

FMA Resources

2007 – 2017 Forest Management Plan for FMA 0200041

May 31, 2007

Prepared by: The Forestry Corp.



2007 – 2017 FMP FOR FMA 0200041

FMA Resources forms one of 10 sections of the 2007 – 2017 Forest Management Plan for Manning Diversified Forest Products Ltd.'s Forest Management Agreement (FMA) 0200041. The Forest Management Plan (FMP) includes the following sections:

- 1. **Introduction and Plan Development** Introduces the companies operating on the FMA and describes the FMP development process, including the public consultation process. Includes the FMP Standards Checklist.
- 2. **FMA** Area Describes the physical environment of the FMA Area.
- 3. **FMA Resources** Describes the natural resources within the FMA Area.
- 4. **Values, Objectives, Indicators and Targets** (VOITs) Details the values, objectives, indicators and targets that were instrumental in selecting the Preferred Forest Management Strategy and in developing forest management strategies for the FMP.
- 5. **Forest Landscape Metrics** Presents specific information regarding forest vegetation composition and natural disturbance within the FMA Area and/or northwestern Alberta to address VOIT requirements.
- 6. **Landbase Netdown** Provides a detailed description of the landbase netdown process, in preparation for the Timber Supply Analysis.
- 7. **Yield Curves** Documents the volume sampling and yield curve development process.
- 8. **Timber Supply Analysis** Describes how the Preferred Forest Management Strategy, which was selected to meet Values and Objectives, was incorporated into the Timber Supply Analysis and provides an Annual Allowable Cut for both the coniferous and deciduous landbases.
- 9. **Implementation** Describes the forest management strategies and operations that will be used to implement the FMP and help ensure that indicators and targets are met.
- 10. **Monitoring and Research** Describes monitoring commitments required to ensure indicators and targets are tracked and describes Manning Diversified's approach to supporting research.



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1. Wildlife Resources

Northwestern Alberta and Manning Diversified's FMA Area support a wide variety of wildlife species. The majority of species whose range encompasses the FMA Area, currently have sufficient populations and/or available habitat to ensure their continuation. However, there are some species that are considered vulnerable because of low or declining populations or specific habitat concerns. These species may need additional consideration and/or protection with regard to forest management planning and operations.

Based on lists maintained by Alberta Natural Heritage Information Centre (ANHIC), MDFP compiled a list of tracked species¹ of mammals, birds, reptiles, amphibians, fish and arthropods occurring or thought to occur within their FMA Area. This list is quite extensive and has been included in as Appendix I (from ANHIC 2007).

The following section outlines the sources available to identify wildlife species considered at risk within the FMA Area and identifies species that warrant special consideration within the FMP, as well as in forest management planning and operations. Fish species are addressed in Section 2 and plants and plant communities in Sections 3 and 4.

1.1 Species at Risk

In Canada, both the Federal and Provincial governments are involved in identification and protection of wild species considered to be at risk. Legislated protection falls under two main Acts:

• Federal – Species at Risk Act – The purposes of this Act are to prevent wildlife species from being extirpated or becoming extinct, to provide for the recovery of wildlife species that are extirpated, endangered or threatened as a result of human activity and to manage species of special concern to prevent them from becoming endangered or threatened (Section 6, SARA). Responsibility for identifying and recognizing species at risk is vested in the Committee on the Status of Endangered Wildlife in Canada (COSEWIC).

¹ Not all tracked species are officially designated 'At Risk'.

• Provincial – Wildlife Act and Wildlife Regulation – This Act and its regulations deal with wildlife, hunting and the identification of endangered or threatened wildlife. Responsibility for identifying and recognizing species at risk is vested in the Endangered Species Conservation Committee.

The assessment of species status is ongoing; new species are added to the list of those considered at risk while some species may be de-listed. These changes may come about as a result of changes to species populations/habitats or with additional scientific information.

1.1.1 Committee on the Status of Endangered Wildlife in Canada

The national status of wild species at risk is assessed by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). COSEWIC was created in 1977 and is recognized nationally as a key source of regarding the status of wild species in Canada. COSEWIC's mandate addresses the following groups of wildlife: mammals, birds, reptiles, amphibians, fish, arthropods, molluscs, vascular plants, mosses and lichens (COSEWIC, 2003a). Within each of these taxonomic groups, COSEWIC classifies wild species (or subspecies, varieties, etc.) into one of the following classes:

- **Extinct** A species that no longer exists.
- **Extirpated** A species no longer existing in the wild in Canada but occurring elsewhere.
- Endangered A species facing imminent extirpation or extinction.
- Threatened A species likely to become endangered if limiting factors are not reversed.
- **Special Concern** A species of special concern because of characteristics that make it particularly sensitive to human activities or natural events (**Vulnerable** from 1990–1999, **Rare** prior to 1990).
- Not At Risk A species that has been evaluated and found to be not at risk (Not in Any Category; No Designation Required).
- **Data Deficient** A species for which there is insufficient scientific information to support status designation (Indeterminate from 1994-1999, ISIBD (Insufficient Scientific Information on which to Base a Designation) prior to 1994).

Criteria used to evaluate species as Endangered or Threatened include:

- Declining total population
- Small distribution and decline or fluctuation in extent or population
- Small total population size and decline in population
- Very small population or restricted distribution
- Quantitative analysis indicating probability of extinction.

Each of these criteria is associated with specific thresholds that must be met for a species to be considered Endangered or Threatened (e.g., categorized as Endangered if $\geq 70\%$ population decline in the past 10 years or 3 generations, whichever is longer; categorized as Threatened if 50 - 69% population decline over the same time frame) (COSEWIC 2003b). Criteria for listing as a species of Special Concern are less quantitative. COSEWIC will list a species under the Special Concern category if it is likely to become threatened if factors which negatively influence the persistence of the species are not reversed/managed or if the species is close to meeting the criteria for Threatened status.

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Appendix II contains a listing of species rated by COSEWIC as Endangered, Threatened or Special Concern that occur or likely occur within Manning Diversified's FMA Area. Key wildlife species that occur within the FMA that appear on this list include woodland caribou, grizzly bear and wolverine.

1.1.2 Provincial Species at Risk Program

Provincially, species that are potentially at risk are initially identified by Fish and Wildlife Division of Alberta Sustainable Resource Division (ASRD). For species that are identified as potentially at risk, Fish and Wildlife, in conjunction with Alberta Conservation Association prepare a provincial status report. The Endangered Species Conservation Committee then assesses the provincial status report along with any relevant COSEWIC ratings/assessments and makes recommendations concerning the designation, management and/or recovery of the species. Provincial designations reflect the status of a species within the Province and may not be consistent with COSEWIC ratings/assessments.

The Wildlife Act and Regulation recognizes both **Endangered** and **Threatened** species. When designating species, the Endangered Species Conservation Committee uses the COSEWIC definitions for these classes. In addition to the species designated Provincially within the Wildlife Regulation, the ASRD also maintains a list of species considered At Risk, May Be At Risk or Sensitive.

Appendix II contains a listing of species identified in the Wildlife by the Province as Endangered or Threatened that occur or likely occur within Manning Diversified's FMA Area. Key wildlife species that occur within the FMA that appear on the Provincial list include woodland caribou and trumpeter swan, both designated Threatened. The Appendix also lists species considered At Risk, May Be At Risk or Sensitive.

1.1.3 Species Considered During FMP Development

Based on the National and Provincial status of the various wildlife species located within the FMA Area and the types of activities/disturbance associated forestry operations, several key species were identified as warranting special consideration within MDFP's FMP. These were:

- Mammals woodland caribou and grizzly bear
- Birds trumpeter swan, black-throated green warbler and cape may warbler.

In addition, one fish species and one non-vascular plant were identified as warranting special consideration (see sections 2.2 and 4.1).

1.2 Woodland Caribou (Rangifer tarandus caribou)

Caribou occur throughout Canada, across a wide variety of habitat types. Woodland caribou represent a subspecies that occurs in the forested and mountainous regions of Canada, including northern and west-central Alberta. Under COSEWIC, the woodland caribou is considered Threatened (boreal population, since 2000), while Provincially it is designated as Threatened under the Province's Wildlife Act. This status is based on reductions in distribution, declines in regional populations and a threat of further population declines associated with human activities.

As part of the Province's Species at Risk program, an evaluation of the status of the Woodland Caribou was completed in 2001. Unless indicated, the information in this section of is derived from the species status report (Dzus, 2001).

Two ecotypes of woodland caribou are often described, the distinction being based on behavior, habitat use and/or morphology. The mountain ecotype winter in the forested foothills of the Rocky Mountains and migrate in the summer to higher alpine areas. The boreal ecotype spends the entire year in forested habitats, moving extensively throughout the year but not following a predictable migration pattern. The woodland caribou in the vicinity of Manning Diversified's FMA Area belong to the boreal ecotype.

Distribution of woodland caribou is linked to availability of terrestrial lichens, which are a primary food source for both ecotypes. In winter, woodland caribou use mature and old-growth coniferous forests that contain large quantities of terrestrial and arboreal lichens. These forests are generally associated with peatland complexes, marshes, bogs, lakes, and rivers. In summer, the caribou occasionally feed in younger stands, after fire or logging, but generally avoid clear cuts, shrub-rich habitat and hardwood dominated stands.

The rut, or mating period, for caribou usually occurs in late September and the first half of October. Caribou cows begin breeding by the time they are 28 months of age and tend to breed annually. They typically give birth to a single calf the following spring (mid-May to mid-June). Survival rates for calves average between 30% and 50%, but can vary from almost none to 100%. Many factors interact to determine calf survival, including quality and quantity of forage (for pregnant females and in the first year of life), number of predators, and weather.

The males are able to breed at 18 to 20 months of age, but most probably have no opportunity before their third or fourth year because of competition between males for breeding females. During the rut, males engage in frequent and furious sparring battles with their antlers. Females travel to isolated, relatively predator-free areas such as islands in lakes and peatlands to calve.

Woodland Caribou occur at very low densities, with approximately 0.03 to 0.12 caribou per square kilometer (Seip 1992, Stuart-Smith et al. 1997). It is believed that this population pattern helps the species avoid predation.

Predation by wolves is considered the leading cause of natural mortality in caribou herds (Seip 1992, Stuart-Smith et al. 1997). Other predators such as bear (*Ursus* spp.), coyote (*Canis latrans*), wolverine (*Gulo gulo*) and Canada lynx (*Lynx Canadensis*) may also prey on caribou. For young calves, considerable natural mortality may result from starvation, inclement weather and low birth-weights resulting from hard winters.

Anthropogenic limiting factors are primarily associated with habitat loss and fragmentation of habitat. Human disturbance associated with agriculture, forestry and oil and gas activity reduce the availability of older forests, which tend to provide important habitat.

In July 1996 the Province estimated a woodland caribou population of approximately 3600 to 6700 within Alberta. Population estimation is difficult for caribou because of their low densities and the census methods available (aerial surveys are not very effective because of the difficulty seeing caribou under conifer tree cover).



The Province has identified areas which are key habitat for woodland caribou and designated them as Woodland Caribou Management Zones (see Figure 1-1). Two areas in the centre of P6 and a large portion of P9 (along the west) lie within Woodland Caribou Management Zones. Forest management operations within these Zones must consider caribou habitat requirements.

Current research initiatives related to the boreal ecotype of the woodland caribou are spearheaded by the Boreal Caribou Committee, through the Boreal Caribou Research Program. The Committee is composed of representatives of the Provincial government and the forestry and energy sectors. Manning Diversified is an active sponsor of the Committee and Research Program.

In 1997, both the northeast and northwest caribou Standing Committees published interim operating guidelines for use in the Caribou Management Zones. These operating guidelines were developed within the framework of adaptive management and, according to Dzus (2001), as early as 1999 the Boreal Caribou Research Program (1999) concluded that the 'guidelines have been shown to be ineffective at conserving caribou and their habitat'.

1.3 Grizzly Bear (Ursus arctos)

The distribution of the grizzly bear (*Ursus arctos horribilis*) is restricted to northwestern North America and the species is generally associated with higher elevation sites. In Alberta, they occur within the Rocky Mountains Natural Region as well as at higher elevations within the Foothills and Boreal Forest Regions. Historically the species was wide ranging throughout western North America, occurring as far south as central Mexico.

The northwestern population was designated of Special Concern by COSEWIC in 2002. Provincially the grizzly bear has not been listed in the Wildlife Regulation and is not Tracked by ANHIC (within the FMA Area).

As part of the Province's Species at Risk program, an evaluation of the status of the grizzly bear was completed in 2002. Unless indicated, the information in this section of is derived from the status report (Kansas, 2002).

The grizzly bear is a subspecies of the brown bear (the other subspecies recognized is *U. a. middendorffi*, the brown bear of the Alaskan islands, often called the Kodiak bear).

Historically, the decline in the grizzly population resulted from agricultural expansion and unrestricted hunting. Agricultural expansion resulted in habitat loss and fragmentation and increased the interaction between grizzly and humans. Currently, the primary factors threatening grizzly populations are still anthropogenic and are generally related to habitat loss and fragmentation, as well as continued interaction between grizzlies and humans. Natural mortality factors include inter-specific competition and disease/parasites (likely minor) as well as malnutrition, which is primarily associated with younger bear.

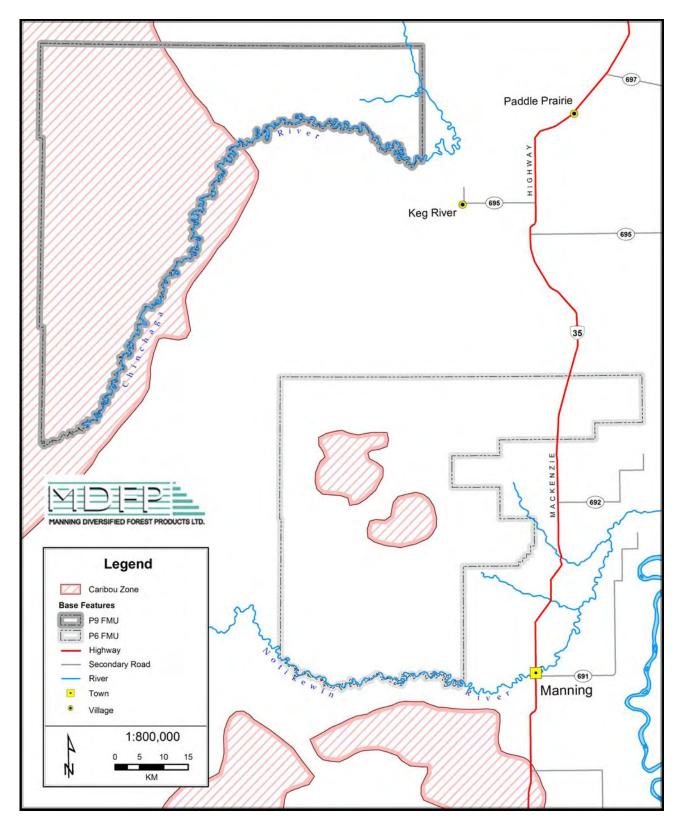


Figure 1-1. Caribou Management Zones within the FMA Area.

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Distribution of grizzly bear within their range is related to seasonal availability of high energy food sources. Grizzly are omnivores, taking advantage of a wide variety of available food sources. Grizzly typically feed on graminoids, forbs, berries and seeds, mammals (including ungulates and rodents) and insects (including ants and wasps). In early spring, they generally favour south slopes and lower elevation sites where graminoids first appear. Wetter sites (adjacent to streams and seepage areas) become important in late spring and early summer, along with disturbed sites such as burns and clearcuts which tend to be very productive in terms of forb production. Berries, particularly *Vaccinium spp*. and *Shepherdia canadensis*, are an extremely important food source for grizzly in late summer.

Denning preferences for grizzly bear within the Boreal are not well known.

Bear mortality throughout the Province is closely related to interactions with humans. Proximity to access is strongly correlated with grizzly mortality. Access increases opportunities for poaching and for other contact-related mortality.

Anthropogenic disturbances related to alteration of habitat is generally less of a concern than the increased access associated with the landbase activities. Clear cut harvesting often improves forage habitat for grizzly by increasing the availability of both berry species and ants. Wildfires can also create similar improvements in forage habitat.

To facilitate bear management, in 1990 the Province of Alberta identified Bear Management Areas (BMA). MDFP's FMA Area lies within BMA 1 and BMA 2A (Figure 1-2). Table 1-1 summarizes population estimates for the Province and for BMA 1 and BMA 2A on an annual basis between 1988 and 2000. Both Provincially and within BMA 1, estimated populations are increasing. The population in BMA 2A, which is closer to developed and agricultural lands, has been declining.

In 1990 Alberta developed a comprehensive management plan for grizzly bear within the Province. The grizzly management plan outlined primary strategies to achieve the following goals:

- increase the provincial population to 1000 bears (under review)
- reduce hunting harvest to 2% of a local area's population
- establish an annual monitor of mortalities with particular emphasis on females
- initiate habitat inventory utilizing grizzly habitat-use information.

Secondary strategies included upgrading bear handling procedures while maintaining an effective response to grizzly-human conflicts and assisting viewing and other non-consumptive enjoyment.

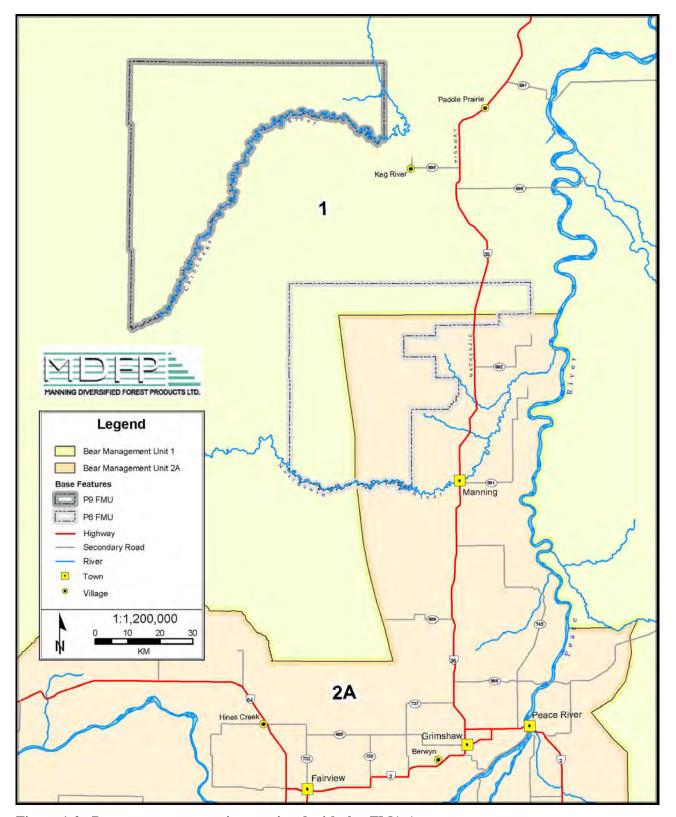


Figure 1-2. Bear management units associated with the FMA Area.

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Table 1-1. Estimate of number of grizzly bear in Bear Management Area 1 and in the remainder of Alberta (excluding national parks) for 1988-2000.

Year	BMA 1	BMA 2A	Rest of Province
1988	82	22	471
1989	84	18	434
1990	90	16	441
1991	90	21	527
1992	92	21	556
1993	93	21	572
1994	96	22	582
1995	102	23	610
1996	109	21	635
1997	119	17	640
1998	124	13	670
1999	126	10	697
2000	134	7	700

1.4 Trumpeter Swan (Cygnus buccinator)

The trumpeter swan is the largest water fowl native to North America. The trumpeter swan was originally distributed fairly extensively throughout the prairie provinces but was thought to have been extirpated in the early 1900s. A flock was later discovered in the Grande Prairie area and with increased protection from human disturbance, the species has made a comeback. The population of trumpeter swan has increased to the point where, in 1996, they were listed as 'Not At Risk' according to COSEWIC (previously they had been listed 'Vulnerable'). Provincially the species is considered at risk and is classified as 'Threatened' under the Wildlife Regulation. The swan is Tracked by ANHIC in the FMA Area. Trumpeter swans have been recorded in two locations within Manning Diversified's FMA Area, both within FMU P6 (see Figure 1-3).

The following description of the species' habitat and biology is primarily from 'Status of the Trumpeter Swan (*Cygnus buccinator*) in Alberta' (James, 2000)

During the summer breeding months, trumpeter swan inhabit lakes and marshes in the Mixedwood and Boreal Natural Sub-regions. Winter grounds are located in the northwestern United States, in a relatively small area near the borders of Montana, Idaho and Wyoming.

The birds arrive from their wintering grounds in mid-April to early May. They form life long mating pairs and take approximately 5 years to reach breeding age. Generally, a single pair will nest on an appropriate breeding lake or pond and they will return to the same location each year.

Breeding habitat requires the following:

- adequate room to take off (approximately 100 m)
- accessible forage
- shallow stable levels of clean fresh water
- emergent vegetation

- low human disturbance
- structure for a nest site (e.g., muskrat or beaver lodge, small island, etc.).

Nesting pairs will lay 3 to 9 eggs which are incubated for approximately 5 weeks. Resulting brood size is approximately 3 birds, based on data collected from the Grande Prairie area. The young feed on aquatic invertebrates and crustaceans before switching to the adult diet that relies on aquatic plants.

Trumpeter swans begin staging on larger lakes in mid-September, about a month prior to migrating to their wintering grounds. The trumpeter swan population in northwestern Alberta is referred to as the Canadian subpopulation, which migrates to wintering grounds in the Montana-Idaho-Wyoming boundary area.

In 2001, the Province published draft 'Recommended land use guidelines for trumpeter swan habitat' (October 30, 2001 Draft, Fish and Wildlife Division). Guidelines directed at all activities in swan habitat areas include:

- April 1 to Sept. 30, no activity within 800 m of the high water mark of identified lakes or water bodies.
- April 1 to Sept. 30, no direct flights over identified lakes or water bodies.
- No long term development (roads, wells, pipelines, etc.) within 500 m of the high water mark on identified lakes or water bodies.

Guidelines related specifically to timber harvesting include:

- No timber harvesting within 200 m of high water mark for identified lakes or water bodies.
- Establishment of a special management zone for timber harvesting between 200 m and 500 m from high water mark, with a detailed plan required.

1.5 Black-throated Green Warbler (Dendroica virens)

The black-throated green warbler is a neotropical migrant that breeds in the boreal forests of Canada and Northeastern United States, while wintering in Mexico and Central America.

Although classified as a 'Species of Special Concern' provincially, the species may be common in some areas of Alberta where suitable habitat exists. The black-throated green warbler is not Tracked by ANHIC within the FMA Area. Nationally, the species is not listed.

The following description of the species' biology and habitat is primarily from 'Status of the Black-throated Green Warbler (*Dendroica virens*) in Alberta' (Norton, 1999).

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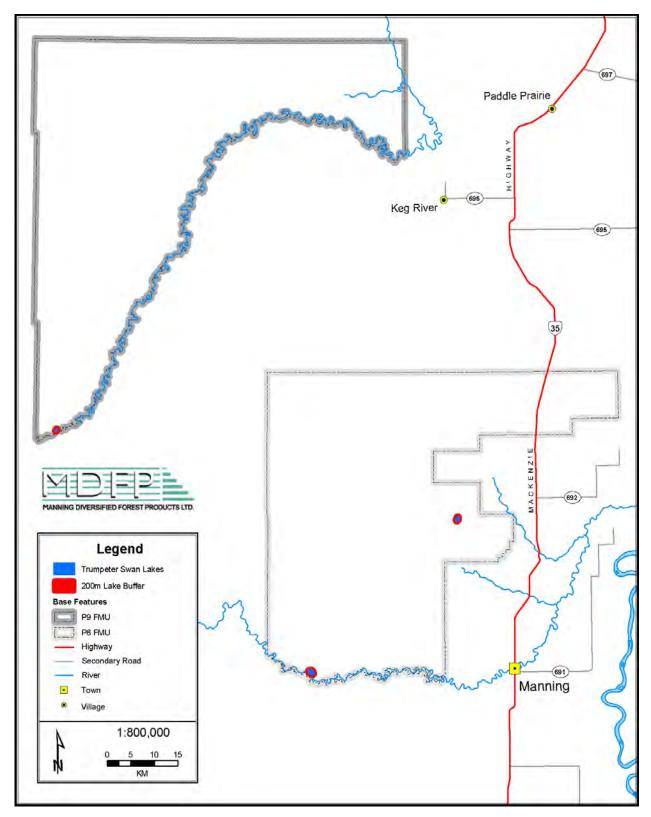


Figure 1-3. Trumpeter swan lakes (including 200 m buffer) within Manning Diversified Forest Products FMA Area.

The black-throated green warbler is a small, foliage-gleaning warbler. Males and females are similar in size (11 to 12 cm and weighing 8 to 11 g) but can be differentiated on the basis of colouring (males are more brightly coloured). Birds are able to reproduce in their first year and can live at least 6 years. The birds feed diurnally, foraging relatively high in the canopy (13 to 15 m). Lepidoptera larvae are an important food source but the species also takes advantage of available beetles, true bugs, wasps, ants, gnats, moths and flies. The bird is not known as a major predator of spruce budworm except when populations reach epidemic levels.

In Alberta it occurs in the boreal forest region and is consistently associated with two habitat types:

- deciduous or coniferous dominated mixedwood, with presence of some mature conifer in the canopy;
- mature/older stands maybe 80-130 years old, dominated by either aspen or spruce.

Some research indicates the species may be found in old coniferous stands and may prefer birch over other deciduous trees. The species inhabits larger tracts of forest and tends to avoid disturbed or edge habitats. Use of individual spruce trees for singing and foraging increases significantly with increasing tree diameter (correlated to some extent with age of stand).

1.6 Cape May Warbler (Dendroica tigrina)

The Cape Mary warbler is a neotropical migrant that breeds in the boreal forests of Canada and Northeastern United States, while wintering in the West Indies and the east coast of Central America.

The species is uncommon in most areas of the Province and there are concerns regarding habitat loss/fragmentation. The Cape May warbler is not currently listed either nationally or Provincially, and is not on the Alberta Natural Heritage Information Centre's Bird Tracking List.

The following description of the species' habitat and biology is primarily from 'Status of the Cape May Warbler (*Dendroica tigrina*) in Alberta' (Norton, 2001). Because the species occurs uncommonly and at low densities, little information is available Provincially regarding its biology, ecology or population status.

The Cape May warbler is a medium-sized warbler that forages diurnally by gleaning insects off leaves and needles near branch tips, relatively high in the canopy. Males and females are approximately 13 cm long and weigh 10 g. Males are more brightly coloured than females. Cape May warblers have been known to survive at least 4 years. Lepidoptera are the primary food source in the summer and the species is considered a major predator of spruce budworm (*Choristoneura fumiferana*) and forest tent caterpillar (*Malacosoma disstria*). There is an indication that Cape May warblers can produce larger clutches when food is abundant and the population may be able to respond relatively quickly to spruce budworm or tent caterpillar outbreaks.

The species is classified as a forest specialist. In Alberta it occurs in the boreal forest and foothills region and is primarily associated with mature to old coniferous forest types, usually spruce or fir dominated stands with relatively open understories. It also is common is spruce-dominated mixedwoods with a component of aspen, poplar and/or birch. There is some indication that the species may also utilize deciduous-dominated stands, black spruce stands and treed fens. Several sources indicate the Cape May warbler may require scattered veteran conifers that extend above the main tree canopy for singing posts. The species tends to be sighted in stands greater than 60 years of age.

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Population information for Alberta is, at best, sketchy. Many of the large studies in Alberta have focused on deciduous-dominated forests and may under represent the Cape May Warbler. Statistics from the Canadian Breeding Bird Survey indicate non-significant population trends (caution is suggested given the low numbers of birds detected). Concern has been expressed related to habitat loss/fragmentation that may be associated with increased forest harvesting within Alberta (which may reduce the extent of older spruce stands). In addition, suppression of spruce budworm outbreaks may reduce opportunities for localized population response to a temporarily abundant food source. The extent that these forest management practices are offset by changes in forest composition associated with fire suppression (which would increase the amount of older forest) is not known.

The relative importance of summer breeding ground habitat loss/fragmentation versus loss/fragmentation of wintering grounds is not know, but is thought to be significant.

1.7 Other Ungulates

Although ungulates such as moose, deer and elk are not considered 'At Risk' within Alberta, the Province has identified key Ungulate Zones, which represent important ungulate habitat, particularly winter ranges. These ranges exclude areas already included within the Caribou Zone, since the Caribou Zone designation receives primary consideration. The map in Figure 1-4 shows the location of key ungulate winter range within MDFP's FMA Area.

Winter ranges represent important ungulate habitat within northern Alberta because of the length and severity of winters. Harsh environmental conditions (e.g., cold temperatures, deep snow, etc.), combined with reduced availability of high quality food sources make it difficult for these species to maintain sufficient energy stores to survive through the winter months.

Forest management operations within these Zones consider ungulate populations and their habitat requirements. Within MDFP's FMA Area, the Ungulate Zones are restricted to the valleys associated with major rivers, specifically the Notikewin, Hotchkiss and Meikle Rivers in P6 and the Chinchaga River in P9.



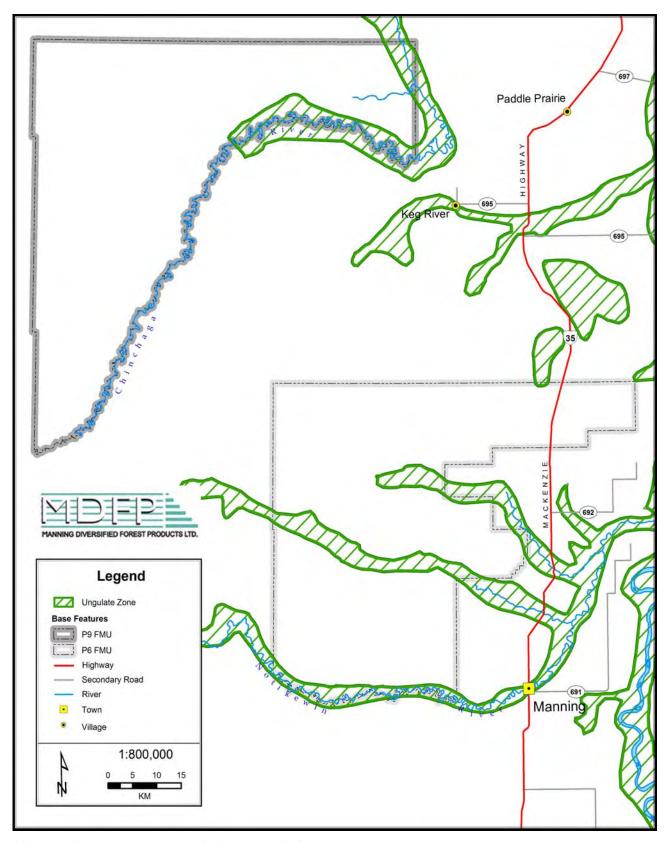


Figure 1-4. Ungulate Zones within the FMA Area.

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2. Fisheries Resources

Fish species are located in lakes, rivers and streams throughout the FMA Area (Figure 2-1). In total, the FMA Area contains 84 waterbodies identified in the AVI as lakes (i.e., NWL/WL), accounting for 927 hectares. Most lakes within the FMA Area are relatively small (i.e., only 18 are greater than 10 hectares) The largest lake in the FMA Area is located in the extreme northeast of FMU P6 and is 277 hectares.

Major rivers within the FMA Area are described in section 5.1 in **FMA Area**.

The Province has evaluated the fishery potential of most regions in the Province, including FMU P6 (information for FMU P9 is not available) (Figure 2-2). The major streams and rivers of the Notikewin watershed (including the Botha, Hotchkiss and Meikle Rivers) are classified as having medium to high fisheries potential.

2.1 Fish Species

Fish density in the Notikewin watershed is considered low, according to the findings of the Northern Watershed Project. The Project reported 17 species of fish, representing 8 different families within the Notikewin River basin (Scrimgeour et al. 2003). Game species include Arctic grayling (*Thymallus arcticus* (Pallas)), mountain whitefish (*Prosopium williamsoni* (Girard)), northern pike (*Esox lucius* Linnaeus) and walleye (*Stizostedion vitreum vitreum* (Mitchill)).

A listing of fish species found within Northwestern Alberta can be found in Chapter 3 – Biota and Ecological Communities in Stelfox and Wynnes 1999.

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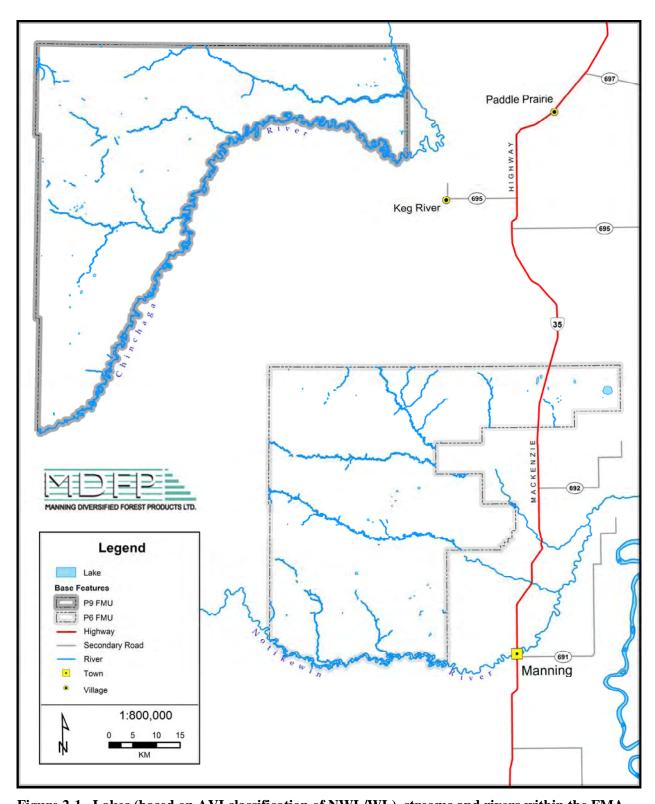


Figure 2-1. Lakes (based on AVI classification of NWL/WL), streams and rivers within the FMA Area.

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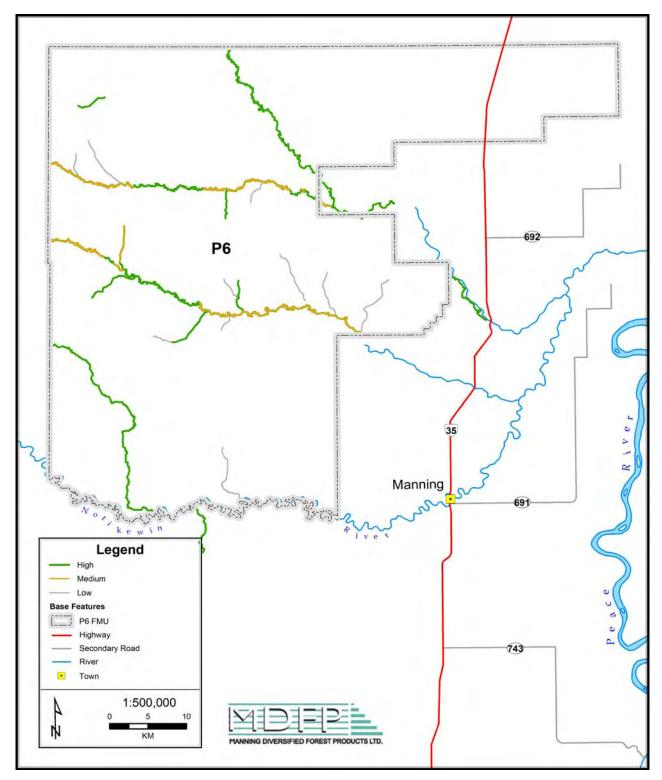


Figure 2-2. Fisheries Potential for FMU P6 (from Provincial Fisheries Information Management database).

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2.2 Northern Pikeminnow (Ptychocheilus oregonensis)

Northern pikeminnow (*Ptychocheilus oregonensis* (Richardson), also referred to as northern squawfish) has also been recorded in the Notikewin (based on information provided by ANHIC). This species is on Alberta Natural Heritage Information Centre's Tracking List for the Lower Boreal Highlands natural subregion. It is not recognized as Endangered or Threatened either Provincially or Federally.

The following description of the species' habitat and biology is primarily from McPhail (1998).

The northern pikeminnow is native to the pacific slopes from the northwestern United States into British Columbia (Figure 2-3). Its distribution in Alberta is limited, possibly only occurring in the Notikewin River. The species occurs in most of the major BC river systems, including Fraser, Skeena and Columbia. Smaller fish or young adults are also found in smaller streams while large individuals are usually found in interior lakes.

Northern pikeminnow spawn between May and July in shallow water over a gravelly bottom in streams, but will also spawn along lake shores. Females produce from 12,000 to 100,00 eggs, depending on size (average about 40,000) and the eggs take approximately one week to hatch. It takes approximately six years for young pikeminnow to begin reproducing.

Adult northern pikeminnow are dark green or green-brown back, with a white/cream abdomen. The head is relatively long and its tail is distinctly forked. The fins are clear, however males display yellow/orange lower fins during spawning periods. Average size ranges from 30 to 50 cm (weighing 1 to 2 kg).

Northern pikeminnows are considered scavengers. Juveniles feed on a variety of aquatic invertebrates, but fish are the favored prey of larger fish (young salmon and trout other minnows, suckers, etc). During the salmon spawning season, they will also feed on eggs. In some jurisdictions the northern pikeminnow are considered serious pest or predator and efforts have been expended in attempts to eradicate them (i.e., a bounty program in the lower Snake River in Washington).

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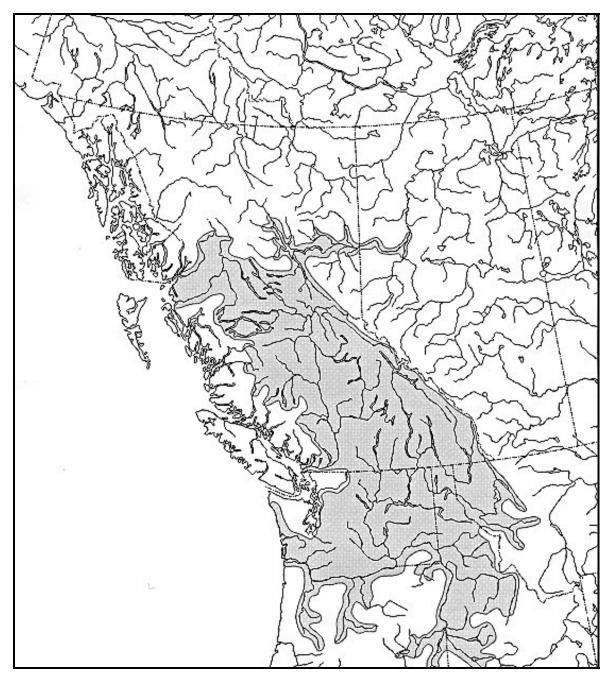


Figure 2-3. Distribution of northern pikeminnow (from http://www.naturewatch.ca/ eman/reports/publications/99 montane/fishes/fishesfig03.html (July 15, 2005)).

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3. Plant Communities

Because MDFP's FMA Area encompasses three distinct Natural Sub-regions, it is supports a wide range of plant communities. Characteristic forest associations in each of these Natural Sub-regions are described briefly in Section 3 in FMA Area.

Within the FMA Area, forested communities tend to be dominated by white spruce and aspen. These tree species may occur as single species stands, however, they commonly occur as mixes, along with other species such as lodgepole pine, birch and poplar. A more detailed summary of the types of forests found within the FMA Area is provided in section 2.1 and 2.2 in **Forest Landscape Metrics**.

A wide range of non-forested communities also form an important component of the landscape within the FMA Area. These communities include *Carex spp.* dominated riparian areas, *Sphagnum spp.* peatlands, upland shrub communities, etc.

The majority of the forested and non-forested plant communities within the FMA Area are relatively well represented Provincially and regionally. However, ANHIC has compiled a list of Ecological Communities within Alberta which identifies communities which are unusual, uncommon or of limited extent (Allen 2006). The list is considered preliminary because, in some cases, knowledge of the extent or distribution of the communities is quite limited.

A total of 36 tracked communities were identified as possibly occurring within the FMA Area. Of these, Allen indicated that 17 were unlikely to be present within the FMA Area. A further 13 had a low likelihood of being present. Of the communities identified, 12 were considered Forest/Woodland communities and 6 of these had a low to medium likelihood of occurring within the FMA Area (Table 3-1). Based on the habitat characteristics of these six Forest/Woodland communities, two communities were identified which could be impacted by forestry operations within the FMA Area. Abstracts for these two forested plant communities are provided in Appendix III.

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Table 3-1. Forest/Woodland Tracked Communities within the Boreal Forest natural region (communities in blue could be impacted by forestry operations).

ode (CEAB#)	Scientific Name	Common Name	Rank[1]	Likelihood	Habitat Notes	Status
40	Picea glauca / Alnus tenuifolia – Betula neoalaskana / Equisetum pratense / Hylocomium splendens	white spruce / river alder – Alaska birch / meadow horsetail / stair-step moss	S3	L	Riparian community associated with major river valleys. Restricted to silt-bearing rivers where extensive silt terraces occur. Forest in areas where flooding and channel migration have created wide valleys, on mid and upper silt terraces.	Would not be in active landbase (river breaks and Notikewan Management Zone).
43	Populus balsamifera / Viburnum opulus / Matteuccia struthiopteris	balsam poplar / high-bush cranberry / ostrich fern	S1S2	L/M	Moist, nutrient-rich community in seepage areas on hillsides/depressions.	May be in active landbase. Ranking indicates up to 20 occurrences or few remaining hectares.
44	Populus tremuloides / Rubus parviflorus / Aralia nudicaulis	aspen / thimbleberry / wild sarsaparilla	S2S3	L	Often associated with seepage areas related to a layer of reduced permeability that restricts drainage and channels seepage.	May be in active landbase. Ranking indicates up to 80 occurrences.
45	Populus tremuloides / Salix bebbiana –Corylus cornuta / Calamagrostis canadensis – Matteuccia struthiopteris	aspen / beaked willow – beaked hazelnut / bluejoint – ostrich fern	S1	L/M	Riparian wet meadow (imperfectly drained), with open tree layer.	Would not be in active landbase (river breaks and Notikewan Management Zone).
170	Populus tremuloides / Rosa acicularis / Apocynum androsaemifolium	aspen / prickly rose / spreading dogbane	SU	L/M	Found on gently sloping fluvial terraces on moderately to well drained sites on sandy substrates.	Would not be in active landbase (river breaks and Notikewan Management Zone).
175	Betula neoalaskana / Ledum groenlandicum / Calamagrostis canadensis	Alaska birch / common Labrador tea / bluejoint	SU	L	Peatland with Alaska birch.	Would not be in active landbase.

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Table 3-1. Forest/Woodland Tracked Communities within the Boreal Forest natural region (communities in blue could be impacted by forestry operations). continued.

Code (CEAB#)	Scientific Name	Common Name	Rank	Likelihood	Habitat Notes	Status
38	Larix laricina / Carex prairea	tamarack / prairie sedge	S 1	U		
188	Larix laricina - Picea mariana / Cornus stolonifera - Rubus idaeus	tamarack - black spruce / red- osier dogwood - wild red raspberry	S1S2	U		
41	Picea glauca / Cetraria islandica	white spruce / lichen	S1?	U		
189	Picea mariana / Cornus stolonifera / feathermoss	black spruce / red-osier dogwood / feathermoss	S1S2	U		
42	Populus balsamifera / Alnus tenuifolia - Cornus stolonifera	balsam poplar / river alder - red-osier dogwood / meadow	S3	U		
114	Populus balsamifera / Rhamnus alnifolia /	balsam poplar / alder-leaved buckthorn	S1	U		

^[1] S1 – Five or fewer occurrences or very few remaining hectares. S2 – Six to 20 occurrences or few remaining hectares. S3 – Twenty-one to 80 occurrences or may be rare and local throughout its range or found locally in a restricted range. SU – Unrankable due to lack of information or conflicting information.

Plant Communities



4. Plant Species

Manning Diversified's FMA Area has not been the focus of many intensive floristic surveys. To some extent, both FMUs P6 and P9 (currently designated P16) are difficult to access during the summer months, when these ground surveys need to be completed. In addition, there are very few parks and protected areas in the immediate vicinity of the FMA Area.

A listing of plant species found within Northwestern Alberta can be found in Chapter 3 – Biota and Ecological Communities in Stelfox and Wynnes (1999). Based on lists maintained by Alberta Natural Heritage Information Centre, MDFP compiled a list of tracked species² of plants occurring or thought to occur within their FMA Area. Because this list is quite extensive, it has been included in as Appendix IV.

4.1 Twisted Bog Moss (Sphagnum contortum)

Twisted bog moss (*Sphagnum contortum* Schultz, sometimes referred to as *Sphagnum subsecundum* var. *contour*) has been reporting from the Twin Lakes Recreation Area (Figure 4-1). This species is on Alberta Natural Heritage Information Centre's Tracking List. It is not recognized as Endangered or Threatened either Provincially or Federally nor is it recognized as At Risk Provincially.

Sphagnum contortum is a moderate to small sized species, usually green/golden to orange in color. It has a weak stem and the branches are somewhat curved with spreading leaves that are ovate to long ovate (ovate-lanceolate) and somewhat turned to one side (subsecund). The leaf tips are blunt and rounded with small teeth (rounded-obtuse and weakly denticulate) (Crum 1983).

Sphagnum contortum is found in base-rich flushes in otherwise more acidic habitats, usually in the open and on very wet sites. The species is known to occur on burned over sedge bogs, sedge meadows and floating mats, often at the edge of water or in the moat surrounding bogs. It often occurs in association with S. warnstorfii, S. centrale, Campylium stellatum, and Calliergonella cuspidata.

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² Not all tracked species are officially designated 'At Risk'.

The species is likely distributed across Canada and the United States of America, Mexico, Costa Rica, Europe and Asia. Additional collection/sighting locations within Alberta are shown in Figure 4-2.

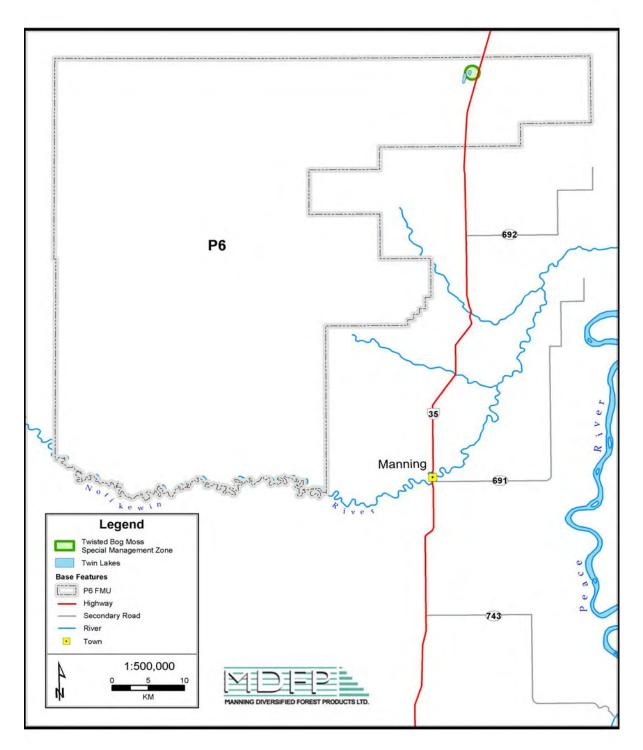


Figure 4-1. Reported location of twisted bog moss, as provided by Alberta Natural Heritage Information Centre.

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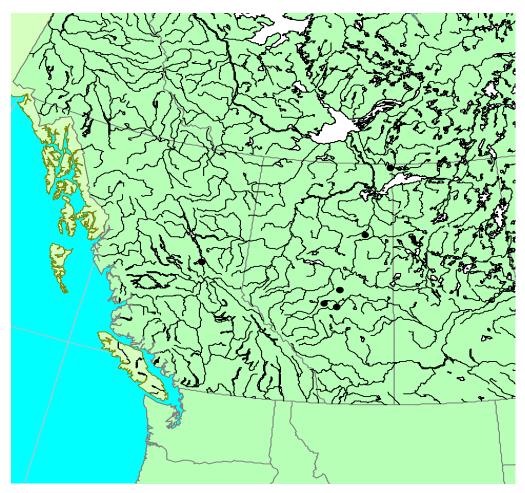


Figure 4-2. Collection/sighting locations for Sphagnum contortum within Alberta (map provided by Rene Belland, University of Alberta and Devonian Botanical Gardens).

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5. Forest Pathogens

Until very recently, defoliators were generally considered the primary threat to the forests of northwestern Alberta in terms of potential pathogens. Spruce budworm (*Choristoneura fumiferana* (Clemens)) which prefers white spruce, is the most important conifer defoliator while large aspen tortrix (*Choristoneura conflictana* (Walker)) and forest tent caterpillar (*Malacosoma disstria* (Hubner) are primary aspen defoliators. Defoliators often impact the growth of host species, but generally do not cause high levels of host mortality.

Within the last few years, the threat to northwestern Alberta posed by the mountain pine beetle (*Dendroctonus ponderosae* Hopkins) has steadily increased and this pathogen now has the potential to cause major losses to the region's lodgepole pine forests. Traditionally, mountain pine beetle outbreaks within Alberta were restricted to the southwest and west-central areas of the Province. However, the severe outbreak in British Columbia over the last ten years has created an extremely widespread and dense infestation source and mountain pine beetle is now considered a major threat to pine forests throughout Alberta. Unlike defoliators, bark beetle attacks during epidemics almost always result in host tree mortality.

The following descriptions of the primary forest pathogens were taken primarily from the following website: http://www.srd.gov.ab.ca/forests/health/i_insects.html and http://www.nrcan-rncan.gc.ca/cfs-scf/science/prodserv/pests.

5.1 Mountain Pine Beetle

The mountain pine beetle can be an extremely destructive pest of mature lodgepole pine forests. It is a bark beetle that feeds on the phloem of host trees. The beetle introduces a blue-stain fungus and, between the fungus and the larval feeding, host trees can be killed within one month of attack. Mortality is the result of disruption of the flow of water and nutrients in the phloem.

The mountain pine beetle generally completes its life cycle within one year. Eggs, deposited in vertical galleries under the tree's bark in mid-summer, hatch in late summer. The larvae are white, grub-like and marked with brown heads. Larvae continue to feed in the phloem, creating new horizontal galleries, and

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then over-winter under the bark. In spring the larvae resume feeding until they are ready to pupate. Pupation is completed by early summer, when the small adult beetles (4.0 7.5 mm in length) emerge to attack new host trees.

Mountain pine beetle damage is characterized by:

- Cream coloured pitch and pitch tubes on the tree trunk (as the tree tries to repel the beetles)
- Sawdust in bark crevices and around base of the tree (from boring by beetles)
- J- shaped vertical egg galleries under the bark, beginning above the entry holes
- Greyish blue sapwood (caused by the blue-stain fungi)
- Yellowish-green needles over the full crown of the tree, becoming reddish the year after initial attack.

The Province of Alberta has initiated an aggressive strategy to limit the spread of mountain pine beetle within the Province. This strategy involves detection and control efforts, as well as salvage and risk reduction.

Detection and control efforts include:

- Annual aerial surveys to spot infestations (generally from the previous year).
- Ground surveys to detect current-year infestations.
- Use of pheromone bait traps to monitor beetle populations.
- Destroying infested trees prior to beetle emergence, by cutting and burning.

As the number and size of mountain pine beetle infestations within Alberta rise, it becomes increasingly unlikely that all infestations can be controlled by cutting and burning infested trees because of the costs and man-power involved. In these cases, salvage operations will be initiated, to maximize the economic recovery for the infested areas. The Province has already implemented policy measures to provide the forestry industry with the flexibility needed to accommodate beetle salvage operations.

Risk reduction (prevention) is a key component of the Province's beetle strategy (ASRD 2007). Risk reduction in susceptible areas includes targeting pine stands for harvest (over spruce stands) over the next 20 years (section 5.2.5 in **Timber Supply Analysis**).

As the mountain pine beetle outbreak in Alberta evolves, additional strategies and policies will need to be implemented to manage the outbreak and minimize it economic consequences.

In 2006, mountain pine beetle infestations were confirmed to the south and southwest of MDFP's FMA Area (see Figure 5-1). The FMA Area currently lies north of the mountain pine beetle 'Area of Primary Concern' as identified by the Province³. It is anticipated that the status and location of infestations will change significantly over the next few years.

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³ http://www.srd.gov.ab.ca/forests/fmd/manuals/pdf/MPB%20Planning%20Interp%20Bulletin Revised Sept%202006 Ver%202.6.pdf

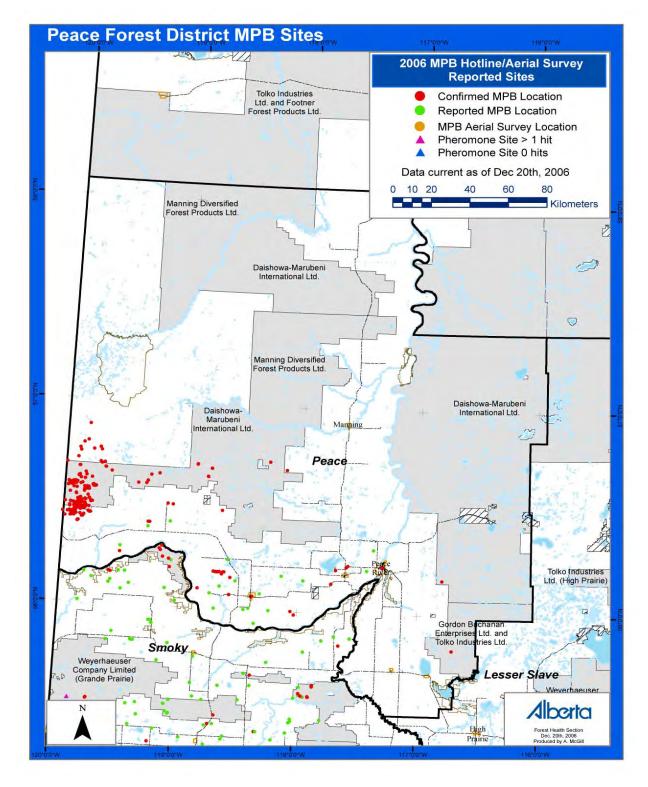


Figure 5-1. Distribution of confirmed and reported mountain pine beetle sites within northwestern Alberta (http://www.srd.gov.ab.ca/forests/health/images/peace_hotline.jpg).

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5.2 Spruce Budworm

The spruce budworm is one of the most important defoliators in the boreal forest in terms of its potential economic impact on the forest industry. The spruce budworm feeds predominantly on the current year's buds and needles but may occasionally consume mature needles. The spruce budworm is indigenous, with a widespread distribution nationally and provincially.

The spruce budworm completes its life cycle within a single year. Eggs hatch in the late summer, producing the first larval stage. The second larval stage move, by wind, to new sites under bark scales. The second larval stage overwinters under the bark in cocoons, emerging in the spring to develop into the third larval stage. These either bore into buds or needles or spin webbing around new shoots and feed on the encased needles. Larval stages continue until mid-June and are responsible for most of the defoliation. At this time, the spruce budworm is 18-24 mm in length with a black head and two rows of paired whitish spots down the back. After the final larval stage, the budworm stops feeding, develops into a pupa and then into a mottled brownish moth. The moths mate, producing eggs that will hatch and develop into larvae prior to winter.

Although white spruce is the preferred host, spruce budworm will also feed on balsam fir and tamarack. Pure white spruce stands may be most susceptible, but mixed conifer and mixed conifer-deciduous stands are also susceptible. Outbreaks usually are initiated in overmature stands but quickly spread to younger stands. Outbreaks recur every 20 to 40 years and can last from 7 to 28 years. Outbreaks can lead to reduced tree growth and vigour. Dead tree tops can result after 4 to 5 years of defoliation and mortality can occur after an additional year or two of damage.

Spruce budworm can be detected by:

- Defoliation of the current year's growth.
- New greenish egg masses found in the fall on the underside of needles; old whitish egg masses on older needles.
- Silken webbing seen in May/June around needles and shoots.
- Rusty brown tree crowns in July, caused by the dead brown needles and pupal cases becoming entangled in silken webbing.

The Province of Alberta developed an 'Integrated Spruce Budworm Management Strategy' (2002) to help address the need for widespread, coordinated efforts in controlling spruce budworm populations. The management program consists of:

- Detection and monitoring of spruce budworm populations,
- Assessment of the consequences of epidemic budworm populations on the land management objectives, and
- Implementation of an action plan to mitigate the impact of epidemic budworm populations on land management objectives.
- Increase budworm tolerance of host stands.
- Reduce population levels through the use of biological control agents.

In 2001, 2002 and 2003, Provincial surveys indicated areas of moderate to severe defoliation caused by spruce budworm in the vicinity of Manning Diversified's FMA Area. The outbreaks were primarily north and northeast of the FMA Area.

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5.3 Spruce Beetle

The spruce beetle belongs to a group of insects commonly referred to as bark beetles. It is in the same genus as the mountain pine beetle.

Spruce beetle occurs at endemic levels throughout Alberta, with outbreaks related to incidents of blowdown, accumulations of debris (e.g., through logging) and damaged standing timber, including fire damaged stems.

The life cycle of the spruce beetle varies between 1 to 3 years depending on location. Within Alberta, the spruce beetle life cycle is completed over a 2 year period. Mature beetles overwinter in the base of trees. In the spring the adults emerge to attack new hosts in May and June. Female beetles tunnel along the wood grain, creating galleries in which they lay their white eggs in mid-summer. Two to four weeks later, the larvae emerge, tunneling under the bark away from the egg gallery. The larvae are white grubs, 3-7 mm in length, with brown heads. The larvae overwinter and then pupate and become adults beetles in the second summer.

Spruce beetle outbreaks can last 2 to 5 years, damaging large-diameter spruce. Larval feeding within the bark can increase incidence of blue stain and other associated fungi, loosens bark and may stop sap flow. Damage cause by spruce beetles and subsequent control is similar to that caused by mountain pine beetle (Section 5.1).

5.4 Large Aspen Tortrix

The large aspen tortrix occurs across Canada and is one of the most serious pests of trembling aspen. The insect causes the leaves to 'roll' using silk threads, forming a feeding shelter.

Yellowish-green larvae emerge from under bark scales and in bark crevices in the spring and begin feeding on foliage. Mature larvae are 1.5 to 2.1 cm in length, are dark green in colour with two rows of black dots and have a black head. By mid June the larvae form pupae, which are normally located within rolled leaves. Adult moths are brownish-grey, with a 2.5 to 3.5 cm wingspan. They emerge in late June through July and mate. Females lay large clusters of eggs on the top surfaces of leaves in July. The larvae hatch about 10 days later, feeding on foliage until early fall and then forming silk shelters for overwintering in bark crevices.

Aspen is the preferred host but the tortrix will also feed on willow, balsam poplar, white birch and choke cherry. Outbreaks of the insect may last 3 to 4 years. Damage is predominantly caused by the later larval stages which may also feed on buds. Massive defoliation can reduce growth increment but rarely results in tree mortality.

Signs of aspen tortrix infestation include:

- Defoliation of aspen and other deciduous species in early summer (April to June)
- Dark green larvae feeding from within rolled leaves
- Black pupal cases within rolled leaves
- Light green egg clusters on leaf surfaces in July.
- In sever infestations, large amounts of spun silk are visible.

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Control measures are not normally taken, since the infestations generally do not last more than 3 or 4 years and tree mortality is not widespread.

From 2001 to 2003 the large aspen tortrix was the predominant aspen defoliator in Alberta. Large portions of northwestern Alberta showed signs of moderate defoliation attributable to this pest in 2001. By 2002, the area affected by this pest continued to increased and in some areas, including the Chinchaga Fire Tower Lookout, the severity increase to 'severe'. Even higher levels of infestation were seen in northwestern Alberta in 2003, although no areas with severe infestations were identified (ASRD 2001, 2002 and 2003).

5.5 Forest Tent Caterpillar

Forest tent caterpillar is generally considered the most serious defoliator of hardwoods in Canada.

The larvae emerge in the spring, as the leaves are emerging. Mature larvae can reach 4.5 to 5.5 cm in length. They are hairy and have very distinctive markings: blue bands, a row of keyhole-shaped white markings and broken orange-brown lines. Larvae continue to feed until mid-June, at which time they form pupae, which are silken cocoons generally formed between two leaves. Adult moths are light brown and have a 3.5 to 4.5 cm wingspan. They emerge in late June through July. Females lay large clusters of eggs in bands around twigs. Young larvae develop inside the eggs before winter but do not hatch until the following spring.

Aspen is the preferred target of tent caterpillar, however, the insect will attack almost any hardwood species during outbreaks. Outbreaks generally last up to 4 years and may reoccur every 10 years. Infestations cause branch dieback and reduce growth increment. Several years of severe defoliation may cause mortality, particularly where trees have additional stress factors.

Signs of forest tent caterpillar infestation include:

- Defoliation of aspen from April to June.
- Egg bands in late summer through early spring
- Hairy, distinctively marked larvae, feeding in large groups (April to June)
- Silken cocoons formed between leaves from late June to early July.

When forest tent caterpillar management outbreaks occur, the following management options exist:

- Aerial surveys of susceptible areas, flown late spring to early summer
- Egg band surveys (fall to spring)
- Application of *Bacillus thuringiensis* var. *kurstake* to control infestations.

In northwestern Alberta, the severity of the large aspen tortrix infestation has overshadowed any damage caused by the forest tent caterpillar (ASRD 2001, 2002 and 2003). Surveys from this period indicate tent caterpillar is present and responsible for some of the damage attributed to the large aspen tortrix (damage caused by the two pests is usually indistinguishable on the basis of aerial surveys). Ground surveys in 2003 indicate the presence of forest tent caterpillar along the Chinchaga River, either in or near MDFP's FMA Area.

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6. Parks, Protected Areas and Recreation Sites

Twin Lakes Provincial Recreation Area is the only park, protected area or recreation site located in or immediately adjacent to Manning Diversified's FMA Area. Notikewin Provincial Park is located in the vicinity of the FMA Area, although it is more than 30 km east of the FMA Area. Chinchaga Wildland Park and Hay-Zama Lakes Wildland Park are located within the region, but not in the immediate vicinity of the FMA Area.

Twin Lakes Provincial Recreation Area is located 65 km north of the town of Manning, just west of highway 35 (see section 9.4 in **FMA Area**). It lies within the north east corner of FMU P6. Twin Lakes Provincial Recreation Area encompasses 5 hectares along the east side of first (eastern) of the two lakes. The Recreation Area offers overnight camping and opportunities for canoeing, fishing, swimming and wildlife viewing. A 3 km looped trail allows access to the second (western) of the two lakes.

Notikewin Provincial Park is located approximately 48 km northeast of Manning (37 km north along highway 35, then 30 km east along secondary highway 692). The Park encompasses approximately 9.7 hectares along the north and east banks of the Peace River. The confluence of the Notikewin and Peace Rivers occurs within the Park boundaries. Notikewin Provincial Park offers overnight camping and provides river access for activities such as power boating, canoeing, fishing, swimming and wildlife viewing.



7. Historical Resources

The Alberta Historical Resources Act (2001) requires that FMA holders include historical resource concerns within the management planning process.

Within Alberta, historical resources are divided into three distinct categories:

- Palaeontological natural features containing evidence of extinct multicellular beings (e.g., fossils and dinosaur bones)
- Archaeological prehistoric and historic cultural artifacts for which no written record exists
- Historical remains relating to the period for which historic documents/records exist, commonly highly visible (e.g., buildings, etc.).

In 2002, Manning Diversified retained Altamira Consulting Ltd. to complete a Historical Resources Management Plan for P06. Unless otherwise indicated, the information presented in this section originated from the Historical Resource Management Plan – Forest Management Unit P6 (Altamira, 2002).

7.1 Inventory

The inventory of historical resources in Alberta, particularly palaeontological and archaeological sites, is very incomplete. Like many resources, the location, extent and significance of historic resources are not well defined.

Typically, palaeontological sites are identified by their relationship to geological formations, which have, in many parts of the province, been inventoried at a relatively broad scale.

Archaeological sites are more difficult to inventory because they not restricted to a particular geological or biological feature. However, archaeological sites occur more often in certain environmental conditions, such as along rivers and lakes, in sheltered southern exposures, etc.

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Historic sites on the other hand, have the advantage of being documented and generally visible, making inventory relatively straightforward.

Table 7-1 provides a summary of the known palaeontologically sensitive areas within P6, based on the Palaeontological Resources Sensitivity Zones Map (Tyrell Museum of Paleontology 1984).

Table 7-1. List of Sensitive Areas for palaeontological resources in P6 (based on Palaeontological Resources Sensitivity Zones Map (Tyrell Museum of Palaeontology 1984)).

Meridian	Township	Range	Sections	Rating
5	91	25	22-23 and 27-29	High
6	91	1	19-22, 25-27 and 30	High
6	91	2	16-17 and 21-25	High
6	91	3	13, 22-24 and 27-32	High
5	96	2	35	Low
5	96	3	36	Low
5	97	2	28-29	Medium

According to the work completed by Altamira, there are no known archaeological sites within FMU P6 and very few known sites in the surrounding region. The lack of regional data makes it difficult to calibrate predictive models that are often used to predict the occurrence of archaeological sites. Instead, Altamira relied on a small number of descriptors that generally have high correlations with archaeological resources (e.g., proximity to water, slope, drainage, proximity to open meadows, etc.). Results of the predictive model indicate archaeological potential is limited in P6 (predictive results are provided in Altimira 2002).

Table 7-2 provides a summary of historic sites identified within FMU P6, based on information from the Provincial Historic Resources database. There are no sites listed within FMU P9 within the database.

Table 7-2. Summary of Historic Sites within FMU P6.

Site Name	Legal Description	Comment
Chinchaga Tower	15-36-93-3-W6M	Lookout
Battle River Tower	17-20-94-23-W5M	Lookout
Twin Lakes Campsite	NE1/4 of 9-29-97-22-W5M	

Use of predictive modeling by Altimira (2002) suggested limited potential conflict between forestry operations and historic resources, since the model suggests only portions of P6 adjacent to major water sources or in elevated geographic situations hold potential for historic resources.

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8. References

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Appendix I Wildlife Tracked by ANHIC That Potentially Occur Within the FMA Area



Key to Rank

- S1/G1 Five or fewer occurrences or only a few remaining individuals. May be especially vulnerable to extirpation because of some factor of its biology.
- S2/G2 Six to 20 or fewer occurrences or with many individuals in fewer locations. May be especially vulnerable to extirpation because of some factor of its biology
- S3/G3 Twenty-one to 100 occurrences. May be rare and local throughout it's range, or in a restricted range (may be abundant in some locations). May be susceptible to extirpation because of large scale disturbances.
- U Status uncertain, often because of low search effort or cryptic nature of the element. Possibly in peril. Unrankable. More information needed.





Appendix II Wildlife Listed by COSEWIC or Alberta That Potentially Occur Within the FMA Area



Key to ASRD Status

- At Risk Any species known to be at risk after formal detailed status assessment and designation as Endangered or Threatened in Alberta.
- May Be At Risk Any species that may be at risk of extinction or extirpation, and is therefore a candidate for detailed risk assessment.
- Sensitive Any species that is not at risk of extinction or extirpation but may require special attention or protection to prevent it from becoming at risk.

COSEWIC Endangered, Threatened or Special Concern

			Occurrence in	1
COSEWIC Status	S Common name	Scientific name	FMA Area	ASRD Status
Endangered	No endangered species ran	ge into the FMA Area		
Threatened	Woodland Caribou, Boreal pop.	Rangifer tarandus caribou	Yes	At risk
Special Concern	Grizzly Bear, northwest population	Ursus arctos	Yes	May be at risk
	Wolverine	Gulo gulo	Yes	May be at risk
	Western Toad	Bufo boreas	Unknown	Sensitive

Species highlited indicate these species were considered during the FMP development.

Provincial (from Schedule 6 of Wildlife Regulation)

Endangered

None within FMA Area

Threatened

Rangifer tarandus caribou (Woodland Caribou) – see COSEWIC list (previous page) Cygnus buccinator (Trumpeter Swan) – see Provincial list (next page)



Provincial (from Alberta Sustainable Resource Development)

			Occurrence i	n
COSEWIC Status	6 Common name	Scientific name	FMA Area	ASRD Status
Not At Risk or Not				
Listed	Fischer	Martes pennanti	Yes	Sensitive
	Lynx	Lynx canadensis	Yes	Sensitive
	Northern Myotis Bat	Myotis septentrionalis	Unknown	May be at risk
	REPTILES AND AMPHIBIAN	IS .		·
	None			
	FISH			
	Arctic Grayling	Thymallus arcticus	Yes	Sensitive
	Largescale Sucker	Catostomus macrocheilus	Unknown	Sensitive
	Northern Pikeminnow	Ptychcheilus oregonensis	Yes	Sensitive
	Northern Redbelly Dace	Phoxinus eos	Yes	Sensitive
	Spoonhead Sculpin	Cottus ricei	Yes	May be at risk
	BUTTERFLIES			,
	Old World Swallowtail	Papilio machaon	Yes	Sensitive
	PLANTS	1		
	Alaskan Orchid	Piperia unalascensis	Unknown	Sensitive
	Bog Adder's Mouth	Malaxis paludosa	Unknown	May be at risl
	Gastony's Cliff-Brake	Pellaea gastonyi	Unknown	May be at risl
	Mountain Bladder Fern	Cystopteris montana	Unknown	May be at risl
	Northern Beech Fern	Phegopteris connectilis	Unknown	May be at risl
	Northern Moonwort	Botrychium pinnatum	Unknown	Sensitive
	Slender Rock-Brake	Cryptogramma stellari	Unknown	May be at risl
	Smooth Cliff-Brake	Pellaea glabella	Unknown	Sensitive
	Smooth Cliff Fern	Woodsia glabella	Unknown	May be at risl
	Spotted Coral-Root	Corallorhiza maculata	Unknown	Sensitive
	Striped Coral-Root	Corallorhiza striata	Unknown	Sensitive
	Yellow Lady's Slipper	Cypripedium parviflorum	Unknown	Sensitive
	White Adder's Mouth	Malaxis brachypoda	Unknown	May be at risl
	White Bog Orchid	Platanthera dilatata	Unknown	Sensitive
	BIRDS			
	American Bittern	Botaurus lentignosus	Yes	Sensitive
	Bald Eagle	Haliaeetus leucocephalus	Yes	Sensitive
	Barred Owl	Strix varia	Unknown	Sensitive
	Bay Breasted Warbler	Dendroica castanea	Yes	Sensitive
	Black-backed Woodpecker	Picoides arcticus	Unknown	Sensitive
	Blackburnian Warbler	Dendroica fusca	Yes	Sensitive
	Black Tern	Chlidonias niger	Yes	Sensitive
	Black-throated Green Warbler	Dendroica virens	Yes	Sensitive
	Canada Warbler	Wilsonia canadensis	Yes	Sensitive
	Cape May Warbler	Dendroica tigrina	Yes	Sensitive



			Occurrence in	
COSEWIC Status	Common name	Scientific name	FMA Area	ASRD Status
Not At Risk or Not	BIRDS (cont.)			
Listed	Common Nighthawk	Chordeiles minor	Yes	Sensitive
	Forster's Tern	Sterna forsteri	Unknown	Sensitive
	Golden Eagle	Aquila chrysaetos	Yes	Sensitive
	Great Blue Herron	Ardea herodias	Unknown	Sensitive
	Great Grey Owl	Strix nebulosa	Yes	Sensitive
	Horned Grebe	Podiceps auritus	Yes	Sensitive
	Northern Goshawk	Accipiter gentilis	Yes	Sensitive
	Northern Pygmy Owl	Glaucidium gnoma	Unknown	Sensitive
	Osprey	Pandion haliaetus	Yes	Sensitive
	Pied-Billed Grebe	Podilymbus podiceps	Yes	Sensitive
	Pileated Woodpecker	Dryocopus pileatus	Yes	Sensitive
	Sandhill Crane	Grus canadensis	Yes	Sensitive
	Sharp-Tailed Grouse	Tympanuchus phasianellus	Yes	Sensitive
	Trumpeter Swan	Cygnus buccinator	Yes	At risk
	Western Grebe	Aechmophorus occidentalis	Yes	Sensitive
	Western Tanager	Piranga ludoviciana	Yes	Sensitive
	White-Winged Scoter	Melanitta fusca	Yes	Sensitive

Species highlited indicate these species were considered during the FMP development.

Range within MDFP FMA was determined by using the SRD website, Alberta Bird Atlas, Northern Watershed Project (Report #2), http://www.osrbg.ca/orchid_native.html, http://bna.birds.cornell.edu/BNA/

Note that his table excludes species listed in the COSEWIC table or as Endangered or Threatened under the Wildlife Act/Regulation.



Appendix III Community Characterization Abstracts



2006-11-30

CEAB000043

Populus balsamifera / Viburnum opulus / Matteuccia struthiopteris balsam poplar / high-bush cranberry / ostrich fern

Classification Comments	- type based on brief verbal description (U98ALL01ABCA) but detailed information is lacking.
	 unclear if Populus balsamifera / Matteuccia struthiopteris with Viburnum opulus should be lumped with stands lacking Viburnum opulus, or if they should be considered separte types.
	- there may also be a similar birch-dominated type in AB, but it is not well documented.
Natural Region(s)	- Boreal Forest
Natural Subregion(s)	- Dry and Central Mixedwood may exend into the Lower Boreal Highlands.
Additional Distribution Comment	- reported from Glory Hills, Beaverhill Lake, also Gregoire L., Battle L., Slave L. area also may occur in the Ft. McMurray area.
Landform(s)	reported on pitted moraine and glaciofluvial outwash.possibly riparian sites.
Environmental Determinants	- moist, nutrient-rich soils, often associated with seepage areas on hillsides and in depressions.
Summary of Environmental Factors	 seepage areas on hillsides and in depressions with moist, nutrient-rich soils. on pitted moraine and glaciofluvial outwash. suitable habitat may also occur in riparian areas.
Vegetation Layers Present	- tree, shrub and herb layers.
Abundant Species per Layer	- Populus balsamifera dominates the tree layer.
	 Matteuccia struthiopteris is clearly the understory dominant. due to sketchy information, cover or constancy of Viburnum opulus unclear.
Subtypes Recognized in Province	- Viburnum opulus seems to be missing from the occurrences in the Ft. McMurray area. These may represent a seperate type, found in riparian rather than seepage areas.
	- similar communities with Betula dominant in the tree canopy, rather than Populus, have also been reported.
Additional Comments	- originally listed as Betula papyrifera / Viburnum opulus / Matteuccia struthiopteris in U98ALL02ABCA but tree species was recorded in error.

Related_Name	Relationship	Reference
Betula papyrifera / Viburnum opulus / Matteuccia struthiopteris	- equivalent	U98ALL02ABCA

Reference Code	Author	Year	Title	Publisher
U98ALL01ABCA	L. Allen	1998	Notes from 1998 Plant Community Tracking List meeting.	On file with ANHIC
U98ALL02ABCA	Allen, Lorna.	1998	Alberta Natural Heritage Information Centre 1998 Preliminary Plant Community Tracking List.	



2006-11-30

CEAB000044

Populus tremuloides / Rubus parviflorus / Aralia nudicaulis aspen / thimbleberry / wild sarsaparilla

Classification Comments	- this community is defined by an open to closed deciduous canopy clearly dominated by Populus tremuloides, a well-developed low shrub layer with Rubus parviflorus clearly dominant and a high cover of Aralia nudicaulis in the forb layer. - other species such as Populus balsamifera, or more infrequently, Betula papyrifera, may be present in the tree layer.
	- there may be a tall shrub understory of Alnus sp. (different researchers have reported either A. cripsa or A. tenuifolia), but it may also be essentially absent.
Natural Region(s)	- Boreal Forest - Foothills
Natural Subregion(s)	- Central Mixedwood - Lower Foothills
Present and Historic Range	- primarily a community found in the western part of the Central Mixedwood, possibly into the Dry Mixedwood does extend into the Lower Foothills.
Additional Distribution Comment	- reported from the slopes of the Smokey River, Whitecourt Mountain, House Mountain may occur in Jasper National Park.
Minimum Elevation	- 765 m
Maximum Elevation	- 900 m
Landform(s)	- slopes of variable origin, including glaciofluvial and morainal.
Topographic Position	- likely mid to lower slopes
Range of Slope	- level to moderate
3	- 0 to 5% (N00LAN01ABCA); up to 16% slope (N84ALB01ABCA)
Range of Aspect	- variable (N84ALB01ABCA) but most commonly northerly (N00LAN01ABCA)
Soil Type	- Brunisolic Gray Luvisol, Eluviated Eutric Brunisol
Soil Moisture	- mesic to subhygric moderately well to well drained.
Additional Soil Comments	mesotrophic to permesotrophic nutrient regime.soils have a moderately fine to coarse textured B horizon.
Hydrologic Influences	 - there is often a layer of reduced permeability in the soil profile that restricts drainage and channels seepage. - short duration seepage likely occurs during heavy rainfall.
Environmental Determinants	 level to moderate slopes, often associated with seepage areas. there is often a layer of reduced permeability in the soil profile that restricts drainage and channels seepage.
Summary of Environmental Factors	- found on level to moderate (up to 16%) slopes of variable aspect, but predominently northerly soils are mesic to subhygric moderately well to well drained Brunisolic Gray
	Luvisols and Eluviated Eutric Brunisols. - this community is often associated with seepage areas related to a layer of reduced permeability in the soil profile that restricts drainage and channels seepage (N84ALB01ABCA). - short duration seepage likely occurs during heavy rainfall.
Vegetation Layers Present	- tree, tall shrub, low shrub, forb, bryoid.
Percent Cover by Layer	- tree 25 to 60%. - tall shrub 0 to 25% - low shrub 30 to 80%. - forb 30 to 70%. - bryoid 0 to 2%



2006-11-30

CEAB000044

Populus tremuloides / Rubus parviflorus / Aralia nudicaulis aspen / thimbleberry / wild sarsaparilla

Abundant Species per Layer	- Populus tremuloides is the dominant tree (15 to 40% cover), but P. balsamifera is a significant component of some stands Alnus sp. is the main tall shrub.
	- Rubus parviflorus with up to 80% cover dominates the well-developed low shrub layer.
	- Arailia nudicaulis is usually the dominant herb, but Epilobium angustifolium is sometimes co-dominant.
Species Found in F	. Brachythecium salebrosum is usually present in low cover.
Species Found in Every Occurrence	- Populus tremuloides, Rubus parviflorus, Rosa acicularis, Alnus sp., Viburnum edule, Arailia nudicaulis, Lathyrus ochroleucus (n = 6).
Vegetation Summary	- Populus tremuloides is dominant, but P. balsamifera is a significant component of some stands
	- Rubus parviflorus dominates the well-developed low shrub layer (from 10 to 60% cover)
	 Viburnum edule is usually present, often in significant amounts (up to 20% cover) Rosa acicularis is also usually present
	 Alnus sp, forms a significant taller shrub layer in some stands (up to 20% cover) - there is a high forb cover of species indicating nutrient-rich conditions, but low cover of grass or moss
	- Aralia nudicaulis is usually the dominant herb, but Epilobium angustifolium is sometimes co-dominant
	- Aster conspicuous and Lathyrus ochroleucus are usually present although with low cover
Variability - Species Composition	 Populus balsamifera is a significant component of some stands (up to 5% cover). Arailia nudicaulis is usually the dominant herb, but Epilobium angustifolium is sometimes co-dominant.
Variability - Structure & Pattern	- there may be a significant taller shrub layer in some stands (up to 20% cover) dominated by Alnus sp., but the tall shrub layer may be absent.
	- the bryoid layer is always sparse, but may be absent in some stands.
Storage Location of Data Used	- plots in ESIS database
Additional Comments	 studies in northeastern British Columbia concluded that aspen understory composition is "more influenced by climate and nutrient and moisture availability than light availability" (J04CHE01ABCA).

Similar_Association	Notes
Populus tremuloides / Amelanchier alnifolia / Heracleum lanatum (C60 in N97ACH01ABCA)	A southern type, separated from CEAB000044 by having more Amelanchier alnifolia and with an understory dominated by Heracleum lanatum.
Populus tremuloides / Rubus parviflorus (CEAB000078)	A southwest AB type with similar dominants, but lacking associated species, such as Viburnum edule & Alnus crispa in the shrub layer or Aralia nudicaulis.
Populus tremuloides / Rubus parviflorus Forest (CEGL000602)	Ranked G2 and noted from ID, UT, WY (Natureserve 2003). Likely more similar to CEAB000078 than this type.

Related_Name	Relationship	Reference
Populus tremuloides / Rubus parviflorus (e13)	- equivalent	N00LAN01ABCA



2006-11-30

CEAB000044

Populus tremuloides / Rubus parviflorus / Aralia nudicaulis aspen / thimbleberry / wild sarsaparilla

Reference Code	Author	Year	Title	Publisher
J04CHE01ABCA	Chen, H.Y.H., S. Legare, and Y. Bergeron	2004	Variation of the understory composition and diversity along a gradient of productivity in Populus tremuloides stands of northern British Columbia, Canada.	Can. J. Bot. 82: 1314-1323 (2004).
N00LAN01ABCA	Lane, C., M. Willoughby and M. Alexander & Rangeland Health Assessment Project	2000	Range Plant Community Types and Carrying Capacity for the Lower Foothills Subregion, Third Approximation	Alberta Environment and Alberta Agriculture, Food and Rural Development
N84ALB01ABCA	Alberta Energy and Natural Resources.	1984	Integrated Resource Inventory of the Deep Basin Study Area, Vol. II Vegetation Classification	Alberta Energy and Natural Resources. Edmonton, Alberta. 111 pp. + appendices.
N97ACH01ABCA	Achuff, PL, R.L. McNeil, M.L. Coleman	1997	Ecological Land Classification of Waterton Lakes National Park, Alberta. Soil and Vegetation Resources	National Parks Service
NNDNAT01ABCA	NatureServe.		NatureServe Explorer: An online encyclopedia of life [web application] http://www.natureserve.org/explorer. Year accessed included in citation.	Arlington, Virginia

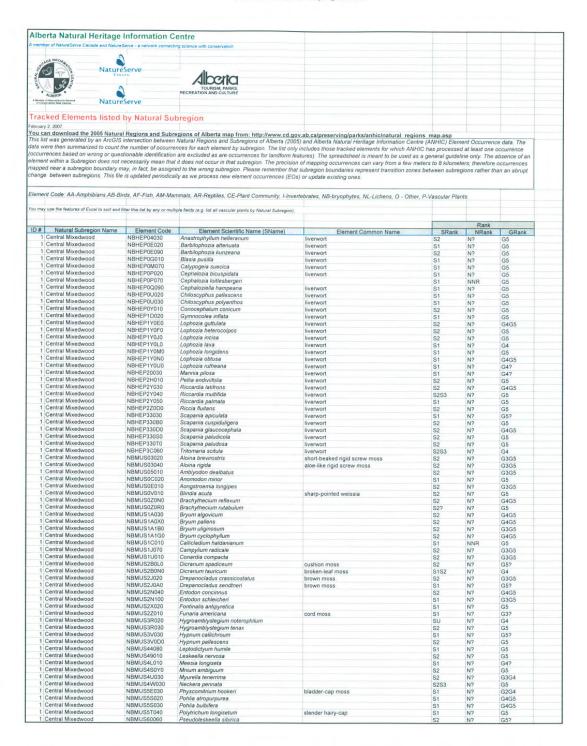


Appendix IV Plant Species Tracked by ANHIC That Potentially Occur Within the FMA Area



Key to Rank

- S1/G1 Five or fewer occurrences or only a few remaining individuals. May be especially vulnerable to extirpation because of some factor of its biology.
- S2/G2 Six to 20 or fewer occurrences or with many individuals in fewer locations. May be especially vulnerable to extirpation because of some factor of its biology
- S3/G3 Twenty-one to 100 occurrences. May be rare and local throughout it's range, or in a restricted range (may be abundant in some locations). May be susceptible to extirpation because of large scale disturbances.
- U Status uncertain, often because of low search effort or cryptic nature of the element. Possibly in peril. Unrankable. More information needed.



	NBMUS6B0D0					
1 Central Mixedwood 1 Central Mixedwood	NBMUS6B0D0	Racomitrium microcarpon		S1?	N3	GNRQ
1 Central Mixedwood	NBMUS6F020 NBMUS6X010	Rhodobryum ontariense		S2	N?	G5
1 Central Mixedwood	NBMUS6Z040	Seligeria calcarea	chalk brittle moss	S1	N?	G4?
1 Central Mixedwood	NBMUS6Z040	Sphagnum balticum	peat moss	S1	N?	G2G4
1 Central Mixedwood 1 Central Mixedwood	NBMUS6Z0A0 NBMUS6Z0K0	Sphagnum fimbriatum	fringed bog moss	S2	N?	G5
1 Central Mixedwood		Sphagnum lindbergii	Lindberg's bog moss	S2	N?	G5?
	NBMUS6Z1T0	Sphagnum contortum	twisted bog moss	S2	N?	G5
1 Central Mixedwood	NBMUS6Z230	Sphagnum fallax	peat moss	S2	N?	G5
1 Central Mixedwood	NBMUS71010	Splachnum ampullaceum	flagon-fruited splachnum	S2	N?	G5
1 Central Mixedwood	NBMUS71020	Splachnum luteum	yellow collar moss	S3	N?	G3
1 Central Mixedwood	NBMUS71040	Splachnum rubrum	red collar moss	S3	N?	G3
1 Central Mixedwood	NBMUS71050	Splachnum sphaericum	globe-fruited splachnum	S2	N?	G3G5
1 Central Mixedwood	NBMUS71060	Splachnum vasculosum	large-fruited splachnum	S2	N?	G3G5
1 Central Mixedwood	NBMUS79050	Spiacinium vascuiosum	large-truited sprachnum	52	N?	
1 Central Mixedwood	NBMUS7F0A0	Tayloria serrata	slender splachnum	52	N?	G4
		Thuidium philibertii		S1S2	N?	G5
1 Central Mixedwood	NBMUS7X020	Weissia controversa	green-cushioned weissia	S2	N?	G5
1 Central Mixedwood	NBMUS7Z050	Zygodon viridissimus		S1	N?	G5
1 Central Mixedwood	NBMUS81080	Plagiomnium rostratum		S1	N?	G5
1 Central Mixedwood	NBMUS88070	Warnstorfia tundrae	brown moss	S2	N?	GU
1 Central Mixedwood	NBMUS88080	Warnstorfia pseudostraminea	brown moss	S1	N?	G3
1 Central Mixedwood	NBMUS8F010	Bryobrittonia longipes	0.0111111000	S2	N3	G3
1 Central Mixedwood	NBMUS93020	Limprichtia cossonii		SU	N?	GU
1 Central Mixedwood	NBMUS95010	Cabindidium assassinii		50	197	
1 Central Mixedwood		Schistidium agassizii	elf bloom moss	S1	N?	G3G5
	NBMUS9N010	Pseudobryum cinclidioides		52	N?	G5
1 Central Mixedwood	NBMUS9Q080	Rhizomnium magnifolium		S2	N?	G4G5
1 Central Mixedwood	NLCAL46120	Cyphelium tigillare		S2	N?	G5
1 Central Mixedwood	NLLEC35010	Cladina portentosa		S1	N?	GNR
1 Central Mixedwood	NLLEC3S100	Ramalina farinacea		S2S3	N?	G3G5
1 Central Mixedwood	NLLEC3S150	Ramalina intermedia		S1	N?	G4G5
1 Central Mixedwood	NLLEC3S150 NLLEC3S210	Ramalina intermedia Ramalina obtusata		01	N?	G4G5 G5?
1 Central Mixedwood	NLLEC3S210 NLLEC3S290			S2		
		Ramalina sinensis		SU	NR	G4G5
1 Central Mixedwood	NLSPH52170	Dermatocarpon moulinsii		S2	N?	GNR
1 Central Mixedwood	NLT0002340	Arthonia patellulata		S3?	N?	G5
1 Central Mixedwood	NLT0003960	Bacidia bagliettoana		S2	N?	G5
1 Central Mixedwood	NLT0004870	Biatora vernalis		S2	N?	G5?
1 Central Mixedwood	NLT0005720	Calicium trabinellum		S2	N?	G3G4
1 Central Mixedwood	NLT0003720	Cladonia cyanipes		S2	N?	GNR
1 Central Mixedwood	NLT0008590	Cladesia manuali de		02		GNR
		Cladonia macrophylla		52	N?	
1 Central Mixedwood	NLT0008800	Cladonia ramulosa		S1	N?	G5?
1 Central Mixedwood	NLT0008830	Cladonia rei		S2	N?	G3G5
1 Central Mixedwood	NLT0008910	Cladonia stricta		SU	N?	GNR
1 Central Mixedwood	NLT0009020	Cladonia umbricola		S1	N?	G3G5
1 Central Mixedwood	NLT0010860	Flavopunctelia soredica		S2	N?	G3G5
1 Central Mixedwood	NLT0012210	Heterodermia speciosa		S2	N?	G5?
1 Central Mixedwood	NLT0012340	Hypocenomyce friesii		S2	N?	G3G5
1 Central Mixedwood	NLT0012560	Imshaugia placorodia		S2	N?	G3G5
1 Central Mixedwood	NLT0012890	Lecania dubitans		S2	N?	G47
1 Central Mixedwood	NLT0013350	Lecanora cateilea		S2	N?	GNR
1 Central Mixedwood	NLT0016420	Lepraria incana		S2	N?	GNR
1 Central Mixedwood	NLT0017840	Melanelia fuliginosa		S1	N?	G5
1 Central Mixedwood	NLT0017890	Melanelia infumata		S2S3	N?	GNR
1 Central Mixedwood	NLT0017900	Melanelia multispora		S2?	N?	G5?
		Meiariella munispora		321	147	
1 Central Mixedwood	NLT0017910	Melanelia olivacea		S1	N?	G3G5
1 Central Mixedwood	NLT0017930	Melanelia panniformis		S1	N?	G4G5
1 Central Mixedwood	NLT0018810	Mycobilimbia sabuletorum		S2	N?	G4G5
1 Central Mixedwood	NLT0018830	Mycoblastus affinis		S2	N?	G3G5
1 Central Mixedwood	NLT0018970	Mycocalicium subtile		S2	N?	G3G4
1 Central Mixedwood	NLT0019520	Nephroma bellum		S2	N?	G3G5
1 Central Mixedwood	NLT0021150	Peltigera polydactyla		S1S2	N?	G5?
1 Central Mixedwood	NLT0021150	Physconia enteroxantha		S12	N?	G3G5
	NL 10022000	Priyaconia enteroxantna		017	N?	G5
1 Central Mixedwood	NLT0022930	Placynthiella uliginosa		S2		
1 Central Mixedwood	NLT0025200	Ramalina calicaris		S1?	N?	GNR
1 Central Mixedwood	NLT0025270	Ramalina dilacerata		S2	N?	G3G5
1 Central Mixedwood	NLT0025410	Ramalina roesleri		S2S3	N?	G3G5
1 Central Mixedwood	NLT0028030	Solorina spongiosa		S2	N?	G3G5
1 Central Mixedwood	NLT0030290	Umbilicaria muehlenbergii		S2	N?	G5
1 Central Mixedwood	NLT0030230	Xanthoria fulva		S1	N?	G5
1 Central Mixedwood	NLTES10620	Stereocaulon condensatum		S1	N?	G4
1 Central Mixedwood	NLIES 10020	Stereocation condensatum		CNID	N?	G3G4
1 Central Mixedwood	NLTES10950	Pannaria conoplea		SNR		G3G4 G4?
1 Central Mixedwood	NLTES11290	Phaeophyscia adiastola		S1	N?	
1 Central Mixedwood	NLTES11410	Phaeophyscia nigricans		S2	N?	G4
1 Central Mixedwood	NLTES11590	Physcia dimidiata		S1	N?	G5?
1 Central Mixedwood	NLTES11740	Physcia tenella		S2	N?	G4
1 Central Mixedwood	NLTEST5030	Peltigera collina		S1	N?	G3G4
1 Central Mixedwood	NLTEST5070	Peltigera evansiana		S2S3	N?	G4
1 Central Mixedwood	NLTEST5080	Peltigera horizontalis		S1S2	N?	G4 G5
1 Central Mixedwood	NI TECTESON	Popoia nadvomikiasa	old man's heard		N?	G3G5
1 Central Mixedwood	NLTEST5380	Bryoria nadvomikiana	old man's beard	S2	N?	G3G5
1 Central Mixedwood	NLTEST5450	Bryoria simplicior	old man's beard	S2S3		
1 Central Mixedwood	NLTEST5510	Bryoria trichodes	old man's beard	SU	N?	G3G5
1 Central Mixedwood	NLTEST5970	Cladonia bacilliformis		S2S3	N3	G4G5
1 Central Mixedwood	NLTEST5990	Cladonia bellidiflora		S2S3	N?	G5
1 Central Mixedwood	NLTEST6880	Cladonia squamosa		S2	N?	G5
1 Central Mixedwood	NLTEST8170	Baeomyces rufus		S2	N?	G5?
1 Central Mixedwood	PDAST0S1Q0	Artemisia tilesii	Herriot's sagewort	S2	N?	G5
1 Central Mixedwood	PDAST0T5G0	Aster x maccallae	. rentre sugeriori	S1S2	N?	GNA
1 Control Mixed Control	DDV6220110	Function manufacture	continued from pure control	S1S2	N5	G5
1 Central Mixedwood	PDAST3P140	Eupatorium maculatum	spotted Joe-pye weed			G5 G5
1 Central Mixedwood	PDAST5F010	Lactuca biennis	tall blue lettuce	S2	N?	
1 Central Mixedwood	PDASTEH020	Aster umbellatus	flat-topped white aster	S2	N?	G5
1 Central Mixedwood	PDBRA05020	Arabidopsis salsuginea	mouse-ear cress	S1	N?	G4G5
1 Central Mixedwood	PDBRA0K0Z0	Cardamine pratensis	meadow bitter cress	S2	N5	G5
1 Central Mixedwood	PDCAM02030	Campanula aparinoides	marsh beliflower	S1	N?	G5
1 Central Mixedwood	PDCAR0W0D0	Spergularia salina	salt-marsh sand spurry	S2	N52	G5
1 Control Mixedwood	DDCAROVODC	Ctellaria origan	satisfied of spurity	02	N3	G5
1 Central Mixedwood	PDCAR0X0B0	Stellaria crispa	wavy-leaved chickweed	S2	N?	G5
1 Central Mixedwood	PDCLU03120	Hypericum majus	large Canada St. John's-wort	S2		
1 Central Mixedwood	PDDRO02060	Drosera linearis	slender-leaved sundew	S2	N4	G4
	PDELT02090	Elatine triandra	waterwort	S1	N?	G5
1 Central Mixedwood						
1 Central Mixedwood 1 Central Mixedwood	PDFAB0F1C0	Astragalus bodinii	Bodin's milk vetch	S1	N?	G4 G3G5T3T5

1 Central Mixedwood PDER02070 [Central mixedwood] PDLAM10050 [Physosotegic addroglamani] false dragonhead] 1 Central Mixedwood PDLAM10050 [Physosotegic addroglamani] false dragonhead] 1 Central Mixedwood PDLAM10050 [Physosotegic addroglamani] false dragonhead] 2 Central Mixedwood PDLAM10050 [Physosotegic addroglamani] false dragonhead] 3 Central Mixedwood PDLAM10050 [PDLAM10050]	\$2 \$2 \$2 \$1 \$1 \$1 \$1 \$1 \$2 \$2 \$2 \$2 \$2 \$3 \$3 \$3 \$3 \$3 \$3 \$3 \$3 \$3 \$3 \$3 \$3 \$3	alse dragonhead initesap \$2	false dragonhead S2 N3? G3? pinesap S2 N7 G5 white water-tily S1 N5 G5 white water-tily S1 N5 G5 willowherb S1 N2? G5 willowherb S2 N7 G5 millowherb
1 Central Mixedwood PDM/MOS032 Montropa hypopathys pinesag white water-lily PDM/MOS03 PDM/MOS030 Nymphaes leitergrai white water-lily pygrny water-lily pygr	92 91 91 91 91 91 92 92 93 94 95 95 95 96 96 97 97 97 97 97 97 97 97 97 97 97 97 97	sinesap S2 white water-lily S1 sygmy water-lily S1 willowherb S1 sill willowherb S2 sill willowherb S2 singed milkwort S1 sea-side plantain S1 sranched cinquefoil S1 ong-leaved bluets S2 sita willow S1 sacks will will will will will willow S2 sacks adde S2 sack adde S2 sand adde S2 surv-fould adde S1	pinesap white water-filly fringed mikewort sea-side plantain S1 N7 G5 side water-fill branched cinquefoil S1 N7 G5 side willow S1 N7 G5 side willow S1 N7 G5 side willow S1 N7 G5 side water-fill golden saxifrage S3 N3 G3 green saxifrage S3 N3 G3 green saxifrage S3 N7 G5 browned sedge S1 N7 G5 sadded sedge S2 N7 G4 Hudson Bay sedge S2 N7 G4 sand sedge S2 N7 G5 slakes to sedge S2 N7 G5 stalked sedge S1 N7 G5 stalked sedge S2 N7 G5 stalked sedge S1 N7 G5 stalked sedge S1 N7 G5 stalked sedge S1 N7 G5 stalked sedge S2 N7 G5 stalked sedge S1 N7 G5 stalked sedge S2 N7 G5 stalked s
1 Central Mixedwood PDNYM05980 Ayrmphaea tetragona white water-lily PDNYM05910 Ayrmphaea tetragona processor of the political pro	\$1 \$1 \$1 \$1 \$2 \$2 \$1 \$1 \$1 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2	white water-lily yogny water-lily yogny water-lily willowherb S1 willowherb S2 ringed milkwort S2 ringed milkwort S3 xea-side plantain S1 xanched cinquefoil S2 xilka willow S1 xilka willow S2 xilka willow S3 xilka willow S1 xilka willow S1 xilka willow S2 xilka willow S3 xilka	white water-lily pygnry water-lily si
Central Mixedwood PiDNYM050E0 Nymphaea tetragona white water-lily pprigry water-lily Central Mixedwood PiDNYM050E0 Spibibium haileanum willowherb willowherb willowherb piDNAM050E0 Epibibium haileanum willowherb willowherb willowherb piDNAM050E0 Epibibium haileanum willowherb willowherb piDNAM050E0 Epibibium haileanum willowherb willowherb piDNAM050E0 Epibibium haileanum willowherb piDNAM050E0 Epibibium haileanum willowherb piDNAM050E0	S1 S2 S2 S2 S2 S2 S2 S2	white water-lily yogny water-lily yogny water-lily willowherb S1 willowherb S2 ringed milkwort S2 ringed milkwort S3 xea-side plantain S1 xanched cinquefoil S2 xilka willow S1 xilka willow S2 xilka willow S3 xilka willow S1 xilka willow S1 xilka willow S2 xilka willow S3 xilka	white water-lily pygmy water-lily s1
Central Mixedwood PDNYM050J0 Nymphaea leibergii pygmy vater-liy villowherb Central Mixedwood PDONA060D0 Epilobium lacifilorum willowherb Central Mixedwood PDONA060D0 Epilobium lacifilorum willowherb central Mixedwood PDNS020U0 Pilartago maritima sea-side plantalin Polygala paucifolia firinged miliword sea-side plantalin Polygala paucifolia tringed miliword sea-side plantalin Polygala paucifolia tringed miliword sea-side plantalin Polentilia munified branched cinquefoli Central Mixedwood PDRUBITIDEO Hetyotis longifolia tong-leaved bluets Sikk willow PDRUBITIDEO Hetyotis longifolia tong-leaved bluets Sikk willow PDRUBITIDEO PDSA070730 Saria scitchensis Sikk willow pilcher-plant dividensis Sikk willow PDSA070750 Sariacenia purpurea pilcher-plant dividensis Sikk willow PDSA070750 Chrysosphenium tetrandrum green saxifrage central Mixedwood PDSAX07050 Chrysosphenium tetrandrum green saxifrage Central Mixedwood PDSA070750 Chrysosphenium tetrandrum green saxifrage Central Mixedwood PMCYP03070 Carex acrta tongo Carex heleonastes Hudson Bay sedge Central Mixedwood PMCYP03050 Carex heleonastes Hudson Bay sedge Central Mixedwood PMCYP03050 Carex heleonastes Hudson Bay sedge Carex heleonastes Carex heleonastes Carex heleonastes Carex heleonastes Carex heleonastes Carex	S1 S2 S2 S2 S2 S2 S2 S2	Dygmy water-lily \$1 Illimitowherb \$1 Still willowherb \$2 Initinged milliwort \$2 sea-side plantain \$1 ranched cinquefoil \$1 ong-leaved bluets \$2 Sita willow \$1 bits willow \$2 bits willow<	pygnry water-lily S1
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Central Mixedwood PDFR020180 Pipsyale paucifolia fringed milkwort Central Mixedwood PDR0518110 Pinstago marilima sea-side plantain Drawswood PDR0518110 Pinstago marilima Sea-side plantain Drawswood PDR08181106 Hedyolis (singifolia long-leaved bluets Sista willow PDR081706 Pinstago marilima Sista willow Drawswood PDSAR02070 Sarracenia purpurea pitcher-plant Central Mixedwood PDSAR02070 Central Mixedwood PDSAR07030 Chrysosplenium iowense golden saxifrage PDSAR07050 Chrysosplenium tetrandum green saxifrage Green saxif	\$1 \$1 \$1 \$1 \$2 \$2 \$3 \$3 \$3 \$2 \$2 \$4 \$5 \$5 \$6 \$6 \$6 \$6 \$6 \$6 \$6 \$6 \$6 \$6 \$6 \$6 \$6	ringed milkwort sea-side plantain stanched cinquefoil oranched cinquefoil oranched cinquefoil stanched cinquefoil stanched cinquefoil stanched cinquefoil stanched cinquefoil stanched	Fringed milkwort S1
Central Mixedwood POFL030100 Pintango maritima sea-sicie plantain	S1 S1 S2 S2 S2 S2 S1 S1	sea-side plantain sea-side plantain starnached cinquefoil starnac	sea-side plantain
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Central Mixedwood PMPOASS090 Spartina pectinata praine cord grass	S1 S2 S2 S1 S2 S2 S2 S2 S2 S3 S2 S1 S2 S2 S2 S2 S2 S2 S2 S3 S3 S2 S3 S2 S3 S3 S3 S4 S5 S5 S5 S5 S5 S5 S5 S5 S5 S5 S5 S5 S5	prainic ord grass state prondweed Robbins pondweed Robbins pondweed S1 Inaar-leaved pondweed S2 Inaar-leaved grape fern S1 Inaar-leaved grape fern S2 Inaar-leaved grape fern S3 Inaar-leaved grape fern S3 Inaar-leaved grape fern	prairie cord grass S1 N? G5
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1 Central Mixedwood PMPOT03080 Potamogeton foliosus leafy pondweed 1 Central Mixedwood PMPOT031020 Potamogeton rebbinsii Robbinsi' pondweed 1 Central Mixedwood PMSPA01080 Sparganium hyperboreum northern bur-reed 1 Central Mixedwood PPADI0H060 Pellaee glabella sep simplex morthern bur-reed 1 Central Mixedwood PPADI0H060 Pellaee glabella sep simplex mountain bladder fern 1 Central Mixedwood PPDRY07050 Cystopters montana mountain bladder fern 1 Central Mixedwood PPLYC01100 Disphasiastrum sichense ground-fir 1 Central Mixedwood PPLYC02070 Huperzia selago mountain club-moss 1 Central Mixedwood PPCPH01070 Botyphium lanceolatum lance-leaved grape fern	\$2 51 51 51 52 52 52 52 52 51 52 51 52 52 52 52 52 53 52 53 54 55 55 52 55 52 52 52 53 53 54 54 55 54 55 56 56 57 57 57 57 57 57 57 57 57 57 57 57 57	leafy pondweed S2 Robbins' pondweed S1 Inna-rieawad pondweed S2 Inna-rieawad pondweed S2 Inna-rieawad pondweed S2 Inna-rieawad S3 Inna-rieawad S3 Inna-rieawad grape fern S2 Inna-rieawad grape fern S2S3 Inna-rie	leafy pondweed
1 Central Mixedwood PMP0T03020 Potamogeton robbinsii Robbinsi pondweed 1 Central Mixedwood PMP0T0310 Potamogeton strictifolius linear-leaved pondweed 1 Central Mixedwood PMSPA01080 Sparganium hyperborerum northern bur-reed 1 Central Mixedwood PPADI0H066 Pellaea glabella symoth clift brake 1 Central Mixedwood PPADI0H066 Pellaea glabella ssp simplex 1 Central Mixedwood PPDRY07050 Cystopteris montana mountain bladder fern 1 Central Mixedwood PPDRY0A080 Oryopteris filix-mas male fern 1 Central Mixedwood PPLYC0100 Diphasiastrum sitchense ground-fir 1 Central Mixedwood PPLYC02070 Huperzia selago mountain club-moss 1 Central Mixedwood PPOPH01070 Botypchium lanceolatum lance-leaved grape fern	51 52 52 52 52 52 52 52 52 52 52 52 52 52	Robbins' pondweed S1 linear-leaved pondweed S2 linear-leaved pondweed S1 smooth cliff brake S2 smooth cliff brake S2 separate S2 male fern S1 ground-fir S2 ground-fir S2 lance-leaved grape fern S2 Mingan grape fern S2S3 S1 S1	Robbins' pondweed
1 Central Mixedwood PMP0T03110 Potamogeton strictibiloius linea-leaved pondweed 1 Central Mixedwood PMSPA01080 Sparganium hyperboreum northern burverleaded 1 Central Mixedwood PPADI0H060 Pelfaea glabella smooth cliff brake 1 Central Mixedwood PPDRY07050 Cystopteris montana mountain bladder fern 1 Central Mixedwood PPDRY0A080 Dyopteris filix-mas male fern 1 Central Mixedwood PPLYC0100 Diphasiastrum sichense ground-fir 1 Central Mixedwood PPLYC02070 Muperzia selago mountain club-moss 1 Central Mixedwood PPOPH01070 Botypchium lanceolatum lance-leaved grape fern	d S2 S1 S2 S2 S2 S2 S1 S1 S2 S3 S1 S2 S2 S2	Innea-leaved pondweed S2	linear-leaved pondweed S2 N? G5
1 Central Mixedwood PMSPA01080 Sparganium hyperboreum northern bur-reed 1 Central Mixedwood PPADI0H060 Pellaea glabella smooth cliff brake 1 Central Mixedwood PPADI0H066 Pellaea glabella ssp simplex 1 Central Mixedwood PPDRY07050 Cystopteris montana mountain bladder fern 1 Central Mixedwood PPDRY0A080 Dypopteris filix-mas male fern 1 Central Mixedwood PPLYC01100 Diphasiastrum sitchense ground-fir 1 Central Mixedwood PPLYC02070 Huperzia selago mountain club-moss 1 Central Mixedwood PPOPH01070 Botypchium lanceolatum lance-leaved grape fern	\$1 \$2 \$2 \$2 \$1 \$1 \$2 \$1 \$1 \$2 \$1 \$2 \$2 \$1 \$1 \$2 \$2 \$1 \$2 \$2 \$1 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2		northern bur-reed S1 N? G5
1 Central Mixedwood PMSPA01080 Sparganium hyperboreum northern bur-reed 1 Central Mixedwood PPADI0H060 Pellaea glabella smooth cliff brake 1 Central Mixedwood PPADI0H066 Pellaea glabella ssp simplex 1 Central Mixedwood PPDRY07050 Cystopteris montana mountain bladder fern 1 Central Mixedwood PPDRY0A080 Dypopteris filix-mas male fern 1 Central Mixedwood PPLYC01100 Diphasiastrum sitchense ground-fir 1 Central Mixedwood PPLYC02070 Huperzia selago mountain club-moss 1 Central Mixedwood PPOPH01070 Botypchium lanceolatum lance-leaved grape fern	S1 S2 S2 S2 S1 S1 S2 S1 S1 S2 S2 S1 S2 S2 S2 S2 S2 S2 S2 S2 S2 S2 S2 S2 S2	northern bur-reed S1 smooth cliff brake S2 smooth cliff brake S2 sc 1 mountain bladder fern S2 male fern S1 ground-fir S2 mountain club-moss S1 lance-leaved grape fern S2 Mingan grape fern S2S3 S1 S1	northern bur-reed
1 Central Mixedwood PPADIGH060 Pellaea glabella smooth cliff brake 1 Central Mixedwood PPADIGH066 Pellaea glabella ssp simplex 1 Central Mixedwood PPDRY07050 Cystopteris montana mountain bladder fern 1 Central Mixedwood PPDRY0A080 Dyopteris filix-mas male fern 1 Central Mixedwood PPLYC0100 Diphasiastrum sichense ground-fir 1 Central Mixedwood PPLYC02070 Huperzia selago mountain club-moss 1 Central Mixedwood PPOPH01070 Botypchium lanceolatum lance-leaved grape fern	\$2 \$2 \$2 \$1 \$1 \$2 \$1 \$1 \$2 \$1 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2	Smooth cliff brake S2 Parameter S2 Parameter S2 Parameter S2 Parameter S2 Parameter S1 Parameter S2 Parameter S3 Parameter S4 Parameter	smooth cliff brake S2 N4N5 G5
1 Central Mixedwood PPADI0H066 Pellaea glabella ssp simplex 1 Central Mixedwood PPDRY07050 Cystopteris montana mountain bladder fern 1 Central Mixedwood PPDRY0AB00 Dryopteris filik-mas male fern 1 Central Mixedwood PPLYC01100 Diphasiastrum sitchense ground-fir 1 Central Mixedwood PPLYC02070 Huperzia selago mountain club-moss 1 Central Mixedwood PPOPH01070 Botrychulm lanceolatum lance-leaved grape fern	S2 S2 S1 S2 S1 S2 S1 S2 S1 S2 S2 S2 S1 S2 S1 S2 S1 S2 S1 S2 S1 S2 S1 S2 S1 S2 S1 S2 S1 S2 S1 S1 S2 S1 S1 S2 S1 S1 S2 S1 S1 S2 S1 S1 S1 S1 S1 S1 S1 S1 S1 S1 S1 S1 S1	S2	S2 N7 GST47
1 Central Mixedwood PPDRY07050 Cystopteris montana mountain bladder fem 1 Central Mixedwood PPDRY0A080 Dryopteris filix-mas male fem 1 Central Mixedwood PPLYC0100 Diphasiastrum sitchense ground-fir 1 Central Mixedwood PPLYC02070 Huperzia selago mountain club-moss 1 Central Mixedwood PPOPH01070 Botypchium lanceolatum lance-leaved grape fem	S2 S1 S2 S1 n S2 S2 S2 S3		mountain bladder fern S2 N? G5 male fern S1 NAN5 G5 ground-fir S2 N? G5 mountain club-moss S1 N5 G5 lance-leaved grape fern S2 N7 G5 Mingan grape fern S2S3 N7 G4 S1 N7 G47
1 Central Mixedwood PPDRY07050 Cystopleris montana mountain bladder fem 1 Central Mixedwood PPDRY0A080 Dyopteris filix-mas male fem 1 Central Mixedwood PPLYC01100 Diphasiastrum sitchense ground-fir 1 Central Mixedwood PPLYC02070 Huperzia selago mountain club-moss 1 Central Mixedwood PPOPH01070 Botypchium lanceolatum lance-leaved grape fem	S1 S2 S1 n S2 S2 S1	male fern S1 ground-fir S2 mountain club-moss S1 lance-leaved grape fern S2 Mingan grape fern S2S3 S1 S1	male fern S1 N4N5 G5 ground-fir S2 N7 G5 mountain club-moss S1 N5 G5 lance-leaved grape fern S2 N7 G5 Mingan grape fern S2S3 N7 G4 S1 N7 G4?
1 Central Mixedwood PPDRY0A080 Dryopteris filix-mas male fern 1 Central Mixedwood PPLYC01100 Diphasiasrum sichense ground-fir 1 Central Mixedwood PPLYC02070 Huperzia selago mountain club-moss 1 Central Mixedwood PPOPH01070 Botrychium lanceolatum lance-leaved grape fern	S1 S2 S1 n S2 S2 S1	male fern S1 ground-fir S2 mountain club-moss S1 lance-leaved grape fern S2 Mingan grape fern S2S3 S1 S1	male fern S1 N4N5 G5 ground-fir S2 N7 G5 mountain club-moss S1 N5 G5 lance-leaved grape fern S2 N7 G5 Mingan grape fern S2S3 N7 G4 S1 N7 G47
1 Central Mixedwood PPLYC01100 Diphasiastrum siichense ground-fir 1 Central Mixedwood PPLYC02070 Huperais selago monation club-moss 1 Central Mixedwood PPOPH01070 Botrychium lanceolatum lance-leaved grape fern	S2 S1 n S2 S2 S1	ground-fir S2 mountain club-moss S1 slance-leaved grape fern S2 slangan grape fern S25 S1	ground-fir \$2 N? \$5 mountain club-moss \$1 N5 G5 lance-leaved grape fern \$2 N? \$6 Mingan grape fern \$1 N7 G47 \$1 N7 G47
1 Central Mixedwood PPLYC02070 Huperzia selago mountain club-moss 1 Central Mixedwood PPOPH01070 Botrychium lanceolatum lance-leaved grape fern	S1 n S2 S2 S1	Mountain club-moss	mountain club-moss S1 N5 G5
1 Central Mixedwood PPOPH01070 Botrychium lanceolatum lance-leaved grape fern	n S2 S2 S1	Iance-leaved grape fern	lance-leaved grape fern S2 N? G5 Mingan grape fern S2S3 N? G4 S1 N? G4?
1 Central Mixedwood PPOPH01070 Botrychium lanceolatum lance-leaved grape fern	S2 S1	Mingan grape fern S2S3 II	Mingan grape fern S2S3 N? G4 S1 N? G4?
TO THE PROPERTY OF THE PROPERT	S2 S1	Mingan grape fern \$2\$3 1	Mingan grape fern \$253 N? \$G4 \$1 N? \$G4?
1 Lentral Mixedwood PPOPHUTURO Botrychium minoanense Minoan grane tern	S1	S1 I	S1 N? G4?
Castal Mischard DDODHASIO Betrablis single-			
1 Central Mixedwood PPOPH010V0 Botrychium pinnetum	S2	normern peech tern S2	normern beech tern S2 N? G5
2 Dry Mixedwood NBHEP0P020 Cephalozia bicuspidata liverwort	S1		
2 Dry Mixedwood NBHEP0Y010 Conocephalum conicum liverwort			
		liverwort S2 I	
			liverwort S2 N? G5
	S1	liverwort S1 I	liverwort S2 N? G5 liverwort S1 N? G5?
	S1 S2	liverwort S1 I	
2 Dry Mixedwood NBHEP20030 Mannia pilosa liverwort	S1 S2 S1	Inverse	Iverwort S2 N? G5
2 Dry Mixedwood NBHEP2H010 Pellia endiviifolia liverwort	S1 S2 S1 S1	Iiverwort	Inverwort S2 N? G5
	S1 S2 S1 S1	Iiverwort	Inverwort S2 N? G5
	S1 S2 S1 S1 S1	Iverwort	Iverwort S2 N? G5
	S1 S2 S1 S1 S2 S2	Iverwort	Inverwort S2 N? G5 Inverwort S1 N? G5? Inverwort S2 N? G5 Inverwort S1 N? G45 Inverwort S1 N? G47 Inverwort S2 N? G5 Inverwort S2 N? G5 Inverwort S2 N? G4G5 Inverwort S2 N? G4G5
2 Dry Mixedwood NBHEP30010 Ricciocarpos natans liverwort	\$1 \$2 \$1 \$1 \$2 \$2 \$2 \$2	Invervort	Iverwort S2 N? G5
2 Dry Mixedwood NBHEP330S0 Scapania paludicola liverwort	\$1 \$2 \$1 \$1 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2	Iverwort	Inverwort S2 N? G5 Inverwort S1 N? G5? Inverwort S2 N? G5 Inverwort S1 N? G4G5 Inverwort S1 N? G4G5 Inverwort S2 N? G5 Inverwort S2 N? G5 Inverwort S2 N? G6 Inverwort S2 N? G5
	\$1 \$2 \$1 \$1 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2	Iverwort	Inverwort S2 N? G5
a bry mixed more inter-pour pagetta paludosa intervolt	\$1 \$2 \$1 \$1 \$2 \$2 \$2 \$2 \$2 \$2	Invervort S1	Inverwort S2 N? G5 Inverwort S1 N? G5? Inverwort S2 N? G5 Inverwort S1 N? G4G5 Inverwort S1 N? G4G5 Inverwort S1 N? G4G Inverwort S2 N? G5 Inverwort S
	\$1 \$2 \$1 \$1 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2	Iverwort	Inverwort S2 N? G5 Inverwort S1 N? G5? Inverwort S2 N? G5 Inverwort S1 N? G4G5 Inverwort S1 N? G47 Inverwort S2 N? G5
2 Dry Mixedwood NBHEP3C010 Tritomaria exsecta liverwort	51 52 51 51 52 52 52 52 52 52 52 52 52	Invervort S1 Invervort S2 Invervort S1 Invervort S1 Invervort S2 Invervort S1 S1	Inverwort S2 N? G5
2 Dry Mixedwood NBHEP3C010 Tritomaria exsecta liverwort 2 Dry Mixedwood NBHEP3C060 Tritomaria scitula liverwort	\$1 \$2 \$1 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2	Invervort	Inverwort S2 N? G5 Inverwort S1 N? G5? Inverwort S2 N? G5 Inverwort S1 N? G4G5 Inverwort S1 N? G47 Inverwort S2 N? G5 Inverwort S1 N? G5 Inverwort S1 N? G5 Inverwort S2S3 N? G4
2 Dry Mixedwood NBHEP3C010 Tritomaria exsecta liverwort 2 Dry Mixedwood NBHEP3C060 Tritomaria scitula liverwort	\$1 \$2 \$1 \$1 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2	Invervort S1	Inverwort S2 N? G5
2 Dry Mixedwood NBHEP3C010 Tritomaria exsecta liverwort IVm Mixedwood NBHEP3C060 Tritomaria scitula liverwort 2 Dry Mixedwood NBMUS03020 Aloina brevirostris short-beaked rigid screw moss	\$1 \$2 \$1 \$1 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2	Invervort S1	Inverwort S2 N? G5
2 Dry Mixedwood NBHEP3C010 Tritomaria exsecta liverwort 2 Dry Mixedwood NBHEP3C060 Tritomaria exclula liverwort Dry Mixedwood NBMUS03020 Aloina brevirostris short-beaked rigid screw moss 2 Dry Mixedwood NBMUS03040 Aloina rigida aloe-like rigid screw moss	\$1 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2	Invervort S1	Inverwort S2 N? G5
2 Dry Mixedwood NBHEP3C010 Tritomaria exsecta liverwort 2 Dry Mixedwood NBHEP3C080 Tritomaria scitula liverwort 2 Dry Mixedwood NBMUS03020 Aloina brevirostris short-beaked rigid screw moss 2 Dry Mixedwood NBMUS03040 Aloina rigida aloe-like rigid screw moss Dry Mixedwood NBMUS0E010 Aongstroemia longipes	\$1 \$5 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2	Invervort S1	Inverwort S2 N? G5
2 Dry Mixedwood NBHEP3C010 Tritomaria exsecta liverwort 2 Dry Mixedwood NBHEP3C060 Tritomaria excitula liverwort Dry Mixedwood NBMUS03020 Aloina brevirostris short-beaked rigid screw moss 2 Dry Mixedwood NBMUS03040 Aloina rigida aloe-like rigid screw moss 2 Dry Mixedwood NBMUS0E010 Angstroemia longipes 2 Dry Mixedwood NBMUS0M080 Atrichum undulatum undulated crane's bill moss	\$1 \$1 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2	Invervort S1	Inverwort S2 N? G5 Inverwort S1 N? G5? Inverwort S2 N? G5 Inverwort S1 N? G4G5 Inverwort S1 N? G47 Inverwort S2 N? G5 Inverwort S2 N? G5 Inverwort S2 N? G65 Inverwort S2 N? G65 Inverwort S2 N? G5 Inverwort S3 S5 N? G5 Inverwort S5 S5 N? G5 Inverwort S5 S5 N? G5
2 Dry Mixedwood NBHEP3C010 Trifomaria exsecta liverwort 2 Dry Mixedwood NBHEP3C080 Trifomaria escula liverwort 2 Dry Mixedwood NBMUS03020 Aloina brevirostris short-beaked rigid screw moss 2 Dry Mixedwood NBMUS03040 Aloina rigida aloe-like rigid screw moss 2 Dry Mixedwood NBMUS0E010 Aongstroemia longipes 2 Dry Mixedwood NBMUS0M080 Alrichum undulatum undulated crane's bill moss Dry Mixedwood NBMUS0V010 Bilindia ecuta sharp-pointed weissia	S1 S2 S2 S2 S2 S2 S2 S2	Invervort S1	Inverwort S2 N? G5
2 Dry Mixedwood NBHEP3C010 Trifomaria exsecta liverwort 2 Dry Mixedwood NBHEP3C080 Trifomaria escula liverwort 2 Dry Mixedwood NBMUS03020 Aloina brevirostris short-beaked rigid screw moss 2 Dry Mixedwood NBMUS03040 Aloina rigida aloe-like rigid screw moss 2 Dry Mixedwood NBMUS0E010 Aongstroemia longipes 2 Dry Mixedwood NBMUS0M080 Alrichum undulatum undulated crane's bill moss Dry Mixedwood NBMUS0V010 Bilindia ecuta sharp-pointed weissia	S1 S2 S2 S2 S2 S2 S2 S2	Invervort S1	Inverwort S2 N? G5
2 Dry Mixedwood NBHEP3C010 Tritomaria exsecta liverwort Dry Mixedwood NBHEP3C060 Tritomaria scitula liverwort 2 Dry Mixedwood NBMUS03020 Alona brevirostris short-beaked rigid screw moss 2 Dry Mixedwood NBMUS03040 Alona rigida aloe-like rigid screw moss 2 Dry Mixedwood NBMUS0E010 Aongstroemia longipes 2 Dry Mixedwood NBMUS0M080 Atrichum undulatum undulated crane's bill moss 2 Dry Mixedwood NBMUS0V010 Bilnidia acuta sharp-pointed weissia Dry Mixedwood NBMUS02020 Brachytheeium acutum	S1 S2 S2 S2 S3 S3 S4 S4 S4 S4 S5 S5 S5 S5	Intervenord	Inverwort S2 N? G5 Inverwort S1 N? G5? Inverwort S2 N? G5 Inverwort S1 N? G4G5 Inverwort S1 N? G4G5 Inverwort S2 N? G5 Inverwort S2 N? G5 Inverwort S2 N? G4G5 Inverwort S2 N? G5 Inverwort S2 N? G3G5 Inverwort S2 N? G5
2 Dry Mixedwood NBHEF3C010 Trifomaria exsecta liverwort 2 Dry Mixedwood NBHEP3C080 Trifomaria scirula liverwort 2 Dry Mixedwood NBMUS03020 Aloina brevirostris short-beaked rigid screw moss 2 Dry Mixedwood NBMUS03040 Aloina rigida aloe-like rigid screw moss 2 Dry Mixedwood NBMUS05010 Aongstroemia longipes aloe-like rigid screw moss 2 Dry Mixedwood NBMUS00010 Blindia acuta undulated crane's bill moss 2 Dry Mixedwood NBMUS02020 Brachythecium rellexum sharp-pointed weissia Dry Mixedwood NBMUS020N0 Brachythecium rellexum	S1 S2 S2 S2 S2 S2 S2 S2	Intervent S1	Inverwort S2 N? G5
2 Dry Mixedwood NBHEP3C010 Tritomaria exsecta liverwort 2 Dry Mixedwood NBHEP3C080 Tritomaria exsecta liverwort 2 Dry Mixedwood NBMUS03020 Aloina brevirostris short-beaked rigid screw moss 2 Dry Mixedwood NBMUS03040 Aloina rigida aloe-like rigid screw moss Dry Mixedwood NBMUS0B000 Anogstroemia longipes 2 Dry Mixedwood NBMUS0M080 Alrichum undulatum undulated crane's bill moss 2 Dry Mixedwood NBMUS0V010 Blindia ecuta sharp-pointed weissia 2 Dry Mixedwood NBMUS0Z0200 Brachythecium rellexum 2 Dry Mixedwood NBMUS0Z0R0 Brachythecium rellexum Dry Mixedwood NBMUS0Z0R0 Brachythecium rubulum	S1 S2 S2 S2 S3 S3 S4 S4 S4 S5 S5 S5 S5 S5	Intervent	Inverwort S2 N? G5 Inverwort S1 N? G5? Inverwort S2 N? G5 Inverwort S1 N? G4G5 Inverwort S1 N? G4G5 Inverwort S2 N? G5 Inverwort
2 Dry Mixedwood NBHEF3C010 Tritomaria exsecta liverwort 2 Dry Mixedwood NBHEP3C0600 Tritomaria sciulula liverwort 2 Dry Mixedwood NBMUS030200 Aloina brevirostris short-beaked rigid screw moss 2 Dry Mixedwood NBMUS05010 Aloina rigida aloe-like rigid screw moss 2 Dry Mixedwood NBMUS05010 Anrichum undulatum undulated crane's bill moss 2 Dry Mixedwood NBMUS02010 Billindia acuta sharp-pointed weissia 2 Dry Mixedwood NBMUS020100 Brachythecium rutum sharp-pointed weissia Dry Mixedwood NBMUS020100 Brachythecium rutabulum Brachythecium rutabulum D Dry Mixedwood NBMUS020100 Brachythecium rutabulum	\$1 \$5 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2	Intervent S1	Inverwort S2 N? G5
2 Dry Mixedwood NBHEF3C010 Tritomaria exsecta liverwort 2 Dry Mixedwood NBHEP3C0600 Tritomaria sciulula liverwort 2 Dry Mixedwood NBMUS030200 Aloina brevirostris short-beaked rigid screw moss 2 Dry Mixedwood NBMUS05010 Aloina rigida aloe-like rigid screw moss 2 Dry Mixedwood NBMUS05010 Anrichum undulatum undulated crane's bill moss 2 Dry Mixedwood NBMUS02010 Billindia acuta sharp-pointed weissia 2 Dry Mixedwood NBMUS020100 Brachythecium rutum sharp-pointed weissia Dry Mixedwood NBMUS020100 Brachythecium rutabulum Brachythecium rutabulum D Dry Mixedwood NBMUS020100 Brachythecium rutabulum	\$1 \$5 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2	Intervent S1	Inverwort S2 N? G5
2 Dry Mixedwood NBHEF3C010 Tritomaria exsecta liverwort 2 Dry Mixedwood NBHEP3C0600 Tritomaria exsecta liverwort 2 Dry Mixedwood NBMUS03020 Aloina ripida short-beaked rigid screw moss 2 Dry Mixedwood NBMUS05010 Aloina ripida aloe-like ripid screw moss D Dry Mixedwood NBMUS06010 Anogstroemia longipes undulated crane's bill moss D Dry Mixedwood NBMUS00010 Alirichum undulatum undulated crane's bill moss 2 Dry Mixedwood NBMUS02000 Bilmdia ecuta sharp-pointed weissia 2 Dry Mixedwood NBMUS02000 Brachythecium acutum Brachythecium rufabulum 2 Dry Mixedwood NBMUS020R0 Brachythecium rufabulum Bryum uliginosum 2 Dry Mixedwood NBMUS1A180 Bryum uliginosum D Dry Mixedwood NBMUS1A160 Bryum uliginosum	S1 S2 S2 S2 S2 S2 S2 S2	Intervent	Inverwort S2 N? G5 Inverwort S1 N? G5? Inverwort S2 N? G5 Inverwort S1 N? G4G5 Inverwort S1 N? G4G5 Inverwort S2 N? G5 Inverwort
2 Dry Misedwood NBHEPSC010 Trifomaria exsecta liverwort 2 Dry Misedwood NBHEPSC060 Trifomaria sciula liverwort 2 Dry Misedwood NBMUS03020 Aloina brevirostris short-beaked rigid screw moss 2 Dry Misedwood NBMUS08010 Aloina freidie aloe-like rigid screw moss 2 Dry Misedwood NBMUS08010 Archour undulatum undulated crane's bill moss 2 Dry Misedwood NBMUS02010 Bindia eurla eurla sharp-pointed weissia 2 Dry Misedwood NBMUS02000 Brachythecium rellexum archythecium ratbulum 2 Dry Misedwood NBMUS02000 Brachythecium ratbulum Brachythecium ratbulum 2 Dry Misedwood NBMUS1A100 Bryum cyclophyllum Bryum cyclophyllum 2 Dry Misedwood NBMUS1A100 Bryum leacidum Bryum cyclophyllum	\$1 \$5 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2	Intervent S1 Intervent S2 Intervent S1 Intervent S1 Intervent S1 Intervent S2 Intervent	Inverwort S2 N? G5
2 Dry Misedwood NBHEP3C010 Tritomaria exsecta liverwort 2 Dry Misedwood NBHEP3C006 Tritomaria esclula liverwort 2 Dry Misedwood NBMUS03020 Aloina brevirostris short-beaked rigid screw moss 2 Dry Misedwood NBMUS00100 Aloina rigida aloe-like rigid screw moss 2 Dry Misedwood NBMUS00100 Anogstroomaria longipes 2 Dry Misedwood NBMUS00100 Blindia acuta sharp-pointed weissia 2 Dry Misedwood NBMUS00200 Brachythecium cultum sharp-pointed weissia 2 Dry Misedwood NBMUS02000 Brachythecium rutabulum sharp-pointed weissia 2 Dry Misedwood NBMUS02000 Brachythecium rutabulum Byum uliginosum 2 Dry Misedwood NBMUS1A160 Byum uliginosum 2 Dry Misedwood NBMUS1A100 Byum uliginosum 2 Dry Misedwood NBMUS1A100 Byum ruticale 2 Dry Misedwood NBMUS1A100 Byum ruticale 2 Dry Misedwood NBMUS1A100 Byum ruticale	S1 S2 S2 S2 S2 S3 S3 S4 S4 S4 S4 S4 S4	Intervent	Inverwort S2 N? G5 Inverwort S1 N? G5? Inverwort S2 N? G5 Inverwort S1 N? G4G5 Inverwort S1 N? G4G5 Inverwort S2 N? G5 Inverwort S2 N? G3G5 Inverwort S2 N? G3G5 Inverwort S2 N? G3G5 Inverwort S2 N? G3G5 Inverwort S2 N? G5 I
2 Dry Misedwood NBHEP3C010 Trifomaria exsecta liverwort 2 Dry Misedwood NBHEP3C060 Trifomaria sciula liverwort 2 Dry Misedwood NBMUS03020 Aloina brevirostris short-beaked rigid screw moss 2 Dry Misedwood NBMUS0E010 Alorgatroemia longipes aloe-like rigid screw moss 2 Dry Misedwood NBMUS0M000 Alrichum undulatum undulated crane's bill moss 2 Dry Misedwood NBMUS02020 Bilmala eura sharp-pointed weissia 2 Dry Misedwood NBMUS020200 Brachythecium rutabulum sharp-pointed weissia 2 Dry Misedwood NBMUS020700 Brachythecium rutabulum Brachythecium rutabulum 2 Dry Misedwood NBMUS1A1180 Bryum cyclophyllum Pur Misedwood 2 Dry Misedwood NBMUS1A100 Bryum cyclophyllum Pur Misedwood 2 Dry Misedwood NBMUS1J070 Campyllum raticale Pur Misedwood 2 Dry Misedwood NBMUS1J0101 Campyllum raticale 2 Dry Misedwood NBMUS1J0101 Campyllum raticale	\$1 \$5 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2	Intervent S1 Intervent S2 Intervent S2 Intervent S1 Intervent S2 Intervent	Inverwort S2 N? G5
2 Dry Misedwood NBHEP3C010 Trilomaria exsecta liverwort Dry Misedwood NBHEP3C060 Trilomaria scitula liverwort Dry Misedwood NBMUS03020 Aloina brevirostris short-beaked rigid screw moss Dry Misedwood NBMUS09040 Aloina in rigida aloe-like rigid screw moss Dry Misedwood NBMUS09000 Arostroemia longipes aloe-like rigid screw moss 2 Dry Misedwood NBMUS09000 Arichum undulatum undulated crane's bill moss 2 Dry Misedwood NBMUS02000 Brachyfreclum acutum sharp-pointed weissia 2 Dry Misedwood NBMUS02000 Brachyfreclum rabbulum Brachyfreclum rabbulum 2 Dry Misedwood NBMUS1A100 Bryum cyclophyllum Bryum cyclophyllum 2 Dry Misedwood NBMUS1A100 Bryum cyclophyllum 2 Dry Misedwood NBMUS1A100 Campyllum radicale 2 Dry Misedwood NBMUS1U010 Coamplace acute	\$1 \$5 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2 \$2	Intervent S1 Intervent S2 Intervent S2 Intervent S1 Intervent S2 Intervent	Inverwort S2 N? G5
2 Dry Mixedwood NBHEP3C010 Tritomaria exsecta liverwort 2 Dry Mixedwood NBHEP3C006 Tritomaria sciulula liverwort 2 Dry Mixedwood NBMUS030200 Aloina ripida aloe-like ripid screw moss Dry Mixedwood NBMUS00100 Aloina ripida aloe-like ripid screw moss Dry Mixedwood NBMUS00100 Aorgstroemia longipes and acuta Dry Mixedwood NBMUS00010 Blindia acuta sharp-pointed weissia Dry Mixedwood NBMUS02000 Brachythecium acutum harp-pointed weissia Dry Mixedwood NBMUS02000 Brachythecium ratabulum 2 Dry Mixedwood NBMUS02000 Bry Mixedwood 2 Dry Mixedwood NBMUS1A100 Bryum uliginosum 2 Dry Mixedwood NBMUS1A100 Bryum recically 2 Dry Mixedwood NBMUS1A100 Bryum recicalle Dry Mixedwood NBMUS1A100 Bryum recicalle Dry Mixedwood NBMUS1A100 Compriliar radicale Dry Mixedwood NBMUS1B1010 Conardia compacta Dry Mixedwood NBMUS1B010 Conardia com	S1	Intervent	Inverwort S2 N? G5 Inverwort S1 N? G5? Inverwort S1 N? G5? Inverwort S1 N? G4G5 Inverwort S1 N? G4G5 Inverwort S2 N? G5 Inverwort S1 N? G5 Inverwort S2 N? G3G5 Inverwort S2 N? G4G5 Inverwort S2 N? G4G5 Inver
2 Dry Misedwood NBHEPSC010 Trifomaria exsecta liverwort 2 Dry Misedwood NBHEPSC060 Trifomaria sciulla liverwort 2 Dry Misedwood NBMUS03020 Aloina brevirostris short-beaked rigid screw moss 2 Dry Misedwood NBMUS09040 Aloina finida aloe-like rigid screw moss 2 Dry Misedwood NBMUS00000 Aropstreemie longipes aloe-like rigid screw moss 2 Dry Misedwood NBMUS00000 Archum undulatum undulated crane's bill moss 2 Dry Misedwood NBMUS020200 Brachythecium rellexum sharp-pointed weissia 2 Dry Misedwood NBMUS020700 Brachythecium rellexum Brachythecium rellexum 2 Dry Misedwood NBMUS1020700 Brachythecium rellexum Brachythecium rellexum 2 Dry Misedwood NBMUS1A160 Bryum relicale Bryum relicale 2 Dry Misedwood NBMUS1A100 Bryum relicale Campyllum relicale 2 Dry Misedwood NBMUS1070 Campyllum relicale Logneytium relicale 2 Dry Misedwood NBMUS1070 Campyllum relicale Logneytium relicale 2 Dry Misedwood </td <td> S1 S2 S2 S2 S2 S2 S3 S3 S4 S4 S4 S4 S5 S5 S5 S5</td> <td> Intervent S1 Intervent S2 Intervent S1 Intervent S1 Intervent S1 Intervent S2 Intervent S3 Intervent S2 Intervent </td> <td> Inverwort S2 N? G5 </td>	S1 S2 S2 S2 S2 S2 S3 S3 S4 S4 S4 S4 S5 S5 S5 S5	Intervent S1 Intervent S2 Intervent S1 Intervent S1 Intervent S1 Intervent S2 Intervent S3 Intervent S2 Intervent	Inverwort S2 N? G5
2 Dry Misedwood NBHEP3C010 Tritomaria exsecta liverwort 2 Dry Misedwood NBHEP3C000 Tritomaria estudia liverwort 2 Dry Misedwood NBMUS03020 Aloina ripida short-beaked rigid screw moss 2 Dry Misedwood NBMUS00100 Aloina ripida aloe-like rigid screw moss 2 Dry Misedwood NBMUS00100 Alona ripida aloe-like rigid screw moss 2 Dry Misedwood NBMUS00000 Alrichum undulatum undulated crane's bill moss 2 Dry Misedwood NBMUS00010 Blindia acuta sharp-pointed weissia 2 Dry Misedwood NBMUS02000 Brachythecium reliexum 2 Dry Misedwood NBMUS102000 Brachythecium reliexum 2 Dry Misedwood NBMUS1A100 Bryum reyclophyllum 2 Dry Misedwood NBMUS1A100 Bryum flaccidum 2 Dry Misedwood NBMUS1A100 Bryum flaccidum 2 Dry Misedwood NBMUS10100 Campyllum radicale 2 Dry Misedwood NBMUS10100 Conardia compacta 2 Dry Misedwood NBMUS10100 Conardia compacta 3 Dry Misedwood	S1 S2 S2 S2 S2 S3 S3 S4 S4 S4 S4 S4 S4	Intervent S1	Inverwort S2 N? G5 Inverwort S1 N? G5? Inverwort S1 N? G5? Inverwort S1 N? G4G5 Inverwort S1 N? G4G5 Inverwort S2 N? G5 Inverwort S2 N? G3G5 Inverwort S2 N? G4G5 S2 N? G4G5 S2 N? G4G5 S2 N? G3G5 S3 N? G4G5 S4 N? G3G5 S4 N? G3G5 S5 N? G4G5 S5 N? G3G5 S6 N? G3G5 S7 N? G4G5 S8 N? G3G5 S9 N? G4G5 S9 N?
2 Dry Misedwood NBHEP3C010 Tritomaria exsecta liverwort 2 Dry Misedwood NBHEP3C000 Tritomaria estudia liverwort 2 Dry Misedwood NBMUS03020 Aloina ripida short-beaked rigid screw moss 2 Dry Misedwood NBMUS00100 Aloina ripida aloe-like rigid screw moss 2 Dry Misedwood NBMUS00100 Alona ripida aloe-like rigid screw moss 2 Dry Misedwood NBMUS00000 Alrichum undulatum undulated crane's bill moss 2 Dry Misedwood NBMUS00010 Blindia acuta sharp-pointed weissia 2 Dry Misedwood NBMUS02000 Brachythecium reliexum 2 Dry Misedwood NBMUS102000 Brachythecium reliexum 2 Dry Misedwood NBMUS1A100 Bryum reyclophyllum 2 Dry Misedwood NBMUS1A100 Bryum flaccidum 2 Dry Misedwood NBMUS1A100 Bryum flaccidum 2 Dry Misedwood NBMUS10100 Campyllum radicale 2 Dry Misedwood NBMUS10100 Conardia compacta 2 Dry Misedwood NBMUS10100 Conardia compacta 3 Dry Misedwood	S1 S2 S2 S2 S2 S3 S3 S4 S4 S4 S4 S4 S4	Intervent S1	Inverwort S2 N? G5
2 Dry Miscelwood NBHEP3C010 Tritomaria exsecta liverwort 2 Dry Miscelwood NBHEP3C060 Tritomaria esculta liverwort 2 Dry Miscelwood NBMUS03020 Aloina brevirostris short-beaked rigid screw moss 2 Dry Miscelwood NBMUS00000 Aloina ingida aloe-like rigid screw moss 2 Dry Miscelwood NBMUS00000 Archum undulatum undulated crane's bill moss 2 Dry Miscelwood NBMUS00000 Airchum undulatum undulated crane's bill moss 2 Dry Miscelwood NBMUS02000 Brachythecium ractum sharp-pointed weissia 2 Dry Miscelwood NBMUS02000 Brachythecium ratebutum sharp-pointed weissia 2 Dry Miscelwood NBMUS1A100 Brachythecium ratebutum Brachythecium ratebutum 2 Dry Miscelwood NBMUS1A100 Bryum cyclophyllum Bryum cyclophyllum 2 Dry Miscelwood NBMUS1A100 Bryum cyclophyllum Bryum cyclophyllum 2 Dry Miscelwood NBMUS1A100 Campilum radicale Indicale 2 Dry Miscelwood NBMUS1B0100 Conardicale Indicale Compactal 2 Dry Miscelwood	S1 S2 S2 S2 S2 S3 S3 S4 S4 S4 S4 S4 S5 S5 S5	Intervent S1	Inverwort S2 N? G5
2 Dry Misedwood NBHEP3C010 Tritomaria exsecta liverwort 2 Dry Misedwood NBHEP3C080 Tritomaria scitula liverwort 2 Dry Misedwood NBMUS03020 Aloina brevirostris short-beaked rigid screw moss 2 Dry Misedwood NBMUS08000 Aloina prigida aloe-like rigid screw moss 2 Dry Misedwood NBMUS08000 Alorichum undulatum undulated crane's bill moss 2 Dry Misedwood NBMUS02000 Bilmdia acuta sharp-pointed weissia 2 Dry Misedwood NBMUS02000 Brachythecium cutum aloe-like rigid screw moss 2 Dry Misedwood NBMUS02000 Brachythecium mutabulum aloe-like rigid screw moss 2 Dry Misedwood NBMUS1A1180 Bryum cyclophyllum aloe-like rigid screw moss 2 Dry Misedwood NBMUS1A100 Bryum cyclophyllum aloe-like rigid screw moss 2 Dry Misedwood NBMUS1A100 Bryum cyclophyllum aloe-like rigid screw moss 2 Dry Misedwood NBMUS1A100 Bryum cyclophyllum aloe-like rigid screw moss 2 Dry Misedwood NBMUS10100 Conardia compacta aloe-like rigid screw moss	S1 S2 S2 S2 S2 S3 S3 S4 S4 S4 S4 S4 S5 S5 S5	Intervent S1	Inverwort S2 N? G5 Inverwort S1 N? G5? Inverwort S2 N? G5 Inverwort S1 N? G4G5 Inverwort S1 N? G4G5 Inverwort S2 N? G5 Inverwort S2 N? G3G5 Inverwort S2 N? G3G5 Inverwort S2 N? G3G5 Inverwort S2 N? G3G5 Inverwort S2 N? G5 Ing-stalked beardless moss S2 N? G5 Ingligation S2
2 Dry Miscedwood NBHEP3C010 Trifomaria exsecta liverwort 2 Dry Miscedwood NBHEP3C000 Trifomaria sciula liverwort 2 Dry Miscedwood NBMUS030200 Aloina brevirostris short-beaked rigid screw moss 2 Dry Miscedwood NBMUS03040 Aloina ingida aloe-like rigid screw moss 2 Dry Miscedwood NBMUS0M000 Archum undulatum undulated crane's bill moss 2 Dry Miscedwood NBMUS0W010 Bilndia acuta sharp-pointed weissia 2 Dry Miscedwood NBMUS0Z02000 Brachythecium realtum sharp-pointed weissia 2 Dry Miscedwood NBMUS0Z0N0 Brachythecium realtum Brachythecium realtum 2 Dry Miscedwood NBMUS1A100 Brachythecium realtum Brachythecium realtum 2 Dry Miscedwood NBMUS1A100 Bryum reyclophythum Bryum reyclophythum 2 Dry Miscedwood NBMUS1A100 Bryum reyclophythum Bryum reyclophythum 2 Dry Miscedwood NBMUS1A100 Bryum reidceale Iong-stalked beardless moss 2 Dry Miscedwood NBMUS1B010 Coanratia compacta Iong-stalked beardless moss	S1 S1 S2	Intervent S1	Inverwort S2 N? G5

2 Dry Mixedwood	NBMUS3V0D0	Hypnum pallescens		S2	N?	G5
2 Dry Mixedwood	NBMUS44080	Leptodictyum humile		S1	N?	G5
2 Dry Mixedwood	NBMUS4L010	Meesia longiseta		S1	14.5	GS
2 Dry Mixedwood	NBMUS5B010	Meesia longiseta		81	N?	G4?
2 Dry Mixedwood	NBMUS5E070	Phascum cuspidatum	cuspidate earth moss	S2	N?	G5
2 Dry Mixedwood		Physcomitrium pyriforme	um moss	S1	N?	G5
2 Dry Mixedwood	NBMUS5S020	Pohlia atropurpurea		S1	N?	G4G5
2 Dry Mixedwood	NBMUS5T040	Polytrichum longisetum	slender hairy-cap	S1	N?	G5
2 Dry Mixedwood	NBMUS6F020	Rhodobryum ontariense		S2	N?	G5
2 Dry Mixedwood	NBMUS6Z070	Sphagnum compactum	neat bog moss	S2	N?	G5
2 Dry Mixedwood	NBMUS6Z0A0	Cohagnum Compactum	fleat bog moss	52	N.S.	G5
2 Dry Mixedwood 2 Dry Mixedwood	NBMUS6Z0A0	Sphagnum fimbriatum	fringed bog moss	S2	N?	G5
2 Dry Mixedwood		Sphagnum contortum	twisted bog moss	S2	N?	G5
2 Dry Mixedwood	NBMUS71010	Splachnum ampullaceum	flagon-fruited splachnum	S2	N?	G5
2 Dry Mixedwood	NBMUS7F0A0	Thuidium philibertii		S1S2	N?	G5
2 Dry Mixedwood	NBMUS7X020	Weissia controversa	green-cushioned weissia	0102	141	0.5
2 Dry Mixedwood	NBMUS81030	vveissia controversa	green-cushioned weissia	S2	N?	G5
2 Dry Mixedwood		Plagiomnium ciliare		S2	N?	G5
2 Dry Mixedwood	NBMUS88070	Warnstorfia tundrae	brown moss	S2	N?	GU
2 Dry Mixedwood	NBMUS8F010	Bryobrittonia longipes		S2	N3	G3
2 Dry Mixedwood	NBMUS93020	Limprichtia cossonii		SU	N?	GU
2 Dry Mixedwood	NBMUS9Q030	Dhinamai an andonala		30		
2 Dry Mixedwood		Rhizomnium andrewsianum		S1	N?	G3G5
2 Dry Mixedwood	NLCAL46120	Cyphelium tigillare		S2	N?	G5
2 Dry Mixedwood	NLLEC3S210	Ramalina obtusata		S2	N?	G5?
2 Dry Mixedwood	NLLEC3S290	Ramalina sinensis		SU	NR	G4G5
2 Dry Mixedwood	NLT0002340	Arthonia patellulata		53?	N?	G5
2 Dry Mixedwood	NLT0005720			537	N?	
2 Dry Mixedwood	NL10005720	Calicium trabinellum		S2	N?	G3G4
2 Dry Mixedwood	NLT0008330	Cladonia cyanipes		S2	N?	GNR
2 Dry Mixedwood	NLT0008980	Cladonia symphycarpa		S2	N?	G3G5
2 Dry Mixedwood	NLT0012450	Hypogymnia rugosa		S1S2	N?	G2G4
2 Dry Mixedwood	NLT0012490	Langua dubitana		5152	IN C	0204
2 Day Missado		Lecania dubitans		S2	N?	G4?
2 Dry Mixedwood	NLT0016420	Lepraria incana		S2	N?	GNR
2 Dry Mixedwood	NLT0016740	Leptogium furfuraceum		S2	N?	GNR
2 Dry Mixedwood	NLT0017910	Melanelia olivacea		S1	N?	G3G5
2 Dry Mixedwood	NLT0017980	Melanelia subalegantula		31	ALC:	CND
2 Day Missado		Melanelia subelegantula		S2	N?	GNR
2 Dry Mixedwood	NLT0018270	Micarea denigrata		SNR	N?	G2G4
2 Dry Mixedwood	NLT0018810	Mycobilimbia sabuletorum		S2	N?	G4G5
2 Dry Mixedwood	NLT0018910	Mycocalicium calicioides		S1	N?	GNR
2 Dry Mixedwood	NLT0018970			62	NIO	
2 Dry Mixedwood 2 Dry Mixedwood	NLT0016970	Mycocalicium subtile		S2	N?	G3G4
2 Dry Mixedwood		Peltigera polydactyla		S1S2	N?	G5?
2 Dry Mixedwood	NLT0022680	Physconia enteroxantha		S1?	N?	G3G5
2 Dry Mixedwood	NLT0022690	Physconia isidiigera		S2	N?	G3G4
2 Dry Mixedwood	NLT0025200	Ramalina calicaris		S1?	N?	GNR
2 Dry Mixedwood 2 Dry Mixedwood	NLT0025270			517	NE	GIVIE
z Dry Mixedwood		Ramalina dilacerata		S2	N?	G3G5
2 Dry Mixedwood	NLT0025410	Ramalina roesleri		S2S3	N?	G3G5
2 Dry Mixedwood	NLT0026470	Rinodina archaea		S2	N?	G4G5
2 Dry Mixedwood	NLT0027880	Scoliciosporum chlorococcum		S2	N?	G4G5
2 Dry Mixedwood 2 Dry Mixedwood	NLT0027880	Score osporum emorococcum		52	INC	0405
2 Dry Mixedwood		Sphinctrina turbinata		S1	N?	G3G5
2 Dry Mixedwood	NLT0029890	Trapeliopsis flexuosa		S1	N?	G5
2 Dry Mixedwood	NLT0031940	Xanthoria hasseana		S1	N?	G5
2 Dry Mixedwood	NLTES11300	Phaeophyscia cernohorskyi		S1	N?	G4G5
2 Dry Mixedwood	NLTES11360	r naeopnyscia cemonorsky		31		
2 Dry Mixedwood		Phaeophyscia hirsuta		S1	N3	G3
2 Dry Mixedwood	NLTES11590	Physcia dimidiata		S1	N?	G5?
	NLTEST5030	Peltigera collina		S1	N?	G3G4
2 Dry Mixedwood	NLTEST5080	Deltiones becausets lie		S1S2	N?	G5
2 Dry Mixedwood	NLTEST5510	Peltigera horizontalis		5152	N?	G5
2 Dry Mixedwood		Bryoria trichodes	old man's beard	SU	N?	G3G5
2 Dry Mixedwood	NLTEST5970	Cladonia bacilliformis		S2S3	N?	G4G5
2 Dry Mixedwood	NLTEST6470	Cladonia macilenta		S2?	N?	G5
2 Dry Mixedwood	NLTEST6880	Cladonia squamosa		62	N?	G5
2 Dry Mixedwood	NLTEST7190	Cladonia squamosa		S2		
2 Dry Mixedwood		Cladina stygia		S1	N?	G5
2 Dry Mixedwood	NLTEST9030	Anaptychia setifera		S2	N?	G3G4
2 Dry Mixedwood	PDAST0S1Q0	Artemisia tilesii	Herriot's sagewort	S2	N?	G5
2 Dry Mixedwood	PDAST3P140	Eupatorium maculatum	agetted les europeed	6163	N5	G5
2 Dry Mixedwood 2 Dry Mixedwood	PDAST5F010	Lupatorium maculatum	spotted Joe-pye weed	S1S2		
2 Dry Mixedwood		Lactuca biennis	tall blue lettuce	S2	N?	G5
2 Dry Mixedwood	PDASTEH020	Aster umbellatus	flat-topped white aster	S2	N?	G5
2 Dry Mixedwood	PDBRA0K0V0	Cardamine parviflora	small bitter cress	S1	N?	G5
2 Dry Mixedwood	PDBRA0K0Z0		meadow bitter cress	S2	N5	G5
2 Dry Mixedwood 2 Dry Mixedwood	PDCAR0X0B0	Cardamine pratensis		52		
2 Dry Mixedwood		Stellaria crispa	wavy-leaved chickweed	S2	N?	G5
2 Dry Mixedwood	PDCLU03120	Hypericum majus	large Canada St. John's-wort	S2	N3	G5
2 Dry Mixedwood	PDDRO02060	Drosera linearis	slender-leaved sundew	S2	N4	G4
2 Dry Mixedwood	PDGEN0C010	Lomatogonium rotatum	marsh felwort	S2S3	N5?	G5
2 Dry Mixedwood	PDGER02070	Geranium carolinianum	Carolina wild according	0200	N2	G5
2 Day Mixed Wood			Carolina wild geranium	S1		
2 Dry Mixedwood	PDLAM1G0E0	Physostegia ledinghamii	false dragonhead	S2	N3?	G3?
2 Dry Mixedwood	PDNYM050J0	Nymphaea leibergii	pygmy water-lily	S1	N5	G5
2 Dry Mixedwood	PDPGL02180	Polygala paucifolia	fringed milkwort	81	N2	G5
2 Dry Mixedwood	PDROS1K900	Public v paracaulic	hybrid dwarf ranch see.	S1 S1	N?	GNA
2 De Missel	PDRUS1K900 PDRUB1T0E0	Rubus x paracaulis	hybrid dwarf raspberry	51		
2 Dry Mixedwood		Hedyotis longifolia	long-leaved bluets	S2 S2	N?	G4G5
2 Dry Mixedwood	PDSAR02070	Sarracenia purpurea	pitcher-plant	S2	N5	G5
2 Dry Mixedwood	PDSAX07030	Chrysosplenium iowense	golden saxifrage	S3	N3	G3
2 Dry Mixedwood	PDVIO04142	Viola pallens	Maclackey's violet	\$3 \$2 \$1 \$2 \$2 \$2 \$2	N2	G5T5
2 De Missed	PMALI040H0		Macloskey's violet	52		
2 Dry Mixedwood		Sagittaria latifolia	broad-leaved arrowhead	51	N?	G5
2 Dry Mixedwood	PMCYP031F0	Carex backii	Back's sedge	S2	N?	G4
2 Dry Mixedwood	PMCYP035T0	Carex heleonastes	Hudson Bay sedge	S2	N?	G4
2 Dry Mixedwood	PMCYP03690	Carex houghtoniana	sand sedge	52	N?	G5
2 Dry Mixedwood	PMCYP036D0	Carry hystoriana		S1	N2	G5
2 Dec Minardo	DMC17030D0	Carex hystericina	porcupine sedge	51		
2 Dry Mixedwood	PMCYP036W0	Carex lacustris	lakeshore sedge	S2	N?	G5
2 Dry Mixedwood	PMCYP038E0	Carex mertensii	purple sedge	S1	N2	G5
2 Dry Mixedwood	PMCYP03AA0	Carex pedunculata	stalked sedge	S1	N?	G5
2 Dry Mixedwood	PMCYP03EN0	Carey vulninoidea		S2	N?	G5
2 Dry Mixedwood	PMCYPU3EN0	Carex vulpinoidea Eleocharis tenuis	fox sedge			Go
2 Dry Mixedwood	PMCYP091S0	Eleocharis tenuis	slender spike-rush	SU	N?	G5
2 Dry Mixedwood	PMCYP0N070	Rhynchospora capillacea Trichophorum clintonii	slender beak-rush	S1	N?	G4
2 Dry Mixedwood	PMCYP0Q0A0	Trichophorum clintonii	Clinton's bulrush	S1	N?	G4
2 Dry Mixedwood 2 Dry Mixedwood	PMCYP0Q0P0	Delha seha saya fiya istilia	river bulrush	S1	N5	G5
z Dry Mixedwood	PMCYPOQOPO	Bolboschoenus fluviatilis		51		G5
2 Dry Mixedwood	PMCYP0Q140	Scirpus pallidus	pale bulrush	S1	N?	G5
2 Dry Mixedwood	PMHYD03010	Elodea bifoliata	two-leaved waterweed	S1	N2	G4G5
,	PMIRIOD180	Sisyrinchium septentrionale	pale blue-eyed grass	S2S3	N3N4	G3G4
2 Dry Mixedwood		Juncus brevicaudatus	pare blue-eyeu grass			
2 Dry Mixedwood			short-tail rush	S2	N5	G5
2 Dry Mixedwood	PMJUN010G0	Juneus Dreviedudatus				
2 Dry Mixedwood 2 Dry Mixedwood	PMJUN012N1	Juncus stygius var americanus	marsh rush	S2	N?	G5T5
2 Dry Mixedwood 2 Dry Mixedwood	PMJUN012N1	Juncus stygius var americanus Luzula acuminata		S2 S1	N?	G5T5 G5
2 Dry Mixedwood	PMJUN010G0 PMJUN012N1 PMJUN02010 PMJUN020H0	Juncus stygius var americanus Luzula acuminata Luzula rufescens	marsh rush	S2 S1 S1		

2 Dry Mixedwood	PMNAJ01020	Najas flexilis	slender naiad	S1S2	N5	G5
2 Dry Mixedwood	PMORC1R060	Malaxis monophylla	white adder's-mouth	S2	N?	G5
2 Dry Mixedwood	PMORC1R070	Malaxis paludosa	bog adder's-mouth	S1	N3	G4
2 Dry Mixedwood	PMPOA200A0	Danthonia spicata	poverty oat grass	\$1\$2	N?	G5
2 Dry Mixedwood	PMPOA240K0	Panicum leibergii	Leiberg's millet	S1	N?	G5
2 Dry Mixedwood	PMPOA2Y060	Glyceria elata	tufted tall manna grass	S2	N?	G4G5
2 Dry Mixedwood	PMPOA481D0	Muhlenbergia racemosa				
2 Dry Mixedwood	PMPOA4J030		marsh muhly	S1	N4N5	G5
2 Dry Mixedwood		Oryzopsis canadensis	Canadian rice grass	S1	N4N5	G5
2 Dry Mixedwood	PMPOA4J070	Oryzopsis micrantha	little-seed rice grass	S2	N?	G5
	PMPOT030B0	Potamogeton foliosus	leafy pondweed	S2	N?	G5
2 Dry Mixedwood	PMPOT030R0	Potamogeton obtusifolius	blunt-leaved pondweed	S2	N?	G5
2 Dry Mixedwood	PMPOT030Z0	Potamogeton robbinsii	Robbins' pondweed	S1	N?	G5
2 Dry Mixedwood	PMPOT03110	Potamogeton strictifolius	linear-leaved pondweed	S2	N?	G5
2 Dry Mixedwood	PMRUP01020	Ruppia cirrhosa	widgeon-grass	S1S2	NR	G5
2 Dry Mixedwood	PMSPA01070	Sparganium glomeratum	bur-reed	S1	N1	G42
2 Dry Mixedwood	PPDRY0A090	Dryopteris cristata	crested shield fern	S1	N?	G5
2 Dry Mixedwood	PPDRY0D020	Gymnocarpium disjunctum	Greated sillerd ferri	S1	N?	G4
2 Dry Mixedwood	PPOPH01070	Botrychium lanceolatum	leave leaved series from			
2 Dry Mixedwood	PPOPH010E0		lance-leaved grape fern	S2	N?	G5
2 Dry Mixedwood 2 Dry Mixedwood	PPOPH010R0	Botrychium simplex	dwarf grape fern	S2	N?	G5
2 Dry Mixedwood 2 Dry Mixedwood		Botrychium minganense	Mingan grape fern	S2S3	N?	G4
	PPOPH010S0	Botrychium ascendens	ascending grape fern	S1	N2N3	G2G3
2 Dry Mixedwood	PPOPH010V0	Botrychium pinnatum		S1	N?	G4?
2 Dry Mixedwood	PPOPH01130	Botrychium pallidum		S1	N1	G3
2 Dry Mixedwood	PPOPH01200	Botrychium michiganense		SU	N?	G1
6 Lower Boreal Highlands	NBHEP04030	Anastrophyllum helleranum	liverwort	52	N?	G5
6 Lower Boreal Highlands	NBHEP0U020	Chiloscyphus pallescens	liverwort	S1	N?	G5
6 Lower Boreal Highlands	NBHEP1Y0U0	Lophozia rutheana	liverwort	S1	N?	G42
6 Lower Boreal Highlands	NBHEP2Y030	Riccardia latifrons	liverwort	S2	N?	G4G5
6 Lower Boreal Highlands	NBHEP2Y040	Riccardia multifida				
6 Lower Boreal Highlands	NBHEP2Z080		liverwort	S2S3	N?	G5
		Riccia cavernosa	liverwort	S1	N?	G5
6 Lower Boreal Highlands	NBHEP330S0	Scapania paludicola	liverwort	S2	N?	G5
6 Lower Boreal Highlands	NBMUS1A1G0	Bryum cyclophyllum		S2	N?	G4G5
6 Lower Boreal Highlands	NBMUS2J0A0	Drepanocladus sendineri	brown moss	S1	N?	G5?
6 Lower Boreal Highlands	NBMUS6P010	Schistostega pennata	luminous moss	S1S2	N?	G3G4
6 Lower Boreal Highlands	NBMUS6Z0A0	Sphagnum fimbriatum	fringed bog moss	S2	N?	G5
6 Lower Boreal Highlands	NBMUS6Z1T0	Sphagnum contortum	twisted bog moss	S2	N?	G5
6 Lower Boreal Highlands	NBMUS6Z230	Sphagnum fallax	peat moss	S2	N?	G5
6 Lower Boreal Highlands	NBMUS71040	Splachnum rubrum				
6 Lower Boreal Highlands	NBMUS79050		red collar moss	S3	N?	G3
6 Lower Boreal Highlands		Tayloria serrata	slender splachnum	S2	N?	G4
	NBMUS88070	Warnstorfia tundrae	brown moss	S2	N?	GU
6 Lower Boreal Highlands	NBMUS9N010	Pseudobryum cinclidioides		S2	N?	G5
6 Lower Boreal Highlands	NBMUS9Q080	Rhizomnium magnifolium		S2	N?	G4G5
6 Lower Boreal Highlands	NLCAL46120	Cyphelium tigillare		S2	N?	G5
6 Lower Boreal Highlands	NLT0012560	Imshaugia placorodia		S2	N?	G3G5
6 Lower Boreal Highlands	NLT0013350	Lecanora cateilea		S2	N?	GNR
6 Lower Boreal Highlands	NLT0019520	Nephroma bellum		S2	N?	G3G5
6 Lower Boreal Highlands	NLTEST7190	Cladina stygia		S1	N?	G5
6 Lower Boreal Highlands	PDBRA0K0Z0	Cardamine pratensis	meadow bitter cress	S2	N5	G5
6 Lower Boreal Highlands	PDFAB0F1C0					
6 Lower Boreal Highlands	PDLNT01080	Astragalus bodinii	Bodin's milk vetch	S1	N?	G4
		Pinguicula villosa	small butterwort	S1	N?	G4
6 Lower Boreal Highlands	PDORO01020	Boschniakia rossica	ground-cone	S1	N?	G5
6 Lower Boreal Highlands	PDSAR02070	Sarracenia purpurea	pitcher-plant	S2	N5	G5
6 Lower Boreal Highlands	PDSAX07030	Chrysosplenium iowense	golden saxifrage	S3	N3	G3
6 Lower Boreal Highlands	PMCYP035T0	Carex heleonastes	Hudson Bay sedge	S2	N?	G4
6 Lower Boreal Highlands	PMCYP03690	Carex houghtoniana	sand sedge	S2	N?	G5
6 Lower Boreal Highlands	PMCYP039Q0	Carex oligosperma	few-fruited sedge	S1S2	N?	G5?
6 Lower Boreal Highlands	PMCYP0Q140	Scirpus pallidus	pale bulrush	S1	N?	G5
6 Lower Boreal Highlands	PMJUN012N1	Juncus stygius var americanus	marsh rush	S2	N?	G5T5
6 Lower Boreal Highlands	PMPOA0H011	Arctagrostis arundinacea	polar grass	S1	N?	G5T5
6 Lower Boreal Highlands	PMPOA170N0					
		Calamagrostis lapponica	Lapland reed grass	S1	N?	G5
6 Lower Boreal Highlands	PMPOT030R0	Potamogeton obtusifolius	blunt-leaved pondweed	S2	N?	G5
6 Lower Boreal Highlands	PPISO01040	Isoetes echinospora	northern quillwort	S1	N?	G5?
6 Lower Boreal Highlands	PPLYC01100	Diphasiastrum sitchense	ground-fir	S2	N?	G5
6 Lower Boreal Highlands	PPOPH01070	Botrychium lanceolatum	lance-leaved grape fern	S2	N?	G5
6 Lower Boreal Highlands	PPOPH010V0	Botrychium pinnatum		S1	N?	G4?
21 Upper Boreal Highlands	NBMUS6Z0A0	Sphagnum fimbriatum	fringed bog moss	S2	N?	G5
	NLT0008330	Cladonia cyanipes		S2	N?	GNR



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