   |   |      |   |   |   |
| 98   | Pipsissewa                  |   |   |   |      |   |   |   |      |   |   |   |      |   |   |   |       |   |   |   |      |   |   |   |
| 134  | Broad-leaved Arrowhead      |   |   |   |      |   |   |   |      |   |   |   |      |   |   |   |       |   |   |   |      |   |   |   |
| 104  | Indian-Pipe                 |   |   |   |      |   |   |   |      |   |   |   |      |   |   |   |       |   |   |   |      |   |   |   |
| 132  | Spotted Joe-Pye Weed        |   |   |   |      |   |   |   |      |   |   |   |      |   |   |   |       |   |   |   |      |   |   |   |
| 89   | Round-leaved Sundew         |   |   |   |      |   |   |   |      |   |   |   |      |   |   |   |       |   |   |   |      |   |   |   |
| 130  | Large-leaved Aster          |   |   |   |      |   |   |   |      |   |   |   |      |   |   |   |       |   |   |   |      |   |   |   |
| 92   | Wintergreen                 |   |   |   |      |   |   |   |      |   |   |   |      |   |   |   |       |   |   |   |      |   |   |   |

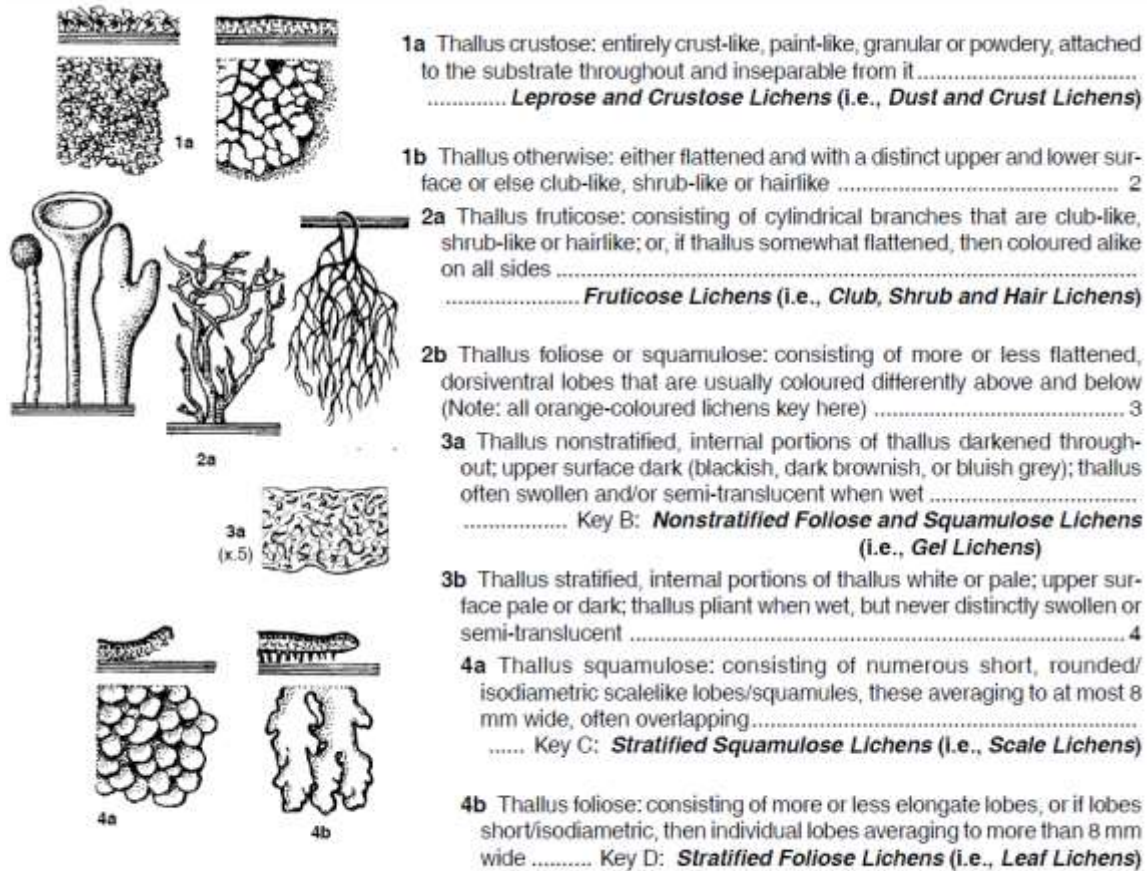
Adapted from: *Canoe Country Flora* by Mark Stensaas

# Mushrooms



Mollen, Cora, Larry Weber. *Fascinating Fungi of the North Woods*. Kollath+Stensaas Publishing. 2007

## Lichen Growth Forms



Adapted from: *The Lichens of British Columbia Illustrated Keys* T. Goward, B. McCune, and D.V. Meidinger. 1994  
<http://www.for.gov.bc.ca/hfd/pubs/docs/srs/srs08.htm>

## Rock Key

The key to the rocks below is a very simplistic key to the most common kinds of rocks found in the Shoal Lake area. It is not complete and likely it will not help you find gold and silver but at least you can identify the 'family' of rocks. Along with the rocks listed below there are also: Conglomerates (many different rock types) and Aggregates (one rock type but all mixed up), and Mafic rocks, including pillowed flows. Mafic rocks are often iron-rich dark green rocks that were erupted as molten lava from an underwater volcano during relatively a relatively peaceful eruption – they may be interpreted as Gabbro. Although I have provide some information on minerals I have not provided a key since that is really outside of a resource on Plants.

Just a little background on Rocks and Minerals: A mineral is a naturally occurring solid with a definite chemical composition and a specific crystalline structure. A rock is an aggregate of one or more minerals (a rock may also include organic remains and mineraloids). Some rocks are predominantly composed of just one mineral.

Commercially valuable minerals and rocks are referred to as industrial minerals. Rocks from which minerals are mined for economic purposes are referred to as ores (the rocks and minerals that remain, after the desired mineral has been separated from the ore, are referred to as tailings).

### Simple Rock Key

1. Is the rock made of crystal grains? (Does it have a lot of flat, shiny faces - maybe tiny to small - that reflect light like little mirrors? You may need to use a magnifier.)
  - The rock is made of crystal grains with flat shiny surfaces. . . Go to 2
  - There are no (or not many) shiny, flat, crystal grains. The rock is layered. . . Go to Sandstone (and other sedimentary rock).
2. Does the rock have both layers and crystal grains? (Look carefully for layers, especially along the edges of the rock. You may need a magnifier.)
  - The rock has both layers and crystals. Layers look like ribbons or bands of minerals running through it, and it is kind of blocky. . . It is Gneiss
  - The rock has crystals, but it has no layers. . . Go to 3
3. Is the entire rock mostly light coloured, compared to other rocks? (Look at the whole rock, not just mineral grains in the rock.)
  - The rock is mostly light coloured or light gray minerals grains. The rock is mostly crystal grains. It is medium or coarse grained, has no layers, and is light coloured. It is Granite (felsic)
  - The rock is mostly dark coloured minerals & coarse grain . . . It is Gabbro (Mafic)

### GNEISS (nice)

What Type of Rock Is It?: Metamorphic

What Does It Look Like?: Gneiss is usually light in color, but it can be quite dark. It looks like it has ribbons or stripes of minerals running through the rock. The grain size is usually fairly coarse. Gneiss usually breaks into blocky pieces, not along the layers. Unlike granite, in which the crystals are randomly arranged, the crystals in gneiss are lined up and in layers. Gneiss is a tough and hard rock. Most of the Canadian Shield is likely a Granite Gneiss.

What Minerals Make Up the Rock?: Almost always: feldspars, quartz, and mica. Sometimes: kyanite, garnet, hornblende, tourmaline, magnetite, and many others.



**How Was It Formed?:** Gneiss is formed from another metamorphic rock, called schist. The schist formed from fine grained sedimentary rock (often a shale). Gneiss can be formed also from some igneous rocks, especially granite. It is usually formed under great pressure from moving plates of the earth's crust.

**Compare To:** schist granite



## **GRANITE (gran'-it)**

**What Type of Rock Is It?** Igneous

**What Minerals Make Up the Rock?** quartz, feldspars (microcline, orthoclase, albite), biotite, muscovite; Sometimes contain: hornblende, augite, magnetite, and zircon. Granite contains 60% feldspar, 20% quartz, and 10% micas.

**What Does It Look Like?** The feldspars give granite most of its color, which may be white to light gray, yellowish, or pink. The quartz is usually smoky gray or white. Black specks of biotite, or sometimes hornblende, are common. So is silvery to brownish muscovite. Granite is coarse grained to very coarse grained. The crystals are randomly arranged (unlike gneiss where they are in lines or layers).

**How Was It Formed?** Granite forms deep in the earth's crust from cooling magma. The magma contains a lot of silica (quartz). Slow cooling produces the large crystals in granite.

**Compare To:** Gneiss (nice) showing predominant layers or bands. Diorite is darker (but not as dark as Gabbro) and finer grains.

**Note:** Felsic Volcanic or Rhyolite is an equivalent volcanic (comes to the surface) rock.



### **GABBRO (gab'-row)**

What Type of Rock Is It? Igneous

What Does It Look Like? Gabbro is dark green to black. When exposed to the weather its surface often turns brown. It has a large grain size (most of the rock is grains larger than rice).

What Minerals Make Up the Rock? plagioclase feldspars, augite, olivene; Sometimes contains: magnetite.

How Was It Formed? Gabbro forms from a magma that is rich in iron and magnesium, and poor in silica (quartz). The magma cools and crystallizes deep below the earth's surface. Gabbro is from the same kind of magma as basalt and diabase, but because it cools more slowly, it develops larger crystals.

Compare To: Basalt which has much finer grains, Diorite which is lighter and finer grains with no distinct crystal outlines.

Uses: Often called 'black-granite' and is used as building material, counter tops, headstones. Gabbro is an important source for many elements – chrome, titanium, copper, nickel, platinum.

Note: Mafic Volcanic (came to surface) or Basalt is an equivalent dark rock with a finer texture. When formed as pillows they are coarser grained near the middle and fine grained to the edge.





Mafic Volcanic on the left, Granite on the right; note the colour change

### **SANDSTONE (sand'-stone)**

What Type of Rock Is It? Sedimentary

What Does It Look Like? Sandstone is often red to brown, light gray to nearly white. Sometimes it is yellow or green. It usually is composed of rounded grains that are all of the same size; and it is usually medium grained. Some sandstones show slight color variations in layering.

What Minerals Make Up the Rock? Quartz; Sometimes contains: feldspars, mica, glauconite (in green coloured sandstone), magnetite, garnet, rutile, ilmenite

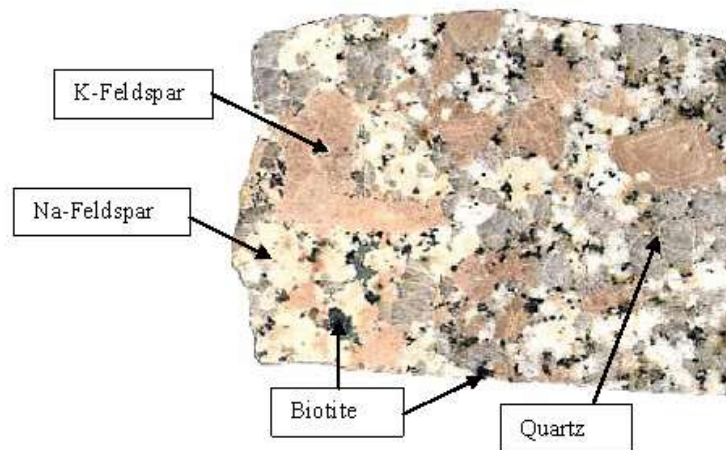
How Was It Formed? Quartz sand that is produced by the weathering of other rocks (such as granite, gneiss, and other sandstones) is deposited by rivers, waves, or wind. The sediment may have been a sand bar, an ocean beach, or desert sand dunes. The sand is buried under other sediments, compacted by the weight of those sediments, and cemented by material dissolved in water that seeps through it.

Related Rocks: Arkose: Usually red or pink, may be gray. Grains are angular. Arkose contains more than 25% feldspar with quartz. Medium to coarse grained. Graywacke: Black or dark green. Usually contains coarse angular grains included with fine grains.



## Minerals

I also wanted to provide a little more mineral background since rocks are so important to the plants, nutrients, culture, and beauty of the Canadian Shield. This list includes only the most prominent of the 76 common mineral types. A little background might be of interest – all that pink/gray stuff is not just Granite/Gabbro but it is made up of many different things (minerals). In order of appearance these minerals are:



### **Feldspar (Orthoclase, Plagioclase)** $KAlSi_3O_8 - NaAlSi_3O_8 - CaAl_2Si_2O_8$

Feldspar blanket term for a wide range of related minerals and is the most common mineral on the surface of the earth. It comes in several different compositions but predominantly it is some kind of aluminium silicate. When combined with potassium it is Orthoclase or Microcline and can be pink. When Sodium or Calcium it is called Plagioclase (sodium albite, calcium anorthite) and can be gray to almost black. Feldspars and quartz are mechanically broken down into crystals of sand. This material along with quartz is used in glass making and ceramics. Some varieties are used in jewellery due to interesting and beautiful optical properties as well as being inexpensive (e.g. moonstone).

### **Quartz** $SiO_4$

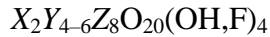
Quartz is the second most abundant mineral in the earth (after Feldspar). It is predominantly composed of Silicon and Oxygen and forms clear to translucent crystals. The colors that you see in quartz are due to various impurities. One really cool feature of quartz is that it resonates with very specific frequencies (piezoelectric properties) that allow it to be used in watches and clocks to keep accurate time.

### **Mica (Biotite, Muscovite)** $K(Mg,Fe)_3(AlSi_3O_{10})(F,OH)_2 - KAl_2(AlSi_3O_{10})(F,OH)_2$

Mica is a group of minerals that form chemically inert sheets or layers with a pearly or silky appearance. Mica can be seen as shiny layered crystals. The shiny crystals were used in ancient Roman times to put on the ground at the Circus Maximus to give it a glittery look. It is a good electrical insulator and is heavily used in electronics. You may have heard of “Isenglass” (Mica) used for peepholes in boilers, lanterns, stoves, and kerosene heaters. These windows are made of a kind of mica because they are less likely to shatter compared to glass when exposed to extreme temperature gradients. There has been some discussion about the meaning of the term in the

song “*The Surrey With The Fringe On Top*” (Oklahoma). Biotite is dark and muscovite is lighter in color.

Generic formula (it is pretty variable)



in which X is K, Na, or Ca or less commonly Ba, Rb, or Cs;

Y is Al, Mg, or Fe or less commonly Mn, Cr, Ti, Li, etc.;

Z is chiefly Si or Al but also may include  $Fe^{3+}$  or Ti.

**Augite**  $(Ca,Na)(Mg,Fe,Al)(Si,Al)_2O_6$

**Hornblende complex**  $(Ca,Na)_{2-3}(Mg,Fe,Al)_5(Al,Si)_8O_{22}(OH,F)_2$ .

These are dark Aluminium Silicate minerals containing one of Calcium/sodium and one of Magnesium/Iron/Aluminium that splits or cleaves in two directions. Jade comes from this group – it is not really that common here. Augites may be associated with ore bearing deposits – nickel, copper, platinum, ...

**Olivene**  $(Mg, Fe)_2SiO_4$

The second name for this mineral is Peridot with a light green to green color with a translucent vitreous appearance. This is also a magnesium iron silicate that is very common in the Earth’s mantle (but not crust) and has also been identified in meteorites, the Moon and Mars. A series of synthetic forsterites (Olivene is one of them) have been produced for lasers that are used for eye surgery, cell imaging, and micromachining.

### **Other**

There are lots and lots of other minerals but they become rarer – like I said earlier this probably will not help you find gold and silver.

## Maps

### Manitoba Pioneer Camp



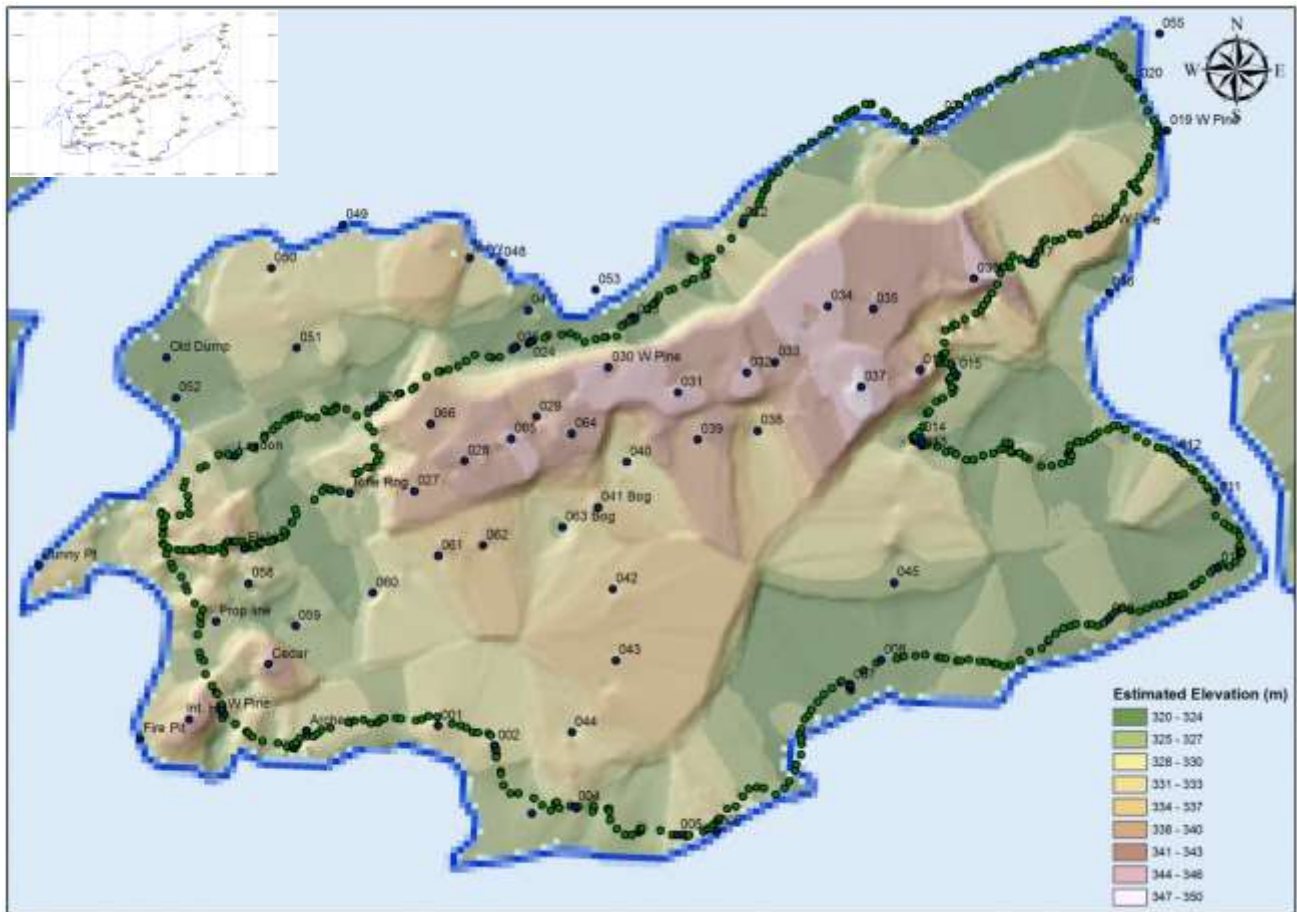
This map was created by Hilderman Thomas Frank Cram Landscape Architecture & Planning. Winnipeg MB, 2004

## Indian Bay (Shoal Lake)



The Atlas of Canada. or GeoBase®, May 2011 © Department of Natural Resources Canada. All rights reserved (<http://atlas.nrcan.gc.ca/site/english/maps/topo/index.html>)

## Elevation Profile, MacKinnon Island



| ID          | Latitude   | Longitude   | Alt. (m) |
|-------------|------------|-------------|----------|
| 001         | 49.6074260 | -95.0701600 | 332.5    |
| 002         | 49.6072540 | -95.0693300 | 330.1    |
| 003         | 49.6068570 | -95.0683580 | 331.0    |
| 004         | 49.6067030 | -95.0681470 | 323.6    |
| 005         | 49.6064660 | -95.0666600 | 328.2    |
| 006         | 49.6065110 | -95.0660890 | 325.7    |
| 007         | 49.6079130 | -95.0642150 | 320.6    |
| 008         | 49.6081550 | -95.0637900 | 321.8    |
| 009         | 49.6086000 | -95.0605140 | 324.1    |
| 010         | 49.6091030 | -95.0589580 | 319.8    |
| 011         | 49.6097630 | -95.0590040 | 323.6    |
| 012         | 49.6101490 | -95.0596050 | 328.3    |
| 013         | 49.6101890 | -95.0632790 | 315.1    |
| 014         | 49.6102470 | -95.0632990 | 317.2    |
| 015         | 49.6108470 | -95.0628100 | 325.0    |
| 016         | 49.6108820 | -95.0633330 | 332.8    |
| 017         | 49.6119110 | -95.0618090 | 329.6    |
| 018         | 49.6122350 | -95.0609600 | 334.1    |
| 019         | 49.6131840 | -95.0598670 | 325.0    |
| 020         | 49.6136170 | -95.0603100 | 319.4    |
| 021         | 49.6132590 | -95.0631350 | 322.1    |
| 022         | 49.6122120 | -95.0659550 | 326.6    |
| 023         | 49.6112750 | -95.0674810 | 319.8    |
| 024         | 49.6110370 | -95.0689720 | 310.8    |
| 025         | 49.6109840 | -95.0692070 | 314.3    |
| 026         | 49.6103940 | -95.0711900 | 324.1    |
| 027         | 49.6096170 | -95.0705900 | 337.3    |
| 028         | 49.6099130 | -95.0698760 | 341.7    |
| 029         | 49.6103450 | -95.0688550 | 336.7    |
| 030         | 49.6108250 | -95.0678360 | 342.7    |
| 031         | 49.6106090 | -95.0668220 | 344.6    |
| 032         | 49.6108120 | -95.0658400 | 343.6    |
| 033         | 49.6109160 | -95.0654350 | 339.7    |
| 034         | 49.6114550 | -95.0646910 | 343.9    |
| 035         | 49.6114390 | -95.0640370 | 341.6    |
| 036         | 49.6117510 | -95.0625930 | 343.3    |
| 037         | 49.6107080 | -95.0641810 | 347.3    |
| 038         | 49.6102700 | -95.0656600 | 329.4    |
| 039         | 49.6101740 | -95.0665190 | 338.6    |
| 040         | 49.6099430 | -95.0675370 | 328.3    |
| 041         | 49.6095130 | -95.0679310 | 335.1    |
| 042         | 49.6087510 | -95.0676860 | 333.8    |
| 043         | 49.6080830 | -95.0676160 | 334.4    |
| 044         | 49.6073990 | -95.0682180 | 328.0    |
| 045         | 49.6088830 | -95.0636280 | 313.0    |
| 046         | 49.6130200 | -95.0635060 | 333.0    |
| 047         | 49.6113410 | -95.0690150 | 320.6    |
| 048         | 49.6117790 | -95.0694290 | 328.8    |
| 049         | 49.6120880 | -95.0717270 | 329.9    |
| 050         | 49.6116660 | -95.0727460 | 327.7    |
| 051         | 49.6109260 | -95.0723460 | 325.3    |
| 052         | 49.6104280 | -95.0740690 | 320.3    |
| 053         | 49.6115470 | -95.0680560 | 323.0    |
| 054         | 49.6144550 | -95.0598790 | 320.5    |
| 055         | 49.6140890 | -95.0600120 | 322.7    |
| 056         | 49.6116550 | -95.0606330 | 320.9    |
| 058         | 49.6087120 | -95.0729440 | 328.8    |
| 059         | 49.6083240 | -95.0722510 | 323.7    |
| 060         | 49.6086520 | -95.0711470 | 324.9    |
| 061         | 49.6090170 | -95.0702220 | 334.1    |
| 062         | 49.6091260 | -95.0695780 | 334.5    |
| 063         | 49.6093180 | -95.0684410 | 325.8    |
| 064         | 49.6101940 | -95.0683390 | 344.0    |
| 065         | 49.6101340 | -95.0692110 | 345.6    |
| 066         | 49.6102490 | -95.0703830 | 337.9    |
| Archery     | 49.6073450 | -95.0720490 | 327.4    |
| Cedar       | 49.6079570 | -95.0726290 | 349.7    |
| Field       | 49.6090350 | -95.0730170 | 321.1    |
| Fire Pit    | 49.6072250 | -95.0744540 | 312.9    |
| Int. Hill   | 49.6074240 | -95.0737520 | 341.7    |
| Lagoon      | 49.6098960 | -95.0732020 | 319.8    |
| Prop. line  | 49.6083470 | -95.0734050 | 326.3    |
| Rifle Range | 49.6095810 | -95.0715220 | 327.3    |
| W. Pine     | 49.6074780 | -95.0732430 | 330.4    |



## Ecosystems of MacKinnon Island

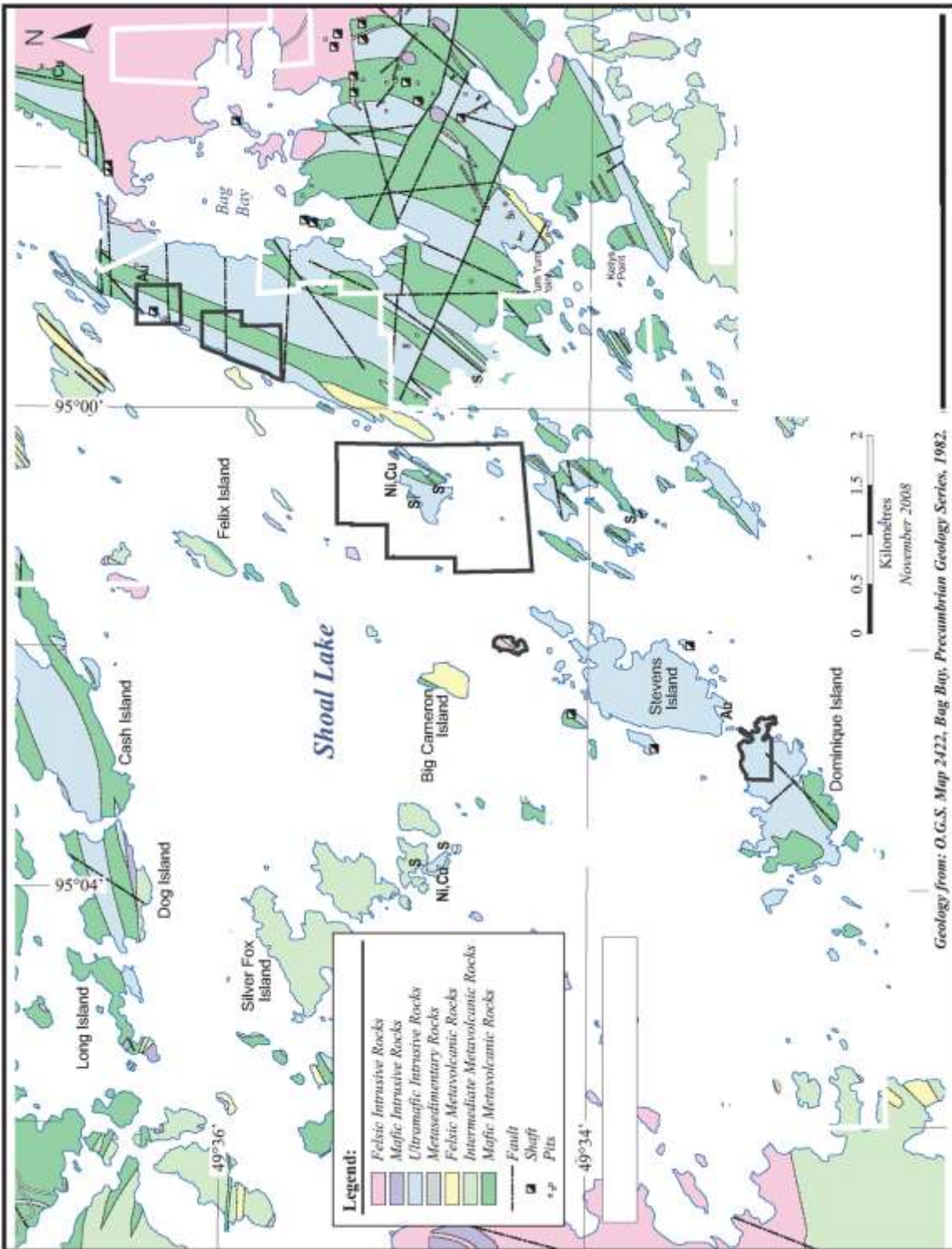


Modified from Kostamo M., and P.L. Lilley, Overview Biophysical Inventory & Environmental Assessment for Manitoba Pioneer Camp Shoal Lake, Ontario. Prepared by A Rocha Canada. March 2004. Image Google Earth, August 5, 2011.

1. Open mixed, multi-storied stands: aspen, green ash, balsam, white cedar
2. Mixed multi-storied stands: white cedar, balsam, aspen, green ash
3. Young mixed stands: balsam, birch, white cedar
4. Open mixed stands: birch, green ash, aspen, balsam, mountain maple
5. Ridge with open mixed stands: green ash, aspen, balsam
6. Wetland complexes

RO – Rock Outcrop  
 Oak – Bur Oak Stands  
 Bog – Peat Bog  
 Marsh – Emergent aquatic and aquatic

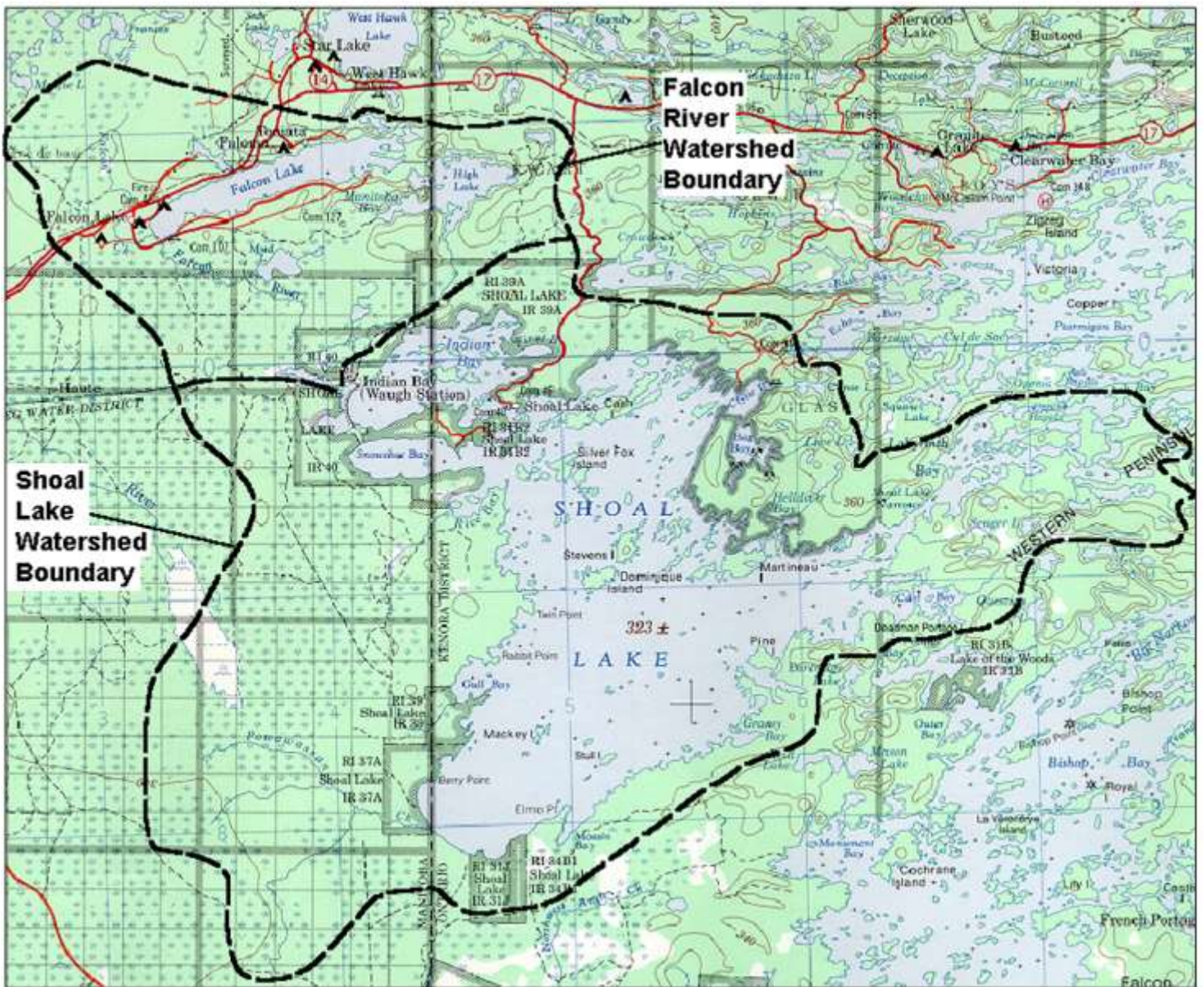
## Geology of Area



modified from: Wayne W. Valliant, Paul Chamois Technical Report On The Shoal Lake West Project, Northwestern Ontario, Canada NI 43-101 Report, 2009

Note: ultramafic & mafic for our purposes represent Gabbro or Basaltic rock. Meta\_ indicates it is partially metamorphed (Gneiss). Felsic Intrusive is Granite with Intermediate between the two.

## Shoal Lake Watershed



Shoal Lake Watershed Working Group, Shoal Lake Watershed Management Plan. 2001  
([http://www.gov.mb.ca/waterstewardship/water\\_quality/quality/shoal\\_lk\\_report\\_index.html](http://www.gov.mb.ca/waterstewardship/water_quality/quality/shoal_lk_report_index.html))