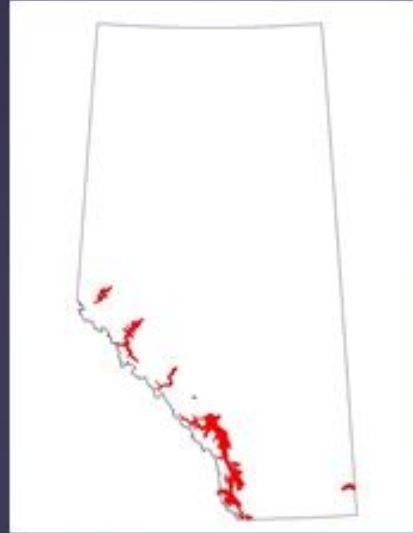


# Guide to ECOLOGICAL SITES OF THE MONTANE SUBREGION



# ECOLOGICAL SITES OF THE MONTANE SUBREGION

Fourth approximation

2021

Prepared by:

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**Note:** This guide reflects the changes to the Ecological sites of the Montane subregion (2020) (Third approximation).

Date	Type of Revision	Version No.	Sections Revised
Dec 2017		2.0	All
March 2020	<ol style="list-style-type: none"> <li>1. Addition of 963 plots to the South Ecosection</li> <li>2. Addition of 13 new community types and three new shrubland phases b7, c6, cc2 to the South Ecosection</li> <li>3. Addition of new ecological site phases industrial/tame, (d9 north and south ecosections, c6 Cypress Hills ecosection)</li> <li>4. Addition of crosswalk table to Alberta Wetland Classification System</li> </ol>	3.0	<ol style="list-style-type: none"> <li>1. Ecological sites: Plots added to all ecological sites in the South Ecosection</li> <li>2. Table 3 (community types Ms (b2a,c19,d1,d3a,d14,d23, d24,d25,d26,d27,d28,e10a,g21,g22,g23)</li> <li>3. Ecological site phases Tables 1,2,3</li> <li>4. General Ecological Descriptions: Wetlands</li> </ol>
March 2021	<ol style="list-style-type: none"> <li>1. Addition of 227 plots to the South Ecosection</li> <li>2. Addition of 5 new community types Msc20, Msc21, Msh29, Msc22, Msc23 to ecosite phases aa2, b5,e2 and g2 in the South Ecosection</li> <li>3. Update Appendix 2 to reflect only soil profiles and soil types described in the Montane subregion</li> <li>4. An outline of successional changes to grass and shrubland plant communities of south and west facing slopes in the presence and absence of disturbance</li> </ol>	4.0	<ol style="list-style-type: none"> <li>1. Ecological sites: Plots added to ecological sites aa-bluebunch wheatgrass, b-bearberry, c-buffaloberry/hairy wildrye, cc-rough fescue, d-mahonia/meadowsweet, e-red osier dogwood and g-meadow in the South Ecosection</li> <li>2. Table 3 (community types Msc20, Msc21, Msh29, Msc22, Msc23)</li> <li>3. Appendix 2 Soil type descriptions for the Montane subregion</li> <li>4. Appendix 3</li> </ol>

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## Executive Summary

The Montane subregion is one of the most diverse subregions within the province of Alberta. The ecological diversity of this subregion creates a landscape that consists of a mosaic of different vegetative communities. This diversity means that these lands are valued for a multitude of uses, including summer range for livestock, prime habitat for many species of wildlife, productive watersheds, wood fibre production and recreation.

It is hoped this classification system can be used by field staff to assess the ecology of the sites and develop management prescriptions on lands within this region. This guide represents the analysis of approximately 3852 plots described in the Montane subregion. This guide includes plots done in the Montane subregion of Banff and Jasper National Parks, the Ya Ha Tinda area west of Sundre, Kootenay Plains west of Rocky Mountain House and community types described in the Cypress Hills. This guide has been split into 3 ecosections Montane Cypress Hills, Montane North (Ya Ha Tinda north to Grande Cache) and Montane South (west of Calgary and south to the Montana border). The 3852 plots represent 276 community types. These types are split into:

Montane Cypress Hills Ecosection (43 plant community types)

Montane North Ecosection (70 plant community types)

Montane South Ecosection (163 plant community types)

The dominant plant species, canopy cover, environmental conditions and response to grazing are outlined for each type.

## Acknowledgements

Landscape classification is the process of breaking the landscape into definable and manageable pieces through a hierarchical classification. In the early 1990's the forested landscape of Alberta was classified using a well organized hierarchical system (Archibald/ Beckingham / Klappstein). Unfortunately this left about 50% of the remaining natural landscapes of the province unclassified. Starting in the late 1990's rangelands undertook efforts to classify the rangelands of Alberta. A need for consistency across the province was recognized. Therefore a hierarchical classification that built on the forested classification was used for all forest dominated subregions in the province.

In January, 1999 the Rangeland Health Assessment Project was initiated. Its purpose was to coordinate the development of rangeland health assessment methods and ecological site descriptions for both forested and grassland dominated rangelands in the province and transfer the new technology (awareness, information and tools) to livestock producers, staff and other stake holders. At this time a website (ESD) was also developed to store the rangeland ecological data, but there was insufficient funds to develop hard copy reports from the website. In 2005 funding was provided by Prairie Farm Rehabilitation Administration (PFRA) of Agriculture and Agri-Food Canada through the technical assistance objective of the Green Cover program and hard copy pdf documents were made available from the old ESD website. In 2010 funding was provided by Policy and Planning Division, Alberta Environment and Parks to upgrade the ESD website to ECOSYS in order to produce hard copy pdf documents from the new website (<https://securexnet.env.gov.ab.ca/EcoSysExternal/>) allowing for improved updates of existing guides with new environmental attributes, soil and landscape information.

The creation of this report would not be possible without data collected in other projects. We would like to acknowledge Parks Canada for allowing us to use data from the Ecological Land Classification of Banff and Jasper National Parks (Holland and Coen 1982). Much of the grassland and shrubland vegetation data collected by Ian Corns and Peter Achuff were incorporated into the Banff and Jasper Mountain ecodistricts of this guide. We would like to acknowledge the work done by Bill Thompson and Paul Hansen who completed the Classification and Management of Riparian and Wetland Sites of Alberta's Grassland Natural Region. All plots done in the Montane subregion for this riparian classification were included in this guide. We would like to acknowledge the Rocky Mountain Forest Reserve Range Association for their continued support in supplying inventory data for the update of the various guides found in the Forest Reserve of Southwestern Alberta. We would also like to acknowledge the work of Lindsay Poulin and Darlene Moisey on the Cypress Hills classification and Karen Sundquist on the shrubland classification.

# Introduction and Background

The province of Alberta is covered by a broad spectrum of vegetation regions from prairie in the South, to alpine vegetation in the mountains and dense forests in the Central and Northern parts of the province. These broad vegetation regions have been classified into 6 natural regions and 21 subregions (Natural Regions and Subregions of Alberta 2006). Each of the regions consists of groups of plant communities which are influenced by environmental conditions and human impacts. Intensive management of these regions requires the ability to recognize the vegetative communities that have similar productivities and respond to disturbance in the same way. These vegetative communities are highly regarded by most resource managers for their ability to provide a wide variety of benefits. They are a classic example of multiple use land, providing summer range for livestock, prime habitat for many species of wildlife, productive watersheds and recreational areas.

The purpose of this guide was to develop a framework that would easily group the ecological sites and vegetative community types in the Montane Natural Subregion of the province. Ecological site classification helps to organize our current understanding about ecosystem function. This organization is achieved by grouping research plots into similar and functional units that respond to disturbance in a similar and predictable manner.

The ecological site classification system outlined in this document organizes ecological information into a format that facilitates understanding and provides a structure for ecologically based management. The system has been developed primarily as a field tool to complement the user's knowledge about ecological site classification, soil description, and plant identification. The objectives of the ecological site classification are:

1. to facilitate the application of ecological information to decisions on a wide variety of activities within the realm of land resource management
2. to facilitate the collection and organization of information to expedite the development of resource management applications and decision support systems
3. to promote communication among resource managers and between managers and the public
4. to provide a common basis for integrated planning, and
5. to reduce resource management costs by integrating ecological information into the decision-making process.

This guide builds on the work outlined in the Field guide to Ecosites of West-Central Alberta (Beckingham et al. 1996) and the Field guide to Ecosites of Southwestern Alberta (Archibald et al. 1996), Ecological sites of the Montane subregion (Willoughby et al. 2020) for the Montane ecological area. It also builds on work done by Baker et al. (2020) for the rangeland plant communities for the Montane subregion. This guide outlines the analysis of 3852 plots described in the Montane subregion.

## Physiography, Climate and Soils

*Please note this summary of Natural Subregion characteristics is largely extracted directly from the Natural Subregions guide (Natural Regions Committee 2006) and is presented here for the reader's convenience.*

The Montane subregion comprises only 0.9 percent of the province and is found in an area south of Chain Lakes to the Montana border, portions of the Bow and Athabasca river valleys and isolated areas near Ya Ha Tinda and Grande Cache (Strong and Leggat 1992). The Montane is distinguished from the other subregions by the presence of Douglas-fir (*Pseudotsuga menziesii*), limber pine (*Pinus flexilis*) and lodgepole pine (*Pinus contorta*). Elevationally the Montane occurs below the Subalpine and Upper Foothills subregions in the mountains and above the Foothills Fescue grass and Foothills Parkland subregions in southern Alberta.

This is the driest and warmest of the three Natural Subregions in the Rocky Mountain Natural Region, and regional and local climatic influences produce a highly diverse array of plant communities and soil types that change rapidly over very short distances (Natural Regions Committee 2006). Mild summers, a summer-high precipitation pattern, frequent Chinook winds and warm winters are characteristics of the Montane Natural Subregion. Owing to warm Pacific air masses and frequent Chinooks, winters in the Montane Natural Subregion are warmer than anywhere else in Alberta except the Foothills Fescue and Foothills Parkland Natural Subregions (Natural Regions Committee 2006). Yearly precipitation ranges from 308 mm to 1279 mm with two precipitation peaks occurring in May-June and again in August-September (Strong 1992). Summer monthly temperatures average 11.9 C and are 2 C warmer than the Subalpine and 2oC cooler than the Foothills Fescue grass subregions. The Montane has the warmest winter temperatures of any forested region in Alberta because of chinook activity and reduced influence of Arctic air (Strong 1992).

The Montane Natural Subregion includes the rolling and hilly foothills of southwestern Alberta and outliers on the Porcupine Hills and Cypress Hills as well as the valley floors and lower slopes of the Crowsnest, Bow, North Saskatchewan, Athabasca and Smoky Rivers that flow from west to east through the Front Ranges. The foothills area is composed of non-marine Cretaceous sandstones, siltstones and shales (Alberta Group, Belly River, St. Mary's River). The Porcupine and Cypress Hills are underlain by non-marine Tertiary sandstones and siltstones. Glacial and river erosion has carved major valleys through Mesozoic and Paleozoic dolomitic and limestone formations and Cretaceous sediments. Rock strata are generally oriented perpendicular to water flow.

Surficial materials in the foothills are mainly medium textured, weakly calcareous tills. However, these deposits can be quite thin in steeper areas where textures tend to be more variable. In major river valleys, fluvial and glaciofluvial sands and gravels form level to gently undulating terraces on valley bottoms; till and colluvial deposits of variable textures occur on lower slopes. Bedrock exposures occur both in the foothills and in the valleys. Extremely calcareous loessal materials occur at the eastern extension of the Athabasca valley in the Brule Lake area.

In the foothills and outlying Montane areas of southern and southwestern Alberta, Orthic Black Chernozems are typical under grasslands with Orthic Dark Gray Chernozems becoming dominant in the wooded areas. On moister northern slopes and higher elevations, Gray Luvisols become significant. Bedrock exposures (nonsoils) also occur. In the valleys, Eutric Brunisols are the dominant soil on fluvial and glaciofluvial deposits.

Regosols are typical of both fluvial terraces adjacent to the rivers and side slopes where erosion or slope movement has recently occurred. Valley side soils may also include Luvisols and Dystric Brunisols where slopes are stable enough to allow soil development to occur. Gleysols and Organic soils are typically associated with fens.

## Approach and Methods of Classification

### Approach:

#### *Ecological classification hierarchy and terminology*

The system of classification in this guide was initially based on the community type approach of Mueggler (1988). Mueggler's system was chosen over the habitat type approach (Daubenmire 1952) or ecosystem association approach (Corns and Annas 1986) because it could classify plant communities irregardless of their successional status. However, as the philosophy of proper functioning condition of a site evolved, it became apparent (through data analysis) that there was a need to also organize the various plant communities based on their response to disturbance (i.e. disturbance vs. natural succession) within an area under similar environmental influences.

It was determined that the ecosystem classification system developed by Corns and Annas (1986) and Beckingham et al. (1996) could accommodate this additional requirement. Thus, this classification system is a combination of Mueggler (1988) and Beckingham et al. (1996). Consequently, this guide adopts a similar ecological unit classification hierarchy (ecodistrict, ecosection, ecological site, ecological site phase, plant community). The ecological classification system is nested within Alberta's geographically based natural region and subregion classification system (Natural Regions Committee 2006).

#### *Ecodistrict*

The ecodistrict level is a unique pattern of slope, landform, soils and vegetation. Mapping of this unit is usually done at a scale of 1:1,000,000 to 1: 250,000 within the whole province (Strong and Anderson 1980). This level of the classification hierarchy is spatially defined and may or may not be unique to a subregion.

#### *Ecosection*

The natural subregion used by the Alberta Government is equivalent to the ecoregion defined by the Canada Committee on Ecological Land Classification (CCELC) as part of a multi-level national mapping system for Canada and that was used for integrated resource planning in Alberta (Marshall et al. 1996). Similarly, the ecodistrict as presently used and its associated scale of mapping is equivalent to the ecodistrict defined by the CCELC. However, the ecosection has a somewhat different meaning in the current context than it did in the national system or than it did when it was applied to integrated planning maps in Alberta in the 1980's and 1990's. For those mapping projects, the ecosection was a subdivision of the ecodistrict and was mapped at 1:20 000 to 1:50 000 as a more specific delineation of recurring landform and vegetation patterns, usually with reference to major community type groups or soil subgroups. In the current scheme, the ecosection is a term used to define one ecodistrict or an aggregation of ecodistricts that represent one or more climatic variants within a natural subregion; therefore, its mapping scale is flexible. This level of the classification system is not spatially defined. The ecosection is a unique pattern of slope, landform, soils and vegetation and may also represent a slight change in the climate of a subregion. Mapping of this unit is usually done at a scale of 1:1,000,000 to 1:100,000 and can be a grouping of ecodistricts or at smaller scales outliers in a subregion. For example the Lower Boreal Highlands subregion is split into the foothills and boreal ecosections which are influenced by their proximity and location within the Boreal and Foothills Natural Regions. Spatially these two ecosections are split by grouping ecodistricts. In contrast an example of a smaller scale ecosection (1:100,000) is the Cypress Hills outlier of the Montane subregion. Subregion ecosections have a characteristic sequence of ecological sites according to soil moisture regime (SMR) and, to a lesser degree, soil nutrient regime (SNR). Currently there are three ecosections described for this subregion.

#### *Ecological Site*

Ecological sites are ecological units that develop under similar environmental influences (climate, moisture, nutrient regime). They are groups of one or more ecological site phases that occur within the same portion of

the edatope (moisture/nutrient grid). Each ecological site is designated with a small letter. These letters range from "a" the driest ecological site and the last letter being the wettest. Each ecological site has been given a name that conveys some information about the ecology of the unit. Ecological sites are typically named after plant species that are common or typical of the site (eg. e low-bush cranberry). The plant that the ecological site is named after, however, may not be present in every plot or stand belonging to the site. Ecological site in this classification system, is a functional unit defined by moisture and nutrients. It is based on the combined interaction of biophysical factors which together dictate the availability of moisture and nutrients for plant growth. Thus, different ecological sites vary in their moisture and nutrient regime and have similar characteristic plants and soils.

### *Ecological site phase*

An ecological site phase is a subdivision of the ecological site based on the dominant species in the canopy. On lowland, meadow or grassland sites where tree canopy is not present the tallest structural vegetation layer with greater than 5% cover determines the ecological site phase. Generally, ecological site phases are mappable units and spatial ecological site phase land cover datasets have been developed from AVI (Alberta Vegetation Inventory) (Derived Ecosite Phase (DEP)) and PLVI (Primary Land Vegetation Inventory). Ecological site phases are identified by the ecological site letter "a" along with a number "a1" representing the phase within the ecological site. Ecological site phases have a distinct range in canopy composition, lower strata plant species and pedogenic processes. The ecological site phase has a strong ecological basis and correlates well with forest cover on forest inventory maps.

### *Plant community type*

Ecological site phases may be subdivided into plant community types, which are the lowest taxonomic unit in the classification system. While plant community types of the same ecological site phase share vegetational similarities they differ in their understory species composition and abundance. Generally the plant community types are named by combining the name of the dominant plant species in each structural layer (eg. White spruce/Horsetail/Moss)

## **Methods:**

### *Plant community classification*

Sampling for this guide occurred within the Montane subregion. This guide outlines the classification of approximately 3852 plots described from 1976 to 2019.

Field inventory for these plots generally followed the Ecological Land Survey Site Description Manual (2003) and uses various site, vegetation and soils forms. Plot data was analyzed using the multivariate analysis techniques of classification and ordination. Classification is the assignment of plots to classes or groups based on the similarity of species within each plot. A polythetic agglomerative approach was used to group the samples. This technique assigns each plot to a cluster which has a single measure. It then agglomerates these clusters into a hierarchy of larger and larger clusters until finally a single cluster contains all the plots (Gauch 1982). The cluster analysis was performed in SAS with Euclidean distance used as the Cluster Distance Measure and Ward's method was used in the Group Linkage Method. The groupings generated in cluster analysis were overlain on the site ordination to determine final groupings.

Ordination was used to find relationships among species, communities and environmental variables. Ordination reduces the dimensionality of the data to 1-3 most important axes to which environmental gradients can be assigned. The ordination technique used in the analysis of the data was DECORANA (Detrended Correspondence Analysis). Once final groupings were determined on the ordination specific environmental variables can be assigned to the variation outlined on the ordination axes.

Plant community summaries were generated by averaging plant species composition, range in composition, and percent constancy of occurrence, among vegetation inventory plots which were part of a community type. Environmental data were sorted into the same plant community groupings to create the plant community

descriptions outlined in this guide. The number of sample plots on which the description was based is also provided (e.g. n=16).

### *Ecological Health and Ecological Status Score*

Ecological health is determined by comparing the functioning of ecological processes on an area (e.g. plant community polygon) of to a standard (i.e. Reference Plant Community) described within an ecological site description. An ecological site is defined by the Task Group on Unity and Concepts (1995) as, “a distinctive kind of land with specific physical characteristics that differs from other kinds of land in its ability to produce a distinctive kind and amount of vegetation”. This guide can be used to determine the appropriate reference plant community, within an ecological site, for a health assessment. We use health terminology (healthy, healthy with problems, or unhealthy), to rank the ability of the land to perform certain ecological functions. These functions include: net primary production, maintenance of soil/site stability, capture and beneficial release of water, nutrient and energy cycling and plant species functional diversity. For a detailed description on how to assess health for various plant communities please refer to “Rangeland Health Assessment for Grassland, Forest and Tame Pasture” (Adams et al. 2016).

An ecological status score (i.e. the integrity of the plant community composition compared to the reference plant community) has been added to each community type description. These values are based on what is currently known about how a reference plant community (RPC) responds to various kinds and levels of disturbance or successional processes. The values indicate how a particular plant community fits in the state and transition model relative to the RPC. If an experienced observer wishes to estimate the health of a plant community without completing a health form, (e.g. a small riparian area), these values can be used as a guide. Occasionally there are 2 options provided for the ecological status score. This was done for two reasons: 1) to express the range of divergence from the RPC possible for a particular plant community; or 2) to allow for different health forms to be used in communities with variable shrub or tree cover (e.g. on sites with high woody cover and/or an obvious LFH layer use the forest rangeland health form and the corresponding ecological status score; on sites dominated by herbaceous cover and/or an obvious herbaceous litter layer use the native grassland form). Late seral plant communities tend to be superior in the efficient capture of solar energy, in cycling of organic matter and nutrients, in retaining moisture, in supporting wildlife habitat values and in providing the highest potential productivity for the site (Adams et al. 2016). In contrast, early seral disturbed stages represent plant communities with diminished ecological processes, which are less stable and more vulnerable to erosion and invasion by weeds and non-native species. In most cases these late seral plant communities are used as the RPC, but sometimes management goals influence the choice of RPC (e.g. a cut block to be maintained as untimbered rangeland).

An example of ecological status scores for grasslands include 40, 27,20,15 and 0. Where a score of 40 represents a plant community that closely resembles the reference plant community and a score of 0 represents a plant community that exhibits significant alterations and >70% of the vegetation is non-native (Adams et al. 2016).



## Correlation of Soils and Ecological Sites

*Please note this summary of Natural Subregion characteristics is largely extracted directly from the Natural Subregions guide (Natural Regions Committee 2006) and is presented here for the reader's convenience.*

Vegetation patterns in the Montane Natural Subregion are complex. Plant community changes occur locally and across the Natural Subregion in response to slope, aspect, elevation and latitude. Plant species distribution patterns, along with significant regional variations in landscapes, suggest a division into three districts defined by topography and latitude:

- x southern foothills and plains and mountain valley district (Montane South Ecosection)
- x Cypress Hills district (Montane Cypress Hills Ecosection)
- x northern mountain valley district (Montane North Ecosection)

The southern foothills and plains district includes lower-elevation areas along the Front Ranges, mainly south of the Bow River Corridor (Montane South Ecosection) but extending northward to approximately the Ya Ha Tinda plateau, where it intergrades with the Montane North Ecosection northward to the Kootenay Plains. The Cypress Hills variant (Montane Cypress Hills Ecosection) is geographically separated from the southern foothills by about 300 km. Limber pine and Douglas fir, both characteristic of the Montane South Ecosection, are not found in the Cypress Hills.

The Montane South Ecosection also includes the Crowsnest Pass and Bow Valley. The Montane North Ecosection includes the Ya Ha Tinda, North Saskatchewan River and mountain valleys to the north (the Athabasca River valley between Jasper and Hinton, and the Smoky River valley near Grande Cache). The Kootenay Plains lie within the North Saskatchewan River valley and are arbitrarily placed in the northern ecosection. They are transitional between the southern and northern valley districts, with grasslands typical of more northerly Montane areas and tree species typical of southern Montane areas, such as limber pine.

### *Montane South Ecosection*

Exposed, rocky ridgetops and upper slopes in the Montane South Ecosection are vegetated by open limber pine and Douglas fir stands, with an understory of ground juniper, bearberry and foothills rough fescue. Rapidly drained Chernozems are typical, and Brunisols also occur. At lower elevations on dry sites in the southern ecosection, grasslands dominated by bluebunch wheatgrass, foothills rough fescue and sedge are typical; many of these grassland species gradually decline in abundance to the north. The grasslands and open forests of the Ya Ha Tinda (Red Deer River valley) are the approximate south–north dividing line between the Montane South and Montane North ecosections.

The grasslands in the Kootenay Plains are dominated by northern wheatgrass and June grass. The bluebunch wheatgrass and foothills rough fescue communities that are more typical of the South Ecosection are both absent. The open forests include Douglas fir and limber pine, the latter species reaching its northern limits in North America in the North Saskatchewan river valley.

In the South Ecosection, at lower elevations, moderately dry south and west-facing slopes may be vegetated by open forests or grasslands. Open forests typically include lodgepole pine, Douglas fir, aspen, and white spruce as pure or mixed stands with understories of bearberry, Canada buffaloberry, hairy wild rye, pine reed grass and forbs on well drained, medium to fine textured Luvisolic and Brunisolic soils. Grasslands are also common on moderately dry south- and west-facing aspects and include foothills rough fescue, Idaho (bluebunch) fescue and Parry oatgrass on well to moderately well drained Chernozemic soils.

Moister sites in the South Ecosection support Douglas fir, aspen, lodgepole pine and white spruce stands with diverse understories. At higher elevations, young lodgepole pine stands are dominant; mixedwood and Douglas fir forests are secondary components except in the Porcupine Hills. White spruce and Engelmann

spruce hybridize, and subalpine fir is occasional. Green alder, white meadowsweet, a variety of forbs and feathermosses are typical understory species. Soils are generally medium to fine textured Brunisols and Luvisols, with some Chernozems occurring at the lowest elevations.

South of the Crowsnest Pass, species such as creeping mahonia, mountain lover and bear-grass are locally common. Moist sites have diverse and vigorous shrub and forb understories with nutrient indicators such as thimbleberry, red-osier dogwood, baneberry, and cow parsnip. Balsam poplar may occur along with other tree species in the overstory. Fine textured, moderately well to imperfectly drained Brunisols, Luvisols and Chernozems are associated with these sites. The wettest sites are willow- or sedge-dominated fens with high water tables and poorly drained Gleysolic soils. Treed fens are very uncommon, and occupy the wettest sites on poorly drained Organic and Gleysolic soils. White spruce is the dominant species, and black spruce is rarely found on highly calcareous sites or in wetlands south of the Bow River corridor.

#### *Montane Cypress Hills Ecoregion*

Plant communities in the Cypress Hills Ecoregion are floristically similar to the southern foothills and plains district to the west. Because of silty or occasionally gravelly, well drained soils and possibly grazing history, grassland communities on level hilltop locations typically have a higher proportion of shrubby cinquefoil and western porcupine grass than communities to the west, and Black Chernozemic soils are common.

Douglas fir, limber pine and bluebunch wheatgrass are common, but are not found in the Cypress Hills. Forests in the Cypress Hills occur on northerly slopes with Luvisolic soils, and include pure or mixed lodgepole pine, aspen and white spruce stands with understories of white meadowsweet, forbs, pine reed grass and white-grained mountain ricegrass.

#### *Montane North Ecoregion*

In the North Ecoregion, hairy wild rye replaces pine reed grass on moist to moderately dry sites, and June grass replaces foothills rough fescue on dry exposed sites. Grasslands are less extensive in this district than in the southern ecoregion. Douglas fir is less common, occurring only within Jasper National Park where it reaches its northernmost known limit in Alberta, and lodgepole pine, aspen and white spruce form the main canopy on forested sites. Black spruce is restricted to wet non-calcareous sites.

The driest, most exposed sites in the North Ecoregion are vegetated by shrubby grasslands with bearberry, silverberry, juniper, Canada buffaloberry, pasture sagewort, hairy wild rye and June grass, and rapidly drained Brunisols are typical. Limber pine and Douglas fir occur on exposed locations in the Kootenay Plains. Somewhat moister sites are forested by open lodgepole pine or white spruce stands with understories of bearberry, Canada buffaloberry and hairy wild rye on well drained Brunisolic soils. Typical sites in the North Ecoregion are forested, occurring on variable slopes and aspects, usually with well drained, moderately moist and often calcareous Brunisolic soils. Mixed lodgepole pine, aspen or white spruce stands have an understory of hairy wild rye and other herbaceous species. Feather moss mats are typical of closed-canopy lodgepole pine and white spruce stands.

Nutrient-rich, moist sites are typically forested by mixed aspen–balsam poplar stands with a lush understory of red-osier dogwood, rose, willow and herbs on moderately well to imperfectly drained, fine textured Brunisolic and Gleyed Gray Luvisols. Shrub and herb-dominated meadows also occur on rich sites along streams. Wetter forested sites are occupied by white spruce stands with horsetail and willow understories on imperfectly to poorly drained Gleysolic and Regosolic soils. Treed, shrubby and sedge-dominated fens are uncommon, and occupy the wettest sites on poorly drained Organic and Gleysolic soils. White spruce is more common than black spruce in treed fens, especially in highly calcareous areas such as those found near Hinton in the Athabasca River valley.

## Guidelines for Determining Ecological Sites

Alberta currently uses two ecological classification methods to determine ecological sites. In the agricultural settlement area of the Province, resource managers can determine site soil conditions using AGRASID (Agricultural Region of Alberta Soil Inventory Database). In the Rocky Mountain, Foothills and Boreal Natural Regions, the Ecological Landscape Classification approach incorporates both vegetation and site conditions (climate, soils and geology) into a hierarchical ecological unit classification (e.g. subregion, ecodistrict, ecosection, ecological site, ecological site phase, plant community) (Strong and Thompson 1995). Ecological sites are areas of similar climate, moisture and nutrient regimes. The combination of moisture and nutrient regimes can be represented on a two-dimensional grid called the edatope grid. The edatope grid is a two-dimensional table with soil moisture regime increasing from bottom to top along the vertical axis and soil nutrient regime increasing from left to right on the horizontal axis. Soil moisture regime (SMR) is defined as the average amount of soil water available annually for evapotranspiration by vascular plants (Meidinger and Pojar 1991). The SMR uses nine classes to define the available soil moisture, which range from the driest (very xeric) to the wettest (hydric). Soil nutrient regime (SNR) is defined as the amount of essential soil nutrients that are available to vascular plants over a period of several years (Meidinger and Pojar 1991). SNR is broken down into five classes that range from A (very poor) to E (very rich). Generally ecological sites are named from low moisture/low nutrient to high moisture/high nutrient. Ecological sites within a Natural subregion are defined unique combinations of soil moisture and nutrients. These conditions, in addition to climate, terrain, and elevations create conditions favourable to specific suite of plants referred to as Indicator species. For example a site with a subxeric moisture regime and poor nutrient regime site is characterized by the "a" [bearberry (subxeric/poor)] ecological site. A resource manager can review the indicator plant species of the ecological site, plant community types, soils and site conditions to see if the plant community in question fits the general descriptions. The following steps provide a framework for determining ecological sites.

### **Step 1** Review background information and pre-stratify the area to be classified

Review information about the area of interest to learn what you can about the landscape and ecology. Consult the natural subregions and Derived Ecosite Phase (DEP) or Primary Land Vegetation Inventory (PLVI) maps to ensure you are using the correct subregion guide. DEP and PLVI classification will also give you the common ecological site phase for a particular forest polygon.

### **Step 2** Carry out a quick reconnaissance of the site to be classified

Take note of the variability and relationship between topography and position on the landscape and the general plant species distribution including trees and understory. Check the DEP and PLVI ecological site phase maps.

### **Step 3** Choose a location that appears to be representative of the area to be classified

Locate an area for your assessment that appears to be representative of the site to be classified, and is homogeneous in slope, plant cover, and overstory canopy conditions as possible. Avoid locating the sample in areas that have received significant natural or artificial disturbance. Also avoid ecotone areas or relatively small areas that are transitional between homogenous ecological units such as slope breaks.

### **Step 4** Determine the plant species composition and abundance

Determine the plant species composition and abundance within a 10x10 m plot. Also record any species that appear to be representative of the ecological unit but occur outside the plot within the same slope position and on the same parent materials. Abundance is estimated by determining the amount of ground area that is covered by the plant species when its canopy is projected onto the ground surface (Ecological Land Survey Site Description Manual 2003).

**Step 5 Determine the important soil properties**

To collect soils data, a soil pit must be dug or augered. In most cases a soil pit 60 cm deep will be adequate. A deeper pit is required when the soil has a coarse to moderately coarse texture. In these cases the pit is dug deeper to see if there are finer-textured layers that are influencing ecological function below the 60 cm of coarse material. A deeper pit is also required when the plant community on the site cannot be explained by the site conditions and soil conditions above 60 cm. The minimum soils data that should be collected within a plot to classify it correctly are organic matter thickness, humus form, Ah horizon thickness, surface texture, effective texture, presence of seepage, depth to mottles, depth to gley, coarse fragment content, parent material/landform and drainage.

**Step 6 Determine important site properties**

Important site variables that should be collected include topographic position, slope, and aspect. Moisture regime, and nutrient regime are inferred from the relationship between regional and subregional climate, soil characteristics (primarily texture, drainage indicators and pH), and site properties.

**Step 7 Determine the natural subregion, ecological site, ecological site phase and plant community type.**

There are several ways to determine the ecological site, ecological site phase and plant community type. The first way to assign an ecological classification to a site is to use the field data collected and go through the various subregion guides to identify the ecological site. You can also use the dichotomous keys to ecological site and ecological site phase. Once you find a potentially correct plant community type, check the soil, site and vegetational characteristics of your site to make sure it is a reasonably close fit to the ecological site, ecological site phase and plant community type described on the various fact sheets (see below). To consider all ecological site choices and decide upon the best fit, you must compare the characteristics of your site, with the descriptions on the fact sheets for all ellipses that overlap the moisture and nutrient classes of your site on the edatope grid for the subregion and adjacent subregions within the area (Ecological Land Survey Site Description Manual 2003).

# How to use the Guide

## Organization of the guide

This guide is an expansion of the Ecosites of West-Central and Southwestern Alberta guides (Beckingham et al. 1996, Archibald et al. 1996) and Ecological sites of the Montane subregion (Willoughby et al. 2020). It contains new information and it is recommended that the reader has access to relevant information from all guides. The community types in this guide are closely related to the ecosites and ecosite phases outlined in Ecosites of West-Central and Southwestern, and are similarly arranged (e.g. Table 1). Table 1 is a reproduction of Figure 17 in Ecosites of West-Central and Southwestern Alberta with community types in this guide further separated into reference range plant communities, successional communities (harvesting and fire). The "Successional community types" or "Harvesting and Fire succession" categories outline the successional sequence the community types undergo with heavy grazing pressure, harvesting or fire disturbance.

The bulk of this guide is community descriptions which include information on the dominant plant species, canopy cover and environmental conditions. When available, we have included plant community successional information to help us determine ecological health and the successional relationships on an ecological site.

Generally, in both guides, ecological units within a subregion are classified by their position on the edatope grid [a specific combination of soil moisture and soil nutrient regime].

The information in this guide is presented and named by:

1. Subregion/Ecological area
  - a. Montane [M]
2. Ecosection [Mc (Cypress Hills), Mn (North), Ms (South)]
3. Dominant cover type
  - a. Native and disturbed grasslands [a, b, c (grazed)]
  - b. Shrublands [d]
  - c. Conifer [e]
  - d. Mixedwood forest [f]
  - e. Deciduous forest [g]
  - f. Harvested or burned forest [h]

NOTE: Each dominant cover type may overlay several ecological sites and ecological site phases. For example Mne (Montane North Ecosection conifer) community types occurs in numerous ecological sites.

3. Community types are presented and named by:

- a. Subregion/Ecological area and dominant cover type [e.g. Mn].
- b. Position on the edatopic grid. Generally, communities are named/numbered from low moisture/poor nutrient status to high moisture/rich nutrient status. For example, Mne1 is a Pf/Juniper-Bearberry community on the subxeric/poor ecological site, while Mne23 is a black spruce-Tamarack/Labrador tea/Golden moss community type on the subhydric/rich ecological site.

NOTE: As additional information is collected and new ecological units are identified and described, an attempt is made to fit them into the pre-existing ones.

## How to read the fact sheets

The field guide contains 4 types of fact sheets: One for ecosection, one for ecological site, one for ecological site phase and one for plant community type.

### *Ecosection*

There is an identification code at the top of the ecosection fact sheet and a name followed by the number of sample sites (pg 45). Each ecosection has been given a name that conveys information about the location of the unit and are frequently named after a general location within the subregion (Ecosection: Cypress Hills (Mc) of the Montane subregion). A short text description of the site is given under the General Description (pg 45), this is followed by a picture or a cross section diagram and map of the ecosection (pg 45). The section on successional relationships gives a brief note about the spatial locations and differences in ecosections (pg 45). This is followed by a list of environmental variables (elevation), ecodistricts and ecological sites associated with the ecosection (pg 45).

### *Ecological site*

There is an identification letter at the top of the ecological site fact sheet and a name, moisture and nutrients followed by the number of sample sites (pg 46). Each ecological site has been given a name that conveys information about the ecology of the unit and are frequently named after a common plant species. A short text description of the site is given under the General Description (pg 46), this is followed by a picture or a cross section diagram of the ecological site (pg 46). The section on successional relationships gives a brief note about the temporal development of the ecological site (pg 46). It generally describes the successional relationships among the ecological site phases and plant community types. Plant species that are indicators of the ecological conditions on the site are listed (pg 46). Site index at 50 years of age at breast height (1.3 m) is presented next. The mean site index is presented in meters followed by the standard error and the number of trees used to calculate the mean (pg 46). Environment and soil variables are then listed and represent a roll-up from the plant community and ecological site phase descriptions (pg 46). Variables that represent environment and soils have a number (1) that indicates the number of the samples in which each variable class occurred. Data has been collected and analyzed from many sources over 40 years and data gaps may exist for many variables. The frequency of occurrence value indicates the number of sampled plots for which data were collected for that variable at the Ecological site, Ecological site phase and plant community fact sheets. Optional variables such as soil exposure, LFH thickness, forage production and stocking rate for livestock may also be listed and represent a roll-up for the plant community and ecological site phase.

### *Ecological site phase*

There is an identification code at the top of the ecological site phase fact sheet and a name followed by the number of sample sites (pg 47). Each ecological site phase has been given a name that conveys information about the dominant tree species or lifeform (shrubland, grassland, tame/disturbance) of the unit and are frequently named after a common plant species. A short text description of the site and successional information maybe given under the General Description or Successional relationships (pg 47) if it provides more detail than is available on the ecological site fact sheet. Plant species that are indicators of the ecological conditions on the site are listed with the average cover summarized from the various plant communities (pg 47). Indicator species for the ecological site phase are identified with an asterix "\*" and are rolled-up to develop the indicator species list for the ecological site fact sheet. Environment and soil variables are then listed and represent a roll-up from the plant community (pg 47). Optional variables such as soil exposure, LFH thickness, forage production and stocking rate for livestock may also be listed and represent a roll-up for the plant communities.

### *Plant community*

There is an identification code at the top of the plant community fact sheet and a name followed by the number of sample sites (pg 48). The name of the plant community is generally the common name of the indicator plant species within the various lifeform layers (tree, shrub, forb, grass, lichen, moss). This is followed by the Latin name of each indicator species and a general description of the community type describing its unique ecology. Plant species that are indicators of the ecological conditions on the site are listed with the mean cover summarized, range in cover and overall constancy (frequency of plots that the species was described (pg 48)). Environment and soil variables are then listed and represent a roll-up from the various plots and assessments (pg 48). Optional variables such as soil exposure, LFH thickness, forage production and stocking rate for livestock may also be listed and represent a roll-up for various plots.

## Results

The analysis of the approximately 3852 plots distinguished 276 community types. These types were split into 3 categories:

1. Montane Cypress Hills Ecosection (43 plant community types)
2. Montane North Ecosection (70 plant community types)
3. Montane South Ecosection (163 plant community types)

The dominant plant species, canopy cover and environmental conditions are outlined for each community type.

# General Ecological Descriptions

## Montane Grassland Ecology

The Montane subregion has highly variable ecological conditions. Much of the variation is the result of complex topography, while the small size of individual ecosystems results in a strong ecotonal effect from the surrounding environments (Strong 1992). Much of the grassland vegetation occurs on south and west facing slopes where seasonally low rainfall coupled with high evapotranspiration, dries the soil sufficiently to kill tree seedlings (Daubenmire 1978). Fire is also an important factor in determining the composition of grasslands because of the high flammability of the vegetation during the dry periods. A lack of fire and an increase in annual precipitation favours the growth of trees onto the more mesic sites.

The Whaleback ridge, Porcupine Hills and south into the Castle area are composed of a mixture of rough fescue grassland, aspen, Douglas fir and lodgepole pine. This area is characteristic of the Blairmore and Morley Foothills ecodistricts (Strong and Thompson 1995) an area of ridged and rolling hills, with moderate slopes (6-30%) and Black Chernozemic soils on submesic to mesic sites. In the Banff and Jasper river valleys and northern Montane areas (Grande Cache, Red Deer, North Saskatchewan and Athabasca river valleys) open Douglas fir, lodgepole pine and Fringed sage/Junegrass communities are common on steep south facing slopes, shallow rocky soils and coarse textured outwash (Strong 1992). These areas are typical of the Banff and Jasper Mountain ecodistricts. These ecodistricts have steep slopes (10-45%) and are dominated by Eutric Brunisolic soils, with submesic to xeric moisture regimes (Strong 1992).

The Cypress Hills ecodistrict is an unglaciated plateau ranging in elevation from about 1300 m in the east to 1465 m at the highest point. Once considered boreal foothills, the area has been reclassified as montane given the bimodal summer precipitation peaks (June and September), the potential for freezing temperatures in all months and the combination of closed canopied lodgepole pine forest with fescue grassland (Strong and Leggatt 1992). Soil parent materials are somewhat unique on the plateau where ancient tertiary gravels are exposed, or, may be capped by a variable veneer of loess; fine silty material deposited by wind from post glacial lake beds to the west of the plateau. Soils are mostly Black Chernozems where grassland vegetation has dominated. Thelma soils are loamy Orthic Black Chernozems associated with rough fescue communities on the top of the bench. Also associated with rough fescue cover, Delmas and Marmaduke soil series are gravel and shallow to gravel Orthic Dark Brown Chernozems found on the shoulder of the escarpment. Orthic Dark Grey Luvisols, like the soils series Reesor (loamy) have developed where lodgepole pine or aspen forest have prevailed (Greenlee 1981).

### *Banff and Jasper Mountain ecodistricts (Plant community code a)*

The two dominant grassland communities in Banff and Jasper National Park include the Fringed sage/Junegrass and Northern wheatgrass-Sheep fescue community types. These communities are typical of steep, south and westerly facing slopes with xeric to subxeric moisture regimes. The soils are poorly developed and nutrient poor. Variants of these community types included the Pussy toes/Junegrass community, which is also found on shallow, south facing slopes and the Juniper/Northern wheatgrass community which is typical of regosolic, eolian sand dunes of the Athabasca river valley near Jasper (Corns and Achuff 1982). A Little clubmoss/Richardson needlgrass community was also found on shallow south facing slopes in small isolated areas within the fir, white spruce, lodgepole pine and Douglas fir forests.

A Kentucky bluegrass-Junegrass/Dandelion community type was described on lower to level slope positions with submesic to subxeric moisture regimes. The presence of a high cover of Junegrass indicates the close affinity this grassland has with the Fringed sage/Junegrass community type. The high cover of Kentucky bluegrass is indicative of heavy grazing influence on this community type.

There were two upland shrub communities found on steep south facing slopes (Bearberry/Juniper and Rose-Snowberry). These community types represented the transition from grassland to forest. The Bearberry/Juniper community type represents the transition from the grassland communities to the dry



lodgepole pine, Douglas fir and spruce forests. In contrast the Rose-Snowberry shrubland appears to represent the transition to moister deciduous and spruce forests.

The grasslands in the Ya Ha Tinda area of the Banff and Jasper ecodistricts are transitional between the grasslands described in Banff and Jasper National Parks and the grasslands in the Morley and Blairmore Foothills ecodistricts of southern Alberta. Rough fescue is common in the Ya Ha Tinda which gives these grasslands some affinity to the rough fescue dominated grasslands in Southern Alberta. *[Throughout the guide the rough fescue species listed for the Banff and Jasper ecodistricts is likely a mixture of foothills rough fescue (*Festuca campestris*) and northern rough fescue (*Festuca altaica*), whereas the rough fescue listed for the Blairmore and Morley Foothills ecodistricts is Foothills rough fescue only (*F. campestris*). The rough fescue listed in the Cypress Hills is a mixture of foothills rough fescue (*F. campestris*) and plains rough fescue (*F. hallii*) (Hill et al. 1995).]* The predominance of junegrass and northern wheatgrass in the Ya Ha Tinda also gives these grasslands some affinity to the grasslands described near Banff and Jasper. The grasslands of the Ya Ha Tinda tend to be dry and well drained. They occur on south and west facing slopes and coarse textured fluvial areas. The dry slopes tend to have a predominance of rough fescue, sedge and junegrass. In contrast the level fluvial areas have a predominance of rough fescue and fringed brome. There are a number of community types in the Ya Ha Tinda that are transitional to the Upper Foothills and Subalpine subregions. These include the Tufted hairgrass-Sedge and Bog birch/Sedge-Rough fescue dominated community types.

*Blairmore and Morley Foothills ecodistricts (Plant community code b and grazed c)*

The Rough fescue-Idaho fescue-Parry oatgrass community dominates mesic to submesic, lower slope positions and terraces with Black Chernozemic soils near the Porcupine Hills and south into the Castle area. Situated upslope from this plant community on slightly drier sites with poorer soils, Parry oatgrass and Idaho fescue replace rough fescue as the dominant grass to form the Idaho fescue-Parry oatgrass-Rough fescue community type. The Bluebunch wheatgrass-Sedge community is found on steep south-facing slopes with Regosolic and Brunisolic soils. Further upslope on dry sandstone outcrops and xeric hillcrests, limber pine dominated community types are very common. A Rough fescue-Sedge/Bearberry-dominated community type is found on hilltops throughout the area. This type tends to be drier than the lower slope dominated rough fescue community type, but it is moister and not as rapidly drained as the Bluebunch wheatgrass-Sedge and limber pine dominated community types. Douglas fir invasion is common on these hilltop community types, to form the Douglas fir/Idaho fescue-Rough fescue community types. At higher elevations the ecotone between forest and grassland is dominated by the Snowberry-Rose-Saskatoon/Bearberry community type on drier sites and by the Pinegrass-Hairy wildrye community on moister sites with northerly aspects.

A Big sagebrush/Bluebunch wheatgrass-Sedge community type was described on a gravelly south facing slope south of Blairmore. This community type is rare in Alberta and appears to be an extension of the Palouse prairie from Eastern Washington (Moss 1947).

There are a number of community types that are characteristic of moist, poorly drained, nutrient rich sites. These include thimbleberry and sedge meadows, Tufted hairgrass-Baltic rush and Forb meadows. The Tufted hairgrass-Baltic rush community has plant species that are more characteristic of the Subalpine subregion (Willoughby and Alexander 2006) and may represent the transition to the subalpine. Thompson and Hansen (2002) have described a number of graminoid wetland dominated communities. These types have been included in this guide. These types include Water, Beaked and Awned sedge, creeping spike rush, bulrush and cattail dominated meadows. These community types are not common in the higher elevations of the Montane and are generally found in the eastern part of the Montane and are transitional to the Foothills Fescue and Foothills Parkland subregions.

There are a number of different grassland community types that have been influenced by grazing pressure (*Plant community code c*). Increased grazing pressure on a rough fescue dominated community type leads to a decline in rough fescue and an increase in Parry oatgrass and Idaho fescue to form the Idaho fescue-Parry oatgrass-Sedge community (Willoughby 1992). Continued heavy grazing pressure allows Kentucky or Canada bluegrass to establish to form the Kentucky bluegrass-Rough fescue or Canada bluegrass-Rough fescue community types. Continued heavy grazing pressure eventually leads to a decline in all native species and the site is dominated by Kentucky bluegrass and dandelion to form the Kentucky bluegrass\Dandelion community

type. There are a number of community types that have been seeded to tame forage species through cultivation or reclamation. These include the Smooth brome-Kentucky bluegrass and Creeping red fescue/Dandelion-Clover community types.

On the drier slopes increased grazing pressure on the Idaho fescue-Parry oatgrass-Rough fescue and Bluebunch wheatgrass community types leads to an increase in low growing forbs and graminoids to form the Sedge/Little clubmoss-Moss phlox community type. On moister sites in these community types, grazing disturbance also leads to the formation of Parry oatgrass-Timothy and Northern wheatgrass-Kentucky bluegrass dominated community types.

#### *Cypress Hills ecosection (Plant community code a)*

Plant communities described in the Cypress Hills are associated with the nearly level plateau or the upper edges of the steep escarpment or rolling uplands. They include a mixture of rough fescue grassland and closed canopy aspen and lodgepole pine dominated forests. The Rough fescue (*Festuca campestris* Rydb.) related plant communities of the Cypress Hills Plateau are unique in the relatively high canopy of Shrubby Cinquefoil (compared to fescue communities described in southwestern Alberta and appears to be a function of the gravelly soil) and the abundance of Intermediate oat grass, a major subdominant grassland species (Moss 1955). On the steep, dry slopes Western Porcupine grass often replaces Intermediate oatgrass in these grassland communities. Idaho fescue also replaces Intermediate oatgrass on shallower soils with gentler slopes. An unresolved issue is the apparent expression of Rough fescue as the Foothills Rough fescue (*F. campestris* Rydb.) bunch grass type on the top of the plateau and the Plains Rough fescue (*F. hallii* Vasey) rhizomatous form on the adjoining slopes of the Cypress Hills.

#### **Montane Shrubland Ecology (Plant community code d (b in Cypress Hills ecosection))**

Shrubland communities in the montane subregion of Alberta occur in valley bottoms, depressional areas, and on moist upland seepage areas. They are highly diverse and dynamic communities that represent transition from wetland to forest or seral stages of development following disturbance. The Green alder-Scouler's willow-Wild red raspberry, Beaked willow/Hairy wild rye and Hawthorn-Snowberry/K. bluegrass community types are found on moist, upland sites. They represent seral stages of development following disturbance. The Green alder-Scouler's willow community type is found on moderate northerly slopes and the Beaked willow/Hairy wild rye community type is found on south-facing slopes with high moisture and nutrient regimes. The Hawthorn-Snowberry dominated community is often associated with small drainages and seepage areas. These upland shrublands provide excellent forage for wildlife in the early stages of succession and was only described in the Cypress Hills ecosection.

Lowland shrublands are found in low, marshy or bog sites and are often considered the edaphic climax communities on these sites since the wet cool soil conditions often prevent succession to forest. However, where organic matter begins to accumulate and the site becomes drier, succession to either black spruce or white spruce will occur. The extent of the shrub cover is highly dependent on the water level. Colonization by willow and other shrubs such as dwarf and bog birch begins on the drier edges of sedge meadows and streams. This colonization expands if the water level decreases, but declines under prolonged exposure to flooded conditions. The understory species most often associated with these shrublands include wire rush, beaked sedge, water sedge, other wetland sedges, and horsetail on the wettest sites. Bluejoint, slender wheatgrass, shrubby cinquefoil, and upland sedges are found on the more mesic, better drained sites. The better drained sites often have a Beaked willow overstory. Where water sedge and/or golden moss are dominant in the understory of the Willow/Water sedge community, indicates a calcium-rich environment, often with stagnant water (Beckingham, 1994; MacKinnon et. al., 1992). A dominance of beaked sedge in the understory of the Basket, Flat leaved or Beaked willow dominated communities, indicates nitrogen-rich conditions with flowing water (Beckingham, 1994). Bluejoint can also be a common understory species on the better-drained sites in these community types. It appears that tufted hair grass will replace bluejoint on similar sites as elevation increases (Lane et. al., 2000).

The shrublands found adjacent to riparian areas occur on well-drained, coarse-textured soils. River alder

indicates a seepage area when found on a slope as in the River alder-willow community type. Elsewhere, it grows best on poorly-drained, lower slope positions. Yellow mountain avens is a common pioneer species on gravelly river bars and rocky slopes and grows especially well on calcium-rich soils (MacKinnon et. al., 1992). Silverberry and Drummond's willow are also common in these riparian areas. Both these species prefer well-drained, coarse textured soils. The riparian shrublands described here will eventually succeed to balsam poplar and white spruce in the absence of disturbance.

Increased grazing pressure tends to allow Kentucky bluegrass and timothy to invade the understory of many of these shrub dominated communities. The high moisture and nutrient content of these sites makes them very productive for livestock grazing.

### **Montane Forest Ecology (Plant community codes e,f and g)**

The Montane subregion is distinguished from other subregions by having two distinct ecological sequences: Douglas-fir (Fd) and limber pine (Pf) in one sequence, and lodgepole pine (Pl) in another. Douglas-fir is the climax species on steep, south-facing, shallow rocky soils, and very coarse-textured outwash in valley bottoms (Strong 1992). Limber pine occupies exposed rocky outcrops where the environmental conditions are extreme. These sites are very xeric with shallow, poorly developed soils. Kuchar (1973) noted that the limber pine in Alberta is found at the northern limit of its range since it is found well below timberline. It is normally associated with high elevations or timberline south of Alberta where it takes on a krummholz form (dwarfed, contorted form, maintained by strong winds).

Closed-canopied lodgepole pine stands represent the primary reference vegetation for the Montane subregion, since they often occur on mesic sites (Strong 1992). In contrast, closed canopied aspen (Aw) stands tend to occur on sites that are warmer and drier than the reference sites (Strong 1992). Douglas-fir and white spruce (Sw) represent the potential climatic climax species for both lodgepole pine and aspen stands (Strong 1992; La Roi and Hnatiuk 1980). Balsam poplar (Pb), however, occupies the moistest sites and will succeed to white spruce since the high moisture content is not conducive to Douglas-fir succession.

Common understory species include thimbleberry, creeping mahonia, Canada buffaloberry, bearberry, snowberry and white meadowsweet. These species tend to define the ecological sites and ecosite phases as described by Archibald et al. (1996). Thimbleberry and creeping mahonia are more common in the Castle area of the province. Moving north of Blairmore in the Montane thimbleberry is often replaced by cow parsnip and creeping mahonia by white meadowsweet on similar ecological sites.

Many of the forested communities at lower elevations (1400-1500 m ) in the Castle area were dominated by subalpine species (subalpine fir (Fa), Engelmann spruce (Se)), whereas the Montane grasslands in this area were described up to elevations of 2000 m. This resulted in a broad range of characteristic species on modal sites. Archibald et al. (1996) felt there had to be further refinement of the Subalpine subregion into upper and lower latitudinal subdivisions. Clearly, this would help to refine the classification of community types in the Castle area.

The common species, canopy cover, community characteristics and productivity are outlined.

### **Montane cutblocks (Plant community code h)**

In order to classify the cutblocks of the Montane subregion properly and understand the successional sequences which occur after harvesting the preharvest community type and year the stand was harvested must be determined. This information was not available for this classification and therefore it was difficult to determine the successional pathways. For example many cutblocks in the Castle area and Porcupine Hills are not regenerating trees. It is not clear if these sites will always have difficulty growing trees because they were historically grasslands or if some other disturbance factor is influencing tree regeneration. Heavy grazing and competition from grass species can influence tree regeneration, heavy grazing pressure was described on a number of cutblocks in the Castle area. These cutblocks had been grazed so heavily that the agronomic

species (Kentucky bluegrass, timothy and clover) dominated the sites and a number of sites had been seeded with creeping red fescue which can compete with tree seedlings for moisture and nutrients.

Cutblocks can be an important source of forage for domestic livestock. They produce on average twice as much as deciduous stands and nearly three times more than conifer stands. This production varies from area to area in the Montane. Generally the production averages 1800 to 1900 kg/ha in the Castle and Porcupine Hills and drops dramatically in the Gap area to 700 kg/ha. It must be remembered that this increase in forage is only temporary. As the cutblock undergoes succession there will be a corresponding drop in forage production. Increases in carrying capacity after harvesting can be acquired through a temporary permit. It must be remembered that maximum forage productivity does not occur on a cutblock until it is approximately 3 years old. One year old cutblocks will generally have less than half the total production of a 3 year old block.

## Wetlands

The Alberta Wetland Classification System (2015) recognizes the hydrological, biogeochemical and biotic processes that affect differing characteristics that can be used to define a wetland. The AWCS recognizes five classes of wetlands in Alberta: bogs, fens, marshes, shallow open water and swamps. Wetlands can be divided into two broad groups: **peatlands** and **mineral wetlands**. In general the AWCS considers bogs and fens to be peatlands and all other wetland classes (i.e. swamps, marshes and shallow open waters) are considered to be mineral wetlands. Wetlands are rare in this Natural Subregion, but rich, often calcareous fens and marshes do occupy about 2 percent of the total Subregion area (Natural Regions Committee 2006). Table A attempts to fit the identified wetland communities and ecological sites in the Montane into the Alberta Wetland Classification System.

**Table A.** Cross walk of broad AWCS classes to general Ecological sites and phases for the Montane subregion (Mc-Cypress Hills Ecosection, Mn-North Ecosection, Ms-South Ecosection)

AWCS Class	AWCS Form	AWCS Code for DEP	Subregion and Ecological Site Phase Code
Bog (B)	Coniferous (W)	BW	
	Shrubby (S)	BS	
	Graminoid (G)	FG	
Fen (F)	Wooded Poor (Wp)	FWp	
	Wooded Rich (Wr)	FWr	<i>Montane (cypress)</i> -Mcg1 <i>Montane (north)</i> -Mnij1 <i>Montane (south)</i> -Msij1
	Shrubby Poor (Sp)	FS	
	Graminoid Poor (Gp)	FG	
	Shrubby Rich (Sr)	FS	<i>Montane (cypress)</i> -Mcg2 <i>Montane (north)</i> -Mnij2 <i>Montane (south)</i> -Msij2
	Graminoid Rich (Gr)	FG	<i>Montane (cypress)</i> -Mcg3 <i>Montane (north)</i> -Mnij3 <i>Montane (south)</i> -Msij3
Marsh (M)	Graminoid (G)	MG	<i>Montane (cypress)</i> -Mch1,e1 <i>Montane (north)</i> -Mnk1,g2 <i>Montane (south)</i> -Msk1,g2
Open water (W)	Aquatic Veg (A)	WA	

	Bare (B)	WB	
Swamp (S)	Wooded Conifer (Wc)	SWc	<b>Montane (cypress)</b> -Mcd1,f2 <b>Montane (north)</b> -Mne1,e3,h2 <b>Montane (south)</b> -Mse1,e3,h2
	Wooded Mixedwood (Wm)	SWm	<b>Montane (cypress)</b> -Mcd3 <b>Montane (north)</b> -Mnh1 <b>Montane (south)</b> -Msh1
	Wooded Deciduous (Wd)	SWd	<b>Montane (cypress)</b> -Mcg1,f1 <b>Montane (north)</b> -Mne2,f1,h1 <b>Montane (south)</b> -Mse2,f1
	Shrubby (S)	SS	<b>Montane (cypress)</b> -Mcd4,f3 <b>Montane (north)</b> -Mne4,g1,h3 <b>Montane (south)</b> -Mse4,g1,h3

For the most part the ecological sites align with AWCS five classes of wetlands (Table A), however some willow, bog birch, sedge, marsh reedgrass and tufted hairgrass dominated ecological sites because of their moisture regime and species composition are classified as meadows and have mineral soils but in the AWCS classification these sites are mineral wetlands which are considered marshes or swamps. Consequently, many fluvial dominated grasslands with subhygric to hygric moisture regimes are classified as marshes in AWCS, but in the Ecological Site Classification System these sites are meadows and the marshes are very wet aquatic systems with subhydric and hydric moisture regimes.

Swamps in AWCS are mineral wetlands where the water table is near or above the ground surface for variable periods during the year and must have at least 25% cover of trees or shrubs. In the AWCS classification swamps are further split into conifer, mixedwood, deciduous or shrub dominated types, with the shrubby dominated swamps further being split by hydroperiod and salinity (AWCS 2015). In the Ecological Site classification system many swamp types are further split into types with differing nutrient regimes poor, medium and rich which are not distinguished in the AWCS system. These swamp types are often distinguished based on leading tree and shrub species with black spruce and Labrador tea growing on poorer sites and larch, white spruce, willow and bog birch growing on richer sites.

About 3 percent of the total area in the Montane Natural Subregion is occupied by water; major rivers and five standing water bodies (Waterton, Minnewanka, Abraham and Brule Lakes and the Ghost Reservoir) account for most of this area. Wetlands are rare in this Natural Subregion, but rich, often calcareous fens and marshes do occupy about 2 percent of the total Subregion area (Natural Regions Committee 2006).

## Nutrient Regime

	<u>Very Poor</u> A	<u>Poor</u> B	<u>Med</u> C	<u>Rich</u> D	<u>Very Rich</u> E
Xeric					
<u>Subxeric</u>			a		
<u>Submesic</u>			b	cc	
Mesic			c	d	
<u>Subhygric</u>				e	
<u>Hygric</u>				f	
<u>Subhydric</u>					g
<u>Hydric</u>					h

## Ecological sites

**a=junegrass-wheatgrass**

subxeric/medium

**b=bearberry-western porcupine grass**

submesic/medium

**c=white meadowsweet**

mesic/medium

**cc= rough fescue**

mesic/rich

**d=red osier dogwood**

subhygric/rich

**e=meadow**

subhygric/medium

**f=horsetail**

hygric/rich

**g=fen**

subhydric/rich

**h=marsh**

hydric/rich

Figure 1. Edatope grid and ecological sites for the Cypress Hills Ecosystem of the Montane subregion.

**Nutrient Regime**

	<b>Very Poor A</b>	<b>Poor B</b>	<b>Med C</b>	<b>Rich D</b>	<b>Very Rich E</b>
<b>Xeric</b>					
<b>Subxeric</b>		a	aa		
<b>Submesic</b>		b	c	cc	
<b>Mesic</b>			d	e	
<b>Subhygric</b>				f	g
<b>Hygric</b>				h	
<b>Subhydric</b>				ij	
<b>Hydric</b>					k

**Moisture Regime**

### Ecological sites

**a=limber pine/juniper**

subxeric/poor

**aa= junegrass-wheatgrass**

subxeric/medium

**b=bearberry**

submesic/poor

**c=hairy wildrye**

submesic/medium

**cc= rough fescue**

submesic/rich

**d=buffaloberry-rose**

mesic/medium

**e=alder-willow**

mesic/rich

**f=balsam poplar**

subhygric/rich

**g=meadow**

subhygric/very rich

**h=horsetail**

hygric/rich

**ij=fen**

subhydric/rich

**k=marsh**

hydric/rich

Figure 2. Edatope grid and ecological sites for the Montane North Ecosession of the Montane subregion

## Nutrient Regime

	<u>Very Poor</u> A	<u>Poor</u> B	<u>Med</u> C	<u>Rich</u> D	<u>Very Rich</u> E
<b>Xeric</b>					
<b><u>Subxeric</u></b>		a	aa		
<b><u>Submesic</u></b>		b	c	cc	
<b>Mesic</b>			d	e	
<b><u>Subhygric</u></b>				f	g
<b><u>Hygric</u></b>				h	
<b><u>Subhydric</u></b>				ij	
<b><u>Hydric</u></b>					k

### Ecological sites

**a=limber pine/juniper**

subxeric/poor

**aa= bluebunch wheatgrass**

subxeric/medium

**b=bearberry**

submesic/poor

**c=buffaloberry/hairy wildrye**

submesic/medium

**cc= rough fescue**

submesic/rich

**d=mahonia-meadowsweet**

mesic/medium

**e=thimbleberry/pine grass**

mesic/rich

**f=balsam poplar**

subhygric/rich

**g=meadow**

subhygric/very rich

**h=horsetail**

hygric/rich

**ij=fen**

subhydric/rich

**k=marsh**

hydric/rich

Figure 3. Edatope grid and ecological sites for the Montane South Ecoregion of the Montane subregion.



# Plant Community Keys

1.	Areas include Ya Ha Tinda, Kootenay Plains, Athabasca and Smoky River valleys .....	2
	Areas include foothills south (Waterton) and west (Ghost) of Calgary and the Bow and Oldman river valleys .....	53
	Area includes the Cypress Hills .....	135
2.	Steep south facing slopes with shallow soils dominated by limber pine and shrublands dominated by bearberry (ecosite a) .....	3
aa)	Steep south and west facing grassy slopes dominated by fringed sage, junegrass, western porcupine grass, snowberry and saskatoon (ecosite 6)	6
b)	South and west facing slopes with a predominant bearberry and juniper understory, fluvial floodplains dominated by yellow mountain avens (ecosite 9)	9
	Shallow south and west facing slopes with a predominance of hairy wildrye and buffaloberry in the understory (ecosite c) .....	16
	Grasslands on mid to lower slope positions with deep black soils dominated by rough fescue, sedge and bog birch species (ecosite cc) .....	22
	Mesic/medium sites with a predominant buffaloberry, alder or moss understory (ecosite d).....	27
	Mesic/rich seepage sites with a predominant river alder, saskatoon and red osier dogwood understory (ecosite e).....	36
	Subhygric/rich flood plains dominated by balsam poplar (ecosite f) .....	41
	Shrubby and grassy meadows adjacent to streams with tufted hairgrass and willow species (ecosite g) .....	42
	Very moist sites with a predominant horsetail understory and some accumulation of organic matter (ecosite h) .....	44
	Wetland sites with black spruce, larch, Labrador tea, willow and bog birch (ecosite ij) .....	48
	Marsh sites dominated by bulrush and cattail species (ecosite k) .....	52
3.	Forested community dominated by limber pine (ecosite phase a1) .....	4
	Grass or shrubland community dominated by bearberry and juniper (ecosite phase a2).....	5
4.	Pf/Juniper-Bearberry (Mne1) .....	p 127
5.	Bearberry/Juniper (slope) ( Mna7) .....	p 129
6.	Grassy slopes with shallow soils (ecosite phase aa1) .....	7
	Moist draws dominated by rose, snowberry and saskatoon (ecosite phase aa2).....	8
7.	Fringed sage/Junegrass-Northern wheatgrass (Mna1) .....	p 132
	Western porcupine grass-Sedge (Mna15) .....	p 133
	Little club-moss/Richardson needle grass (Mna5).....	p 134
8.	Rose-Snowberry-Saskatoon (Mnb1) .....	p 136
9.	Conifer (white spruce, lodgepole pine) dominated community types (ecosite phase b1) .....	10
	Aspen dominated community types (ecosite phase b2) .....	11
	Site dominated by a mixture of conifer and deciduous species (ecosite phase b3) .....	12
	Fluvial floodplains dominated by yellow mountain avens (ecosite phase b4).....	13
	Fluvial floodplains dominated by bearberry, juniper and shrubby cinquefoil (ecosite phase b5).....	14
	Sites dominated by Douglas fir (ecosite phase b6) .....	15
10.	Pl/Bearberry-Juniper (Mne2).....	p 139
	Sw/Bearberry-Juniper (Mne4).....	p 140
11.	Aw/Bearberry/Hairy wildrye (Mnc1).....	p 142
12.	Aw-Sw-Pl/Bearberry (Mnd1) .....	p 144
13.	Yellow mountain avens (Mnb2).....	p 146
	Yellow mountain avens-Bearberry (Mnb3) .....	p 147
14.	Bearberry/Juniper-Shrubby cinquefoil (fluvial) (Mna2).....	p 149
15.	Fd-Pl/Bearberry (Mne3).....	p 151
16.	Douglas fir dominated community types (ecosite phase c1).....	17
	Lodgepole pine and white spruce dominated community types (ecosite phase c2) .....	18
	Aspen dominated community types (ecosite phase c3).....	19
	Community types dominated by a mixture of conifer and deciduous species (ecosite phase c4).....	20
	Site dominated by shrub species (buffaloberry and bearberry) (ecosite phase c5).....	21
17.	Fd/Hairy wildrye/Moss (Mne5) .....	p 154
18.	Sw/Hairy wildrye ( Mne7) .....	p 156
	Pl/Hairy wildrye (Mne6).....	p 158
	Sw/Yellow Mountain Avens-Silverberry (fluvial) ( Mne8) .....	p 157
19.	Aw/Hairy wildrye ( Mnc2) .....	p 161
	Pb/Juniper (fluvial) (Mnc3).....	p 162
20.	Sw-Bw/Juniper-Bearberry (Mnd2).....	p 164

21. Buffaloberry-Bearberry (Mnb5) .....	p 166
22. Grasslands dominated by rough fescue (ecosite phase cc1) .....	23
Shrublands dominated by bog birch and rough fescue (ecosite phase cc2) .....	24
Grasslands encroached by conifer tree species (ecosite phase cc3) .....	25
Grasslands encroached by deciduous tree species (ecosite phase cc4) .....	26
23. Rough fescue-Fringed brome-Sedge (Mna11) .....	p 169
Rough fescue-Sedge-Junegrass (Mna12) .....	p 170
Sedge-June grass (Mna13) .....	p 171
24. Bog birch/Sedge-Rough fescue (Mna10) .....	p 173
25. Currently no plant communities described	
26. Currently no plant communities described	
27. Douglas fir dominated community types (ecosite phase d1).....	28
Lodgepole pine dominated community types (ecosite phase d2) .....	29
White spruce dominated community types (ecosite phase d3).....	30
Aspen dominated community types (ecosite phase d4) .....	31
Shrub dominated community types (willow, chokecherry, saskatoon) (ecosite phase d5) .....	32
Grassy sites dominated by hairy wildrye (ecosite phase d6) .....	33
Site dominated by a mixture of conifer and deciduous species (ecosite phase d7) .....	34
industrial disturbance or cultivated fields seeded to agronomic species (ecosite phase d9) .....	35
28. Fd/Snowberry (Mne9).....	p 179
Fd/Moss (Mne10) .....	p 178
29. Pl/Buffaloberry-Rose/Moss (Mne11) .....	p 181
Pl/Alder (Mne12).....	p 182
Pl/false azalea-grouseberry (Mne13) .....	p 183
30. Sw/Buffaloberry-Rose/Moss ( Mne14) .....	p 185
Sw/Alder (Mne15).....	p 188
Se/false azalea ( Mne16).....	p 186
Sw(Se)/Moss (Mne17) .....	p 189
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31. Aw/Buffaloberry-Rose (Mnc4).....	p 192
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33. Hairy wildrye/Aster (Mna3).....	p 197
34. Aw-Sw/Alder (Mnd3).....	p 199
Aw-Sw-Pl/Buffaloberry-Rose (Mnd4) .....	p 200
35. Creeping red fescue-Timothy-Kentucky bluegrass (Mna14).....	p 202
36. Lodgepole pine dominated community types (ecosite phase e1) .....	37
Aspen - Balsam poplar dominated community types (ecosite phase e2).....	38
White spruce dominated community types (ecosite phase e3).....	39
River alder and willow dominated community types (ecosite phase e4) .....	40
37. Currently no plant communities described	
38. Pb-Aw/Canada buffaloberry (Mnc5).....	p 207
Aw/Saskatoon-Chokecherry (Mnc6) .....	p 208
39. Sw/Red osier dogwood (Mne20).....	p 210
Sw/Willow/Hairy wildrye (Mne21).....	p 211
40. River alder-Thimbleberry (Mnb9) .....	p 214
Scouler's willow- Green alder (Mnb10) .....	p 213
41. Pb-Aw/Red osier dogwood (Mnc7) .....	p 217
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42. Meadows dominated by shrubs (bog birch, willow) (ecosite phase g1) .....	43
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44. Site dominated by a mixture of conifer and deciduous species (ecosite phase h1) .....	45
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Site dominated by shrub and forb species (willow, horsetail) (ecosite phase h3).....	47
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49. Pl-Sb/Labrador tea/Feather moss (Mne19).....	p 236
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Steep south and west facing grass and shrub dominated slopes (ecosite aa).....	55
Steep south and west facing slopes with predominant bearberry understory (ecosite b).....	58
South and west facing slopes with a predominant buffaloberry and hairy wildrye dominated understory, grasslands on upper slope positions dominated by Parry oatgrass (ecosite c).....	66
Midslope and lower slope grasslands with deep black soils dominated by rough fescue (ecosite cc).....	81
Mesic medium sites on shallow slopes with well developed soils (ecosite d).....	88
Seepage areas with an understory dominated by thimbleberry and cow parsnip (ecosite e) .....	105
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Wetlands dominated by willow, bog birch and sedge species (ecosite ij) .....	130
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# Plant Community Tables

Table 1. Montane Cypress Hills Ecosection Communities

Ecological Site / Range Site	Ecosite Phase / Ecological Range Site	Reference Plant Community	Grazing Succession	Modified Plant Community	Harvesting Succession
a junegrass-wheatgrass (subxeric/medium)	a1 grassland	Mca1 Fringed sage/Junegrass-Northern wheatgrass			
	a2 shrubland	Mcb3 Snowberry-Saskatoon/Junegrass			
b bearberry-western porcupine grass (submesic/medium)	b1 bearberry PI	Mce1 PI/dwarf bilberry			
	b2 bearberry Aw	Mcc1 Aw/Rose/Bearberry			
	b3 Western porcupine grass	Mca2 Rough fescue-Western porcupine grass	Mca4 Western porcupine grass-Rough fescue/Little clubmoss		
		Mca3 Shrubby cinquefoil/Rough fescue-Idaho fescue	Mca10 Canada bluegrass-Idaho fescue		
c white meadowsweet (mesic/medium)	c1 white meadowsweet PI-Sw	Mce2 PI/White meadowsweet/Pinegrass			
	c2 white meadowsweet Sw	Mce3 Sw-PI/Snowberry			
	c3 white meadowsweet Aw	Mcc2 Aw/Snowberry-White meadowsweet			
	c4 white meadowsweet Aw-PI-Sw	Mcd1 Aw-Sw/Snowberry-White meadowsweet			
	c5 white meadowsweet shrub	Mca9 Rose/Sedge-Pinegrass-Kentucky bluegrass			
	c6 industrial/tame				
cc rough fescue (mesic/rich)	cc1 rough fescue	Mca5 Shrubby cinquefoil/Rough fescue-Intermediate oat grass	Mca6 Shrubby cinquefoil/Foothills rough fescue-Kentucky bluegrass		
			Mca7 Kentucky bluegrass-Rough fescue		
			Mca8 Kentucky bluegrass-Smooth brome		
	cc2 rough fescue shrub	Mcb1 Snowberry-Rose/Rough fescue	Mcb2 Snowberry-Rose/Kentucky bluegrass		
	cc3 rough fescue PI	Mce4 PI/Kentucky bluegrass-Rough fescue			

Ecological Site / Range Site	Ecosite Phase / Ecological Range Site	Reference Plant Community	Grazing Succession	Modified Plant Community	Harvesting Succession
d red osier dogwood (subhygric/rich)	d1 red osier dogwood Sw-Pl				
	d2 red osier dogwood Aw	Mcc3 Aw/Red osier dogwood	Mcc5 Aw/Hawthorn/Tall buttercup		
		Mcc4 Aw/Saskatoon			
	d3 red osier dogwood Aw-Pl-Sw	Mcd2 Aw-Sw/Saskatoon			
	d4 red osier dogwood shrub	Mcb4 Silver sagebrush/Kentucky bluegrass			
		Mcb5 Silverberry/Kentucky bluegrass			
		Mcb9 Chokecherry-Saskatoon-Snowberry			
e meadow (subhygric/medium)	e1 tufted hairgrass	Mca11 Tufted hairgrass-Sedge	Mca12 Tufted hairgrass-Kentucky bluegrass		
			Mca13 Kentucky bluegrass-Foxtail barley-Tufted hairgrass		
f horsetail (hygric/rich)	f1 horsetail Aw-Pb	Mcc6 Aw/Horsetail-Cow parsnip	Mcc7 Aw/Kentucky bluegrass		
	f2 horsetail Sw	Mce5 Sw/Horsetail			
	f3 horsetail shrubland	Mcb6 Beaked willow/Horsetail	Mcb7 Beaked willow/Kentucky bluegrass/Tall buttercup		
Mcb8 Hawthorne-Snowberry-Chokeycherry					
Mca14 Wild licorce					
g fen (subhydric/rich)	g1 treed fen				
	g2 shrubby fen	Mcb10 Flat leaved willow/Timothy			
	g3 graminoid fen	Mca15 Sedge meadows			
Mca16 Baltic rush					
h marsh (hydric/rich)	h1 marsh	Mca17 Creeping spike rush			
		Mca18 Great bulrush			

Ecological Site / Range Site	Ecosite Phase / Ecological Range Site	Reference Plant Community	Grazing Succession	Modified Plant Community	Harvesting Succession
		Mca19 Cattail			

**Table 2. Montane North Ecoregion Communities**

<b>Ecological Site / Range Site</b>	<b>Ecosite Phase / Ecological Range Site</b>	<b>Reference Plant Community</b>	<b>Grazing Succession</b>	<b>Modified Plant Community</b>	<b>Harvesting Succession</b>
a limber pine/juniper (subxeric/poor)	a1 limber pine/juniper Pf	Mne1 Pf/Juniper-Bearberry			
	a2 juniper/bearberry shrub	Mna7 Bearberry/Juniper (slope)			
aa junegrass-wheat grass (subxeric/medium)	aa1 grassland	Mna1 Fringed sage/Junegrass-Northern wheatgrass			
		Mna15 Western porcupine grass-Sedge			
		Mna5 Little club-moss/Richardson needle grass			
	aa2 rose-saskatoon shrubland	Mnb1 Rose-Snowberry-Saskatoon			
b bearberry (submesic/poor)	b1 bearberry PI-Sw	Mne2 PI/Bearberry-Juniper			
		Mne4 Sw/Bearberry-Juniper			
	b2 bearberry Aw	Mnc1 Aw/Bearberry/Hairy wildrye			
	b3 bearberry Aw-Sw-PI	Mnd1 Aw-Sw-PI/Bearberry			
	b4 yellow mountain avens	Mnb2 Yellow mountain avens			
		Mnb3 Yellow mountain avens-Bearberry			
	b5 bearberry shrubland	Mna2 Bearberry/Juniper-Shrubby cinquefoil (fluvial)			
	b6 bearberry Fd	Mne3 Fd-PI/Bearberry			
c hairy wildrye (submesic/medium)	c1 hairy wildrye Fd	Mne5 Fd/Hairy wildrye/Moss			
	c2 hairy wildrye PI-Sw	Mne7 Sw/Hairy wildrye			Mnf1 Juniper/Hairy wildrye (Sw)
		Mne8 Sw/Yellow Mountain Avens-Silverberry (fluvial)			
		Mne6 PI/Hairy wildrye			
	c3 hairy wildrye Aw	Mnc2 Aw/Hairy wildrye			

Ecological Site / Range Site	Ecosite Phase / Ecological Range Site	Reference Plant Community	Grazing Succession	Modified Plant Community	Harvesting Succession	
		Mnc3 Pb/Juniper (fluvial)				
	c4 hairy wildrye Aw-Sw-PI-Fd	Mnd2 Sw-Bw/Juniper-Bearberry				
	c5 shrubland-grassland	Mnb5 Buffaloberry-Bearberry				
cc rough fescue grassland (submesic/rich)	cc1 rough fescue	Mna11 Rough fescue-Fringed brome-Sedge	Mna13 Sedge-June grass			
		Mna12 Rough fescue-Sedge-Junegrass				
	cc2 shrubland	Mna10 Bog birch/Sedge-Rough fescue				
	cc3 rough fescue PI-Sw					
	cc4 rough fescue Aw					
d Canada buffaloberry-rose (mesic/medium)	d1 Canada buffaloberry Fd	Mne10 Fd/Moss				
		Mne9 Fd/Snowberry				
	d2 Canada buffaloberry PI	Mne11 PI/Buffaloberry-Rose/Moss				
		Mne12 PI/Alder				
		Mne13 PI/false azalea-grouseberry				
	d3 Canada buffaloberry Sw	Mne14 Sw/Buffaloberry-Rose/Moss				Mnf2 Rose/Hairy wildrye (Sw)
		Mne16 Se/false azalea				
		Mne18 Sw(Fa)/Moss				
		Mne15 Sw/Alder				
		Mne17 Sw(Se)/Moss				
	d4 Canada buffaloberry Aw	Mnc4 Aw/Buffaloberry-Rose				
d5 Canada buffaloberry shrubland	Mnb6 Beaked willow-Canada buffaloberry/Hairy wildrye					

Ecological Site / Range Site	Ecosite Phase / Ecological Range Site	Reference Plant Community	Grazing Succession	Modified Plant Community	Harvesting Succession
		Mnb8 Chokecherry-Saskatoon			
	d6 hairy wildrye grassland	Mna3 Hairy wildrye/Aster			
	d8 Canada buffaloberry Aw-PI-Sw-Fd	Mnd3 Aw-Sw/Alder			
		Mnd4 Aw-Sw-PI/Buffaloberry-Rose			
	d9 industrial/tame	Mna14 Creeping red fescue-Timothy-Kentucky bluegrass			
e alder-willow (mesic/rich)	e1 alder-willow PI	Mne26 PI/Willow/Hairy wildrye			
	e2 alder-willow Aw	Mnc5 Pb-Aw/Canada buffaloberry			
		Mnc6 Aw/Saskatoon-Chokecherry			
	e3 alder-willow Sw	Mne20 Sw/Red osier dogwood			
		Mne21 Sw/Willow/Hairy wildrye			
	e4 alder-willow shrub	Mnb10 Scouler's willow- Green alder			
		Mnb9 River alder-Thimbleberry			
	f balsam poplar (subhygric/rich)	f1 balsam poplar	Mnc7 Pb-Aw/Red osier dogwood		
Mnc8 Pb/Willow-Silverberry					
g meadow (subhygric/very rich)	g1 shrubby meadow	Mnb11 Bog birch/Tufted hairgrass-Sedge	Mnb12 Willow/Timothy		
		Mnb7 Water birch/Bearberry/Bog sedge			
	g2 grassy meadow	Mna4 Tufted hair grass-Sedge			
h horsetail (hygric/rich)	h1 horsetail Sw-Pb	Mnc9 Pb/Horsetail			
	h2 horsetail Sw	Mne22 Sw/horsetail			
	h3 horsetail shrubland	Mna6 Variegated horsetail/Rush-like sedge			
		Mnb13 Willow/Horsetail			

<b>Ecological Site / Range Site</b>	<b>Ecosite Phase / Ecological Range Site</b>	<b>Reference Plant Community</b>	<b>Grazing Succession</b>	<b>Modified Plant Community</b>	<b>Harvesting Succession</b>
ij fen (subhydric/rich)	ij1 treed fen	Mne19 Pl-Sb/Labrador tea/Feather moss			
		Mne23 Sb/Labrador tea/Golden moss			
		Mne24 Sb-Lt/Willow-Bog birch/Golden moss			
		Mne25 Sb-Sw/Bog birch/Sedge			
	ij2 shrubby fen	Mnb14 Labrador tea-Willow/Golden moss			
		Mnb15 Willow-Bog birch/Water sedge	Mnb16 Willow/Kentucky bluegrass		
	ij3 graminoid fen	Mna8 Water sedge meadows			
k marsh (hydric/rich)	k1 marsh	Mna9 Great bulrush			



**Table 3. Montane South Ecoregion Communities**

Ecological Site / Range Site	Ecosite Phase / Ecological Range Site	Reference Plant Community	Grazing Succession	Modified Plant Community	Harvesting Succession
a limber pine/juniper(subxeric/poor)	a1 limber pine/juniper Fd-Pf	Mse2 Pf-Fd/Juniper/Bearberry			
aa bluebunch wheat grass(subxeric/medium)	aa1 bluebunch wheat grass grassland	Msb3 Bluebunch wheat grass-Sedge	Msc13 Sedge-June grass-Bluebunch wheat grass/Fringed sage		
	aa2 bluebunch wheat grass shrubland	Msb5 Big sagebrush/Bluebunch wheat grass-Rough fescue/Bearberry	Msc21 Big sagebrush/Idaho fescue-Bluebunch wheatgrass/Bearberry		
		Msd23 Snowberry-Rose/Bluebunch wheat grass-Rough fescue			
b bearberry(submesic/poor)	b1 bearberry PI	Mse3 PI/Bearberry-Juniper			
	b2 bearberry Aw	Msg1 Aw/Bearberry/Foothills rough fescue			
	b3 bearberry Aw-Sw-PI	Msf1 Aw-Fd-PI-Sw/Bearberry			
	b4 yellow mountain avens	Msd2 Yellow mountain avens/June grass			
		Msf2 Sw-PI-Pb/Yellow mountain avens (fluvial)			
	b5 bearberry grassland	Msa7 Bearberry-Juniper			
		Msb4 Foothills rough fescue-Sedge/Bearberry-Juniper	Msc15 Bearberry/Little clubmoss/Parry oatgrass-Sedge Msc20 Sedge-Junegrass/Moss phlox-Fringed sage		
	b6 bearberry Sw	Mse24 Sw/Juniper-Bearberry			
	b7 bearberry shrubland	Msd24 Saskatoon-Bearberry/Foothills rough fescue			
c buffaloberry/hairy wild rye (submesic/medium)	c1 Canada buffaloberry/hairy wild rye Fd	Mse6 Fd/Hairy wild rye	Mse6b Fd/Timothy		Msh28 PI-Fd/Foothills rough fescue (cutblock)
		Mse6a Fd/Needle litter			

Ecological Site / Range Site	Ecosite Phase / Ecological Range Site	Reference Plant Community	Grazing Succession	Modified Plant Community	Harvesting Succession
	c2 Canada buffaloberry/hairy wild rye PI	Mse5 PI/Canada buffaloberry/Hairy wild rye			Msh11 Lodgepole pine/Hairy wild rye (cutblock)
		Mse7 PI/Low bilberry/Hairy wild rye			Msh13 Hairy wild rye (cutblock)
	c3 Canada buffaloberry/hairy wild rye Aw	Msg2 Aw/Rose/Hairy wild rye			
		c4 Canada buffaloberry/hairy wild rye Aw-Sw-PI-Fd	Msf3 Aw-PI-Sw/Canada buffaloberry/Hairy wild rye		
	Msf5 Aw-Sw/Grouseberry				Msh12 White spruce/Hairy wild rye (cutblock)
	c5 grassland	Msb2 Parry oat grass-Foothills rough fescue-Idaho fescue	Msc19 Timothy-Parry oat grass		
			Msc1a Sedge-Parry oat grass-Foothills rough fescue		
			Msc6 Sedge-Idaho fescue/Little club-moss		
		Msb2a Idaho fescue-Parry oat grass-Foothills rough fescue			
		Msb9 Fd/Idaho fescue-Rough fescue			
c6 shrubland	Msd25 Rose/Parry oat grass-Rough fescue				
cc rough fescue grassland(submesic/rich)	cc1 rough fescue	Msb1 Foothills rough fescue-Idaho fescue-Parry oat grass	Msc1 Idaho fescue-Parry oat grass-Sedge	Msc18 Weeds/Bare ground	
			Msc2 Canada bluegrass-Foothills rough fescue-Slender wheat grass	Msc4 Kentucky bluegrass-Timothy/Dandelion	
			Msc3 Kentucky bluegrass-Foothills rough fescue	Msc5 Smooth brome-Kentucky bluegrass	
			Msc9 Foothills rough fescue-Kentucky bluegrass		
		Msb15 Foothills rough fescue-Hairy wild rye			

Ecological Site / Range Site	Ecosite Phase / Ecological Range Site	Reference Plant Community	Grazing Succession	Modified Plant Community	Harvesting Succession
	cc2 rough fescue shrub	Msd21 Bog birch/Rough fescue/Bearberry			
		Msd26 Shrubby cinquefoil/Foothills rough fescue			
		Msd27 Rose-Saskatoon-Snowberry/Foothills rough fescue	Msd28 Shrubby cinquefoil-Rose/Kentucky bluegrass-Foothills rough fescue		
	cc3 rough fescue Fd	Msb8 Fd/Foothills rough fescue-Idaho fescue			
	cc4 rough fescue Aw	Msb10 Aw/Foothills rough fescue/Strawberry			
		Msb14 Fireweed (Aw)			
d mahonia-meadowsweet(mesic/medium)	d1 creeping mahonia-white meadowsweet Fd	Mse10 Fd/White meadowsweet			Msh16 Douglas-fir/Pine grass(cutblock)
		Mse10a Fd/Snowberry			
		Mse10b Fd/Feather moss			
		Mse26 Fd-PI/Pine grass			
	d2 creeping mahonia-white meadowsweet PI	Mse11 PI/Feather moss			Msh17 Pine grass (cutblock)
		Mse4 PI/Green alder			Msh26 Snowberry/Pine grass-Kentucky bluegrass (cutblock/burn)
		Mse8 PI/White meadowsweet			
		Mse9 PI/Pine grass	Mse25 PI/Pine grass-Timothy		Msh14 Lodgepole pine/Pine grass (cutblock)
					Msh24 Creeping red fescue-Timothy (cutblock)
	d3 creeping mahonia-white meadowsweet Sw	Mse12 Sw/Feather moss			Msh15 White spruce/Pine grass (cutblock)
		Mse18 Se/Grouseberry/Moss	Mse22 Se/Clover-Oxeye daisy		

Ecological Site / Range Site	Ecosite Phase / Ecological Range Site	Reference Plant Community	Grazing Succession	Modified Plant Community	Harvesting Succession	
		Mse19 Se/Moss				
		Mse20 Fa-Pl-Sw/White meadowsweet/Pine grass				
		Mse21 Fa-Se/Heart-leaved arnica				
	d4 white meadowsweet Aw	Msg18 Aw/Alder		Msg23 Aw/Orchard grass-Kentucky bluegrass		
		Msg4 Aw/White meadowsweet/Pine grass	Msg21 Aw/White meadowsweet/Kentucky bluegrass			
		Msg5 Aw/Rose/Pine grass	Msg6 Aw/Pine grass-Kentucky bluegrass Msg7 Aw/Timothy-Kentucky bluegrass			
	d5 creeping mahonia-white meadowsweet shrubland	Msb16g Big sagebrush-Buckthorn/	Msb16 Big sagebrush-Buckthorn/Kentucky bluegrass			
		Msb6a Snowberry-Rose-Saskatoon	Msc11 Snowberry-Rose/Kentucky bluegrass			
		Msd15a Silverberry-Saskatoon	Msd15 Silverberry-Saskatoon/Kentucky bluegrass			
	d6 pine grass grassland	Msb7 Pine grass-Hairy wild rye/Strawberry	Msb21 Pine grass-Kentucky bluegrass			
	d8 creeping mahonia-white meadowsweet Aw-Pl-Sw-Fd	Msf15 Aw-Sw/Rose/Pine grass				
		Msf4 Aw-Pl/Pine grass	Msf9 Pl-Aw/Snowberry/Kentucky bluegrass		Msh18 Aw/Kentucky bluegrass-Timothy (cutblock)	
		Msf4a Fd-Aw/Pine grass				
		Msf6 Aw-Fd/White meadowsweet				
	d9 industrial/tame	Msc7 Creeping red fescue/Dandelion-Clover				
	e thimbleberry/pine grass(mesic/rich)	e1 thimbleberry/pine grass Pl	Mse13 Pl/Thimbleberry			Msh20 Lodgepole pine/Thimbleberry (cutblock)
			Mse14 Pl/Thimbleberry/Bear-grass			

Ecological Site / Range Site	Ecosite Phase / Ecological Range Site	Reference Plant Community	Grazing Succession	Modified Plant Community	Harvesting Succession	
		Msf8a Aw-Pl/Marsh reed grass				
	e2 thimbleberry/pine grass Aw	Msg10 Aw/Thimbleberry			Msh22 Thimbleberry (cutblock)	
		Msg11 Aw/Cow parsnip	Msg17 Aw/Cow parsnip/Kentucky bluegrass			
		Msg8 Aw/Snowberry-Saskatoon	Msg9 Aw/Snowberry/Kentucky bluegrass		Msh29 Snowberry-Thimbleberry (Aw) (burn)	
		Msg9a Aw-Pb/Marsh reed grass	Msg22 Aw/Marsh reed grass-Kentucky bluegrass			
	e3 thimbleberry/pine grass Sw	Mse16 Sw/Thimbleberry				
		Mse27 Fd/Thimbleberry				
	e4 thimbleberry shrubland	Msb11 Thimbleberry				
		Msd1 Saskatoon-Snowberry/Marsh reed grass	Msd14 Raspberry-Chokecherry/Kentucky bluegrass			
		Msd19a Beaked willow/Cow parsnip	Msd19 Beaked willow/Cow parsnip/Kentucky bluegrass			
	f balsam poplar(subhygric/rich)	f1 balsam poplar Pb	Msf11 Sw-Pb/Snowberry			
			Msf14 Pb-Sw/Rose/Forbs	Msf7 Aw-Pb-Sw/Snowberry/Forbs		
			Msg12 Pb/Thimbleberry	Msg13 Pb/Cow parsnip/Kentucky bluegrass		
Msg14 Pb/Snowberry			Msg16 Pb-Aw/Red-osier dogwood/Kentucky bluegrass			
			Msg3 Pb/Snowberry/Smooth brome			
Msg15 Aw/Willow						
Msg20 Balsam poplar/Willow						
g meadow(subhygric/very rich)	g1 shrubby meadow	Msd13 Water birch-Smooth willow/Pine grass				
		Msd16 Willow/Marsh reed grass	Msd4 Willow/Kentucky bluegrass-Timothy			

Ecological Site / Range Site	Ecosite Phase / Ecological Range Site	Reference Plant Community	Grazing Succession	Modified Plant Community	Harvesting Succession	
		Msd17 Willow-Bog birch/Tufted hair grass-Foothills rough fescue	Msd17a Willow-Bog birch/Kentucky bluegrass			
		Msd22 River alder/Marsh reedgrass				
		Msd3 Willow-Snowberry				
		Msd3a Willow/Tufted hairgrass				
		Msd5 Green alder-Scoulers willow				
		Msd9 Basket willow/Sedge-Marsh reedgrass	Msd9a Basket willow/Kentucky bluegrass			
	g2 grassy meadow	Msb13 Tufted hair grass-Graceful sedge	Msc16 Kentucky bluegrass-Tufted hairgrass			
			Msb13a Baltic rush			
		Msb24 Foothills rough fescue-Tufted hair grass	Msc22 Kentucky bluegrass-Timothy-Rough fescue-Tufted hairgrass			
			Msc23 Kentucky bluegrass-Timothy/Clover			
	h horsetail(hygric/rich)	h1 horsetail Sw-Pb	Msg19 Sw-Pb/Horsetail			
		h2 horsetail Sw	Mse12a Sw/Horsetail			Msh25 Horsetail-Fireweed
Mse12b Sw/Silverberry						
h3 horsetail shrubland		Msd7 Flat leaved willow/Horsetail/Sedge				
ij fen(subhydic/rich)	ij1 treed fen	Msd12 Sb/Willow/Sedge			Msh27 Sedge cutblock	
		Mse17 Sb-Lt/Labrador tea				
		Mse23 Sb/Bog birch/Sedge				
	ij2 shrubby fen	Msd10 Drummond's willow				
		Msd11 Willow/Sedge				

Ecological Site / Range Site	Ecosite Phase / Ecological Range Site	Reference Plant Community	Grazing Succession	Modified Plant Community	Harvesting Succession
		Msd18 Willow-Bog birch/Sedge			
		Msd8 Myrtle leaved willow/Sedge	Msd8a Myrtle leaved willow/Kentucky bluegrass		
	ij3 graminoid fen	Msb12 Water-Small bottle sedge	Msc17 Small bottle sedge-Kentucky bluegrass		
		Msb22 Bog muhly			
		Msb23 Mud sedge			
		Msb25 Marsh reed grass			
	k marsh(hydric/rich)	k1 marsh	Msb19 Bulrush		
Msb20 Cattail					

# Mc Montane Cypress Hills Ecosection (n=195)

Natural Subregion: Montane

## General Description

The Montane Natural Subregion in Alberta includes three distinct ecosections. The Montane Cypress Hills Ecosection is located southeast of Medicine Hat within the Cypress Hills of Alberta. It includes the Cypress Hills ecodistrict. This ecosection intergrades with the Mixedgrass subregion which surrounds the lower elevations of the Cypress Hills.



## Environmental Variables

Elevation (range): 1262 (1111-1458) M

## Ecological Sites

## Site Count

a	junegrass-wheatgrass (subxeric/medium)	5
b	bearberry-western porcupine grass (submesic/medium)	33
c	white meadowsweet (mesic/medium)	20
cc	rough fescue (mesic/rich)	97
d	red osier dogwood (subhygric/rich)	13
e	meadow (subhygric/medium)	5
f	horsetail (hygric/rich)	14
g	fen (subhydric/rich)	5
h	marsh (hydric/rich)	3





## a junegrass-wheatgrass (subxeric/medium) (n=5)

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

### General Description

This ecosite is located on steep south and west facing slopes throughout the Cypress Hills with shallow soils. The range site tends to be gravels. The soils are regosolic and brunisolic, with medium nutrient regimes and generally have subxeric moisture regime. The grassland communities within this ecological site are not common in the Cypress Hills and are often dominated by northern wheat grass, june grass, fringed sage, needle and thread grass, sheep fescue, upland sedge, juniper and bearberry species. A community with a low cover of snowberry and Saskatoon was also described in this ecological site.



### Environmental Variables

Moisture Regime: Subxeric (moderately dry) (2), Xeric (dry) (1), Submesic (moderately fresh) (1)

Nutrient Regime: Mesotrophic (medium) (3), Submesotrophic (poor) (1)

Elevation (range): 1215 (1170-1250) M

Slope (%): strong slope (2), very strong slope (1), moderate slope (1)

Aspect: Southerly (3), Westerly (1)

Topographic Position: Midslope (3), Upper Slope (1)

### Soil Variables

Soil Drainage: Well drained (2), Imperfectly drained (1), Moderately well drained (1), Very rapidly drained (1)

Soil Subgroup: ORTHIC BLACK CHERNOZEM (1)

Surface Texture:

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (1)

Parent Material: Fluvial (1)

Soil Type:

Humus Form

### Successional Relationships

Due to the nature of the site grasslands often remain the climax vegetation on these sites. On moister sites shrubs such as saskatoon, silverberry, snowberry and rose, often invade the site with succession to Lodgepole pine. Heavy grazing pressure on these grasslands can often lead to a degraded site that is dominated by fringed sage, sedge, and little club-moss. However, on moister sites timothy and Kentucky bluegrass can often invade into this ecosite.

### LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

### Indicator Species

#### Shrub

COMMON WILD ROSE

*Rosa woodsii*

SNOWBERRY (BUCKBRUSH)

*Symphoricarpos occidentalis*

SASKATOON

*Amelanchier alnifolia*

#### Forb

PASTURE SAGEWORT

*Artemisia frigida*

PRAIRIE SELAGINELLA

*Selaginella densa*

#### Graminoid

NEEDLE-AND-THREAD

*Stipa comata*

NORTHERN WHEAT GRASS

*Agropyron dasystachyum*

WESTERN WHEAT GRASS

*Agropyron smithii*

JUNE GRASS

*Koeleria macrantha*

# a1 grassland (n=3)

**Natural Subregion:** Montane  
**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** a junegrass-wheatgrass (subxeric/medium)

## Characteristic Species

### Shrub

- [ 1.6 ] SILVER SAGEBRUSH  
*Artemisia cana*

### Forb

- [ 5.8 ] PASTURE SAGEWORT\*  
*Artemisia frigida*
- [ 3.3 ] PRAIRIE SELAGINELLA\*  
*Selaginella densa*
- [ 2.8 ] BROOMWEED  
*Gutierrezia sarothrae*
- [ 1.6 ] CREEPING WHITE PRAIRIE ASTER  
*Aster falcatus*
- [ 1.0 ] MOSS PHLOX  
*Phlox hoodii*
- [ 0.3 ] COLORADO RUBBER-PLANT  
*Hymenoxys richardsonii*

### Graminoid

- [ 12.3 ] JUNE GRASS\*  
*Koeleria macrantha*
- [ 10.6 ] NORTHERN WHEAT GRASS\*  
*Agropyron dasystachyum*
- [ 4.3 ] NEEDLE-AND-THREAD\*  
*Stipa comata*
- [ 3.3 ] WESTERN WHEAT GRASS\*  
*Agropyron smithii*
- [ 2.3 ] COLUMBIA NEEDLE GRASS  
*Stipa columbiana*
- [ 2.0 ] GREEN NEEDLE GRASS  
*Stipa viridula*
- [ 1.7 ] LOW SEDGE  
*Carex stenophylla*
- [ 1.3 ] BLUE GRAMA  
*Bouteloua gracilis*
- [ 1.0 ] ALKALI BLUEGRASS  
*Poa juncifolia*

## Environmental Variables

Moisture Regime: Subxeric (moderately dry) (1), Xeric (dry) (1)  
 Nutrient Regime: Submesotrophic (poor) (1), Mesotrophic (medium) (1)  
 Elevation (range): 1203 (1170-1236) M  
 Slope (%): moderate slope (1), strong slope (1)  
 Aspect: Southerly (2)  
 Topographic Position: Upper Slope (1), Midslope (1)

## Soil Variables

Soil Drainage: Very rapidly drained (1), Well drained (1), Moderately well drained (1)  
 Soil Subgroup: ORTHIC BLACK CHERNOZEM (1)  
 Surface Texture:  
 Effective Texture:  
 Depth to Mottles/Gley:  
 Organic Thickness: 0 - 5 cm (1)  
 Parent Material: Fluvial (1)  
 Soil Type:  
 Humus Form

## LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

# Mca1 Fringed sage/Junegrass-Northern wheatgrass (n=3)

## (*Artemisia frigida*/*Koeleria macrantha*-*Agropyron dasystachyum*)

This community type is typical of shallow to steep south facing slopes with coarse textured soils. The range site is gravelly. It is similar to the June grass-Plains reed grass community described by Stringer (1973) near Banff and Jasper, the Purple reed grass/Fringed sage community described by Bailey et al. (1992) in the Yukon and the Fringed sage/Slender wheat grass community described by Pojar (1982) in Northern British Columbia. The prominent species of these grasslands (june grass, northern wheat grass, fringed sage, pussy toes and bearberry) are typical of xerophytic and Mixed Prairie type grasslands throughout Western Canada. The desiccating winds of the area and steep south-facing slopes would contribute to a climate that is similar to the Mixed Prairie subregion (Strong 1992). Grazing has also seemed to have had an influence on this community type. Bailey et al. (1992), found that fringed sage, pussy toes, bearberry and low growing sedges increased and purple reed grass declined with increased grazing pressure on the Purple reed grass/Fringed sage community type. It would appear the dry site conditions, and heavy grazing pressure have contributed to the development of this grassland community.

**Natural Subregion:** Montane

**Ecosession:** Mc Montane Cypress Hills Ecosession

**Ecosite:** a junegrass-wheatgrass (subxeric/medium)

**Ecosite Phase:** a1 grassland

Plant Composition	Canopy Cover (%)		
	Mean	Range	Const.
<b>Medium Shrub (0.5 to 2 m)</b>			
SILVER SAGEBRUSH ( <i>Artemisia cana</i> )	1.6	1.0-3.0	100
<b>Tall Forb (&gt;= 30 cm)</b>			
CREeping WHITE PRAIRIE ASTER ( <i>Aster falcatus</i> )	1.6	0.0-4.0	67
<b>Low Forb (&lt; 30 cm)</b>			
PASTURE SAGEWORT ( <i>Artemisia frigida</i> )	5.8	4.0-9.6	100
PRAIRIE SELAGINELLA ( <i>Selaginella densa</i> )	3.3	0.0-10.0	33
BROOMWEED ( <i>Gutierrezia sarothrae</i> )	2.8	1.0-6.5	100
MOSS PHLOX ( <i>Phlox hoodii</i> )	1.0	0.0-2.0	67
COLORADO RUBBER-PLANT ( <i>Hymenoxys richardsonii</i> )	0.3	0.0-1.0	33
<b>Graminoid</b>			
JUNE GRASS ( <i>Koeleria macrantha</i> )	12.3	6.0-18.0	100
NORTHERN WHEAT GRASS ( <i>Agropyron dasystachyum</i> )	10.6	0.0-32.0	33
NEEDLE-AND-THREAD ( <i>Stipa comata</i> )	4.3	0.0-13.0	33
WESTERN WHEAT GRASS ( <i>Agropyron smithii</i> )	3.3	0.0-9.0	67
COLUMBIA NEEDLE GRASS ( <i>Stipa columbiana</i> )	2.3	0.0-7.0	33
GREEN NEEDLE GRASS ( <i>Stipa viridula</i> )	2.0	1.0-4.0	100
LOW SEDGE ( <i>Carex stenophylla</i> )	1.7	0.0-4.2	67
BLUE GRAMA ( <i>Bouteloua gracilis</i> )	1.3	0.0-3.0	67
ALKALI BLUEGRASS ( <i>Poa juncifolia</i> )	1.0	0.0-2.0	67

### Environmental Variables

Ecological Status Score: 27-40

Moisture Regime: Xeric (dry) (1), Subxeric (moderately dry) (1)

Nutrient Regime: Submesotrophic (poor) (1), Mesotrophic (medium) (1)

Elevation (range): 1203 (1170-1236) M

Slope (%): 10 - 15.99 (1), 16 - 30.99 (1)

Aspect: Southerly (2)

Topographic Position: Midslope (1), Upper Slope (1)

### Soil Variables

Soil Drainage: Very rapidly drained (1), Well drained (1), Moderately well drained (1)

Soil Subgroup: ORTHIC BLACK CHERNOZEM (1)

Surface Texture:

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (1)

Parent Material: Fluvial (1)

Soil Type:

Humus Form

LFH Thickness	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

## a2 shrubland (n=2)

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** a junegrass-wheatgrass (subxeric/medium)

### Characteristic Species

#### Shrub

- [ 7.0 ] SASKATOON\*  
*Amelanchier alnifolia*
- [ 7.0 ] SNOWBERRY (BUCKBRUSH)\*  
*Symphoricarpos occidentalis*
- [ 5.5 ] SILVER SAGEBRUSH  
*Artemisia cana*
- [ 1.0 ] COMMON WILD ROSE\*  
*Rosa woodsii*

#### Forb

- [ 2.5 ] LOW GOLDENROD  
*Solidago missouriensis*
- [ 1.5 ] PRAIRIE SAGEWORT  
*Artemisia ludoviciana*
- [ 1.5 ] SMALL-LEAVED PUSSYTOES  
*Antennaria parvifolia*
- [ 1.5 ] COMMON YARROW  
*Achillea millefolium*
- [ 1.0 ] DOUGLAS KNOTWEED  
*Polygonum douglasii*
- [ 1.0 ] GOLDEN ASTER  
*Heterotheca villosa*
- [ 1.0 ] MOSS PHLOX  
*Phlox hoodii*
- [ 1.0 ] BASTARD TOADFLAX  
*Comandra umbellata*
- [ 1.0 ] PASTURE SAGEWORT  
*Artemisia frigida*

#### Graminoid

- [ 3.5 ] SUN-LOVING SEDGE  
*Carex pensylvanica*
- [ 3.5 ] JUNE GRASS  
*Koeleria macrantha*
- [ 2.5 ] KENTUCKY BLUEGRASS  
*Poa pratensis*
- [ 2.0 ] ALKALI BLUEGRASS  
*Poa juncifolia*
- [ 1.5 ] GREEN NEEDLE GRASS  
*Stipa viridula*
- [ 1.5 ] SLENDER WHEAT GRASS  
*Agropyron trachycaulum*
- [ 1.5 ] WESTERN WHEAT GRASS  
*Agropyron smithii*
- [ 1.0 ] THREAD-LEAVED SEDGE  
*Carex filifolia*

### Environmental Variables

Moisture Regime: Subxeric (moderately dry) (1), Submesic (moderately fresh) (1)

Nutrient Regime: Mesotrophic (medium) (2)

Elevation (range): 1228 (1207-1250) M

Slope (%): very strong slope (1), strong slope (1)

Aspect: Westerly (1), Southerly (1)

Topographic Position: Midslope (2)

### Soil Variables

Soil Drainage: Well drained (1), Imperfectly drained (1)

Soil Subgroup:

Surface Texture:

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness:

Parent Material:

Soil Type:

Humus Form

### LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

## Mcb3 Snowberry-Saskatoon/Junegrass (n=2)

### (*Symphoricarpos occidentalis*-*Amelanchier alnifolia*/*Koeleria macrantha*)

This community type is typical of steep south facing slopes with coarse textured soils. The range site is gravelly. The presence of small amounts of snowberry and saskatoon indicate slightly better moisture and nutrient conditions than the Fringed sage/Junegrass community type previously described. The presence of silver sagebrush is unusual in this community type and may have been misidentified. Grazing can have had an influence on this community type. Bailey et al. (1992), found that fringed sage, pussy toes, bearberry and low growing sedges increased and purple reed grass declined with increased grazing pressure on the Purple reed grass/Fringed sage community type in the Yukon. It would appear the dry site conditions, and heavy grazing pressure have contributed to the development of this grassland community.

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** a junegrass-wheatgrass (subxeric/medium)

**Ecosite Phase:** a2 shrubland

#### Plant Composition

#### Canopy Cover (%)

#### Environmental Variables

	Mean	Range	Const.	
<b>Medium Shrub (0.5 to 2 m)</b>				Ecological Status Score: 40
SASKATOON ( <i>Amelanchier alnifolia</i> )	7.0	0.0-14.0	50	Moisture Regime: Subxeric (moderately dry) (1), Submesic (moderately fresh) (1)
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	7.0	1.0-13.0	100	Nutrient Regime: Mesotrophic (medium) (2)
SILVER SAGEBRUSH ( <i>Artemisia cana</i> )	5.5	5.0-6.0	100	Elevation (range): 1228 (1207-1250) M
COMMON WILD ROSE ( <i>Rosa woodsii</i> )	1.0	1.0-1.0	100	Slope (%): 16 - 30.99 (1), 31 - 45.99 (1)
<b>Tall Forb (&gt;= 30 cm)</b>				Aspect: Southerly (1), Westerly (1)
LOW GOLDENROD ( <i>Solidago missouriensis</i> )	2.5	0.0-5.0	50	Topographic Position: Midslope (2)
PRAIRIE SAGEWORT ( <i>Artemisia ludoviciana</i> )	1.5	1.0-2.0	100	<b>Soil Variables</b>
GOLDEN ASTER ( <i>Heterotheca villosa</i> )	1.0	1.0-1.0	100	Soil Drainage: Well drained (1), Imperfectly drained (1)
DOUGLAS KNOTWEED ( <i>Polygonum douglasii</i> )	1.0	1.0-1.0	100	Soil Subgroup:
<b>Low Forb (&lt; 30 cm)</b>				Surface Texture:
COMMON YARROW ( <i>Achillea millefolium</i> )	1.5	1.0-2.0	100	Effective Texture:
SMALL-LEAVED PUSSYTOES ( <i>Antennaria parvifolia</i> )	1.5	0.0-3.0	50	Depth to Mottles/Gley:
PASTURE SAGEWORT ( <i>Artemisia frigida</i> )	1.0	1.0-1.0	100	Organic Thickness:
BASTARD TOADFLAX ( <i>Comandra umbellata</i> )	1.0	1.0-1.0	100	Parent Material:
MOSS PHLOX ( <i>Phlox hoodii</i> )	1.0	1.0-1.0	100	Soil Type:
<b>Graminoid</b>				Humus Form
SUN-LOVING SEDGE ( <i>Carex pensylvanica</i> )	3.5	1.0-6.0	100	<b>LFH Thickness</b>
JUNE GRASS ( <i>Koeleria macrantha</i> )	3.5	1.0-6.0	100	Mean
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	2.5	0.0-5.0	50	Min
ALKALI BLUEGRASS ( <i>Poa juncifolia</i> )	2.0	1.0-3.0	100	Max
WESTERN WHEAT GRASS ( <i>Agropyron smithii</i> )	1.5	0.0-3.0	50	Count
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	1.5	1.0-2.0	100	cm:
GREEN NEEDLE GRASS ( <i>Stipa viridula</i> )	1.5	1.0-2.0	100	0.00
THREAD-LEAVED SEDGE ( <i>Carex filifolia</i> )	1.0	1.0-1.0	100	0.00
				0.00
				0

## b bearberry-western porcupine grass (submesic/medium) (n=33)

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

### General Description

This ecosite represents relatively dry conditions for the subregion but not as dry as the junegrass ecosite previously described. The range site tends to be shallow to gravel and gravel. Stands usually have closed canopies. Understory vegetation is generally sparse; however, rose and bearberry in the forested stands are commonly occurring species. Edaphic grasslands in this ecosite are restricted to steeper slopes, but are not as steep as the junegrass dominated grasslands. These grasslands are dominated by rough fescue, Idaho fescue, Western porcupine grass and sedge species.



### Environmental Variables

Moisture Regime: Submesic (moderately fresh) (7), Subxeric (moderately dry) (5), Mesic (fresh) (2)

Nutrient Regime: Mesotrophic (medium) (13), Permesotrophic (rich) (1)

Elevation (range): 1330 (1164-1448) M

Slope (%): moderate slope (7), strong slope (6), level (2), nearly level (2)

Aspect: Northerly (5), Westerly (5), Easterly (2), Level (2), Southerly (1)

Topographic Position: Midslope (7), Lower Slope (3), Level (2), Crest (1), Upper Slope (1)

### Soil Variables

Soil Drainage: Well drained (29), Moderately well drained (2), Imperfectly drained (1)

Soil Subgroup: ORTHIC BLACK CHERNOZEM (14), DARK GRAY LUVISOL (1)

Surface Texture:

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (19)

Parent Material: Undifferentiated Mineral (7), Eolian (4), Fluvial (4), Fluvioeolian (2), Saprolite (1)

Soil Type:

Humus Form

### Successional Relationships

Lodgepole pine and aspen form pure and mixed stands on this ecosite. Succession is towards white spruce; however, succession rates are slow due to the dry nature of the ecosite. Shrub and forb layers may be very sparse depending on canopy closure, particularly in lodgepole pine stands. Heavy grazing on the grasslands in this ecosite will lead to a community dominated by sedge, little clubmoss and fringed sage.

### LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

### Indicator Species

#### Tree

LOGEPOLE PINE

*Pinus contorta*

ASPEN

*Populus tremuloides*

#### Shrub

PRICKLY ROSE

*Rosa acicularis*

DWARF BILBERRY

*Vaccinium caespitosum*

COMMON BEARBERRY

*Arctostaphylos uva-ursi*

#### Graminoid

WESTERN PORCUPINE GRASS

*Stipa curtiseta*

FOOTHILLS ROUGH FESCUE

*Festuca campestris*

PLAINS ROUGH FESCUE

*Festuca hallii*

NORTHERN WHEAT GRASS

*Agropyron dasystachyum*

INTERMEDIATE OAT GRASS

*Danthonia intermedia*

SUN-LOVING SEDGE

*Carex pensylvanica*

# b1 bearberry PI (n=1)

**Natural Subregion:** Montane  
**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** b bearberry-western porcupine grass (submesic/medium)

## Characteristic Species

### Tree

- [ 60.0 ] LODGEPOLE PINE\*  
*Pinus contorta*

### Shrub

- [ 46.5 ] DWARF BILBERRY\*  
*Vaccinium caespitosum*
- [ 9.0 ] SHRUBBY CINQUEFOIL  
*Potentilla fruticosa*

### Forb

- [ 9.0 ] GRACEFUL CINQUEFOIL  
*Potentilla gracilis*
- [ 5.6 ] WILD STRAWBERRY  
*Fragaria virginiana*
- [ 4.5 ] SMOOTH ASTER  
*Aster laevis*
- [ 1.5 ] TUFTED FLEABANE  
*Erigeron caespitosus*
- [ 1.1 ] VEINY MEADOW RUE  
*Thalictrum venulosum*
- [ 1.1 ] EARLY BLUE VIOLET  
*Viola adunca*
- [ 1.0 ] COMMON DANDELION  
*Taraxacum officinale*

### Graminoid

- [ 9.1 ] SUN-LOVING SEDGE\*  
*Carex pensylvanica*
- [ 3.1 ] INTERMEDIATE OAT GRASS  
*Danthonia intermedia*
- [ 1.6 ] FOOTHILLS ROUGH FESCUE  
*Festuca campestris*
- [ 1.5 ] SLENDER WHEAT GRASS (VAR. OF AGROTRA )  
*Agropyron unilaterale*
- [ 1.5 ] IDAHO FESCUE  
*Festuca idahoensis*
- [ 1.0 ] JUNE GRASS  
*Koeleria macrantha*

## Environmental Variables

Moisture Regime:  
 Nutrient Regime:  
 Elevation (range): 0 (0-0) M  
 Slope (%): level (1)  
 Aspect:  
 Topographic Position:

## Soil Variables

Soil Drainage: Well drained (1)  
 Soil Subgroup: ORTHIC BLACK CHERNOZEM (1)  
 Surface Texture:  
 Effective Texture:  
 Depth to Mottles/Gley:  
 Organic Thickness: 0 - 5 cm (1)  
 Parent Material: Eolian (1)  
 Soil Type:  
 Humus Form

## LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

# Mce1 PI/dwarf bilberry (n=1)

## (*Pinus contorta/Vaccinium caespitosum*)

This community is typical of the pine dominated community types adjacent to the grasslands within the Cypress Hills. They tend to be dry sites, that are well drained with poor to medium nutrient regimes. Forage production on these sites tends to be low because of the closed canopy cover. Succession in the absence of disturbance will be to white spruce.

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** b bearberry-western porcupine grass (submesic/medium)

**Ecosite Phase:** b1 bearberry PI

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables				
	Mean	Range							
<b>Understory Tree</b>					Ecological Status Score: 25				
LODGEPOLE PINE ( <i>Pinus contorta</i> )	60.0	60.0-60.0		100	Moisture Regime:				
<b>Medium Shrub (0.5 to 2 m)</b>					Nutrient Regime:				
DWARF BILBERRY ( <i>Vaccinium caespitosum</i> )	46.5	46.5-46.5		100	Elevation (range): 0 (0-0) M				
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	9.0	9.0-9.0		100	Slope (%): 0 - 0.49 (1)				
<b>Tall Forb (&gt;= 30 cm)</b>					Aspect:				
GRACEFUL CINQUEFOIL ( <i>Potentilla gracilis</i> )	9.0	9.0-9.0		100	Topographic Position:				
SMOOTH ASTER ( <i>Aster laevis</i> )	4.5	4.5-4.5		100	<b>Soil Variables</b>				
VEINY MEADOW RUE ( <i>Thalictrum venulosum</i> )	1.1	1.1-1.1		100	Soil Drainage: Well drained (1)				
<b>Low Forb (&lt; 30 cm)</b>					Soil Subgroup: ORTHIC BLACK CHERNOZEM (1)				
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	5.6	5.6-5.6		100	Surface Texture:				
TUFTED FLEABANE ( <i>Erigeron caespitosus</i> )	1.5	1.5-1.5		100	Effective Texture:				
EARLY BLUE VIOLET ( <i>Viola adunca</i> )	1.1	1.1-1.1		100	Depth to Mottles/Gley:				
COMMON DANDELION ( <i>Taraxacum officinale</i> )	1.0	1.0-1.0		100	Organic Thickness: 0 - 5 cm (1)				
<b>Graminoid</b>					Parent Material: Eolian (1)				
SUN-LOVING SEDGE ( <i>Carex pensylvanica</i> )	9.1	9.1-9.1		100	Soil Type:				
INTERMEDIATE OAT GRASS ( <i>Danthonia intermedia</i> )	3.1	3.1-3.1		100	Humus Form				
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	1.6	1.6-1.6		100	<b>LFH Thickness</b>				
SLENDER WHEAT GRASS (VAR. OF AGROTRA) ( <i>Agropyron unilaterale</i> )	1.5	1.5-1.5		100	<b>Mean</b>	<b>Min</b>	<b>Max</b>	<b>Count</b>	
IDAHO FESCUE ( <i>Festuca idahoensis</i> )	1.5	1.5-1.5		100	cm:	0.00	0.00	0.00	0
JUNE GRASS ( <i>Koeleria macrantha</i> )	1.0	1.0-1.0		100					



## b2 bearberry Aw (n=1)

**Natural Subregion:** Montane  
**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** b bearberry-western porcupine grass (submesic/medium)

### Characteristic Species

#### Tree

- [ 63.0 ] ASPEN\*  
*Populus tremuloides*

#### Shrub

- [ 3.0 ] WILD RED RASPBERRY  
*Rubus idaeus*
- [ 2.0 ] PRICKLY ROSE\*  
*Rosa acicularis*
- [ 2.0 ] COMMON BEARBERRY\*  
*Arctostaphylos uva-ursi*
- [ 1.0 ] GROUND JUNIPER  
*Juniperus communis*
- [ 1.0 ] NORTHERN GOOSEBERRY  
*Ribes oxycanthoides*
- [ 1.0 ] SNOWBERRY  
*Symphoricarpos albus*
- [ 1.0 ] DWARF BILBERRY  
*Vaccinium caespitosum*

#### Forb

- [ 6.0 ] WILD STRAWBERRY  
*Fragaria virginiana*
- [ 3.0 ] SMOOTH ASTER  
*Aster laevis*
- [ 2.0 ] TALL BUTTERCUP  
*Ranunculus acris*
- [ 2.0 ] THIN-LEAVED RAGWORT  
*Senecio pseud aureus*
- [ 1.0 ] SPREADING SWEET CICELY  
*Osmorhiza depauperata*
- [ 1.0 ] NORTHERN BEDSTRAW  
*Galium boreale*
- [ 1.0 ] WILD WHITE GERANIUM  
*Geranium richardsonii*
- [ 1.0 ] SMALL-LEAVED PUSSYTOES  
*Antennaria parvifolia*

#### Graminoid

- [ 4.0 ] PURPLE OAT GRASS  
*Schizachne purpurascens*
- [ 1.0 ] KEELED BROME  
*Bromus carinatus*
- [ 1.0 ] SLENDER WHEAT GRASS  
*Agropyron trachycaulum*
- [ 1.0 ] HAY SEDGE  
*Carex siccata*

### Environmental Variables

Moisture Regime: Mesic (fresh) (1)  
 Nutrient Regime: Mesotrophic (medium) (1)  
 Elevation (range): 1448 (1448-1448) M  
 Slope (%): moderate slope (1)  
 Aspect: Level (1)  
 Topographic Position: Midslope (1)

### Soil Variables

Soil Drainage: Well drained (1)  
 Soil Subgroup:  
 Surface Texture:  
 Effective Texture:  
 Depth to Mottles/Gley:  
 Organic Thickness:  
 Parent Material:  
 Soil Type:  
 Humus Form

### LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

# Mcc1 Aw/Rose/Bearberry (n=1)

(*Populus tremuloides*/*Rosa acicularis*/*Arctostaphylos uva-ursi*)

This community type occupies dry, upper slope and hilltop positions and represents the invasion of aspen onto a Rough fescue dominated community type. The soils on this community type are fairly well developed and the moisture conditions are high enough to favour the growth of aspen. In years of drought aspen will likely die back in this community type. Frequent fire also tends to control the spread of aspen onto these rough fescue dominated grasslands. The lack of fire in the last 50 years has allowed many of these grasslands to be invaded by aspen. Invasion of aspen causes a 50% decline in forage productivity and a loss in soil productivity

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** b bearberry-western porcupine grass (submesic/medium)

**Ecosite Phase:** b2 bearberry Aw

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables				
	Mean	Range							
<b>Overstory Tree</b>					Ecological Status Score: 25				
ASPEN ( <i>Populus tremuloides</i> )	63.0	63.0-63.0		100	Moisture Regime: Mesic (fresh) (1)				
<b>Medium Shrub (0.5 to 2 m)</b>					Nutrient Regime: Mesotrophic (medium) (1)				
WILD RED RASPBERRY ( <i>Rubus idaeus</i> )	3.0	3.0-3.0		100	Elevation (range): 1448 (1448-1448) M				
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	2.0	2.0-2.0		100	Slope (%): 10 - 15.99 (1)				
PRICKLY ROSE ( <i>Rosa acicularis</i> )	2.0	2.0-2.0		100	Aspect: Level (1)				
GROUND JUNIPER ( <i>Juniperus communis</i> )	1.0	1.0-1.0		100	Topographic Position: Midslope (1)				
NORTHERN GOOSEBERRY ( <i>Ribes oxycanthoides</i> )	1.0	1.0-1.0		100	<b>Soil Variables</b>				
SNOWBERRY ( <i>Symphoricarpos albus</i> )	1.0	1.0-1.0		100	Soil Drainage: Well drained (1)				
DWARF BILBERRY ( <i>Vaccinium caespitosum</i> )	1.0	1.0-1.0		100	Soil Subgroup:				
<b>Tall Forb (&gt;= 30 cm)</b>					Surface Texture:				
SMOOTH ASTER ( <i>Aster laevis</i> )	3.0	3.0-3.0		100	Effective Texture:				
TALL BUTTERCUP ( <i>Ranunculus acris</i> )	2.0	2.0-2.0		100	Depth to Mottles/Gley:				
THIN-LEAVED RAGWORT ( <i>Senecio pseud aureus</i> )	2.0	2.0-2.0		100	Organic Thickness:				
WILD WHITE GERANIUM ( <i>Geranium richardsonii</i> )	1.0	1.0-1.0		100	Parent Material:				
SPREADING SWEET CICELY ( <i>Osmorhiza depauperata</i> )	1.0	1.0-1.0		100	Soil Type:				
<b>Low Forb (&lt; 30 cm)</b>					Humus Form				
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	6.0	6.0-6.0		100	<b>LFH Thickness</b>				
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	1.0	1.0-1.0		100					
SMALL-LEAVED PUSSYTOES ( <i>Antennaria parvifolia</i> )	1.0	1.0-1.0		100					
<b>Graminoid</b>									
PURPLE OAT GRASS ( <i>Schizachne purpurascens</i> )	4.0	4.0-4.0		100					
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	1.0	1.0-1.0		100					
KEELED BROME ( <i>Bromus carinatus</i> )	1.0	1.0-1.0		100					
HAY SEDGE ( <i>Carex siccata</i> )	1.0	1.0-1.0		100					
					<b>LFH Thickness</b>				
					cm:				
					Mean				
					Min				
					Max				
					Count				
					0.00				
					0.00				
					0.00				
					0				

### b3 Western porcupine grass (n=31)

Natural Subregion: Montane

Ecosection: Mc Montane Cypress Hills Ecosection

Ecosite: b bearberry-western porcupine grass (submesic/medium)

#### Characteristic Species

##### Shrub

- [ 6.6 ] SHRUBBY CINQUEFOIL  
*Potentilla fruticosa*
- [ 2.6 ] COMMON WILD ROSE  
*Rosa woodsii*

##### Forb

- [ 4.7 ] GOLDEN BEAN  
*Thermopsis rhombifolia*
- [ 3.1 ] NORTHERN BEDSTRAW  
*Galium boreale*
- [ 1.7 ] PRAIRIE SELAGINELLA  
*Selaginella densa*
- [ 1.1 ] SILVERY PERENNIAL LUPINE  
*Lupinus argenteus*

##### Graminoid

- [ 31.5 ] FOOTHILLS ROUGH FESCUE\*  
*Festuca campestris*
- [ 6.2 ] IDAHO FESCUE  
*Festuca idahoensis*
- [ 5.3 ] PLAINS ROUGH FESCUE\*  
*Festuca hallii*
- [ 4.4 ] WESTERN PORCUPINE GRASS\*  
*Stipa curtisetia*
- [ 2.5 ] NORTHERN WHEAT GRASS\*  
*Agropyron dasystachyum*
- [ 1.8 ] SEDGE SPECIES  
*Carex*
- [ 1.6 ] INTERMEDIATE OAT GRASS\*  
*Danthonia intermedia*
- [ 1.2 ] HOOKER'S OAT GRASS  
*Helictotrichon hookeri*
- [ 1.2 ] JUNE GRASS  
*Koeleria macrantha*

#### Environmental Variables

Moisture Regime: Submesic (moderately fresh) (7), Subxeric (moderately dry) (5), Mesic (fresh) (1)

Nutrient Regime: Mesotrophic (medium) (12), Permesotrophic (rich) (1)

Elevation (range): 1291 (1164-1404) M

Slope (%): strong slope (6), moderate slope (6), nearly level (2), level (1)

Aspect: Northerly (5), Westerly (5), Easterly (2), Level (1), Southerly (1)

Topographic Position: Midslope (6), Lower Slope (3), Level (2), Crest (1), Upper Slope (1)

#### Soil Variables

Soil Drainage: Well drained (27), Moderately well drained (2), Imperfectly drained (1)

Soil Subgroup: ORTHIC BLACK CHERNOZEM (13), DARK GRAY LUVISOL (1)

Surface Texture:

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (18)

Parent Material: Undifferentiated Mineral (7), Fluvial (4), Eolian (3), Fluvioeolian (2), Saprolite (1)

Soil Type:

Humus Form

#### LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

# Mca10 Canada bluegrass-Idaho fescue (n=1)

## (*Poa compressa*-*Festuca idahoensis*)

This is a mid to late seral plant community on loamy and shallow-to-gravel range sites on the slopes of the Cypress Hills plateau. This plant community represents a grazed Rough fescue-Idaho fescue community type. More heavily grazed micro patches will be dominated by bluebunch fescue, Kentucky bluegrass and forbs (golden bean). Continued heavy grazing pressure will eventually lead to a community dominated by sedge and bluegrass species.

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** b bearberry-western porcupine grass (submesic/medium)

**Ecosite Phase:** b3 Western porcupine grass

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Medium Shrub (0.5 to 2 m)</b>				Ecological Status Score: 15-20
PRAIRIE ROSE ( <i>Rosa arkansana</i> )	4.4	4.4-4.4	100	Moisture Regime:
<b>Tall Forb (&gt;= 30 cm)</b>				Nutrient Regime:
WILD VETCH ( <i>Vicia americana</i> )	1.6	1.6-1.6	100	Elevation (range): 0 (0-0) M
PRAIRIE SAGEWORT ( <i>Artemisia ludoviciana</i> )	1.0	1.0-1.0	100	Slope (%):
<b>Low Forb (&lt; 30 cm)</b>				Aspect:
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	7.8	7.8-7.8	100	Topographic Position:
GOLDEN BEAN ( <i>Thermopsis rhombifolia</i> )	4.6	4.6-4.6	100	<b>Soil Variables</b>
COMMON DANDELION ( <i>Taraxacum officinale</i> )	3.0	3.0-3.0	100	Soil Drainage: Well drained (1)
PRAIRIE CROCUS ( <i>Anemone patens</i> )	2.6	2.6-2.6	100	Soil Subgroup: DARK GRAY LUVISOL (1)
YELLOW FALSE DANDELION ( <i>Agoseris glauca</i> )	2.4	2.4-2.4	100	Surface Texture:
HAREBELL ( <i>Campanula rotundifolia</i> )	2.0	2.0-2.0	100	Effective Texture:
COMMON YARROW ( <i>Achillea millefolium</i> )	1.8	1.8-1.8	100	Depth to Mottles/Gley:
<b>Graminoid</b>				Organic Thickness: 0 - 5 cm (1)
CANADA BLUEGRASS ( <i>Poa compressa</i> )	40.8	40.8-40.8	100	Parent Material: Fluvial (1)
IDAHO FESCUE ( <i>Festuca idahoensis</i> )	12.0	12.0-12.0	100	Soil Type:
PLAINS ROUGH FESCUE ( <i>Festuca hallii</i> )	6.0	6.0-6.0	100	Humus Form
NORTHERN WHEAT GRASS ( <i>Agropyron dasystachyum</i> )	5.4	5.4-5.4	100	<b>LFH Thickness</b>
SEDGE SPECIES ( <i>Carex</i> )	1.4	1.4-1.4	100	Mean
INTERMEDIATE OAT GRASS ( <i>Danthonia intermedia</i> )	1.2	1.2-1.2	100	Min
BLUEGRASSES ( <i>Poa</i> )	1.0	1.0-1.0	100	Max
				Count
				cm: 0.00 0.00 0.00 0

## Mca2 Rough fescue-Western porcupine grass (n=17)

### (*Festuca campestris*-*Stipa curtisetata*)

This is the reference plant community for thin break and gravel range sites in the upper slopes of the Cypress Hills. There remains some uncertainty about the species of rough fescue found from the upper slopes of the Cypress Hills, down slope to the lower slopes of the Mixedgrass subregion. On the Cypress Hills bench, rough fescue expresses as a bunch grass and then as a sod forming species as you progress downslope. Genetic studies proposed by Agriculture Canada may clear up this point of confusion in the future. Coupland (1961) described this plant community and our analysis suggests that it is found on the drier thin break and gravel influenced sites adjoining the Cypress Hills plateau and upper slopes. This community is very similar to the MGA1 community in the adjoining mixed grass natural subregion. Subdominant species in this community more closely resemble the shrubby cinquefoil/rough fescue-Intermediate oatgrass community of the plateau, while the MGA1 more closely resembles the adjoining dry mixed grass prairie. Mid-summer aridity is a common feature of these rangeland soils given their exposure and coarse texture. Conservative stocking rates are needed to require adequate litter.

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** b bearberry-western porcupine grass (submesic/medium)

**Ecosite Phase:** b3 Western porcupine grass

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Medium Shrub (0.5 to 2 m)</b>				Ecological Status Score: 40
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	2.4	0.0-20.5	41	Moisture Regime: Submesic (moderately fresh) (5), Subxeric (moderately dry) (4), Mesic (fresh) (1)
COMMON WILD ROSE ( <i>Rosa woodsii</i> )	2.2	0.0-9.5	71	Nutrient Regime: Mesotrophic (medium) (9), Permesotrophic (rich) (1)
<b>Tall Forb (&gt;= 30 cm)</b>				Elevation (range): 1249 (1176-1376) M
PRAIRIE SAGEWORT ( <i>Artemisia ludoviciana</i> )	1.9	0.0-9.0	65	Slope (%): 10 - 15.99 (5), 16 - 30.99 (3), 0.5 - 2.49 (2)
SILVERY PERENNIAL LUPINE ( <i>Lupinus argenteus</i> )	1.2	0.0-6.0	35	Aspect: Westerly (4), Northerly (4), Easterly (1), Southerly (1)
<b>Low Forb (&lt; 30 cm)</b>				Topographic Position: Midslope (5), Level (2), Lower Slope (2), Upper Slope (1)
GOLDEN BEAN ( <i>Thermopsis rhombifolia</i> )	5.8	0.0-20.0	82	<b>Soil Variables</b>
PRAIRIE SELAGINELLA ( <i>Selaginella densa</i> )	3.4	0.0-23.0	47	Soil Drainage: Well drained (15), Moderately well drained (1), Imperfectly drained (1)
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	2.3	0.0-13.0	77	Soil Subgroup: ORTHIC BLACK CHERNOZEM (6)
PRAIRIE CROCUS ( <i>Anemone patens</i> )	1.4	0.0-6.1	82	Surface Texture:
FIELD MOUSE-EAR CHICKWEED ( <i>Cerastium arvense</i> )	1.1	0.0-7.0	65	Effective Texture:
<b>Graminoid</b>				Depth to Mottles/Gley:
ROUGH FESCUE ( <i>Festuca scabrella</i> )	26.0	0.0-95.0	59	Organic Thickness: 0 - 5 cm (7)
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	8.1	0.0-48.5	24	Parent Material: Undifferentiated Mineral (4), Eolian (1), Fluvial (1), Saprolite (1)
WESTERN PORCUPINE GRASS ( <i>Stipa curtisetata</i> )	7.6	0.0-30.0	94	Soil Type:
NORTHERN WHEAT GRASS ( <i>Agropyron dasystachyum</i> )	2.7	0.0-14.7	71	Humus Form
HOOKER'S OAT GRASS ( <i>Helictotrichon hookeri</i> )	2.5	0.0-13.0	77	
PLAINS ROUGH FESCUE ( <i>Festuca hallii</i> )	2.4	0.0-21.0	18	
JUNE GRASS ( <i>Koeleria macrantha</i> )	2.4	0.0-15.0	88	
THREAD-LEAVED SEDGE ( <i>Carex filifolia</i> )	1.2	0.0-13.0	24	
PATTERSON'S BLUEGRASS ( <i>Poa pattersonii</i> )	1.2	0.0-20.0	12	
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	1.2	0.0-9.5	41	
				<b>LFH Thickness</b>
				Mean
				Min
				Max
				Count
				cm:
				0.00
				0.00
				0.00
				0

## Mca3 Shrubby cinquefoil/Rough fescue-Idaho fescue (n=8)

(*Potentilla fruticosa*/*Festuca campestris*-*Festuca idahoensis*)

This is a reference plant community for shallow-to-gravel range sites on the Cypress Hills Plateau. Though the shrubby cinquefoil/foothills rough fescue - intermediate oatgrass community type is most common on the plateau, this community type occurs on similar soils but with thinner loess deposits over gravels (Thelma and Marmaduke). This community type tends to have a lower canopy cover of shrubby cinquefoil and a greater ground cover of moss/lichen compared to Mca5. With grazing pressure, Idaho fescue and forb cover will increase significantly.

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** b bearberry-western porcupine grass (submesic/medium)

**Ecosite Phase:** b3 Western porcupine grass

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Medium Shrub (0.5 to 2 m)</b>				Ecological Status Score: 27-40
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	10.8	0.0-46.5	88	Moisture Regime:
COMMON WILD ROSE ( <i>Rosa woodsii</i> )	3.0	0.0-7.1	75	Nutrient Regime:
<b>Tall Forb (&gt;= 30 cm)</b>				Elevation (range): 1404 (1404-1404) M
SILVERY PERENNIAL LUPINE ( <i>Lupinus argenteus</i> )	1.0	0.0-5.1	50	Slope (%): 0 - 0.49 (1), 16 - 30.99 (1)
<b>Low Forb (&lt; 30 cm)</b>				Aspect: Northerly (1)
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	3.9	0.0-12.6	88	Topographic Position:
GOLDEN BEAN ( <i>Thermopsis rhombifolia</i> )	3.7	0.0-10.6	75	<b>Soil Variables</b>
THREE-FLOWERED AVENS ( <i>Geum triflorum</i> )	1.2	0.0-8.0	50	Soil Drainage: Well drained (7)
<b>Graminoid</b>				Soil Subgroup: ORTHIC BLACK CHERNOZEM (6)
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	29.0	0.0-51.8	75	Surface Texture:
IDAHO FESCUE ( <i>Festuca idahoensis</i> )	12.4	5.0-21.7	100	Effective Texture:
PLAINS ROUGH FESCUE ( <i>Festuca hallii</i> )	8.2	0.0-43.5	38	Depth to Mottles/Gley:
SEDGE SPECIES ( <i>Carex</i> )	3.7	0.0-27.0	25	Organic Thickness: 0 - 5 cm (8)
INTERMEDIATE OAT GRASS ( <i>Danthonia intermedia</i> )	3.2	0.0-18.7	38	Parent Material: Eolian (2), Fluvioeolian (2), Undifferentiated Mineral (2), Fluvial (1)
NORTHERN WHEAT GRASS ( <i>Agropyron dasystachyum</i> )	2.3	0.0-9.6	50	Soil Type:
SLENDER WHEAT GRASS (VAR. OF AGROTRA) ( <i>Agropyron unilaterale</i> )	1.7	0.0-8.6	38	Humus Form
CALIFORNIA OAT GRASS ( <i>Danthonia californica</i> )	1.4	0.0-11.9	13	<b>LFH Thickness</b>
WESTERN PORCUPINE GRASS ( <i>Stipa curtisetata</i> )	1.3	0.0-11.0	13	Mean
SUN-LOVING SEDGE ( <i>Carex pensylvanica</i> )	1.1	0.0-4.7	75	Min
				Max
				Count
				cm:
				0.00
				0.00
				0.00
				0

## Mca4 Western porcupine grass-Rough fescue/Little clubmoss (n=5)

### (*Stipa curtiseteta*-*Festuca hallii*/*Selaginella densa*)

On drier, gravelly and thin break sites within the Western porcupine grass dominated community types increased grazing pressure causes rough fescue to decline and allows low growing sedge, western porcupine grass, junegrass and forb species to increase to form this community type. Continued heavy grazing pressure will eventually cause western porcupine grass to decline and the community may appear similar to the fringed sage, junegrass dominated community type (Mca1).

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** b bearberry-western porcupine grass (submesic/medium)

**Ecosite Phase:** b3 Western porcupine grass

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Medium Shrub (0.5 to 2 m)</b>					Ecological Status Score: 20-15
COMMON WILD ROSE ( <i>Rosa woodsii</i> )	2.6	0.0-10.0	60		Moisture Regime: Submesic (moderately fresh) (2), Subxeric (moderately dry) (1)
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	1.3	0.0-4.5	40		Nutrient Regime: Mesotrophic (medium) (3)
<b>Tall Forb (&gt;= 30 cm)</b>					Elevation (range): 1220 (1164-1320) M
CREeping WHITE PRAIRIE ASTER ( <i>Aster falcatus</i> )	2.1	0.0-5.0	60		Slope (%): 16 - 30.99 (2), 10 - 15.99 (1)
DOTTED BLAZINGSTAR ( <i>Liatris punctata</i> )	1.4	0.0-7.0	20		Aspect: Level (1), Easterly (1), Westerly (1)
PRAIRIE SAGEWORT ( <i>Artemisia ludoviciana</i> )	1.2	0.0-4.0	60		Topographic Position: Crest (1), Lower Slope (1), Midslope (1)
<b>Low Forb (&lt; 30 cm)</b>					<b>Soil Variables</b>
PRAIRIE SELAGINELLA ( <i>Selaginella densa</i> )	4.0	0.0-16.0	60		Soil Drainage: Well drained (4), Moderately well drained (1)
GOLDEN BEAN ( <i>Thermopsis rhombifolia</i> )	1.7	0.0-3.5	80		Soil Subgroup: ORTHIC BLACK CHERNOZEM (1)
BASTARD TOADFLAX ( <i>Comandra umbellata</i> )	1.5	0.0-5.0	60		Surface Texture:
LATE YELLOW LOCOWEED ( <i>Oxytropis monticola</i> )	1.5	0.0-7.6	40		Effective Texture:
PASTURE SAGEWORT ( <i>Artemisia frigida</i> )	1.3	0.7-3.1	100		Depth to Mottles/Gley:
THREE-FLOWERED AVENS ( <i>Geum triflorum</i> )	1.2	0.0-5.0	60		Organic Thickness: 0 - 5 cm (2)
COMMON YARROW ( <i>Achillea millefolium</i> )	1.0	0.0-4.0	60		Parent Material: Fluvial (1), Undifferentiated Mineral (1)
<b>Graminoid</b>					Soil Type:
WESTERN PORCUPINE GRASS ( <i>Stipa curtiseteta</i> )	37.1	8.0-88.0	100		Humus Form
JUNE GRASS ( <i>Koeleria macrantha</i> )	6.2	5.0-9.0	100		
ROUGH FESCUE ( <i>Festuca scabrella</i> )	4.8	0.0-21.0	60		
NORTHERN WHEAT GRASS ( <i>Agropyron dasystachyum</i> )	3.9	0.0-11.9	60		
PLAINS ROUGH FESCUE ( <i>Festuca hallii</i> )	3.7	0.0-10.0	40		
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	2.6	0.0-9.2	40		
SUN-LOVING SEDGE ( <i>Carex pensylvanica</i> )	1.5	0.0-7.5	20		
LOW SEDGE ( <i>Carex stenophylla</i> )	1.2	0.0-6.2	20		
HOOKEr'S OAT GRASS ( <i>Helictotrichon hookeri</i> )	1.0	0.0-4.0	40		
					<b>LFH Thickness</b>
					<b>Mean</b>
					<b>Min</b>
					<b>Max</b>
					<b>Count</b>
				cm:	0.00
					0.00
					0.00
					0

## c white meadowsweet (mesic/medium) (n=20)

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

### General Description

The mesic ecosite for the ecosection supports a variety of plant communities. The plant communities of this ecological site are floristically similar to the southern ecosection located to the West. Forests in the Cypress Hills occur on northerly slopes with Luvisolic soils and include pure or mixed lodgepole pine, aspen and white spruce stands with understories of white meadowsweet and pinegrass (Natural Regions Committee 2006). Douglas fir and limber pine dominated communities were not described in the Cypress Hills. The range site for this particular ecological site is predominantly Loamy.



### Environmental Variables

**Moisture Regime:** Mesic (fresh) (14), Subhygric (moderately moist) (2), Submesic (moderately fresh) (2), Subxeric (moderately dry) (1)

**Nutrient Regime:** Mesotrophic (medium) (15), Permesotrophic (rich) (2), Submesotrophic (poor) (2)

**Elevation (range):** 1271 (1212-1429) M

**Slope (%):** steep slope (5), strong slope (5), level (2), moderate slope (2), very strong slope (2), gentle slope (1), very gentle slope (1), very steep slope (1)

**Aspect:** Northerly (5), Southerly (4), Westerly (4), Level (4), Easterly (2)

**Topographic Position:** Midslope (13), Lower Slope (2), Level (1), Upper Slope (1)

### Soil Variables

**Soil Drainage:** Well drained (12), Rapidly drained (3), Moderately well drained (2), Poorly drained (1), Imperfectly drained (1)

**Soil Subgroup:** ORTHIC GRAY LUVISOL (2), ORTHIC BLACK CHERNOZEM (1)

**Surface Texture:** Silt loam (2), Silty Sand (1), Loam (1)

**Effective Texture:** Loam (2)

**Depth to Mottles/Gley:**

**Organic Thickness:** 0 - 5 cm (5)

**Parent Material:** Eolian (1)

**Soil Type:**

**Humus Form**

### Successional Relationships

Lodgepole pine and white spruce form pure and mixed stands on this ecosite. Succession is toward white spruce; however, the extensive fire and disturbance history in the area has resulted in a predominance of lodgepole pine stands.

### LFH Thickness

	Mean	Min	Max	Count
cm:	2.00	2.00	3.00	2

### Indicator Species

#### Tree

WHITE SPRUCE

*Picea glauca*

LODGEPOLE PINE

*Pinus contorta*

ASPEN

*Populus tremuloides*

#### Shrub

CANADA BUFFALOBERRY

*Shepherdia canadensis*

WHITE MEADOWSWEET

*Spiraea betulifolia*

SNOWBERRY

*Symphoricarpos albus*

SNOWBERRY (BUCKBRUSH)

*Symphoricarpos occidentalis*

#### Graminoid

PINE REED GRASS

*Calamagrostis rubescens*



# c1 white meadowsweet PI-Sw (n=4)

Natural Subregion: Montane

Ecosection: Mc Montane Cypress Hills Ecosection

Ecosite: c white meadowsweet (mesic/medium)

## Characteristic Species

### Tree

[ 45.2 ] LODGEPOLE PINE\*  
*Pinus contorta*

[ 4.4 ] WHITE SPRUCE\*  
*Picea glauca*

### Shrub

[ 5.0 ] WHITE MEADOWSWEET\*  
*Spiraea betulifolia*

[ 3.2 ] CANADA BUFFALOBERRY\*  
*Shepherdia canadensis*

[ 1.7 ] PRICKLY ROSE  
*Rosa acicularis*

[ 1.7 ] TWINFLOWER  
*Linnaea borealis*

[ 1.7 ] DWARF BILBERRY  
*Vaccinium caespitosum*

[ 1.2 ] SNOWBERRY  
*Symphoricarpos albus*

### Forb

[ 1.2 ] CREAM-COLORED VETCHLING  
*Lathyrus ochroleucus*

[ 1.0 ] SPREADING SWEET CICELY  
*Osmorhiza depauperata*

[ 1.0 ] WILD STRAWBERRY  
*Fragaria virginiana*

[ 1.0 ] NORTHERN BEDSTRAW  
*Galium boreale*

[ 1.0 ] SHOWY ASTER  
*Aster conspicuus*

### Moss and Liverwort

[ 1.0 ] KNIGHT'S PLUME MOSS  
*Ptilium crista-castrensis*

### Graminoid

[ 11.2 ] PINE REED GRASS\*  
*Calamagrostis rubescens*

[ 8.7 ] WHITE-GRAINED MOUNTAIN RICE GRASS  
*Oryzopsis asperifolia*

[ 7.0 ] PURPLE OAT GRASS  
*Schizachne purpurascens*

## Environmental Variables

Moisture Regime: Mesic (fresh) (2), Subxeric (moderately dry) (1), Submesic (moderately fresh) (1)

Nutrient Regime: Mesotrophic (medium) (2), Submesotrophic (poor) (2)

Elevation (range): 1352 (1290-1429) M

Slope (%): strong slope (2), very gentle slope (1), moderate slope (1)

Aspect: Easterly (2), Westerly (1), Northerly (1)

Topographic Position: Midslope (2), Lower Slope (1), Upper Slope (1)

## Soil Variables

Soil Drainage: Well drained (2), Imperfectly drained (1), Rapidly drained (1)

Soil Subgroup: ORTHIC GRAY LUVISOL (2)

Surface Texture: Silt loam (2)

Effective Texture: Loam (2)

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (2)

Parent Material:

Soil Type:

Humus Form

## LFH Thickness

	Mean	Min	Max	Count
cm:	2.00	2.00	3.00	2

## Mce2 PI/White meadowsweet/Pinegrass (n=4)

(*Pinus contorta/Spiraea betulifolia/Calamagrostis rubescens*)

This community is one of several community types which represent the mesic/medium ecosite for the Montane subregion. These sites can be dominated by white spruce, aspen or lodgepole pine. The understory can be dominated by white meadowsweet, pinegrass or feather moss depending on the successional status of the stand. White meadowsweet is well adapted to growing on dry rocky slopes (Mackinnon et al. 1992). The presence of a high cover of white meadowsweet may indicate slightly drier conditions and shallower soils than a community dominated by pinegrass. This community type produces little forage for domestic livestock and should be considered non-use.

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** c white meadowsweet (mesic/medium)

**Ecosite Phase:** c1 white meadowsweet PI-Sw

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 25
LOGEPOLE PINE ( <i>Pinus contorta</i> )	45.2	33.0-60.0	100	Moisture Regime: Mesic (fresh) (2), Subxeric (moderately dry) (1), Submesic (moderately fresh) (1)
<b>Understory Tree</b>				Nutrient Regime: Submesotrophic (poor) (2), Mesotrophic (medium) (2)
WHITE SPRUCE ( <i>Picea glauca</i> )	2.2	0.0-5.0	75	Elevation (range): 1352 (1290-1429) M
<b>Tall Shrub (2 to 5m)</b>				Slope (%): 16 - 30.99 (2), 2.5 - 5.99 (1), 10 - 15.99 (1)
WHITE SPRUCE ( <i>Picea glauca</i> )	1.2	0.0-3.0	75	Aspect: Easterly (2), Westerly (1), Northerly (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Topographic Position: Midslope (2), Lower Slope (1), Upper Slope (1)
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	5.0	2.0-13.0	100	<b>Soil Variables</b>
CANADA BUFFALOBERRY ( <i>Shepherdia canadensis</i> )	3.2	0.0-9.0	75	Soil Drainage: Well drained (2), Imperfectly drained (1), Rapidly drained (1)
TWINFLOWER ( <i>Linnaea borealis</i> )	1.7	0.0-6.0	50	Soil Subgroup: ORTHIC GRAY LUVISOL (2)
PRICKLY ROSE ( <i>Rosa acicularis</i> )	1.7	1.0-4.0	100	Surface Texture: Silt loam (2)
DWARF BILBERRY ( <i>Vaccinium caespitosum</i> )	1.7	0.0-5.0	75	Effective Texture: Loam (2)
SNOWBERRY ( <i>Symphoricarpos albus</i> )	1.2	0.0-3.0	75	Depth to Mottles/Gley:
WHITE SPRUCE ( <i>Picea glauca</i> )	1.0	0.0-3.0	50	Organic Thickness: 0 - 5 cm (2)
<b>Tall Forb (&gt;= 30 cm)</b>				Parent Material:
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	1.2	1.0-2.0	100	Soil Type:
SHOWY ASTER ( <i>Aster conspicuus</i> )	1.0	0.0-2.0	75	Humus Form
SPREADING SWEET CICELY ( <i>Osmorhiza depauperata</i> )	1.0	1.0-1.0	100	
<b>Low Forb (&lt; 30 cm)</b>				
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	1.0	0.0-2.0	75	
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	1.0	0.0-2.0	75	
<b>Graminoid</b>				
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	11.2	9.0-15.0	100	
WHITE-GRAINED MOUNTAIN RICE GRASS ( <i>Oryzopsis asperifolia</i> )	8.7	1.0-15.0	100	
PURPLE OAT GRASS ( <i>Schizachne purpurascens</i> )	7.0	0.0-15.0	75	
<b>Moss</b>				
KNIGHT'S PLUME MOSS ( <i>Ptilium crista-castrensis</i> )	1.0	0.0-2.0	75	

LFH Thickness	Mean	Min	Max	Count
cm:	2.00	2.00	3.00	2

## c2 white meadowsweet Sw (n=5)

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** c white meadowsweet (mesic/medium)

### Characteristic Species

#### Tree

- [ 51.2 ] WHITE SPRUCE  
*Picea glauca*
- [ 4.6 ] LODGEPOLE PINE  
*Pinus contorta*
- [ 3.8 ] ASPEN  
*Populus tremuloides*

#### Shrub

- [ 4.7 ] WILD RED RASPBERRY  
*Rubus idaeus*
- [ 3.2 ] SNOWBERRY (BUCKBRUSH)\*  
*Symphoricarpos occidentalis*
- [ 2.4 ] PRICKLY ROSE  
*Rosa acicularis*
- [ 1.6 ] WHITE MEADOWSWEET  
*Spiraea betulifolia*
- [ 1.4 ] SNOWBERRY\*  
*Symphoricarpos albus*

#### Forb

- [ 3.2 ] AMERICAN PELLITORY  
*Parietaria pennsylvanica*
- [ 3.0 ] WILD STRAWBERRY  
*Fragaria virginiana*
- [ 2.8 ] WESTERN CANADA VIOLET  
*Viola canadensis*
- [ 1.6 ] COMMON DANDELION  
*Taraxacum officinale*
- [ 1.6 ] SPREADING SWEET CICELY  
*Osmorhiza depauperata*
- [ 1.5 ] COMMON NETTLE  
*Urtica dioica*
- [ 1.2 ] VEINY MEADOW RUE  
*Thalictrum venulosum*
- [ 1.2 ] SWEET-SCENTED BEDSTRAW  
*Galium triflorum*
- [ 1.0 ] CREAM-COLORED VETCHLING  
*Lathyrus ochroleucus*

#### Graminoid

- [ 2.2 ] KENTUCKY BLUEGRASS  
*Poa pratensis*

### Environmental Variables

Moisture Regime: Mesic (fresh) (3), Subhygric (moderately moist) (2)  
 Nutrient Regime: Mesotrophic (medium) (3), Permesotrophic (rich) (2)  
 Elevation (range): 1224 (1212-1245) M  
 Slope (%): level (2), very strong slope (1), very steep slope (1), strong slope (1)  
 Aspect: Level (4), Westerly (1)  
 Topographic Position: Midslope (3)

### Soil Variables

Soil Drainage: Well drained (2), Moderately well drained (1), Rapidly drained (1)  
 Soil Subgroup:  
 Surface Texture: Silty Sand (1), Loam (1)  
 Effective Texture:  
 Depth to Mottles/Gley:  
 Organic Thickness: 0 - 5 cm (2)  
 Parent Material:  
 Soil Type:  
 Humus Form

### LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

## Mce3 Sw-PI/Snowberry (n=5)

### (*Picea glauca*-*Pinus contorta*/*Symphoricarpos occidentalis*)

This community type was described on moderate south and westerly facing slopes on the east side of the Cypress Hills. Snowberry is generally indicative of nutrient rich seepage areas in the Montane subregion and generally forms thickets in the lower slope positions. The snowberry in this community type consists of small individual plants that are uniformly scattered throughout the community. Archibald et al. (1996) did not recognize this community type and placed it within the hairy wildrye (submesic/medium) ecosite because of the moderate slopes the community was described on. However, the high constancy of snowberry in this community type appears to indicate slightly higher moisture and nutrients. Consequently, this community type was placed within the mesic/medium ecosite. Livestock may use these community types but the forage production is only moderate and the areas where this community type were described are generally inaccessible to livestock. As a result this community type should be rated as non-use range.

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** c white meadowsweet (mesic/medium)

**Ecosite Phase:** c2 white meadowsweet Sw

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 25
WHITE SPRUCE ( <i>Picea glauca</i> )	51.2	23.0-80.0	100	Moisture Regime: Mesic (fresh) (3), Subhygric (moderately moist) (2)
LOGEPOLE PINE ( <i>Pinus contorta</i> )	4.6	0.0-23.0	20	Nutrient Regime: Mesotrophic (medium) (3), Permesotrophic (rich) (2)
<b>Understory Tree</b>				Elevation (range): 1224 (1212-1245) M
ASPEN ( <i>Populus tremuloides</i> )	2.0	0.0-8.0	40	Slope (%): 0 - 0.49 (2), 16 - 30.99 (1), 31 - 45.99 (1), 71 - 100.99 (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Aspect: Level (4), Westerly (1)
WILD RED RASPBERRY ( <i>Rubus idaeus</i> )	4.7	0.0-16.0	60	Topographic Position: Midslope (3)
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	3.2	0.0-10.0	80	<b>Soil Variables</b>
PRICKLY ROSE ( <i>Rosa acicularis</i> )	2.4	0.0-10.0	60	Soil Drainage: Well drained (2), Moderately well drained (1), Rapidly drained (1)
ASPEN ( <i>Populus tremuloides</i> )	1.8	0.0-8.0	40	Soil Subgroup:
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	1.6	0.0-6.0	40	Surface Texture: Silty Sand (1), Loam (1)
SNOWBERRY ( <i>Symphoricarpos albus</i> )	1.4	0.0-7.0	20	Effective Texture:
<b>Tall Forb (&gt;= 30 cm)</b>				Depth to Mottles/Gley:
AMERICAN PELLITORY ( <i>Parietaria pensylvanica</i> )	3.2	0.0-9.0	40	Organic Thickness: 0 - 5 cm (2)
SPREADING SWEET CICELY ( <i>Osmorhiza depauperata</i> )	1.6	0.5-5.0	100	Parent Material:
COMMON NETTLE ( <i>Urtica dioica</i> )	1.5	0.0-5.0	60	Soil Type:
VEINY MEADOW RUE ( <i>Thalictrum venulosum</i> )	1.2	0.0-3.0	60	Humus Form
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	1.0	0.5-2.0	100	<b>LFH Thickness</b>
<b>Low Forb (&lt; 30 cm)</b>				Mean
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	3.0	0.0-10.0	80	Min
WESTERN CANADA VIOLET ( <i>Viola canadensis</i> )	2.8	0.0-5.0	80	Max
COMMON DANDELION ( <i>Taraxacum officinale</i> )	1.6	0.0-3.0	80	Count
SWEET-SCENTED BEDSTRAW ( <i>Galium triflorum</i> )	1.2	0.0-3.0	40	cm:
<b>Graminoid</b>				0.00
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	2.2	0.0-10.0	40	0.00
				0.00
				0

### c3 white meadowsweet Aw (n=7)

Natural Subregion: Montane

Ecosection: Mc Montane Cypress Hills Ecosection

Ecosite: c white meadowsweet (mesic/medium)

#### Characteristic Species

##### Tree

[ 61.3 ] ASPEN\*  
*Populus tremuloides*

[ 1.4 ] WHITE SPRUCE  
*Picea glauca*

##### Shrub

[ 9.8 ] SNOWBERRY (BUCKBRUSH)  
*Symphoricarpos occidentalis*

[ 8.8 ] WHITE MEADOWSWEET  
*Spiraea betulifolia*

[ 5.1 ] SNOWBERRY  
*Symphoricarpos albus*

[ 3.8 ] PRICKLY ROSE  
*Rosa acicularis*

[ 2.8 ] NORTHERN GOOSEBERRY  
*Ribes oxycanthoides*

[ 2.1 ] CHOKE CHERRY  
*Prunus virginiana*

[ 1.0 ] SASKATOON  
*Amelanchier alnifolia*

##### Forb

[ 6.5 ] WESTERN CANADA VIOLET  
*Viola canadensis*

[ 2.1 ] WILD STRAWBERRY  
*Fragaria virginiana*

[ 2.1 ] VEINY MEADOW RUE  
*Thalictrum venulosum*

[ 1.5 ] CREAM-COLORED VETCHLING  
*Lathyrus ochroleucus*

[ 1.4 ] SPREADING SWEET CICELY  
*Osmorhiza depauperata*

[ 1.1 ] FAIRYBELLS  
*Disporum trachycarpum*

[ 1.0 ] NORTHERN BEDSTRAW  
*Galium boreale*

##### Graminoid

[ 5.0 ] SLENDER WHEAT GRASS  
*Agropyron trachycaulum*

[ 2.8 ] WHITE-GRAINED MOUNTAIN RICE GRASS  
*Oryzopsis asperifolia*

[ 1.4 ] FRINGED BROME  
*Bromus ciliatus*

#### Environmental Variables

Moisture Regime: Mesic (fresh) (7)

Nutrient Regime: Mesotrophic (medium) (7)

Elevation (range): 1250 (1234-1280) M

Slope (%): steep slope (3), very strong slope (1), moderate slope (1), gentle slope (1), strong slope (1)

Aspect: Southerly (3), Northerly (3), Westerly (1)

Topographic Position: Midslope (5), Level (1), Lower Slope (1)

#### Soil Variables

Soil Drainage: Well drained (7)

Soil Subgroup:

Surface Texture:

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness:

Parent Material:

Soil Type:

Humus Form

#### LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

## Mcc2 Aw/Snowberry-White meadowsweet (n=7)

(*Populus tremuloides*/*Symphoricarpos occidentalis*-*Spiraea betulifolia*)

This community, dominated by a aspen overstory and an understory of snowberry and white meadowsweet, and represents an earlier successional stage of the pine and spruce white meadowsweet dominated community types. This community has a high cover of snowberry which may indicate slightly moister, better developed soils.

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** c white meadowsweet (mesic/medium)

**Ecosite Phase:** c3 white meadowsweet Aw

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables				
	Mean	Range							
<b>Overstory Tree</b>					Ecological Status Score: 25				
ASPEN ( <i>Populus tremuloides</i> )	48.2	0.0-85.0		71	Moisture Regime: Mesic (fresh) (7)				
WHITE SPRUCE ( <i>Picea glauca</i> )	1.4	0.0-10.0		14	Nutrient Regime: Mesotrophic (medium) (7)				
<b>Understory Tree</b>					Elevation (range): 1250 (1234-1280) M				
ASPEN ( <i>Populus tremuloides</i> )	13.1	0.0-60.0		29	Slope (%): 46 - 70.99 (3), 6 - 9.99 (1), 10 - 15.99 (1), 16 - 30.99 (1), 31 - 45.99 (1)				
<b>Medium Shrub (0.5 to 2 m)</b>					Aspect: Northerly (3), Southerly (3), Westerly (1)				
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	9.8	0.0-24.0		86	Topographic Position: Midslope (5), Level (1), Lower Slope (1)				
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	8.8	1.0-15.0		100	<b>Soil Variables</b>				
SNOWBERRY ( <i>Symphoricarpos albus</i> )	5.1	0.0-13.0		43	Soil Drainage: Well drained (7)				
PRICKLY ROSE ( <i>Rosa acicularis</i> )	3.8	0.0-9.0		86	Soil Subgroup:				
NORTHERN GOOSEBERRY ( <i>Ribes oxycanthoides</i> )	2.8	0.0-9.0		86	Surface Texture:				
CHOKE CHERRY ( <i>Prunus virginiana</i> )	2.1	0.0-5.0		86	Effective Texture:				
SASKATOON ( <i>Amelanchier alnifolia</i> )	1.0	0.0-3.0		71	Depth to Mottles/Gley:				
<b>Tall Forb (&gt;= 30 cm)</b>					Organic Thickness:				
VEINY MEADOW RUE ( <i>Thalictrum venulosum</i> )	2.1	0.0-4.0		86	Parent Material:				
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	1.5	0.0-5.0		86	Soil Type:				
SPREADING SWEET CICELY ( <i>Osmorhiza depauperata</i> )	1.4	1.0-2.0		100	Humus Form				
FAIRYBELLS ( <i>Disporum trachycarpum</i> )	1.1	1.0-2.0		100	<b>LFH Thickness</b>				
<b>Low Forb (&lt; 30 cm)</b>					<b>Mean</b>	<b>Min</b>	<b>Max</b>	<b>Count</b>	
WESTERN CANADA VIOLET ( <i>Viola canadensis</i> )	6.5	2.0-9.0		100	cm:	0.00	0.00	0.00	0
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	2.1	0.0-5.0		86					
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	1.0	1.0-1.0		100					
<b>Graminoid</b>									
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	5.0	0.0-16.0		71					
WHITE-GRAINED MOUNTAIN RICE GRASS ( <i>Oryzopsis asperifolia</i> )	2.8	0.0-8.0		86					
FRINGED BROME ( <i>Bromus ciliatus</i> )	1.4	0.0-4.0		71					

## c4 white meadowsweet Aw-PI-Sw (n=3)

Natural Subregion: Montane

Ecosection: Mc Montane Cypress Hills Ecosection

Ecosite: c white meadowsweet (mesic/medium)

### Characteristic Species

#### Tree

[ 33.3 ] ASPEN  
*Populus tremuloides*

[ 25.6 ] WHITE SPRUCE  
*Picea glauca*

#### Shrub

[ 8.0 ] SNOWBERRY (BUCKBRUSH)  
*Symphoricarpos occidentalis*

[ 5.6 ] WHITE MEADOWSWEET  
*Spiraea betulifolia*

[ 2.0 ] PRICKLY ROSE  
*Rosa acicularis*

[ 2.0 ] TWINFLOWER  
*Linnaea borealis*

[ 1.0 ] DOUGLAS HAWTHORN  
*Crataegus douglasii*

#### Forb

[ 3.6 ] WESTERN CANADA VIOLET  
*Viola canadensis*

[ 2.3 ] SMOOTH ASTER  
*Aster laevis*

[ 1.6 ] VEINY MEADOW RUE  
*Thalictrum venulosum*

[ 1.6 ] WILD STRAWBERRY  
*Fragaria virginiana*

[ 1.3 ] FAIRYBELLS  
*Disporum trachycarpum*

[ 1.0 ] SPREADING SWEET CICELY  
*Osmorhiza depauperata*

[ 1.0 ] NORTHERN BEDSTRAW  
*Galium boreale*

#### Graminoid

[ 5.3 ] FRINGED BROME  
*Bromus ciliatus*

[ 4.0 ] WHITE-GRAINED MOUNTAIN RICE GRASS  
*Oryzopsis asperifolia*

[ 2.6 ] SLENDER WHEAT GRASS  
*Agropyron trachycaulum*

### Environmental Variables

Moisture Regime: Mesic (fresh) (2), Submesic (moderately fresh) (1)

Nutrient Regime: Mesotrophic (medium) (3)

Elevation (range): 1258 (1212-1289) M

Slope (%): steep slope (2), strong slope (1)

Aspect: Westerly (1), Southerly (1), Northerly (1)

Topographic Position: Midslope (3)

### Soil Variables

Soil Drainage: Moderately well drained (1), Poorly drained (1), Rapidly drained (1)

Soil Subgroup:

Surface Texture:

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness:

Parent Material:

Soil Type:

Humus Form

### LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

# Mcd1 Aw-Sw/Snowberry-White meadowsweet (n=3)

(*Populus tremuloides*-*Picea glauca*/*Symphoricarpos occidentalis*-*Spiraea betulifolia*)

This community, dominated by a aspen and white spruce overstory and an understory of snowberry and white meadowsweet, and represents an earlier successional stage of the pine and spruce white meadowsweet dominated community types. This community has a high cover of snowberry which may indicate slightly moister, better developed soils.

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** c white meadowsweet (mesic/medium)

**Ecosite Phase:** c4 white meadowsweet Aw-PI-Sw

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables				
	Mean	Range							
<b>Overstory Tree</b>					Ecological Status Score: 25				
WHITE SPRUCE ( <i>Picea glauca</i> )	22.3	14.0-38.0		100	Moisture Regime: Mesic (fresh) (2), Submesic (moderately fresh) (1)				
<b>Understory Tree</b>					Nutrient Regime: Mesotrophic (medium) (3)				
ASPEN ( <i>Populus tremuloides</i> )	33.3	17.0-45.0		100	Elevation (range): 1258 (1212-1289) M				
<b>Tall Shrub (2 to 5m)</b>					Slope (%): 46 - 70.99 (2), 16 - 30.99 (1)				
WHITE SPRUCE ( <i>Picea glauca</i> )	3.3	0.0-9.0		67	Aspect: Northerly (1), Southerly (1), Westerly (1)				
DOUGLAS HAWTHORN ( <i>Crataegus douglasii</i> )	1.0	0.0-2.0		67	Topographic Position: Midslope (3)				
<b>Medium Shrub (0.5 to 2 m)</b>					<b>Soil Variables</b>				
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	8.0	0.0-16.0		67	Soil Drainage: Rapidly drained (1), Moderately well drained (1), Poorly drained (1)				
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	5.6	5.0-7.0		100	Soil Subgroup:				
TWINFLOWER ( <i>Linnaea borealis</i> )	2.0	0.0-6.0		33	Surface Texture:				
PRICKLY ROSE ( <i>Rosa acicularis</i> )	2.0	1.0-3.0		100	Effective Texture:				
<b>Tall Forb (&gt;= 30 cm)</b>					Depth to Mottles/Gley:				
SMOOTH ASTER ( <i>Aster laevis</i> )	2.3	0.0-6.0		67	Organic Thickness:				
VEINY MEADOW RUE ( <i>Thalictrum venulosum</i> )	1.6	1.0-2.0		100	Parent Material:				
FAIRYBELLS ( <i>Disporum trachycarpum</i> )	1.3	1.0-2.0		100	Soil Type:				
SPREADING SWEET CICELY ( <i>Osmorhiza depauperata</i> )	1.0	1.0-1.0		100	Humus Form				
<b>Low Forb (&lt; 30 cm)</b>					<b>LFH Thickness</b>				
WESTERN CANADA VIOLET ( <i>Viola canadensis</i> )	3.6	0.0-6.0		67					
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	1.6	1.0-3.0		100					
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	1.0	1.0-1.0		100					
<b>Graminoid</b>									
FRINGED BROME ( <i>Bromus ciliatus</i> )	5.3	1.0-14.0		100					
WHITE-GRAINED MOUNTAIN RICE GRASS ( <i>Oryzopsis asperifolia</i> )	4.0	0.0-8.0		67					
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	2.6	1.0-5.0		100					
					<b>LFH Thickness</b>	<b>Mean</b>	<b>Min</b>	<b>Max</b>	<b>Count</b>
					cm:	0.00	0.00	0.00	0



## c5 white meadowsweet shrub (n=1)

Natural Subregion: Montane

Ecosection: Mc Montane Cypress Hills Ecosection

Ecosite: c white meadowsweet (mesic/medium)

### Characteristic Species

#### Shrub

- [ 1.7 ] PRICKLY ROSE  
*Rosa acicularis*
- [ 1.7 ] WILD RED RASPBERRY  
*Rubus idaeus*

#### Forb

- [ 8.3 ] COMMON DANDELION  
*Taraxacum officinale*
- [ 6.3 ] WILD STRAWBERRY  
*Fragaria virginiana*
- [ 4.3 ] THREE-FLOWERED AVENS  
*Geum triflorum*
- [ 4.3 ] GRACEFUL CINQUEFOIL  
*Potentilla gracilis*
- [ 3.9 ] VEINY MEADOW RUE  
*Thalictrum venulosum*
- [ 3.0 ] YELLOW FALSE DANDELION  
*Agoseris glauca*
- [ 1.7 ] SHOWY ASTER  
*Aster conspicuus*
- [ 1.7 ] COMMON YARROW  
*Achillea millefolium*
- [ 1.3 ] LINDLEY'S ASTER  
*Aster ciliolatus*
- [ 1.2 ] CANADA THISTLE  
*Cirsium arvense*

#### Graminoid

- [ 18.0 ] KENTUCKY BLUEGRASS  
*Poa pratensis*
- [ 17.8 ] SEDGE SPECIES  
*Carex*
- [ 12.5 ] PINE REED GRASS  
*Calamagrostis rubescens*
- [ 2.8 ] INTERMEDIATE OAT GRASS  
*Danthonia intermedia*
- [ 1.7 ] IDAHO FESCUE  
*Festuca idahoensis*
- [ 1.3 ] AWNED WHEAT GRASS (VAR. OF AGROTRA; USE AGROTRA)  
*Agropyron subsecundum*

### Environmental Variables

Moisture Regime:  
Nutrient Regime:  
Elevation (range): 0 (0-0) M  
Slope (%):  
Aspect:  
Topographic Position:

### Soil Variables

Soil Drainage: Well drained (1)  
Soil Subgroup: ORTHIC BLACK CHERNOZEM (1)  
Surface Texture:  
Effective Texture:  
Depth to Mottles/Gley:  
Organic Thickness: 0 - 5 cm (1)  
Parent Material: Eolian (1)  
Soil Type:  
Humus Form

### LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

# Mca9 Rose/Sedge-Pinegrass-Kentucky bluegrass (n=1)

(*Rosa acicularis*/*Carex spp.*-*Calamagrostis rubescens*-*Poa pratensis*)

This community type represents the transition from grassland to forest on moist sites with northerly aspects. It appears this community occurs in areas that have some seepage throughout the growing season. There is usually high forb cover on these sites with strawberry and showy aster being common. Pine grass and sedge are the common grass species in the understory of conifer and deciduous stands and their dominance in this community type may indicate a transition to a forested community. The high moisture content of this site also favours the growth of Kentucky bluegrass.

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** c white meadowsweet (mesic/medium)

**Ecosite Phase:** c5 white meadowsweet shrub

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Medium Shrub (0.5 to 2 m)</b>				Ecological Status Score: 15-20
PRICKLY ROSE ( <i>Rosa acicularis</i> )	1.7	1.7-1.7	100	Moisture Regime:
WILD RED RASPBERRY ( <i>Rubus idaeus</i> )	1.7	1.7-1.7	100	Nutrient Regime:
<b>Tall Forb (&gt;= 30 cm)</b>				Elevation (range): 0 (0-0) M
GRACEFUL CINQUEFOIL ( <i>Potentilla gracilis</i> )	4.3	4.3-4.3	100	Slope (%):
VEINY MEADOW RUE ( <i>Thalictrum venulosum</i> )	3.9	3.9-3.9	100	Aspect:
SHOWY ASTER ( <i>Aster conspicuus</i> )	1.7	1.7-1.7	100	Topographic Position:
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	1.3	1.3-1.3	100	<b>Soil Variables</b>
CANADA THISTLE ( <i>Cirsium arvense</i> )	1.2	1.2-1.2	100	Soil Drainage: Well drained (1)
<b>Low Forb (&lt; 30 cm)</b>				Soil Subgroup: ORTHIC BLACK CHERNOZEM (1)
COMMON DANDELION ( <i>Taraxacum officinale</i> )	8.3	8.3-8.3	100	Surface Texture:
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	6.3	6.3-6.3	100	Effective Texture:
THREE-FLOWERED AVENS ( <i>Geum triflorum</i> )	4.3	4.3-4.3	100	Depth to Mottles/Gley:
YELLOW FALSE DANDELION ( <i>Agoseris glauca</i> )	3.0	3.0-3.0	100	Organic Thickness: 0 - 5 cm (1)
COMMON YARROW ( <i>Achillea millefolium</i> )	1.7	1.7-1.7	100	Parent Material: Eolian (1)
<b>Graminoid</b>				Soil Type:
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	18.0	18.0-18.0	100	Humus Form
SEDGE SPECIES ( <i>Carex</i> )	17.8	17.8-17.8	100	<b>LFH Thickness</b>
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	12.5	12.5-12.5	100	Mean
INTERMEDIATE OAT GRASS ( <i>Danthonia intermedia</i> )	2.8	2.8-2.8	100	Min
IDAHO FESCUE ( <i>Festuca idahoensis</i> )	1.7	1.7-1.7	100	Max
AWNED WHEAT GRASS (VAR. OF AGROTRA; USE AGROTRA ) ( <i>Agropyron subsecundum</i> )	1.3	1.3-1.3	100	Count
				cm:
				0.00
				0.00
				0.00
				0

## c6 industrial/tame (n=0)

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** c white meadowsweet (mesic/medium)

### Characteristic Species

---

### Environmental Variables

---

Moisture Regime:

Nutrient Regime:

Elevation (range):

Slope (%):

Aspect:

Topographic Position:

### Soil Variables

---

Soil Drainage:

Soil Subgroup:

Surface Texture:

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness:

Parent Material:

Soil Type:

Humus Form

### LFH Thickness

---

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

# cc rough fescue (mesic/rich) (n=97)

Natural Subregion: Montane

Ecosection: Mc Montane Cypress Hills Ecosection

## General Description

This ecosite is typical of south and west facing slopes and lower slope positions throughout the Montane subregion from an elevation of 1300 m to 1900 m. This ecosite is usually dominated by grass species because of the dry site conditions and westerly winds. The soils of this ecosite are dominated by deep black chernozemic soils. A number of rough fescue dominated sites have not had the species composition change in over 30 years of no disturbance indicating the climax nature of this ecosite in the Montane subregion. In the Cypress Hills this ecological site is found on Loamy, level bench sites. The rough fescue species on these bench sites was described as Foothills rough fescue whereas on the slopes and in transition to the Mixedgrass subregion Plains rough fescue tends to dominate.



## Environmental Variables

Moisture Regime: Submesic (moderately fresh) (8), Mesic (fresh) (5), Subhygric (moderately moist) (3)  
Nutrient Regime: Mesotrophic (medium) (14), Permesotrophic (rich) (6)  
Elevation (range): 1327 (1111-1458) M  
Slope (%): level (26), strong slope (6), moderate slope (5), gentle slope (4), very gentle slope (3), nearly level (2), very strong slope (1)  
Aspect: Northerly (6), Southerly (5), Easterly (5), Level (2), Westerly (1)  
Topographic Position: Midslope (6), Crest (2), Lower Slope (2), Upper Slope (2), Level (1), Toe (1)

## Soil Variables

Soil Drainage: Well drained (77), Moderately well drained (3), Rapidly drained (1), Imperfectly drained (1)  
Soil Subgroup: ORTHIC BLACK CHERNOZEM (68), BLACK BLACK CHERNOZEM (2), ORTHIC REGOSOL (2), DARK GRAY LUVISOL (1), ORTHIC DARK BROWN CHERNOZEM (1)  
Surface Texture: Silt loam (1), Silty Sand (1)  
Effective Texture:  
Depth to Mottles/Gley:  
Organic Thickness: 0 - 5 cm (81)  
Parent Material: Eolian (54), Undifferentiated Mineral (13), Fluvial (4), Fluvioeolian (2), Morainal (1)  
Soil Type:  
Humus Form

## Successional Relationships

Due to the nature of the site grasslands often remain the climax vegetation on these sites. On moister sites shrubs and trees such as saskatoon, snowberry, chokecherry and aspen often invade the site with succession to Lodgepole pine. Heavy grazing pressure on these grasslands can often lead to a degraded site that is dominated by Kentucky bluegrass, timothy and clover species. Many sites within this ecosite have been cultivated and are dominated by cereal crops and smooth brome

## LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

## Indicator Species

### Shrub

- COMMON WILD ROSE  
*Rosa woodsii*
- SNOWBERRY (BUCKBRUSH)  
*Symphoricarpos occidentalis*
- SHRUBBY CINQUEFOIL  
*Potentilla fruticosa*

### Graminoid

- FOOTHILLS ROUGH FESCUE  
*Festuca campestris*
- PLAINS ROUGH FESCUE  
*Festuca hallii*
- IDAHO FESCUE  
*Festuca idahoensis*
- INTERMEDIATE OAT GRASS  
*Danthonia intermedia*

# cc1 rough fescue (n=75)

Natural Subregion: Montane

Ecosection: Mc Montane Cypress Hills Ecosection

Ecosite: cc rough fescue (mesic/rich)

## Characteristic Species

### Shrub

- [ 12.5 ] SHRUBBY CINQUEFOIL\*  
*Potentilla fruticosa*

### Forb

- [ 3.4 ] NORTHERN BEDSTRAW  
*Galium boreale*
- [ 3.3 ] THREE-FLOWERED AVENS  
*Geum triflorum*
- [ 2.9 ] SILVERY PERENNIAL LUPINE  
*Lupinus argenteus*
- [ 1.9 ] GOLDEN BEAN  
*Thermopsis rhombifolia*
- [ 1.4 ] GRACEFUL CINQUEFOIL  
*Potentilla gracilis*
- [ 1.2 ] SLENDER BLUE BEARDTONGUE  
*Penstemon procerus*
- [ 1.0 ] LOW GOLDENROD  
*Solidago missouriensis*
- [ 1.0 ] WILD STRAWBERRY  
*Fragaria virginiana*
- [ 1.0 ] YELLOW FALSE DANDELION  
*Agoseris glauca*

### Graminoid

- [ 27.0 ] FOOTHILLS ROUGH FESCUE\*  
*Festuca campestris*
- [ 9.3 ] INTERMEDIATE OAT GRASS\*  
*Danthonia intermedia*
- [ 9.0 ] PLAINS ROUGH FESCUE\*  
*Festuca hallii*
- [ 2.0 ] SUN-LOVING SEDGE  
*Carex pensylvanica*
- [ 1.7 ] IDAHO FESCUE\*  
*Festuca idahoensis*
- [ 1.5 ] SEDGE SPECIES  
*Carex*

## Environmental Variables

Moisture Regime: Mesic (fresh) (3), Submesic (moderately fresh) (2)

Nutrient Regime: Mesotrophic (medium) (5), Permesotrophic (rich) (3)

Elevation (range): 1360 (1111-1458) M

Slope (%): level (22), strong slope (3), moderate slope (2), gentle slope (2), very gentle slope (1), nearly level (1)

Aspect: Southerly (3), Northerly (3), Easterly (2)

Topographic Position: Crest (2), Lower Slope (1), Upper Slope (1), Midslope (1)

## Soil Variables

Soil Drainage: Well drained (61), Moderately well drained (2)

Soil Subgroup: ORTHIC BLACK CHERNOZEM (59), ORTHIC REGOSOL (2), BLACK BLACK CHERNOZEM (2), DARK GRAY LUVISOL (1)

Surface Texture:

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (68)

Parent Material: Eolian (51), Undifferentiated Mineral (8), Fluvial (3), Fluvioeolian (2)

Soil Type:

Humus Form

## LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

## Mca5 Shrubby cinquefoil/Rough fescue-Intermediate oat grass (n=52)

### (*Potentilla fruticosa*/*Festuca campestris*-*Danthonia intermedia*)

This is the reference plant community for loamy and shallow-to-gravel range sites on top of the Cypress Hills plateau at about 1400 m elevation, and is associated with Thelma (THA) soils, orthic black chernozems developed on loess deposits over tertiary gravels. Rough fescue expresses itself as the *F. campestris*, bunch grass type on the plateau while it appears as *F. hallii*, the rhizomatous type on the upper breaks and slopes of the plateau. This plant community has been described by Moss (1955) and Coupland (1961) who noted intermediate oat grass as key subdominant species to rough fescue on the Cypress Hills plateau, vs. Parry oat grass in montane grasslands of southwestern Alberta (Willoughby et al 2001). Shrubby cinquefoil contributes a much higher canopy cover in this community type at a mean cover of 13% versus about 3% in the foothills Montane community described by Willoughby et al 2001. Shrubby cinquefoil, intermediate oat grass, Idaho fescue and a number of forb species will increase with grazing pressure. With control of wildfires, this community appears to be vulnerable to conifer encroachment, especially lodgepole pine. Like foothill rough fescue communities, this community tends to have low soil exposure and a low cover of moss and lichen. The community is highly productive and in the absence of grazing or fire will produce a very heavy litter build up. In the absence of grazing rough fescue will also grow to the exclusion of other species (Moss and Campbell 1947).

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** cc rough fescue (mesic/rich)

**Ecosite Phase:** cc1 rough fescue

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Medium Shrub (0.5 to 2 m)</b>					Ecological Status Score: 27-40
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	12.5	0.0-33.5	98		Moisture Regime: Submesic (moderately fresh) (1), Mesic (fresh) (1)
<b>Tall Forb (&gt;= 30 cm)</b>					Nutrient Regime: Permesotrophic (rich) (3), Mesotrophic (medium) (2)
SILVERY PERENNIAL LUPINE ( <i>Lupinus argenteus</i> )	2.9	0.0-15.6	56		Elevation (range): 1376 (1111-1458) M
GRACEFUL CINQUEFOIL ( <i>Potentilla gracilis</i> )	1.4	0.0-9.6	50		Slope (%): 0 - 0.49 (17), 16 - 30.99 (2), 6 - 9.99 (1)
LOW GOLDENROD ( <i>Solidago missouriensis</i> )	1.0	0.0-8.1	79		Aspect: Northerly (2), Southerly (1)
<b>Low Forb (&lt; 30 cm)</b>					Topographic Position: Crest (1), Lower Slope (1)
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	3.4	0.0-11.4	94		<b>Soil Variables</b>
THREE-FLOWERED AVENS ( <i>Geum triflorum</i> )	3.3	0.0-16.5	77		Soil Drainage: Well drained (41), Moderately well drained (1)
GOLDEN BEAN ( <i>Thermopsis rhombifolia</i> )	1.9	0.0-17.4	56		Soil Subgroup: ORTHIC BLACK CHERNOZEM (43), BLACK BLACK CHERNOZEM (2)
SLENDER BLUE BEARDTONGUE ( <i>Penstemon procerus</i> )	1.2	0.0-11.5	44		Surface Texture:
YELLOW FALSE DANDELION ( <i>Agoseris glauca</i> )	1.0	0.0-4.1	83		Effective Texture:
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	1.0	0.0-15.0	46		Depth to Mottles/Gley:
<b>Graminoid</b>					Organic Thickness: 0 - 5 cm (48)
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	27.0	0.0-68.3	73		Parent Material: Eolian (38), Undifferentiated Mineral (3), Fluvioeolian (2), Fluvial (1)
INTERMEDIATE OAT GRASS ( <i>Danthonia intermedia</i> )	9.3	0.0-42.1	89		Soil Type:
PLAINS ROUGH FESCUE ( <i>Festuca hallii</i> )	9.0	0.0-65.0	25		Humus Form
SUN-LOVING SEDGE ( <i>Carex pensylvanica</i> )	2.0	0.0-10.5	64		<b>LFH Thickness</b>
IDAHO FESCUE ( <i>Festuca idahoensis</i> )	1.7	0.0-9.5	71		<b>Mean</b>
SEDGE SPECIES ( <i>Carex</i> )	1.5	0.0-20.5	37		<b>Min</b>
					<b>Max</b>
					<b>Count</b>
					cm: 0.00 0.00 0.00 0

# Mca6 Shrubby cinquefoil/Foothills rough fescue-Kentucky bluegrass (n=15)

## (*Potentilla fruticosa*/*Festuca campestris*-*Poa pratensis*)

This is a mid to late seral plant community on loamy and shallow-to-gravel range sites on the top of the Cypress Hills plateau, and is associated with orthic black chernozems (Thelma) and orthic dark browns (Marmaduke). This plant community has a mixed structure of lightly grazed and heavily grazed patches that occur in many fescue grasslands as a result of light stocking and summer grazing use. Cattle will graze rough fescue more uniformly under winter grazing use but under summer grazing will often choose other associated species first (Willms et al. 1997). More heavily grazed micro patches will be dominated by intermediate oat grass, Kentucky bluegrass and forbs (golden bean). Continued heavy grazing pressure will eventually lead to a community dominated by Kentucky bluegrass.

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** cc rough fescue (mesic/rich)

**Ecosite Phase:** cc1 rough fescue

### Plant Composition

### Canopy Cover (%)

### Environmental Variables

	Mean	Range	Const.	
<b>Medium Shrub (0.5 to 2 m)</b>				Ecological Status Score: 15-20
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	4.2	0.0-15.5	87	Moisture Regime: Mesic (fresh) (1)
COMMON WILD ROSE ( <i>Rosa woodsii</i> )	1.6	0.0-10.0	67	Nutrient Regime: Mesotrophic (medium) (1)
<b>Tall Forb (&gt;= 30 cm)</b>				Elevation (range): 1318 (1318-1318) M
SILVERY PERENNIAL LUPINE ( <i>Lupinus argenteus</i> )	3.4	0.0-12.0	73	Slope (%): 0 - 0.49 (4), 0.5 - 2.49 (1), 6 - 9.99 (1), 16 - 30.99 (1)
GRACEFUL CINQUEFOIL ( <i>Potentilla gracilis</i> )	2.2	0.0-8.0	67	Aspect: Northerly (1), Easterly (1), Southerly (1)
<b>Low Forb (&lt; 30 cm)</b>				Topographic Position: Upper Slope (1)
GOLDEN BEAN ( <i>Thermopsis rhombifolia</i> )	6.3	0.0-16.1	80	<b>Soil Variables</b>
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	3.5	0.1-8.6	100	Soil Drainage: Well drained (14)
THREE-FLOWERED AVENS ( <i>Geum triflorum</i> )	2.0	0.0-12.0	60	Soil Subgroup: ORTHIC BLACK CHERNOZEM (12), DARK GRAY LUVISOL (1)
COMMON DANDELION ( <i>Taraxacum officinale</i> )	1.5	0.0-4.0	87	Surface Texture:
YELLOW FALSE DANDELION ( <i>Agoseris glauca</i> )	1.4	0.0-4.5	67	Effective Texture:
<b>Graminoid</b>				Depth to Mottles/Gley:
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	27.5	0.0-65.0	87	Organic Thickness: 0 - 5 cm (14)
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	8.8	0.0-27.6	60	Parent Material: Eolian (10), Fluvial (2), Undifferentiated Mineral (2)
PLAINS ROUGH FESCUE ( <i>Festuca hallii</i> )	5.6	0.0-29.2	27	Soil Type:
BLUEGRASSES ( <i>Poa</i> )	3.3	0.0-20.1	27	Humus Form
ROUGH FESCUE ( <i>Festuca scabrella</i> )	2.2	0.0-34.0	7	
INTERMEDIATE OAT GRASS ( <i>Danthonia intermedia</i> )	2.0	0.0-10.6	47	
NORTHERN WHEAT GRASS ( <i>Agropyron dasystachyum</i> )	1.7	0.0-9.6	60	
TIMOTHY ( <i>Phleum pratense</i> )	1.7	0.0-13.5	27	
SUN-LOVING SEDGE ( <i>Carex pensylvanica</i> )	1.6	0.0-6.5	53	
IDAHO FESCUE ( <i>Festuca idahoensis</i> )	1.6	0.0-5.6	60	
SEDGE SPECIES ( <i>Carex</i> )	1.3	0.0-9.2	47	

LFH Thickness	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

# Mca7 Kentucky bluegrass-Rough fescue (n=6)

## (*Poa pratensis*-*Festuca campestris*)

Long-term heavy grazing pressure leads to decline in rough fescue and an increase in Intermediate oatgrass and sedge species. Continued grazing pressure reduces the competitive advantage of rough fescue and the other native grass species and allows Kentucky bluegrass to establish on the site. Continued heavy grazing pressure eventually leads to a decline in all native species and the plant community will resemble a Timothy-Kentucky bluegrass/ Dandelion type. Rough fescue is a much more desirable forage species because it maintains its nutrient content into the dormant season. In contrast, Kentucky bluegrass loses its palatability, and nutrient content if it is allowed to flower and set seed. There is still a large component of native species within this community type, which will facilitate recovery if the grazing pressure is reduced.

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** cc rough fescue (mesic/rich)

**Ecosite Phase:** cc1 rough fescue

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Medium Shrub (0.5 to 2 m)</b>				Ecological Status Score: 8-20
COMMON WILD ROSE ( <i>Rosa woodsii</i> )	4.0	0.0-9.2	83	Moisture Regime: Mesic (fresh) (1)
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	3.3	0.0-11.0	83	Nutrient Regime: Mesotrophic (medium) (1)
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	2.6	0.0-6.0	67	Elevation (range): 1336 (1336-1336) M
<b>Tall Forb (&gt;= 30 cm)</b>				Slope (%): 0 - 0.49 (1), 2.5 - 5.99 (1), 10 - 15.99 (1)
GRACEFUL CINQUEFOIL ( <i>Potentilla gracilis</i> )	2.4	0.0-4.5	67	Aspect: Easterly (1)
PRAIRIE SAGEWORT ( <i>Artemisia ludoviciana</i> )	1.4	0.0-5.5	33	Topographic Position: Midslope (1)
<b>Low Forb (&lt; 30 cm)</b>				<b>Soil Variables</b>
GOLDEN BEAN ( <i>Thermopsis rhombifolia</i> )	5.1	0.0-18.0	50	Soil Drainage: Well drained (5)
COMMON DANDELION ( <i>Taraxacum officinale</i> )	4.6	0.0-8.9	83	Soil Subgroup: ORTHIC BLACK CHERNOZEM (4), ORTHIC REGOSOL (1)
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	4.4	0.0-11.0	67	Surface Texture:
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	4.0	1.0-6.1	100	Effective Texture:
YELLOW FALSE DANDELION ( <i>Agoseris glauca</i> )	2.6	0.0-9.0	67	Depth to Mottles/Gley:
FIELD MOUSE-EAR CHICKWEED ( <i>Cerastium arvense</i> )	1.5	0.0-7.0	50	Organic Thickness: 0 - 5 cm (5)
<b>Graminoid</b>				Parent Material: Eolian (3), Undifferentiated Mineral (2)
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	17.8	0.0-51.0	83	Soil Type:
AWNLESS BROME ( <i>Bromus inermis</i> )	9.3	0.0-56.0	17	Humus Form
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	4.5	0.0-11.5	50	<b>LFH Thickness</b>
ROUGH FESCUE ( <i>Festuca scabrella</i> )	3.0	0.0-18.0	17	Mean
INTERMEDIATE OAT GRASS ( <i>Danthonia intermedia</i> )	2.8	0.0-8.5	67	Min
TIMOTHY ( <i>Phleum pratense</i> )	2.8	0.0-7.0	67	Max
SEDGE SPECIES ( <i>Carex</i> )	2.3	0.0-9.4	33	Count
PLAINS ROUGH FESCUE ( <i>Festuca hallii</i> )	2.0	0.0-10.3	33	cm:
NORTHERN WHEAT GRASS ( <i>Agropyron dasystachyum</i> )	1.7	0.0-8.5	33	0.00
				0.00
				0.00
				0



## Mca8 Kentucky bluegrass-Smooth brome (n=2)

### (*Poa pratensis*-*Bromus inermis*)

This community type appears to once have represented a Rough fescue-Intermediate oatgrass community type on Black Chernozmic soils. Continued heavy grazing at the beginning of the century has shifted the community to one dominated by Kentucky bluegrass, timothy, smooth brome and dandelion. The climax range condition model suggests that vegetation development will be directional, predictable and revert to the original vegetation when protected from grazing, but once Kentucky bluegrass has established, it appears to compete with rough fescue for co-dominance. When protected from grazing these Kentucky bluegrass dominated types move toward a different community type rather than back to the original vegetation. These sites closely follow the "State transition model" proposed by Westoby et al. (1989).

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** cc rough fescue (mesic/rich)

**Ecosite Phase:** cc1 rough fescue

#### Plant Composition

#### Canopy Cover (%)

#### Environmental Variables

	Mean	Range	Const.	
<b>Understory Tree</b>				Ecological Status Score: 8-15
SASKATOON ( <i>Amelanchier alnifolia</i> )	2.0	0.0-4.0	50	Moisture Regime: Submesic (moderately fresh) (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Nutrient Regime: Mesotrophic (medium) (1)
COMMON WILD ROSE ( <i>Rosa woodsii</i> )	4.5	1.0-8.0	100	Elevation (range): 1410 (1410-1410) M
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	2.0	0.0-4.0	50	Slope (%): 10 - 15.99 (1)
<b>Tall Forb (&gt;= 30 cm)</b>				Aspect: Southerly (1)
PRAIRIE SAGEWORT ( <i>Artemisia ludoviciana</i> )	2.5	0.0-5.0	50	Topographic Position: Crest (1)
LOW GOLDENROD ( <i>Solidago missouriensis</i> )	1.0	0.0-2.0	50	
<b>Low Forb (&lt; 30 cm)</b>				<b>Soil Variables</b>
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	6.0	0.1-12.0	100	Soil Drainage: Well drained (1), Moderately well drained (1)
GOLDEN BEAN ( <i>Thermopsis rhombifolia</i> )	5.2	0.5-10.0	100	Soil Subgroup: ORTHIC REGOSOL (1)
COMMON YARROW ( <i>Achillea millefolium</i> )	3.6	0.2-7.0	100	Surface Texture:
FIELD MOUSE-EAR CHICKWEED ( <i>Cerastium arvense</i> )	1.0	0.0-2.0	50	Effective Texture:
<b>Graminoid</b>				Depth to Mottles/Gley:
BLUEGRASSES ( <i>Poa</i> )	22.5	0.0-45.0	50	Organic Thickness: 0 - 5 cm (1)
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	19.0	0.0-38.0	50	Parent Material: Undifferentiated Mineral (1)
AWNLESS BROME ( <i>Bromus inermis</i> )	18.0	0.0-36.0	50	Soil Type:
NORTHERN WHEAT GRASS ( <i>Agropyron dasystachyum</i> )	6.8	1.0-12.6	100	Humus Form
				<b>LFH Thickness</b>
				<b>Mean</b>
				<b>Min</b>
				<b>Max</b>
				<b>Count</b>
				cm:
				0.00
				0.00
				0.00
				0

## cc2 rough fescue shrub (n=21)

Natural Subregion: Montane

Ecosection: Mc Montane Cypress Hills Ecosection

Ecosite: cc rough fescue (mesic/rich)

### Characteristic Species

#### Shrub

- [ 16.5 ] SNOWBERRY (BUCKBRUSH)\*  
*Symphoricarpos occidentalis*
- [ 8.0 ] COMMON WILD ROSE\*  
*Rosa woodsii*
- [ 2.5 ] SHRUBBY CINQUEFOIL  
*Potentilla fruticosa*
- [ 1.8 ] PRICKLY ROSE  
*Rosa acicularis*
- [ 1.1 ] PRAIRIE ROSE  
*Rosa arkansana*

#### Forb

- [ 3.5 ] NORTHERN BEDSTRAW  
*Galium boreale*
- [ 3.1 ] GOLDEN BEAN  
*Thermopsis rhombifolia*
- [ 2.3 ] THREE-FLOWERED AVENS  
*Geum triflorum*
- [ 1.3 ] YELLOW FALSE DANDELION  
*Agoseris glauca*
- [ 1.2 ] WILD VETCH  
*Vicia americana*

#### Graminoid

- [ 8.5 ] FOOTHILLS ROUGH FESCUE  
*Festuca campestris*
- [ 5.1 ] PLAINS ROUGH FESCUE  
*Festuca hallii*
- [ 3.9 ] TIMOTHY  
*Phleum pratense*
- [ 3.4 ] KENTUCKY BLUEGRASS  
*Poa pratensis*
- [ 2.5 ] WESTERN PORCUPINE GRASS  
*Stipa curtisetata*
- [ 2.1 ] COLUMBIA NEEDLE GRASS  
*Stipa columbiana*
- [ 1.6 ] SEDGE SPECIES  
*Carex*
- [ 1.5 ] IDAHO FESCUE  
*Festuca idahoensis*

### Environmental Variables

Moisture Regime: Submesic (moderately fresh) (6), Subhygric (moderately moist) (3), Mesic (fresh) (2)

Nutrient Regime: Mesotrophic (medium) (9), Permesotrophic (rich) (3)

Elevation (range): 1263.5 (1143-1350) M

Slope (%): level (4), moderate slope (3), strong slope (3), gentle slope (2), very gentle slope (2), very strong slope (1), nearly level (1)

Aspect: Easterly (3), Northerly (3), Southerly (2), Level (2), Westerly (1)

Topographic Position: Midslope (5), Level (1), Lower Slope (1), Toe (1), Upper Slope (1)

### Soil Variables

Soil Drainage: Well drained (15), Imperfectly drained (1), Moderately well drained (1), Rapidly drained (1)

Soil Subgroup: ORTHIC BLACK CHERNOZEM (8), ORTHIC DARK BROWN CHERNOZEM (1)

Surface Texture: Silty Sand (1), Silt loam (1)

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (12)

Parent Material: Undifferentiated Mineral (5), Eolian (2), Morainal (1), Fluvial (1)

Soil Type:

Humus Form

### LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

## Mcb2 Snowberry-Rose/Kentucky bluegrass (n=12)

### (*Symphoricarpos occidentalis*-*Rosa acicularis*/*Poa pratensis*)

This community type represents moist pockets of shrubland in gullies and depressional areas within rough fescue dominated grasslands. This community type is very similar to the Snowberry/Rough fescue dominated community type previously described. These sites will eventually become invaded by aspen to form the Aw/Snowberry dominated community type. The increased moisture content on these sites favours the growth of snowberry which has slowly invaded into the surrounding grasslands and with any increase in grazing pressure Kentucky bluegrass tends to invade into the understory on these sites.

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** cc rough fescue (mesic/rich)

**Ecosite Phase:** cc2 rough fescue shrub

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Medium Shrub (0.5 to 2 m)</b>				Ecological Status Score: 15-20
SNOWBERRY (BUCKBRUSH) <i>(Symphoricarpos occidentalis)</i>	25.4	7.0-70.0	100	Moisture Regime: Submesic (moderately fresh) (4), Subhygric (moderately moist) (3), Mesic (fresh) (1)
COMMON WILD ROSE <i>(Rosa woodsii)</i>	7.1	0.0-33.0	58	Nutrient Regime: Mesotrophic (medium) (6), Permesotrophic (rich) (2)
SHRUBBY CINQUEFOIL <i>(Potentilla fruticosa)</i>	2.5	0.0-28.0	25	Elevation (range): 1230 (1143-1274) M
<b>Tall Forb (&gt;= 30 cm)</b>				Slope (%): 0 - 0.49 (3), 16 - 30.99 (2), 0.5 - 2.49 (1), 2.5 - 5.99 (1), 6 - 9.99 (1), 10 - 15.99 (1), 31 - 45.99 (1)
CANADA THISTLE <i>(Cirsium arvense)</i>	3.1	0.0-10.0	58	Aspect: Level (2), Northerly (2), Easterly (2), Southerly (1)
PRAIRIE SAGEWORT <i>(Artemisia ludoviciana)</i>	1.7	0.0-7.5	50	Topographic Position: Midslope (4), Level (1), Toe (1)
SMOOTH ASTER <i>(Aster laevis)</i>	1.6	0.0-7.0	50	<b>Soil Variables</b>
COMMON GOAT'S-BEARD <i>(Tragopogon dubius)</i>	1.1	0.0-14.0	8	Soil Drainage: Well drained (8), Imperfectly drained (1)
CREEPING WHITE PRAIRIE ASTER <i>(Aster falcatus)</i>	1.0	0.0-9.0	33	Soil Subgroup: ORTHIC BLACK CHERNOZEM (2), ORTHIC DARK BROWN CHERNOZEM (1)
STICKY PURPLE GERANIUM <i>(Geranium viscosissimum)</i>	1.0	0.0-4.0	50	Surface Texture: Silt loam (1), Silty Sand (1)
<b>Low Forb (&lt; 30 cm)</b>				Effective Texture:
NORTHERN BEDSTRAW <i>(Galium boreale)</i>	1.5	0.0-4.1	75	Depth to Mottles/Gley:
GOLDEN BEAN <i>(Thermopsis rhombifolia)</i>	1.3	0.0-8.1	42	Organic Thickness: 0 - 5 cm (6)
COMMON DANDELION <i>(Taraxacum officinale)</i>	1.2	0.0-3.0	58	Parent Material: Fluvial (1), Morainal (1), Undifferentiated Mineral (1)
COMMON YARROW <i>(Achillea millefolium)</i>	1.1	0.0-3.0	83	Soil Type:
<b>Graminoid</b>				Humus Form
KENTUCKY BLUEGRASS <i>(Poa pratensis)</i>	35.0	5.0-67.0	100	<b>LFH Thickness</b>
AWNLESS BROME <i>(Bromus inermis)</i>	6.1	0.0-29.0	58	<b>Mean</b>
TIMOTHY <i>(Phleum pratense)</i>	3.0	0.0-14.0	67	<b>Min</b>
GREEN NEEDLE GRASS <i>(Stipa viridula)</i>	1.6	0.0-12.0	50	<b>Max</b>
				<b>Count</b>
				cm: 0.00 0.00 0.00 0

# Mcb1 Snowberry-Rose/Rough fescue (n=9)

## (*Symphoricarpos occidentalis-Rosa acicularis/Festuca campestris*)

This community type represents moist pockets of shrubland in gullies and depressional areas within rough fescue dominated grasslands. This community type is very similar to the Snowberry/Rough fescue dominated community type described in the Central Parkland subregion (Kupsch et al. 2013). These sites will eventually become invaded by aspen to form the Aw/Snowberry dominated community type.

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** cc rough fescue (mesic/rich)

**Ecosite Phase:** cc2 rough fescue shrub

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables										
	Mean	Range													
<b>Medium Shrub (0.5 to 2 m)</b>					Ecological Status Score: 40 Moisture Regime: Submesic (moderately fresh) (2), Mesic (fresh) (1) Nutrient Regime: Mesotrophic (medium) (3), Permesotrophic (rich) (1) Elevation (range): 1297 (1259-1350) M Slope (%): 10 - 15.99 (2), 0 - 0.49 (1), 2.5 - 5.99 (1), 6 - 9.99 (1), 16 - 30.99 (1) Aspect: Northerly (1), Easterly (1), Southerly (1), Westerly (1) Topographic Position: Lower Slope (1), Midslope (1), Upper Slope (1)										
SNOWBERRY (BUCKBRUSH) <i>(Symphoricarpos occidentalis)</i>	10.4	0.0-31.0	78												
COMMON WILD ROSE <i>(Rosa woodsii)</i>	8.0	0.0-18.0	89												
SHRUBBY CINQUEFOIL <i>(Potentilla fruticosa)</i>	2.5	0.0-10.0	89												
PRICKLY ROSE <i>(Rosa acicularis)</i>	1.8	0.0-16.5	11												
PRAIRIE ROSE <i>(Rosa arkansana)</i>	1.1	0.0-10.4	11												
<b>Tall Forb (&gt;= 30 cm)</b>															
WILD VETCH <i>(Vicia americana)</i>	1.2	0.0-7.0	67												
<b>Low Forb (&lt; 30 cm)</b>															
NORTHERN BEDSTRAW <i>(Galium boreale)</i>	3.5	1.6-7.5	100												
GOLDEN BEAN <i>(Thermopsis rhombifolia)</i>	3.1	0.0-8.0	89												
THREE-FLOWERED AVENS <i>(Geum triflorum)</i>	2.3	0.0-9.6	78												
YELLOW FALSE DANDELION <i>(Agoseris glauca)</i>	1.3	0.0-5.5	67												
<b>Graminoid</b>															
FOOTHILLS ROUGH FESCUE <i>(Festuca campestris)</i>	8.5	0.0-30.5	44												
ROUGH FESCUE <i>(Festuca scabrella)</i>	6.1	0.0-22.0	33												
PLAINS ROUGH FESCUE <i>(Festuca hallii)</i>	5.1	0.0-22.0	33												
TIMOTHY <i>(Phleum pratense)</i>	3.9	0.0-14.1	67												
KENTUCKY BLUEGRASS <i>(Poa pratensis)</i>	3.4	0.0-15.0	33												
WESTERN PORCUPINE GRASS <i>(Stipa curtisetata)</i>	2.5	0.0-8.0	56												
COLUMBIA NEEDLE GRASS <i>(Stipa columbiana)</i>	2.1	0.0-13.0	22												
SEDGE SPECIES <i>(Carex)</i>	1.6	0.0-7.3	33												
IDAHO FESCUE <i>(Festuca idahoensis)</i>	1.5	0.0-7.0	56												
					<b>Soil Variables</b>										
					Soil Drainage: Well drained (7), Moderately well drained (1), Rapidly drained (1) Soil Subgroup: ORTHIC BLACK CHERNOZEM (6) Surface Texture: Effective Texture: Depth to Mottles/Gley: Organic Thickness: 0 - 5 cm (6) Parent Material: Undifferentiated Mineral (4), Eolian (2) Soil Type: Humus Form										
					<table border="1"> <thead> <tr> <th>LFH Thickness</th> <th>Mean</th> <th>Min</th> <th>Max</th> <th>Count</th> </tr> </thead> <tbody> <tr> <td>cm:</td> <td>0.00</td> <td>0.00</td> <td>0.00</td> <td>0</td> </tr> </tbody> </table>	LFH Thickness	Mean	Min	Max	Count	cm:	0.00	0.00	0.00	0
LFH Thickness	Mean	Min	Max	Count											
cm:	0.00	0.00	0.00	0											

# cc3 rough fescue PI (n=1)

**Natural Subregion:** Montane  
**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** cc rough fescue (mesic/rich)

## Characteristic Species

### Tree

[ 15.0 ] LODGEPOLE PINE  
*Pinus contorta*

[ 5.0 ] WHITE SPRUCE  
*Picea glauca*

### Shrub

[ 21.5 ] SHRUBBY CINQUEFOIL  
*Potentilla fruticosa*

### Forb

[ 6.0 ] CANADA THISTLE  
*Cirsium arvense*

[ 2.5 ] GRACEFUL CINQUEFOIL  
*Potentilla gracilis*

[ 1.8 ] COMMON YARROW  
*Achillea millefolium*

[ 1.7 ] NORTHERN BEDSTRAW  
*Galium boreale*

[ 1.6 ] COMMON DANDELION  
*Taraxacum officinale*

[ 1.6 ] WILD STRAWBERRY  
*Fragaria virginiana*

[ 1.6 ] HAREBELL  
*Campanula rotundifolia*

[ 1.1 ] THREE-FLOWERED AVENS  
*Geum triflorum*

[ 1.0 ] TALL BUTTERCUP  
*Ranunculus acris*

### Graminoid

[ 21.5 ] KENTUCKY BLUEGRASS  
*Poa pratensis*

[ 17.5 ] FOOTHILLS ROUGH FESCUE  
*Festuca campestris*

[ 12.6 ] SLENDER WHEAT GRASS (VAR. OF AGROTRA )  
*Agropyron unilaterale*

[ 5.0 ] TIMOTHY  
*Phleum pratense*

[ 2.6 ] INTERMEDIATE OAT GRASS  
*Danthonia intermedia*

[ 2.1 ] SEDGE SPECIES  
*Carex*

[ 2.0 ] CANBY BLUEGRASS  
*Poa canbyi*

## Environmental Variables

Moisture Regime:

Nutrient Regime:

Elevation (range): 0 (0-0) M

Slope (%):

Aspect:

Topographic Position:

## Soil Variables

Soil Drainage: Well drained (1)

Soil Subgroup: ORTHIC BLACK CHERNOZEM (1)

Surface Texture:

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (1)

Parent Material: Eolian (1)

Soil Type:

Humus Form

## LFH Thickness

cm:

Mean	Min	Max	Count
0.00	0.00	0.00	0

## Mce4 PI/Kentucky bluegrass-Rough fescue (n=1)

(*Pinus contorta*/*Poa pratensis*-*Festuca campestris*)

This community type represents the transition from a rough fescue dominated grassland to an lodgepole pine dominated forest. Lodgepole pine has invaded onto the grassland and the species composition of the understory is slowly succeeding to species characteristic of forested stands such as strawberry and slender wheatgrass. Lodgepole pine favors the mesic sites and north-facing slopes throughout the Cypress Hills. Forage production on the grasslands declines rapidly when lodgepole pine cover increases; from a high of 2000 kg/ha to a low of 500 kg/ha.

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** cc rough fescue (mesic/rich)

**Ecosite Phase:** cc3 rough fescue PI

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Understory Tree</b>					Ecological Status Score: 25
LOGEPOLE PINE ( <i>Pinus contorta</i> )	15.0	15.0-15.0	100		Moisture Regime:
WHITE SPRUCE ( <i>Picea glauca</i> )	5.0	5.0-5.0	100		Nutrient Regime:
<b>Medium Shrub (0.5 to 2 m)</b>					Elevation (range): 0 (0-0) M
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	21.5	21.5-21.5	100		Slope (%):
<b>Tall Forb (&gt;= 30 cm)</b>					Aspect:
CANADA THISTLE ( <i>Cirsium arvense</i> )	6.0	6.0-6.0	100		Topographic Position:
GRACEFUL CINQUEFOIL ( <i>Potentilla gracilis</i> )	2.5	2.5-2.5	100		<b>Soil Variables</b>
TALL BUTTERCUP ( <i>Ranunculus acris</i> )	1.0	1.0-1.0	100		Soil Drainage: Well drained (1)
<b>Low Forb (&lt; 30 cm)</b>					Soil Subgroup: ORTHIC BLACK CHERNOZEM (1)
COMMON YARROW ( <i>Achillea millefolium</i> )	1.8	1.8-1.8	100		Surface Texture:
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	1.7	1.7-1.7	100		Effective Texture:
HAREBELL ( <i>Campanula rotundifolia</i> )	1.6	1.6-1.6	100		Depth to Mottles/Gley:
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	1.6	1.6-1.6	100		Organic Thickness: 0 - 5 cm (1)
COMMON DANDELION ( <i>Taraxacum officinale</i> )	1.6	1.6-1.6	100		Parent Material: Eolian (1)
THREE-FLOWERED AVENS ( <i>Geum triflorum</i> )	1.1	1.1-1.1	100		Soil Type:
<b>Graminoid</b>					Humus Form
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	21.5	21.5-21.5	100		<b>LFH Thickness</b>
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	17.5	17.5-17.5	100		Mean
SLENDER WHEAT GRASS (VAR. OF AGROTRA) ( <i>Agropyron unilaterale</i> )	12.6	12.6-12.6	100		Min
TIMOTHY ( <i>Phleum pratense</i> )	5.0	5.0-5.0	100		Max
INTERMEDIATE OAT GRASS ( <i>Danthonia intermedia</i> )	2.6	2.6-2.6	100		Count
SEDGE SPECIES ( <i>Carex</i> )	2.1	2.1-2.1	100		cm:
CANBY BLUEGRASS ( <i>Poa canbyi</i> )	2.0	2.0-2.0	100		0.00
					0.00
					0.00
					0

## d red osier dogwood (subhygric/rich) (n=13)

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

### General Description

The dogwood ecosite is subhygric and nutrient rich. These sites are commonly found in mid or lower slope topographic positions or near water courses where they receive nutrient-rich seepage or flood waters for a portion of the growing season. Fine-textured glaciolacustrine and till parent materials are common and plant communities tend to be high in species richness, cover, and diversity. Common species include saskatoon, chokecherry, silver sage, silverberry and red osier dogwood. Highly disturbed sites are often dominated by hawthorn, thistle, smooth brome and Kentucky bluegrass.



### Environmental Variables

Moisture Regime: Subhygric (moderately moist) (5), Mesic (fresh) (4), Submesic (moderately fresh) (3), Subxeric (moderately dry) (1)  
Nutrient Regime: Mesotrophic (medium) (8), Permesotrophic (rich) (5)  
Elevation (range): 1248 (1126-1422) M  
Slope (%): level (5), moderate slope (3), steep slope (2), strong slope (2)  
Aspect: Level (5), Northerly (2), Southerly (2), Westerly (2), Easterly (1)  
Topographic Position: Lower Slope (4), Midslope (4), Toe (1), Upper Slope (1), Level (1)

### Soil Variables

Soil Drainage: Well drained (6), Moderately well drained (2), Rapidly drained (1)  
Soil Subgroup:  
Surface Texture: Loam (2), Sandy loam (1), Silty Sand (1)  
Effective Texture:  
Depth to Mottles/Gley:  
Organic Thickness: 0 - 5 cm (4)  
Parent Material:  
Soil Type:  
Humus Form

### Successional Relationships

Succession proceeds slowly after disturbance due to the proliferation of grass, forb and shrub cover. This explosion of vegetational cover can make tree establishment (especially coniferous) difficult and can reduce early growth rates. Once white spruce becomes established, high growth rates can be expected. .

LFH Thickness	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

### Indicator Species

#### Tree

WHITE SPRUCE  
*Picea glauca*  
ASPEN  
*Populus tremuloides*

#### Shrub

NORTHERN GOOSEBERRY  
*Ribes oxycanthoides*  
SNOWBERRY (BUCKBRUSH)  
*Symphoricarpos occidentalis*  
CHOKE CHERRY  
*Prunus virginiana*  
SASKATOON  
*Amelanchier alnifolia*  
SILVER SAGEBRUSH  
*Artemisia cana*  
RED-OSIER DOGWOOD  
*Cornus stolonifera*  
ROUND-LEAVED HAWTHORN  
*Crataegus rotundifolia*  
SILVERBERRY  
*Elaeagnus commutata*

#### Forb

COW PARSNIP  
*Heracleum lanatum*

# d1 red osier dogwood Sw-PI (n=0)

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** d red osier dogwood (subhygric/rich)

## General Description

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A number of ecological site phases currently have no data. These ecological site phases have been created as place holders because they were described in the other ecosections.

## Characteristic Species

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## Environmental Variables

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Moisture Regime:

Nutrient Regime:

Elevation (range):

Slope (%):

Aspect:

Topographic Position:

## Soil Variables

---

Soil Drainage:

Soil Subgroup:

Surface Texture:

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness:

Parent Material:

Soil Type:

Humus Form

## LFH Thickness

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	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0



## d2 red osier dogwood Aw (n=5)

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** d red osier dogwood (subhygric/rich)

### Characteristic Species

#### Tree

- [ 68.7 ] ASPEN\*  
*Populus tremuloides*

#### Shrub

- [ 12.5 ] UNDIFFERENTIATED ROSE  
*Rosa*
- [ 11.7 ] SASKATOON\*  
*Amelanchier alnifolia*
- [ 6.2 ] CHOKE CHERRY\*  
*Prunus virginiana*
- [ 5.0 ] NORTHERN GOOSEBERRY\*  
*Ribes oxycanthoides*
- [ 5.0 ] RED-OSIER DOGWOOD\*  
*Cornus stolonifera*
- [ 5.0 ] ROUND-LEAVED HAWTHORN\*  
*Crataegus rotundifolia*
- [ 1.0 ] SNOWBERRY (BUCKBRUSH)  
*Symphoricarpos occidentalis*

#### Forb

- [ 8.8 ] WESTERN CANADA VIOLET  
*Viola canadensis*
- [ 4.2 ] WILD STRAWBERRY  
*Fragaria virginiana*
- [ 2.5 ] NORTHERN BEDSTRAW  
*Galium boreale*
- [ 2.5 ] COMMON DANDELION  
*Taraxacum officinale*
- [ 1.5 ] WILD WHITE GERANIUM  
*Geranium richardsonii*
- [ 1.5 ] COMMON HORSETAIL  
*Equisetum arvense*
- [ 1.5 ] SPREADING SWEET CICELY  
*Osmorhiza depauperata*
- [ 1.5 ] VEINY MEADOW RUE  
*Thalictrum venulosum*
- [ 1.0 ] WILD BERGAMOT  
*Monarda fistulosa*
- [ 1.0 ] COW PARSNIP\*  
*Heracleum lanatum*

#### Graminoid

- [ 5.0 ] VIRGINIA WILD RYE  
*Elymus virginicus*
- [ 2.5 ] TIMOTHY  
*Phleum pratense*
- [ 1.5 ] SPRENGEL'S SEDGE  
*Carex sprengeii*
- [ 1.5 ] KENTUCKY BLUEGRASS  
*Poa pratensis*

### Environmental Variables

Moisture Regime: Subhygric (moderately moist) (3), Mesic (fresh) (2)

Nutrient Regime: Permesotrophic (rich) (3), Mesotrophic (medium) (2)

Elevation (range): 1353 (1285-1422) M

Slope (%): level (3), moderate slope (1), steep slope (1)

Aspect: Level (3), Westerly (2)

Topographic Position: Lower Slope (3), Midslope (2)

### Soil Variables

Soil Drainage: Well drained (3)

Soil Subgroup:

Surface Texture: Loam (2), Sandy loam (1)

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (3)

Parent Material:

Soil Type:

Humus Form

### LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

## Mcc3 Aw/Red osier dogwood (n=1)

(*Populus tremuloides*/*Cornus stolonifera*)

This community type is moist and occurs around depressions, near streams and rivers on alluvial terraces and near springs and seeps (Thompson and Hansen 2002). This community type is seral to communities dominated by white spruce. High levels of grazing disturbance will reduce the shrub layer and under extreme heavy grazing the understory will become dominated by Kentucky bluegrass, timothy, dandelion and in some cases Canada thistle.

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** d red osier dogwood (subhygric/rich)

**Ecosite Phase:** d2 red osier dogwood Aw

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables				
	Mean	Range							
<b>Overstory Tree</b>					Ecological Status Score: 25				
ASPEN ( <i>Populus tremuloides</i> )	70.0	70.0-70.0		100	Moisture Regime: Subhygric (moderately moist) (1)				
<b>Tall Shrub (2 to 5m)</b>					Nutrient Regime: Permesotrophic (rich) (1)				
SASKATOON ( <i>Amelanchier alnifolia</i> )	10.0	10.0-10.0		100	Elevation (range): 0 (0-0) M				
ROUND-LEAVED HAWTHORN ( <i>Crataegus rotundifolia</i> )	10.0	10.0-10.0		100	Slope (%): 0 - 0.49 (1)				
CHOKE CHERRY ( <i>Prunus virginiana</i> )	10.0	10.0-10.0		100	Aspect: Level (1)				
<b>Medium Shrub (0.5 to 2 m)</b>					Topographic Position: Lower Slope (1)				
UNDIFFERENTIATED ROSE ( <i>Rosa</i> )	20.0	20.0-20.0		100	<b>Soil Variables</b>				
RED-OSIER DOGWOOD ( <i>Cornus stolonifera</i> )	10.0	10.0-10.0		100	Soil Drainage: Well drained (1)				
NORTHERN GOOSEBERRY ( <i>Ribes oxycanthoides</i> )	10.0	10.0-10.0		100	Soil Subgroup:				
PURPLE CLEMATIS ( <i>Clematis occidentalis</i> )	3.0	3.0-3.0		100	Surface Texture: Sandy loam (1)				
<b>Tall Forb (&gt;= 30 cm)</b>					Effective Texture:				
COMMON HORSETAIL ( <i>Equisetum arvense</i> )	3.0	3.0-3.0		100	Depth to Mottles/Gley:				
WILD WHITE GERANIUM ( <i>Geranium richardsonii</i> )	3.0	3.0-3.0		100	Organic Thickness: 0 - 5 cm (1)				
SPREADING SWEET CICELY ( <i>Osmorhiza depauperata</i> )	3.0	3.0-3.0		100	Parent Material:				
VEINY MEADOW RUE ( <i>Thalictrum venulosum</i> )	3.0	3.0-3.0		100	Soil Type:				
<b>Low Forb (&lt; 30 cm)</b>					Humus Form				
WESTERN CANADA VIOLET ( <i>Viola canadensis</i> )	10.0	10.0-10.0		100	<b>LFH Thickness</b>				
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	3.0	3.0-3.0		100					
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	3.0	3.0-3.0		100					
COMMON DANDELION ( <i>Taraxacum officinale</i> )	3.0	3.0-3.0		100					
<b>Graminoid</b>									
VIRGINIA WILD RYE ( <i>Elymus virginicus</i> )	10.0	10.0-10.0		100					
REDTOP ( <i>Agrostis stolonifera</i> )	3.0	3.0-3.0		100					
SPRENGEL'S SEDGE ( <i>Carex sprengelii</i> )	3.0	3.0-3.0		100					
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	3.0	3.0-3.0		100					
					<b>LFH Thickness</b>	<b>Mean</b>	<b>Min</b>	<b>Max</b>	<b>Count</b>
					cm:	0.00	0.00	0.00	0

## Mcc4 Aw/Saskatoon (n=2)

### (*Populus tremuloides*/*Amelanchier alnifolia*)

This community type occurs on lower slopes on the edges of rivers and sloughs. Nutrient seepage occurs at some point in the growing season and the high water table favours the growth of saskatoon. Stands with a high shrub density have very little palatable forage available for domestic livestock and should be rated as non-use. In contrast more open stands have a good cover of grasses and forbs and should be considered secondary range.

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** d red osier dogwood (subhygric/rich)

**Ecosite Phase:** d2 red osier dogwood Aw

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Overstory Tree</b>					Ecological Status Score: 25
ASPEN ( <i>Populus tremuloides</i> )	67.5	60.0-75.0	100		Moisture Regime: Mesic (fresh) (1), Subhygric (moderately moist) (1)
SASKATOON ( <i>Amelanchier alnifolia</i> )	1.0	0.0-2.0	50		Nutrient Regime: Mesotrophic (medium) (1), Permesotrophic (rich) (1)
<b>Tall Shrub (2 to 5m)</b>					Elevation (range): 1285 (1285-1285) M
SASKATOON ( <i>Amelanchier alnifolia</i> )	13.5	7.0-20.0	100		Slope (%): 0 - 0.49 (1), 46 - 70.99 (1)
CHOKE CHERRY ( <i>Prunus virginiana</i> )	2.5	2.0-3.0	100		Aspect: Level (1), Westerly (1)
ASPEN ( <i>Populus tremuloides</i> )	2.0	0.0-4.0	50		Topographic Position: Lower Slope (1), Midslope (1)
<b>Medium Shrub (0.5 to 2 m)</b>					<b>Soil Variables</b>
UNDIFFERENTIATED ROSE ( <i>Rosa</i> )	5.0	0.0-10.0	50		Soil Drainage: Well drained (1)
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	2.0	1.0-3.0	100		Soil Subgroup:
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	1.5	0.0-3.0	50		Surface Texture: Loam (1)
<b>Tall Forb (&gt;= 30 cm)</b>					Effective Texture:
COW PARSNIP ( <i>Heracleum lanatum</i> )	2.0	1.0-3.0	100		Depth to Mottles/Gley:
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	2.0	1.0-3.0	100		Organic Thickness: 0 - 5 cm (1)
WILD BERGAMOT ( <i>Monarda fistulosa</i> )	2.0	1.0-3.0	100		Parent Material:
<b>Low Forb (&lt; 30 cm)</b>					Soil Type:
WESTERN CANADA VIOLET ( <i>Viola canadensis</i> )	7.7	0.5-15.0	100		Humus Form
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	5.5	1.0-10.0	100		
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	2.0	1.0-3.0	100		
COMMON DANDELION ( <i>Taraxacum officinale</i> )	2.0	1.0-3.0	100		
<b>Graminoid</b>					<b>LFH Thickness</b>
TIMOTHY ( <i>Phleum pratense</i> )	5.0	0.0-10.0	50		Mean
TALL TRisetum ( <i>Trisetum canescens</i> )	5.0	0.0-10.0	50		Min
FRINGED BROME ( <i>Bromus ciliatus</i> )	2.0	1.0-3.0	100		Max
NORTHERN WHEAT GRASS ( <i>Agropyron dasystachyum</i> )	1.5	0.0-3.0	50		Count
					cm:
					0.00
					0.00
					0.00
					0

## Mcc5 Aw/Hawthorn/Tall buttercup (n=2)

(*Populus tremuloides*/*Crataegus rotundifolia*/*Ranunculus acris*)

Thompson and Hansen (2002) described hawthorn communities on sites disturbed by long term heavy grazing. They found the greatest occurrence along drainages, valley bottoms and seepages throughout the Cypress Hills. Hawthorne communities tend to form dense thickets that are impenetrable for livestock. Consequently this community type should be rated as non-use.

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecotope:** d red osier dogwood (subhygric/rich)

**Ecotope Phase:** d2 red osier dogwood Aw

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Overstory Tree</b>					Ecological Status Score: 5-15
ASPEN ( <i>Populus tremuloides</i> )	60.0	60.0-60.0	100		Moisture Regime: Mesic (fresh) (1), Subhygric (moderately moist) (1)
<b>Tall Shrub (2 to 5m)</b>					Nutrient Regime: Mesotrophic (medium) (1), Permesotrophic (rich) (1)
ROUND-LEAVED HAWTHORN ( <i>Crataegus rotundifolia</i> )	10.0	0.0-20.0	50		Elevation (range): 1422 (1422-1422) M
DOUGLAS HAWTHORN ( <i>Crataegus douglasii</i> )	5.0	0.0-10.0	50		Slope (%): 0 - 0.49 (1), 10 - 15.99 (1)
BEAKED WILLOW ( <i>Salix bebbiana</i> )	1.5	0.0-3.0	50		Aspect: Level (1), Westerly (1)
<b>Medium Shrub (0.5 to 2 m)</b>					Topographic Position: Lower Slope (1), Midslope (1)
NORTHERN GOOSEBERRY ( <i>Ribes oxycanthoides</i> )	9.5	9.0-10.0	100		<b>Soil Variables</b>
UNDIFFERENTIATED ROSE ( <i>Rosa</i> )	5.0	0.0-10.0	50		Soil Drainage: Well drained (1)
PRICKLY ROSE ( <i>Rosa acicularis</i> )	3.0	0.0-6.0	50		Soil Subgroup:
WILD RED RASPBERRY ( <i>Rubus idaeus</i> )	2.0	1.0-3.0	100		Surface Texture: Loam (1)
<b>Tall Forb (&gt;= 30 cm)</b>					Effective Texture:
TALL BUTTERCUP ( <i>Ranunculus acris</i> )	5.5	1.0-10.0	100		Depth to Mottles/Gley:
WILD WHITE GERANIUM ( <i>Geranium richardsonii</i> )	3.0	3.0-3.0	100		Organic Thickness: 0 - 5 cm (1)
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	2.0	1.0-3.0	100		Parent Material:
COMMON NETTLE ( <i>Urtica dioica</i> )	1.5	0.0-3.0	50		Soil Type:
<b>Low Forb (&lt; 30 cm)</b>					Humus Form
WHITE CLOVER ( <i>Trifolium repens</i> )	10.0	0.0-20.0	50		
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	2.5	2.0-3.0	100		
COMMON DANDELION ( <i>Taraxacum officinale</i> )	2.5	2.0-3.0	100		
WESTERN CANADA VIOLET ( <i>Viola canadensis</i> )	2.5	2.0-3.0	100		
<b>Graminoid</b>					
TIMOTHY ( <i>Phleum pratense</i> )	6.0	2.0-10.0	100		
VIRGINIA WILD RYE ( <i>Elymus virginicus</i> )	5.0	0.0-10.0	50		
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	5.0	0.0-10.0	50		
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	1.0	0.0-2.0	50		
					<b>LFH Thickness</b>
					<b>Mean</b>
					<b>Min</b>
					<b>Max</b>
					<b>Count</b>
				cm:	0.00
					0.00
					0.00
					0

### d3 red osier dogwood Aw-PI-Sw (n=2)

**Natural Subregion:** Montane  
**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** d red osier dogwood (subhygric/rich)

#### Characteristic Species

##### Tree

- [ 51.5 ] ASPEN  
*Populus tremuloides*
- [ 24.0 ] WHITE SPRUCE\*  
*Picea glauca*
- [ 1.5 ] LODGEPOLE PINE  
*Pinus contorta*

##### Shrub

- [ 12.0 ] SASKATOON  
*Amelanchier alnifolia*
- [ 2.0 ] WHITE MEADOWSWEET  
*Spiraea betulifolia*
- [ 1.5 ] NET-VEINED WILLOW  
*Salix reticulata*

##### Forb

- [ 5.5 ] CREAM-COLORED VETCHLING  
*Lathyrus ochroleucus*
- [ 3.5 ] WESTERN CANADA VIOLET  
*Viola canadensis*
- [ 2.0 ] WILD VETCH  
*Vicia americana*
- [ 2.0 ] NORTHERN BEDSTRAW  
*Galium boreale*
- [ 2.0 ] LINDLEY'S ASTER  
*Aster ciliolatus*
- [ 1.5 ] SILVERY PERENNIAL LUPINE  
*Lupinus argenteus*
- [ 1.0 ] COW PARSNIP  
*Heracleum lanatum*

##### Graminoid

- [ 5.0 ] NODDING TRisetum  
*Trisetum cernuum*
- [ 2.5 ] WHITE-GRAINED MOUNTAIN RICE GRASS  
*Oryzopsis asperifolia*
- [ 1.5 ] KENTUCKY BLUEGRASS  
*Poa pratensis*

#### Environmental Variables

Moisture Regime: Mesic (fresh) (1), Subhygric (moderately moist) (1)  
 Nutrient Regime: Permesotrophic (rich) (1), Mesotrophic (medium) (1)  
 Elevation (range): 1225 (1225-1225) M  
 Slope (%): level (1), steep slope (1)  
 Aspect: Level (1), Northerly (1)  
 Topographic Position: Upper Slope (1)

#### Soil Variables

Soil Drainage: Moderately well drained (1)  
 Soil Subgroup:  
 Surface Texture:  
 Effective Texture:  
 Depth to Mottles/Gley:  
 Organic Thickness:  
 Parent Material:  
 Soil Type:  
 Humus Form

#### LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

## Mcd2 Aw-Sw/Saskatoon (n=2)

### (*Populus tremuloides*-*Picea glauca*/*Amelanchier alnifolia*)

This community type is very similar to the Aw/Saskatoon dominated community types previously described, but is not as successional advanced. Succession on the red osier dominated ecosites will be from aspen to pine and then to white spruce (Archibald et al. 1996). The northerly aspect of this particular community type has reduced the frequency of fire, allowing succession to white spruce. Note as succession occurs there is a corresponding drop in forage productivity. This community type would be rated as non-use for domestic livestock.

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** d red osier dogwood (subhygric/rich)

**Ecosite Phase:** d3 red osier dogwood Aw-PI-Sw

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Overstory Tree</b>					Ecological Status Score: 25
ASPEN ( <i>Populus tremuloides</i> )	51.5	33.0-70.0	100		Moisture Regime: Mesic (fresh) (1), Subhygric (moderately moist) (1)
WHITE SPRUCE ( <i>Picea glauca</i> )	21.5	20.0-23.0	100		Nutrient Regime: Mesotrophic (medium) (1), Permesotrophic (rich) (1)
LOGEPOLE PINE ( <i>Pinus contorta</i> )	1.5	0.0-3.0	50		Elevation (range): 1225 (1225-1225) M
<b>Understory Tree</b>					Slope (%): 0 - 0.49 (1), 46 - 70.99 (1)
WHITE SPRUCE ( <i>Picea glauca</i> )	2.5	0.0-5.0	50		Aspect: Level (1), Northerly (1)
<b>Tall Shrub (2 to 5m)</b>					Topographic Position: Upper Slope (1)
SASKATOON ( <i>Amelanchier alnifolia</i> )	5.0	0.0-10.0	50		<b>Soil Variables</b>
<b>Medium Shrub (0.5 to 2 m)</b>					Soil Drainage: Moderately well drained (1)
SASKATOON ( <i>Amelanchier alnifolia</i> )	7.0	0.0-14.0	50		Soil Subgroup:
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	2.0	0.0-4.0	50		Surface Texture:
<b>Low Shrub (&lt; 0.5m)</b>					Effective Texture:
NET-VEINED WILLOW ( <i>Salix reticulata</i> )	1.5	0.0-3.0	50		Depth to Mottles/Gley:
<b>Tall Forb (&gt;= 30 cm)</b>					Organic Thickness:
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	5.5	1.0-10.0	100		Parent Material:
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	2.0	1.0-3.0	100		Soil Type:
WILD VETCH ( <i>Vicia americana</i> )	2.0	1.0-3.0	100		Humus Form
SILVERY PERENNIAL LUPINE ( <i>Lupinus argenteus</i> )	1.5	0.0-3.0	50		
COW PARSNIP ( <i>Heracleum lanatum</i> )	1.0	0.0-2.0	50		
<b>Low Forb (&lt; 30 cm)</b>					
WESTERN CANADA VIOLET ( <i>Viola canadensis</i> )	3.5	0.0-7.0	50		
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	2.0	1.0-3.0	100		
<b>Graminoid</b>					
NODDING TRISETUM ( <i>Trisetum cernuum</i> )	5.0	0.0-10.0	50		
WHITE-GRAINED MOUNTAIN RICE GRASS ( <i>Oryzopsis asperifolia</i> )	2.5	2.0-3.0	100		
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	1.5	0.0-3.0	50		

LFH Thickness	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

## d4 red osier dogwood shrub (n=6)

Natural Subregion: Montane

Ecosection: Mc Montane Cypress Hills Ecosection

Ecosite: d red osier dogwood (subhygric/rich)

### Characteristic Species

#### Shrub

- [ 10.6 ] SNOWBERRY (BUCKBRUSH)\*  
*Symphoricarpos occidentalis*
- [ 10.1 ] SILVERBERRY\*  
*Elaeagnus commutata*
- [ 7.3 ] CHOKE CHERRY  
*Prunus virginiana*
- [ 4.6 ] SILVER SAGEBRUSH\*  
*Artemisia cana*
- [ 4.0 ] COMMON WILD ROSE  
*Rosa woodsii*
- [ 3.3 ] SASKATOON  
*Amelanchier alnifolia*
- [ 3.0 ] CREEPING JUNIPER  
*Juniperus horizontalis*
- [ 2.2 ] UNDIFFERENTIATED ROSE  
*Rosa*
- [ 1.3 ] NORTHERN GOOSEBERRY  
*Ribes oxycanthoides*

#### Forb

- [ 1.5 ] SMOOTH ASTER  
*Aster laevis*
- [ 1.3 ] COMMON DANDELION  
*Taraxacum officinale*
- [ 1.1 ] LATE GOLDENROD  
*Solidago gigantea*
- [ 1.1 ] WHITE CLOVER  
*Trifolium repens*

#### Graminoid

- [ 14.4 ] KENTUCKY BLUEGRASS  
*Poa pratensis*
- [ 5.4 ] PATTERSON'S BLUEGRASS  
*Poa pattersonii*
- [ 4.8 ] CANADA BLUEGRASS  
*Poa compressa*
- [ 2.8 ] AWNLESS BROME  
*Bromus inermis*
- [ 2.3 ] TIMOTHY  
*Phleum pratense*
- [ 2.1 ] ROUGH FESCUE  
*Festuca scabrella*
- [ 1.6 ] SPRENGEL'S SEDGE  
*Carex sprengei*
- [ 1.1 ] WIRE RUSH  
*Juncus balticus*

### Environmental Variables

Moisture Regime: Submesic (moderately fresh) (3), Mesic (fresh) (1), Subxeric (moderately dry) (1), Subhygric (moderately moist) (1)

Nutrient Regime: Mesotrophic (medium) (5), Permesotrophic (rich) (1)

Elevation (range): 1186.67 (1126-1250) M

Slope (%): moderate slope (2), strong slope (2), level (1)

Aspect: Southerly (2), Level (1), Easterly (1), Northerly (1)

Topographic Position: Midslope (2), Level (1), Lower Slope (1), Toe (1)

### Soil Variables

Soil Drainage: Well drained (3), Moderately well drained (1), Rapidly drained (1)

Soil Subgroup:

Surface Texture: Silty Sand (1)

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (1)

Parent Material:

Soil Type:

Humus Form

### LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

## Mcb4 Silver sagebrush/Kentucky bluegrass (n=2)

(*Artemisia cana/Poa pratensis*)

The presence of silver sagebrush in this community type indicates the overflow conditions on this community. Thompson and Hansen (2002) described a silver sagebrush dominated community on alluvial terraces on broad and narrow floodplains where overland flow allowed for a greater than normal moisture regime. Adams et al (2004) described silver sagebrush on sites that varied from saline to Loamy in the Mixedgrass subregion. The dominance of Canada bluegrass and silverberry in this community likely indicates a non-saline overflow community which has some seepage occurring throughout the growing season. Thompson and Hansen (2002) found that Kentucky bluegrass, smooth brome and dandelion increased with an increase in grazing pressure on silver sagebrush dominated sites. This community type is likely transitional to the Mixedgrass subregion.

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** d red osier dogwood (subhygric/rich)

**Ecosite Phase:** d4 red osier dogwood shrub

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Medium Shrub (0.5 to 2 m)</b>				Ecological Status Score: 15-20
SILVER SAGEBRUSH ( <i>Artemisia cana</i> )	14.0	12.0-16.0	100	Moisture Regime: Submesic (moderately fresh) (2)
COMMON WILD ROSE ( <i>Rosa woodsii</i> )	2.0	0.0-4.0	50	Nutrient Regime: Mesotrophic (medium) (2)
<b>Tall Forb (&gt;= 30 cm)</b>				Elevation (range): 1159 (1138-1180) M
CREeping WHITE PRAIRIE ASTER ( <i>Aster falcatus</i> )	4.0	0.0-8.0	50	Slope (%): 10 - 15.99 (1), 16 - 30.99 (1)
TUFTED WHITE PRAIRIE ASTER ( <i>Aster ericoides</i> )	1.0	0.0-2.0	50	Aspect: Southerly (2)
WILD VETCH ( <i>Vicia americana</i> )	1.0	1.0-1.0	100	Topographic Position: Lower Slope (1), Toe (1)
<b>Low Forb (&lt; 30 cm)</b>				<b>Soil Variables</b>
COMMON YARROW ( <i>Achillea millefolium</i> )	1.5	1.0-2.0	100	Soil Drainage: Well drained (1), Moderately well drained (1)
PRAIRIE SELAGINELLA ( <i>Selaginella densa</i> )	1.0	0.0-2.0	50	Soil Subgroup:
<b>Graminoid</b>				Surface Texture:
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	32.0	2.0-62.0	100	Effective Texture:
CANADA BLUEGRASS ( <i>Poa compressa</i> )	14.5	0.0-29.0	50	Depth to Mottles/Gley:
AWNLESS BROME ( <i>Bromus inermis</i> )	4.0	0.0-8.0	50	Organic Thickness:
GREEN NEEDLE GRASS ( <i>Stipa viridula</i> )	4.0	0.0-8.0	50	Parent Material:
JUNE GRASS ( <i>Koeleria macrantha</i> )	2.0	1.0-3.0	100	Soil Type:
				Humus Form
				<b>LFH Thickness</b>
				<b>Mean</b>
				<b>Min</b>
				<b>Max</b>
				<b>Count</b>
				cm:
				0.00
				0.00
				0.00
				0



## Mcb5 Silverberry/Kentucky bluegrass (n=3)

### (*Elaeagnus commutata*/*Poa pratensis*)

Thompson and Hansen (2002) described Silverberry dominated community types on alluvial floodplain terraces, depressions and ravines, seepage areas with northerly or easterly aspects where additional moisture accumulates. They also felt this community type was strongly associated with disturbance and the understory is often dominated by smooth brome and Kentucky bluegrass. In the absence of disturbance this community may have a predominance of rough fescue in the understory.

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** d red osier dogwood (subhygric/rich)

**Ecosite Phase:** d4 red osier dogwood shrub

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Tall Shrub (2 to 5m)</b>				Ecological Status Score: 15-20
SILVERBERRY ( <i>Elaeagnus commutata</i> )	10.0	0.0-30.0	33	Moisture Regime: Subxeric (moderately dry) (1), Mesic (fresh) (1), Subhygric (moderately moist) (1)
BEAKED WILLOW ( <i>Salix bebbiana</i> )	1.0	0.0-3.0	33	Nutrient Regime: Mesotrophic (medium) (2), Permesotrophic (rich) (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Elevation (range): 1188 (1126-1250) M
SILVERBERRY ( <i>Elaeagnus commutata</i> )	12.3	0.0-24.0	67	Slope (%): 0 - 0.49 (1), 16 - 30.99 (1)
CREeping JUNIPER ( <i>Juniperus horizontalis</i> )	9.0	0.0-27.0	33	Aspect: Level (1), Easterly (1)
UNDIFFERENTIATED ROSE ( <i>Rosa</i> )	6.6	0.0-20.0	33	Topographic Position: Level (1), Midslope (1)
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	4.0	0.0-7.0	67	
COMMON WILD ROSE ( <i>Rosa woodsii</i> )	3.0	0.0-8.0	67	
<b>Tall Forb (&gt;= 30 cm)</b>				<b>Soil Variables</b>
SMOOTH ASTER ( <i>Aster laevis</i> )	4.6	0.0-13.0	67	Soil Drainage: Rapidly drained (1), Well drained (1)
CANADA THISTLE ( <i>Cirsium arvense</i> )	3.5	0.0-10.0	67	Soil Subgroup:
LATE GOLDENROD ( <i>Solidago gigantea</i> )	3.3	0.0-10.0	33	Surface Texture: Silty Sand (1)
TALL BUTTERCUP ( <i>Ranunculus acris</i> )	1.0	0.0-3.0	33	Effective Texture:
<b>Low Forb (&lt; 30 cm)</b>				Depth to Mottles/Gley:
COMMON DANDELION ( <i>Taraxacum officinale</i> )	4.0	0.0-10.0	67	Organic Thickness: 0 - 5 cm (1)
WHITE CLOVER ( <i>Trifolium repens</i> )	3.3	0.0-10.0	33	Parent Material:
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	2.6	0.0-8.0	33	Soil Type:
<b>Graminoid</b>				Humus Form
PATTERSON'S BLUEGRASS ( <i>Poa pattersonii</i> )	16.3	0.0-48.0	67	
TIMOTHY ( <i>Phleum pratense</i> )	7.0	0.0-20.0	67	
ROUGH FESCUE ( <i>Festuca scabrella</i> )	6.3	0.0-19.0	33	
WIRE RUSH ( <i>Juncus balticus</i> )	3.3	0.0-10.0	33	
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	3.3	0.0-10.0	33	
AWNLESS BROME ( <i>Bromus inermis</i> )	1.6	0.0-3.0	67	
				<b>LFH Thickness</b>
				<b>Mean</b>
				<b>Min</b>
				<b>Max</b>
				<b>Count</b>
cm:	0.00	0.00	0.00	0

# Mcb9 Chokecherry-Saskatoon-Snowberry (n=1)

## (*Prunus virginiana*-*Amelanchier alnifolia*-*Symphoricarpos occidentalis*)

Thompson and Hansen (2002) found chokecherry dominated communities as minor types along streams, rivers and ponds throughout southern Alberta. They also found stands on hillsides immediately below a spring or seep. This community tends to form dense thickets which are inaccessible to livestock. They found that increased disturbance of this community led to an increase of rose, snowberry and Kentucky bluegrass.

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** d red osier dogwood (subhygric/rich)

**Ecosite Phase:** d4 red osier dogwood shrub

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Understory Tree</b>				Ecological Status Score: 27-40
WHITE SPRUCE ( <i>Picea glauca</i> )	1.0	1.0-1.0	100	Moisture Regime: Submesic (moderately fresh) (1)
<b>Tall Shrub (2 to 5m)</b>				Nutrient Regime: Mesotrophic (medium) (1)
CHOKE CHERRY ( <i>Prunus virginiana</i> )	16.0	16.0-16.0	100	Elevation (range): 1213 (1213-1213) M
SASKATOON ( <i>Amelanchier alnifolia</i> )	10.0	10.0-10.0	100	Slope (%): 10 - 15.99 (1)
SILVERBERRY ( <i>Elaeagnus commutata</i> )	8.0	8.0-8.0	100	Aspect: Northerly (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Topographic Position: Midslope (1)
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	28.0	28.0-28.0	100	<b>Soil Variables</b>
COMMON WILD ROSE ( <i>Rosa woodsii</i> )	7.0	7.0-7.0	100	Soil Drainage: Well drained (1)
CHOKE CHERRY ( <i>Prunus virginiana</i> )	6.0	6.0-6.0	100	Soil Subgroup:
NORTHERN GOOSEBERRY ( <i>Ribes oxycanthoides</i> )	4.0	4.0-4.0	100	Surface Texture:
CANADA BUFFALOBERRY ( <i>Shepherdia canadensis</i> )	2.0	2.0-2.0	100	Effective Texture:
<b>Tall Forb (&gt;= 30 cm)</b>				Depth to Mottles/Gley:
COMMON NETTLE ( <i>Urtica dioica</i> )	1.0	1.0-1.0	100	Organic Thickness:
<b>Low Forb (&lt; 30 cm)</b>				Parent Material:
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	2.0	2.0-2.0	100	Soil Type:
<b>Graminoid</b>				Humus Form
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	8.0	8.0-8.0	100	<b>LFH Thickness</b>
SPRENGEL'S SEDGE ( <i>Carex sprengelii</i> )	5.0	5.0-5.0	100	<b>Mean</b>
AWNLESS BROME ( <i>Bromus inermis</i> )	3.0	3.0-3.0	100	<b>Min</b>
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	1.0	1.0-1.0	100	<b>Max</b>
				<b>Count</b>
				cm: 0.00 0.00 0.00 0

## e meadow (subhygric/medium) (n=5)

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

### General Description

The meadow ecosite tends to be mesic to subhygric and occurs on depressions where flooding and/or high water tables increase soil water content that replenish nutrients. The soils on these sites tend to have thick Ah horizons and loamy textures. Thompson and Hansen (2002) felt the tufted hairgrass meadows were slightly alkaline in southeastern Alberta. This ecological site is not common in this ecosection and is characterized by Tufted hairgrass dominated community types.



### Environmental Variables

Moisture Regime: Subhygric (moderately moist) (3), Hygric (moist) (1), Subhygric (moderately wet) (1)

Nutrient Regime: Permesotrophic (rich) (3), Mesotrophic (medium) (2)

Elevation (range): 1171 (1126-1201) M

Slope (%): nearly level (3), level (1)

Aspect: Easterly (2), Level (1), Southerly (1)

Topographic Position: Depression (2), Level (2)

### Soil Variables

Soil Drainage: Imperfectly drained (2), Poorly drained (2)

Soil Subgroup:

Surface Texture: Clay (1)

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (1)

Parent Material:

Soil Type:

Humus Form

### Successional Relationships

The meadow ecosite is successional stable. Disturbance regime, cold air drainage, and competition from a diverse cover of shrubs, forbs and grasses slow or inhibit the establishment of trees. These sites are often heavily grazed and tend to become dominated by Kentucky bluegrass, foxtail barley, fowl bluegrass, salt grass and timothy (Thompson and Hansen 2002).

### LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

### Indicator Species

#### Graminoid

WIRE RUSH

*Juncus balticus*

FOXTAIL BARLEY

*Hordeum jubatum*

TUFTED HAIR GRASS

*Deschampsia cespitosa*

WOOLLY SEDGE

*Carex lanuginosa*

# e1 tufted hairgrass (n=5)

Natural Subregion: Montane  
 Ecoregion: Mc Montane Cypress Hills Ecoregion

Ecosite: e meadow (subhygric/medium)

## Characteristic Species

### Graminoid

- [ 54.5 ] TUFTED HAIR GRASS\*  
*Deschampsia cespitosa*
- [ 13.0 ] WIRE RUSH\*  
*Juncus balticus*
- [ 10.0 ] CREEPING SPIKE-RUSH  
*Eleocharis palustris*
- [ 10.0 ] THREE-SQUARE RUSH  
*Scirpus pungens*
- [ 4.0 ] WOOLLY SEDGE\*  
*Carex lanuginosa*
- [ 1.0 ] TIMOTHY  
*Phleum pratense*
- [ 0.7 ] FOXTAIL BARLEY\*  
*Hordeum jubatum*

## Environmental Variables

Moisture Regime: Subhygric (moderately moist) (3), Hygric (moist) (1), Subhygric (moderately wet) (1)  
 Nutrient Regime: Permesotrophic (rich) (3), Mesotrophic (medium) (2)  
 Elevation (range): 1171 (1126-1201) M  
 Slope (%): nearly level (3), level (1)  
 Aspect: Easterly (2), Level (1), Southerly (1)  
 Topographic Position: Depression (2), Level (2)

## Soil Variables

Soil Drainage: Poorly drained (2), Imperfectly drained (2)  
 Soil Subgroup:  
 Surface Texture: Clay (1)  
 Effective Texture:  
 Depth to Mottles/Gley:  
 Organic Thickness: 0 - 5 cm (1)  
 Parent Material:  
 Soil Type:  
 Humus Form

LFH Thickness	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

# Mca11 Tufted hairgrass-Sedge (n=2)

(*Deschampsia cespitosa*-*Carex spp.*)

This community is located on moist sites that are better drained and slightly drier than the pure sedge meadows. It consists of almost a pure stand of tufted hairgrass and appears to be slightly alkaline. These sites are not common and are only found in isolated depressional areas.

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** e meadow (subhygric/medium)

**Ecosite Phase:** e1 tufted hairgrass

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Graminoid</b>				Ecological Status Score: 27-40
TUFTED HAIR GRASS ( <i>Deschampsia cespitosa</i> )	54.5	29.0-80.0	100	Moisture Regime: Subhygric (moderately moist) (1), Subhydic (moderately wet) (1)
WIRE RUSH ( <i>Juncus balticus</i> )	13.0	3.0-23.0	100	Nutrient Regime: Mesotrophic (medium) (1), Permesotrophic (rich) (1)
CREEPING SPIKE-RUSH ( <i>Eleocharis palustris</i> )	10.0	0.0-20.0	50	Elevation (range): 1186 (1186-1186) M
THREE-SQUARE RUSH ( <i>Scirpus pungens</i> )	10.0	0.0-20.0	50	Slope (%): 0 - 0.49 (1), 0.5 - 2.49 (1)
WOOLLY SEDGE ( <i>Carex lanuginosa</i> )	4.0	0.0-8.0	50	Aspect: Level (1), Easterly (1)
TIMOTHY ( <i>Phleum pratense</i> )	1.0	0.0-2.0	50	Topographic Position: Depression (1)
FOXTAIL BARLEY ( <i>Hordeum jubatum</i> )	0.7	0.5-1.0	100	
				<b>Soil Variables</b>
				Soil Drainage: Poorly drained (1)
				Soil Subgroup:
				Surface Texture: Clay (1)
				Effective Texture:
				Depth to Mottles/Gley:
				Organic Thickness: 0 - 5 cm (1)
				Parent Material:
				Soil Type:
				Humus Form
				<b>LFH Thickness</b>
				<b>Mean</b>
				<b>Min</b>
				<b>Max</b>
				<b>Count</b>
				cm:
				0.00
				0.00
				0.00
				0

## Mca12 Tufted hairgrass-Kentucky bluegrass (n=1)

### (*Deschampsia cespitosa*-*Poa pratensis*)

This community type is similar to the other Kentucky bluegrass/Tufted hairgrass dominated community types, but grazing pressure has been lighter or it was heavy and then became more moderate because of reduced stocking rates or rotational grazing. Willoughby (1992), found that tufted hairgrass could compete with Kentucky bluegrass in the absence of grazing, but it appears that once Kentucky bluegrass is established it remains to form a stable community type.

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** e meadow (subhygric/medium)

**Ecosite Phase:** e1 tufted hairgrass

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Medium Shrub (0.5 to 2 m)</b>				Ecological Status Score: 20-27
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	1.0	1.0-1.0	100	Moisture Regime: Hygric (moist) (1)
<b>Tall Forb (&gt;= 30 cm)</b>				Nutrient Regime: Permesotrophic (rich) (1)
COMMON TALL SUNFLOWER ( <i>Helianthus nuttallii</i> )	9.0	9.0-9.0	100	Elevation (range): 1201 (1201-1201) M
BULL THISTLE ( <i>Cirsium vulgare</i> )	1.0	1.0-1.0	100	Slope (%): 0.5 - 2.49 (1)
LATE GOLDENROD ( <i>Solidago gigantea</i> )	1.0	1.0-1.0	100	Aspect: Southerly (1)
MARSH HEDGE-NETTLE ( <i>Stachys palustris</i> )	1.0	1.0-1.0	100	Topographic Position: Level (1)
<b>Low Forb (&lt; 30 cm)</b>				<b>Soil Variables</b>
SILVERWEED ( <i>Potentilla anserina</i> )	4.0	4.0-4.0	100	Soil Drainage: Imperfectly drained (1)
SMALL-LEAVED PUSSYTOES ( <i>Antennaria parvifolia</i> )	2.0	2.0-2.0	100	Soil Subgroup:
COMMON DANDELION ( <i>Taraxacum officinale</i> )	1.0	1.0-1.0	100	Surface Texture:
<b>Graminoid</b>				Effective Texture:
TUFTED HAIR GRASS ( <i>Deschampsia cespitosa</i> )	28.0	28.0-28.0	100	Depth to Mottles/Gley:
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	15.0	15.0-15.0	100	Organic Thickness:
WIRE RUSH ( <i>Juncus balticus</i> )	10.0	10.0-10.0	100	Parent Material:
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	3.0	3.0-3.0	100	Soil Type:
GRACEFUL SEDGE ( <i>Carex praegracilis</i> )	2.0	2.0-2.0	100	Humus Form
FOXTAIL BARLEY ( <i>Hordeum jubatum</i> )	1.0	1.0-1.0	100	
				<b>LFH Thickness</b>
				<b>Mean</b>
				<b>Min</b>
				<b>Max</b>
				<b>Count</b>
				cm:
				0.00
				0.00
				0.00
				0

# Mca13 Kentucky bluegrass-Foxtail barley-Tufted hairgrass (n=2)

(*Poa pratensis*-*Hordeum jubatum*-*Deschampsia cespitosa*)

This community appears to represent a tufted hairgrass-sedge community that was heavily grazed. Increased grazing pressure favours the growth of Kentucky bluegrass and foxtail barley on these tufted hairgrass meadows in the Cypress Hills ecosection (Thompson and Hansen 2002).

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** e meadow (subhygric/medium)

**Ecosite Phase:** e1 tufted hairgrass

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables				
	Mean	Range							
<b>Tall Forb (&gt;= 30 cm)</b>					Ecological Status Score: 15-20				
TUFTED WHITE PRAIRIE ASTER ( <i>Aster ericoides</i> )	7.5	2.0-13.0		100	Moisture Regime: Subhygric (moderately moist) (2)				
GUMWEED ( <i>Grindelia squarrosa</i> )	4.5	1.0-8.0		100	Nutrient Regime: Mesotrophic (medium) (1), Permesotrophic (rich) (1)				
ALSIKE CLOVER ( <i>Trifolium hybridum</i> )	1.0	0.0-2.0		50	Elevation (range): 1126 (1126-1126) M				
BUSHY KNOTWEED ( <i>Polygonum ramosissimum</i> )	0.5	0.0-1.0		50	Slope (%): 0.5 - 2.49 (1)				
<b>Low Forb (&lt; 30 cm)</b>					Aspect: Easterly (1)				
COMMON DANDELION ( <i>Taraxacum officinale</i> )	2.5	1.0-4.0		100	Topographic Position: Level (1), Depression (1)				
<b>Graminoid</b>					<b>Soil Variables</b>				
FOXTAIL BARLEY ( <i>Hordeum jubatum</i> )	19.0	3.0-35.0		100	Soil Drainage: Imperfectly drained (1), Poorly drained (1)				
TIMOTHY ( <i>Phleum pratense</i> )	16.0	0.0-32.0		50	Soil Subgroup:				
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	13.5	12.0-15.0		100	Surface Texture:				
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	4.5	0.0-9.0		50	Effective Texture:				
TUFTED HAIR GRASS ( <i>Deschampsia cespitosa</i> )	4.5	3.0-6.0		100	Depth to Mottles/Gley:				
ALKALI CORD GRASS ( <i>Spartina gracilis</i> )	2.0	0.0-4.0		50	Organic Thickness:				
SALT GRASS ( <i>Distichlis stricta</i> )	1.0	0.0-2.0		50	Parent Material:				
ALKALI BLUEGRASS ( <i>Poa juncifolia</i> )	1.0	0.0-2.0		50	Soil Type:				
					Humus Form				
					<b>LFH Thickness</b>	<b>Mean</b>	<b>Min</b>	<b>Max</b>	<b>Count</b>
					cm:	0.00	0.00	0.00	0

## f horsetail (hygric/rich) (n=14)

**Natural Subregion:** Montane

### General Description

The horsetail ecosite is wet and nutrient rich. These sites are commonly found on toe and lower slope positions with fluvial parent materials where flooding or seepage periodically replenishes the substrate nutrient availability. With wet soils gleysolic soils are common and organic matter tends to accumulate. Mottles were within 25cm of the soil surface in over 80% of the sites (Archibald et al. 1996) . Horsetails commonly form a blanket over the forest floor. Range sites for this ecological site include Lotic conifer and Lotic Shrub.



**Ecosection:** Mc Montane Cypress Hills Ecosection

### Environmental Variables

Moisture Regime: Subhygric (moderately moist) (7), Hygric (moist) (4), Mesic (fresh) (1), Submesic (moderately fresh) (1)

Nutrient Regime: Permesotrophic (rich) (8), Mesotrophic (medium) (6)

Elevation (range): 1242 (1154-1328) M

Slope (%): level (8), nearly level (2), very strong slope (2), very gentle slope (1), moderate slope (1)

Aspect: Level (6), Easterly (4), Northerly (1), Westerly (1)

Topographic Position: Midslope (3), Toe (2), Level (2), Lower Slope (2)

### Soil Variables

Soil Drainage: Imperfectly drained (5), Moderately well drained (3), Poorly drained (1), Well drained (1)

Soil Subgroup: CALCAREOUS BLACK CHERNOZEM (1), GLEYED GRAY LUVISOL (1), GLEYED REGOSOL (1), GLEYED DARK GRAY LUVISOL (1), GLEYED REGO BLACK CHERNOZEM (1), REGO GLEYSOL (1)

Surface Texture: Loam (2), Silt loam (2), Silty Sand (1), Sandy clay (1)

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (12)

Parent Material: Lacustrine (3), Fluvial (2), Colluvial (1), Morainal (1)

Soil Type:

Humus Form FIBRIMOR (1)

### Successional Relationships

Balsam poplar is a pioneer species on this ecosite. White spruce is the expected climax species; however, its establishment may be slow due to high vegetation competition.

### Indicator Species

#### Tree

WHITE SPRUCE

*Picea glauca*

ASPEN

*Populus tremuloides*

#### Shrub

BEAKED WILLOW

*Salix bebbiana*

FLAT-LEAVED WILLOW

*Salix planifolia*

#### Forb

COW PARSNIP

*Heracleum lanatum*

COMMON HORSETAIL

*Equisetum arvense*

### LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0



# f1 horsetail Aw-Pb (n=3)

Natural Subregion: Montane  
 Ecosection: Mc Montane Cypress Hills Ecosection

Ecosite: f horsetail (hygric/rich)

## Characteristic Species

### Tree

- [ 84.2 ] ASPEN\*  
*Populus tremuloides*

### Shrub

- [ 5.5 ] SNOWBERRY (BUCKBRUSH)  
*Symphoricarpos occidentalis*
- [ 1.5 ] PRICKLY ROSE  
*Rosa acicularis*
- [ 1.0 ] WILD RED RASPBERRY  
*Rubus idaeus*

### Forb

- [ 21.5 ] COW PARSNIP\*  
*Heracleum lanatum*
- [ 14.5 ] LATE GOLDENROD  
*Solidago gigantea*
- [ 12.0 ] WESTERN CANADA VIOLET  
*Viola canadensis*
- [ 6.0 ] COMMON HORSETAIL\*  
*Equisetum arvense*
- [ 5.5 ] WILD WHITE GERANIUM  
*Geranium richardsonii*
- [ 5.0 ] CANADA GOLDENROD  
*Solidago canadensis*
- [ 2.0 ] TALL MEADOW RUE  
*Thalictrum dasycarpum*
- [ 1.5 ] COMMON DANDELION  
*Taraxacum officinale*
- [ 1.5 ] WESTERN MEADOW RUE  
*Thalictrum occidentale*
- [ 1.0 ] WILD VETCH  
*Vicia americana*
- [ 1.0 ] LINDLEY'S ASTER  
*Aster ciliolatus*

### Graminoid

- [ 4.5 ] AWNLESS BROME  
*Bromus inermis*
- [ 4.5 ] SLENDER WHEAT GRASS  
*Agropyron trachycaulum*
- [ 4.0 ] BLUEJOINT  
*Calamagrostis canadensis*
- [ 1.5 ] KENTUCKY BLUEGRASS  
*Poa pratensis*

## Environmental Variables

Moisture Regime: Subhygric (moderately moist) (2), Hygric (moist) (1)  
 Nutrient Regime: Mesotrophic (medium) (2), Permesotrophic (rich) (1)  
 Elevation (range): 1228 (1222-1233) M  
 Slope (%): level (2), very gentle slope (1)  
 Aspect: Level (1), Easterly (1)  
 Topographic Position: Level (1), Toe (1)

## Soil Variables

Soil Drainage: Imperfectly drained (1), Moderately well drained (1)  
 Soil Subgroup: GLEYED REGOSOL (1)  
 Surface Texture: Loam (1)  
 Effective Texture:  
 Depth to Mottles/Gley:  
 Organic Thickness: 0 - 5 cm (2)  
 Parent Material: Lacustrine (1)  
 Soil Type:  
 Humus Form

## LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

## Mcc6 Aw/Horsetail-Cow parsnip (n=2)

### (*Populus tremuloides*/*Equisetum arvense*-*Heracleum lanatum*)

This community type is found on moist-rich Gleysolic soils. These sites are characterized by high water tables and will likely succeed to white spruce. The shrub species richness and diversity restricts livestock access, however horses have been noticed to selectively graze different species of horsetail during the summer and winter months.

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** f horsetail (hygric/rich)

**Ecosite Phase:** f1 horsetail Aw-Pb

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables				
	Mean	Range							
<b>Overstory Tree</b>					Ecological Status Score: 25				
ASPEN ( <i>Populus tremuloides</i> )	81.2	65.0-97.5	100		Moisture Regime: Subhygric (moderately moist) (1), Hygric (moist) (1)				
<b>Medium Shrub (0.5 to 2 m)</b>					Nutrient Regime: Mesotrophic (medium) (2)				
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	5.5	1.0-10.0	100		Elevation (range): 1228 (1222-1233) M				
ASPEN ( <i>Populus tremuloides</i> )	3.0	0.0-6.0	50		Slope (%): 0 - 0.49 (1), 2.5 - 5.99 (1)				
PRICKLY ROSE ( <i>Rosa acicularis</i> )	1.5	0.0-3.0	50		Aspect: Easterly (1)				
WILD RED RASPBERRY ( <i>Rubus idaeus</i> )	1.0	0.0-2.0	50		Topographic Position: Level (1), Toe (1)				
<b>Tall Forb (&gt;= 30 cm)</b>					<b>Soil Variables</b>				
COW PARSNIP ( <i>Heracleum lanatum</i> )	21.5	3.0-40.0	100		Soil Drainage: Moderately well drained (1), Imperfectly drained (1)				
LATE GOLDENROD ( <i>Solidago gigantea</i> )	14.5	0.0-29.0	50		Soil Subgroup: GLEYED REGOSOL (1)				
COMMON HORSETAIL ( <i>Equisetum arvense</i> )	6.0	0.0-12.0	50		Surface Texture:				
WILD WHITE GERANIUM ( <i>Geranium richardsonii</i> )	5.5	1.0-10.0	100		Effective Texture:				
CANADA GOLDENROD ( <i>Solidago canadensis</i> )	5.0	0.0-10.0	50		Depth to Mottles/Gley:				
TALL MEADOW RUE ( <i>Thalictrum dasycarpum</i> )	2.0	0.0-4.0	50		Organic Thickness: 0 - 5 cm (1)				
WESTERN MEADOW RUE ( <i>Thalictrum occidentale</i> )	1.5	0.0-3.0	50		Parent Material: Lacustrine (1)				
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	1.0	0.0-2.0	50		Soil Type:				
WILD VETCH ( <i>Vicia americana</i> )	1.0	0.0-2.0	50		Humus Form				
<b>Low Forb (&lt; 30 cm)</b>					<b>LFH Thickness</b>				
WESTERN CANADA VIOLET ( <i>Viola canadensis</i> )	12.0	0.0-24.0	50		<b>Mean</b>	<b>Min</b>	<b>Max</b>	<b>Count</b>	
COMMON DANDELION ( <i>Taraxacum officinale</i> )	1.5	0.0-3.0	50		0.00	0.00	0.00	0	
<b>Graminoid</b>									
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	4.5	0.0-9.0	50						
AWNLESS BROME ( <i>Bromus inermis</i> )	4.5	0.0-9.0	50						
BLUEJOINT ( <i>Calamagrostis canadensis</i> )	4.0	0.0-8.0	50						
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	1.5	0.0-3.0	50						

# Mcc7 Aw/Kentucky bluegrass (n=1)

## (*Populus tremuloides*/*Poa pratensis*)

This community is similar to the Aw/Horsetail-Cow parsnip community, but heavy grazing pressure has shifted the understory away from native species and allowed dandelion, clover, timothy and Kentucky bluegrass to establish on the site. This change in species composition with increased grazing pressure is similar to observations made by Willoughby (1995). The invasion of non-native species onto this site makes this community very productive for domestic livestock, but the presence of overgrazed communities indicates some type of distribution problem and the management of the disposition should be discussed with the permittees.

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** f horsetail (hygric/rich)

**Ecosite Phase:** f1 horsetail Aw-Pb

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 5-10
ASPEN ( <i>Populus tremuloides</i> )	80.0	80.0-80.0	100	Moisture Regime: Subhygric (moderately moist) (1)
WHITE SPRUCE ( <i>Picea glauca</i> )	10.0	10.0-10.0	100	Nutrient Regime: Permesotrophic (rich) (1)
<b>Understory Tree</b>				Elevation (range): 0 (0-0) M
WHITE SPRUCE ( <i>Picea glauca</i> )	5.0	5.0-5.0	100	Slope (%): 0 - 0.49 (1)
ASPEN ( <i>Populus tremuloides</i> )	2.0	2.0-2.0	100	Aspect: Level (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Topographic Position:
NORTHERN GOOSEBERRY ( <i>Ribes oxycanthoides</i> )	3.0	3.0-3.0	100	<b>Soil Variables</b>
WILD RED RASPBERRY ( <i>Rubus idaeus</i> )	3.0	3.0-3.0	100	Soil Drainage:
<b>Tall Forb (&gt;= 30 cm)</b>				Soil Subgroup:
GRACEFUL CINQUEFOIL ( <i>Potentilla gracilis</i> )	3.0	3.0-3.0	100	Surface Texture: Loam (1)
<b>Low Forb (&lt; 30 cm)</b>				Effective Texture:
COMMON YARROW ( <i>Achillea millefolium</i> )	10.0	10.0-10.0	100	Depth to Mottles/Gley:
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	10.0	10.0-10.0	100	Organic Thickness: 0 - 5 cm (1)
COMMON DANDELION ( <i>Taraxacum officinale</i> )	3.0	3.0-3.0	100	Parent Material:
WHITE CLOVER ( <i>Trifolium repens</i> )	3.0	3.0-3.0	100	Soil Type:
<b>Graminoid</b>				Humus Form
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	20.0	20.0-20.0	100	<b>LFH Thickness</b>
ROUGH HAIR GRASS ( <i>Agrostis scabra</i> )	3.0	3.0-3.0	100	Mean
FRINGED BROME ( <i>Bromus ciliatus</i> )	3.0	3.0-3.0	100	Min
GRACEFUL SEDGE ( <i>Carex praegracilis</i> )	3.0	3.0-3.0	100	Max
TIMOTHY ( <i>Phleum pratense</i> )	3.0	3.0-3.0	100	Count
				cm:
				0.00
				0.00
				0.00
				0

## f2 horsetail Sw (n=4)

Natural Subregion: Montane

Ecosection: Mc Montane Cypress Hills Ecosection

Ecosite: f horsetail (hygric/rich)

### Characteristic Species

#### Tree

- [ 67.5 ] WHITE SPRUCE\*  
*Picea glauca*
- [ 5.1 ] BALSAM POPLAR  
*Populus balsamifera*

#### Shrub

- [ 5.2 ] WILD RED RASPBERRY  
*Rubus idaeus*
- [ 2.5 ] WHITE MEADOWSWEET  
*Spiraea betulifolia*
- [ 1.6 ] UNDIFFERENTIATED ROSE  
*Rosa*

#### Forb

- [ 25.0 ] COMMON HORSETAIL  
*Equisetum arvense*
- [ 10.1 ] WESTERN CANADA VIOLET  
*Viola canadensis*
- [ 5.8 ] WILD WHITE GERANIUM  
*Geranium richardsonii*
- [ 2.6 ] RED AND WHITE BANE BERRY  
*Actaea rubra*
- [ 2.5 ] LINDLEY'S ASTER  
*Aster ciliolatus*
- [ 2.3 ] WILD STRAWBERRY  
*Fragaria virginiana*
- [ 1.7 ] SPREADING SWEET CICELY  
*Osmorhiza depauperata*
- [ 1.6 ] VEINY MEADOW RUE  
*Thalictrum venulosum*
- [ 1.6 ] COMMON DANDELION  
*Taraxacum officinale*
- [ 1.6 ] CREAM-COLORED VETCHLING  
*Lathyrus ochroleucus*
- [ 1.5 ] BUNCHBERRY  
*Cornus canadensis*
- [ 1.1 ] STAR-FLOWERED SOLOMON'S-SEAL  
*Smilacina stellata*
- [ 1.0 ] WILD VETCH  
*Vicia americana*

#### Graminoid

- [ 2.5 ] PURPLE OAT GRASS  
*Schizachne purpurascens*

### Environmental Variables

Moisture Regime: Subhygric (moderately moist) (2), Hygric (moist) (2)

Nutrient Regime: Permesotrophic (rich) (3), Mesotrophic (medium) (1)

Elevation (range): 1322 (1322-1322) M

Slope (%): level (3), very strong slope (1)

Aspect: Level (3), Westerly (1)

Topographic Position: Lower Slope (1)

### Soil Variables

Soil Drainage: Imperfectly drained (1)

Soil Subgroup: GLEYED GRAY LUVISOL (1)

Surface Texture: Silt loam (2), Silty Sand (1)

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (4)

Parent Material: Colluvial (1)

Soil Type:

Humus Form FIBRIMOR (1)

### LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

## Mce5 Sw/Horsetail (n=4)

### (*Picea glauca*/*Equisetum arvense*)

This community type represents one of the wettest and most nutrient-rich forest conditions in the Montane. Seepage and high water tables can be expected. Nutrient levels are high resulting in high diversity in shrub and forb layers. Generally, there is little palatable forage for domestic livestock and this community type should be rated as non-use. This community type occupies Lotic coniferous range sites.

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** f horsetail (hygric/rich)

**Ecosite Phase:** f2 horsetail Sw

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Overstory Tree</b>					Ecological Status Score: 25
WHITE SPRUCE ( <i>Picea glauca</i> )	67.5	60.0-70.0	100		Moisture Regime: Subhygric (moderately moist) (2), Hygric (moist) (2)
BALSAM POPLAR ( <i>Populus balsamifera</i> )	5.1	0.0-10.0	75		Nutrient Regime: Permesotrophic (rich) (3), Mesotrophic (medium) (1)
<b>Medium Shrub (0.5 to 2 m)</b>					Elevation (range): 1322 (1322-1322) M
WILD RED RASPBERRY ( <i>Rubus idaeus</i> )	5.2	0.0-20.0	75		Slope (%): 0 - 0.49 (3), 31 - 45.99 (1)
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	2.5	0.0-10.0	25		Aspect: Level (3), Westerly (1)
UNDIFFERENTIATED ROSE ( <i>Rosa</i> )	1.6	0.0-3.0	75		Topographic Position: Lower Slope (1)
<b>Tall Forb (&gt;= 30 cm)</b>					<b>Soil Variables</b>
COMMON HORSETAIL ( <i>Equisetum arvense</i> )	25.0	10.0-40.0	100		Soil Drainage: Imperfectly drained (1)
WILD WHITE GERANIUM ( <i>Geranium richardsonii</i> )	5.8	0.5-10.0	100		Soil Subgroup: GLEYED GRAY LUVISOL (1)
RED AND WHITE BANE BERRY ( <i>Actaea rubra</i> )	2.6	0.0-10.0	50		Surface Texture: Silt loam (2), Silty Sand (1)
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	2.5	0.0-10.0	25		Effective Texture:
SPREADING SWEET CICELY ( <i>Osmorhiza depauperata</i> )	1.7	0.5-3.0	100		Depth to Mottles/Gley:
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	1.6	0.0-3.0	75		Organic Thickness: 0 - 5 cm (4)
VEINY MEADOW RUE ( <i>Thalictrum venulosum</i> )	1.6	0.0-3.0	75		Parent Material: Colluvial (1)
STAR-FLOWERED SOLOMON'S-SEAL ( <i>Smilacina stellata</i> )	1.1	0.5-3.0	100		Soil Type:
WILD VETCH ( <i>Vicia americana</i> )	1.0	0.0-3.0	75		Humus Form FIBRIMOR (1)
<b>Low Forb (&lt; 30 cm)</b>					<b>LFH Thickness</b>
WESTERN CANADA VIOLET ( <i>Viola canadensis</i> )	10.1	0.0-30.0	75		<b>Mean</b>
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	2.3	0.5-3.0	100		<b>Min</b>
COMMON DANDELION ( <i>Taraxacum officinale</i> )	1.6	0.0-3.0	75		<b>Max</b>
BUNCHBERRY ( <i>Cornus canadensis</i> )	1.5	0.0-3.0	50		<b>Count</b>
<b>Graminoid</b>					cm:
PURPLE OAT GRASS ( <i>Schizachne purpurascens</i> )	2.5	0.0-10.0	25		0.00
					0.00
					0.00
					0

### f3 horsetail shrubland (n=7)

Natural Subregion: Montane

Ecosection: Mc Montane Cypress Hills Ecosection

Ecosite: f horsetail (hygric/rich)

#### Characteristic Species

##### Shrub

- [ 80.0 ] BEAKED WILLOW\*  
*Salix bebbiana*
- [ 3.0 ] FLAT-LEAVED WILLOW\*  
*Salix planifolia*
- [ 3.0 ] PRICKLY ROSE  
*Rosa acicularis*
- [ 3.0 ] SNOWBERRY (BUCKBRUSH)  
*Symphoricarpos occidentalis*

##### Forb

- [ 10.0 ] STAR-FLOWERED SOLOMON'S-SEAL  
*Smilacina stellata*
- [ 10.0 ] CANADA GOLDENROD  
*Solidago canadensis*
- [ 10.0 ] COMMON HORSETAIL  
*Equisetum arvense*
- [ 3.0 ] WESTERN MEADOW RUE  
*Thalictrum occidentale*
- [ 3.0 ] COMMON DANDELION  
*Taraxacum officinale*
- [ 3.0 ] UNDIFFERENTIATED SONCHUS  
*Sonchus*
- [ 3.0 ] UNDIFFERENTIATED VIOLA  
*Viola*
- [ 3.0 ] WILD MINT  
*Mentha arvensis*

##### Graminoid

- [ 20.0 ] AWNLESS BROME  
*Bromus inermis*
- [ 10.0 ] AWNED SEDGE  
*Carex atherodes*
- [ 3.0 ] KENTUCKY BLUEGRASS  
*Poa pratensis*

#### Environmental Variables

Moisture Regime: Subhygric (moderately moist) (3), Hygric (moist) (1), Mesic (fresh) (1), Submesic (moderately fresh) (1)

Nutrient Regime: Permesotrophic (rich) (4), Mesotrophic (medium) (3)

Elevation (range): 1221 (1154-1328) M

Slope (%): level (3), nearly level (2), very strong slope (1), moderate slope (1)

Aspect: Easterly (3), Level (2), Northerly (1)

Topographic Position: Midslope (3), Level (1), Lower Slope (1), Toe (1)

#### Soil Variables

Soil Drainage: Imperfectly drained (3), Moderately well drained (2), Well drained (1), Poorly drained (1)

Soil Subgroup: CALCAREOUS BLACK CHERNOZEM (1), GLEYED REGO BLACK CHERNOZEM (1), REGO GLEYSOL (1), GLEYED DARK GRAY LUVISOL (1)

Surface Texture: Sandy clay (1), Loam (1)

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (6)

Parent Material: Fluvial (2), Lacustrine (2), Morainal (1)

Soil Type:

Humus Form

#### LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

# Mca14 Wild licorce (n=1)

## (*Glycyrrhiza lepidota*)

Thompson and Hansen (2002) described this community in southern Alberta on sloping banks, low terraces and recent alluvial deposits adjacent to streams and rivers. Thompson and Hansen felt this community was a pioneer community on recent alluvial deposits and in some cases it is a grazing induced climax on sites that once supported sandbar willow or cottonwood community types. In the absence of disturbance this community will likely succeed to willow and Populus species.

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** f horsetail (hygric/rich)

**Ecosite Phase:** f3 horsetail shrubland

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Medium Shrub (0.5 to 2 m)</b>				Ecological Status Score: 20-27
SANDBAR WILLOW ( <i>Salix exigua</i> )	0.5	0.5-0.5	100	Moisture Regime: Submesic (moderately fresh) (1)
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	0.5	0.5-0.5	100	Nutrient Regime: Mesotrophic (medium) (1)
<b>Tall Forb (&gt;= 30 cm)</b>				Elevation (range): 1154 (1154-1154) M
WILD LICORICE ( <i>Glycyrrhiza lepidota</i> )	70.0	70.0-70.0	100	Slope (%): 31 - 45.99 (1)
WILD VETCH ( <i>Vicia americana</i> )	10.0	10.0-10.0	100	Aspect: Easterly (1)
CANADA THISTLE ( <i>Cirsium arvense</i> )	0.5	0.5-0.5	100	Topographic Position: Lower Slope (1)
<b>Low Forb (&lt; 30 cm)</b>				<b>Soil Variables</b>
WHITE CLOVER ( <i>Trifolium repens</i> )	10.0	10.0-10.0	100	Soil Drainage: Moderately well drained (1)
HORSETAIL SPECIES ( <i>Equisetum</i> )	3.0	3.0-3.0	100	Soil Subgroup: CALCAREOUS BLACK CHERNOZEM (1)
<b>Graminoid</b>				Surface Texture:
MEADOW FESCUE ( <i>Festuca pratensis</i> )	10.0	10.0-10.0	100	Effective Texture:
TIMOTHY ( <i>Phleum pratense</i> )	10.0	10.0-10.0	100	Depth to Mottles/Gley:
AWNLESS BROME ( <i>Bromus inermis</i> )	3.0	3.0-3.0	100	Organic Thickness: 0 - 5 cm (1)
WIRE RUSH ( <i>Juncus balticus</i> )	3.0	3.0-3.0	100	Parent Material: Morainal (1)
				Soil Type:
				Humus Form
				<b>LFH Thickness</b>
				<b>Mean</b>
				<b>Min</b>
				<b>Max</b>
				<b>Count</b>
				cm:
				0.00
				0.00
				0.00
				0

## Mcb6 Beaked willow/Horsetail (n=1)

### (*Salix bebbiana*/*Equisetum arvense*)

This community type is relatively abundant in the Cypress Hills. Corns and Achuff (1982) described a similar community type on hygric, level to gently sloping fluvial landforms of various aspects. The soils are imperfectly to poorly drained and are subject to periodic flooding and sediment deposition. Tree cover is absent and willow cover is high. Field horsetail is the dominant herb. Other species may also be found, such as dwarf shrubs and sedges, however, these are minor components. This community type is usually disturbed by livestock grazing and is often dominated by Kentucky bluegrass, timothy and buttercup in the understory.

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** f horsetail (hygric/rich)

**Ecosite Phase:** f3 horsetail shrubland

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Medium Shrub (0.5 to 2 m)</b>				Ecological Status Score: 40
BEAKED WILLOW ( <i>Salix bebbiana</i> )	80.0	80.0-80.0	100	Moisture Regime: Hygric (moist) (1)
PRICKLY ROSE ( <i>Rosa acicularis</i> )	3.0	3.0-3.0	100	Nutrient Regime: Mesotrophic (medium) (1), Permesotrophic (rich) (1)
FLAT-LEAVED WILLOW ( <i>Salix planifolia</i> )	3.0	3.0-3.0	100	Elevation (range): 1237 (1237-1237) M
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	3.0	3.0-3.0	100	Slope (%): 0 - 0.49 (1)
				Aspect:
				Topographic Position: Toe (1)
<b>Tall Forb (&gt;= 30 cm)</b>				<b>Soil Variables</b>
COMMON HORSETAIL ( <i>Equisetum arvense</i> )	10.0	10.0-10.0	100	Soil Drainage: Poorly drained (1)
STAR-FLOWERED SOLOMON'S-SEAL ( <i>Smilacina stellata</i> )	10.0	10.0-10.0	100	Soil Subgroup: REGO GLEYSOL (1)
CANADA GOLDENROD ( <i>Solidago canadensis</i> )	10.0	10.0-10.0	100	Surface Texture:
WILD MINT ( <i>Mentha arvensis</i> )	3.0	3.0-3.0	100	Effective Texture:
WESTERN MEADOW RUE ( <i>Thalictrum occidentale</i> )	3.0	3.0-3.0	100	Depth to Mottles/Gley:
				Organic Thickness: 0 - 5 cm (1)
				Parent Material: Lacustrine (1)
				Soil Type:
				Humus Form
<b>Low Forb (&lt; 30 cm)</b>				
COMMON DANDELION ( <i>Taraxacum officinale</i> )	3.0	3.0-3.0	100	
<b>Graminoid</b>				
AWNLESS BROME ( <i>Bromus inermis</i> )	20.0	20.0-20.0	100	<b>LFH Thickness</b>
AWNED SEDGE ( <i>Carex atherodes</i> )	10.0	10.0-10.0	100	Mean
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	3.0	3.0-3.0	100	Min
				Max
				Count
<b>Not Applicable</b>				cm:
UNDIFFERENTIATED SONCHUS ( <i>Sonchus</i> )	3.0	3.0-3.0	100	0.00
UNDIFFERENTIATED VIOLA ( <i>Viola</i> )	3.0	3.0-3.0	100	0.00
				0.00
				0



## Mcb7 Beaked willow/Kentucky bluegrass/Tall buttercup (n=2)

(*Salix bebbiana*/*Poa pratensis*/*Ranunculus acris*)

This community type is very similar to the Beaked willow/Horsetail community type, however, this community type has been altered by grazing. The grazing pressure or flood disturbance has promoted the establishment of timothy, Kentucky bluegrass and tall buttercup. These sites are often very productive because of the higher nutrients and moisture and once Kentucky bluegrass and timothy become established these sites will be readily grazed by livestock. In the absence of disturbance this type will likely succeed to white spruce.

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** f horsetail (hygric/rich)

**Ecosite Phase:** f3 horsetail shrubland

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Tall Shrub (2 to 5m)</b>				Ecological Status Score: 15-20
BEAKED WILLOW ( <i>Salix bebbiana</i> )	25.0	10.0-40.0	100	Moisture Regime: Subhygric (moderately moist) (2)
FALSE MOUNTAIN WILLOW ( <i>Salix pseudomonticola</i> )	1.5	0.0-3.0	50	Nutrient Regime: Permesotrophic (rich) (2)
<b>Tall Forb (&gt;= 30 cm)</b>				Elevation (range): 0 (0-0) M
TALL BUTTERCUP ( <i>Ranunculus acris</i> )	15.0	10.0-20.0	100	Slope (%): 0 - 0.49 (2)
WILD WHITE GERANIUM ( <i>Geranium richardsonii</i> )	6.5	3.0-10.0	100	Aspect: Level (2)
WATER-HEMLOCK ( <i>Cicuta maculata</i> )	1.5	0.0-3.0	50	Topographic Position: Level (1)
NORTHERN WILLOWHERB ( <i>Epilobium ciliatum</i> )	1.5	0.0-3.0	50	<b>Soil Variables</b>
COMMON HORSETAIL ( <i>Equisetum arvense</i> )	1.5	0.0-3.0	50	Soil Drainage: Moderately well drained (1), Imperfectly drained (1)
YELLOW AVENS ( <i>Geum aleppicum</i> )	1.5	0.0-3.0	50	Soil Subgroup:
WILD MINT ( <i>Mentha arvensis</i> )	1.5	0.0-3.0	50	Surface Texture: Loam (1), Sandy clay (1)
GRACEFUL CINQUEFOIL ( <i>Potentilla gracilis</i> )	1.5	0.0-3.0	50	Effective Texture:
<b>Low Forb (&lt; 30 cm)</b>				Depth to Mottles/Gley:
COMMON DANDELION ( <i>Taraxacum officinale</i> )	10.2	0.5-20.0	100	Organic Thickness: 0 - 5 cm (2)
WHITE CLOVER ( <i>Trifolium repens</i> )	10.0	10.0-10.0	100	Parent Material:
<b>Graminoid</b>				Soil Type:
TIMOTHY ( <i>Phleum pratense</i> )	35.0	20.0-50.0	100	Humus Form
WIRE RUSH ( <i>Juncus balticus</i> )	6.5	3.0-10.0	100	<b>LFH Thickness</b>
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	6.5	3.0-10.0	100	Mean
REDTOP ( <i>Agrostis stolonifera</i> )	5.0	0.0-10.0	50	Min
SMALL BOTTLE SEDGE ( <i>Carex utriculata</i> )	5.0	0.0-10.0	50	Max
FOWL MANNA GRASS ( <i>Glyceria striata</i> )	5.0	0.0-10.0	50	Count
				cm:
				0.00
				0.00
				0.00
				0

## Mcb8 Hawthorne-Snowberry-Chokecherry (n=3)

### (*Crataegus rotundifolia*-*Symphoricarpos occidentalis*-*Prunus virginiana*)

Thompson and Hansen (2002) described hawthorne communities on sites disturbed by long term heavy grazing. They found the greatest occurrence along drainages, valley bottoms and seepages throughout the Cypress Hills. Hawthorne communities tend to form dense thickets that are impenetrable to livestock. Consequently this community type should be rated as non-use.

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** f horsetail (hygric/rich)

**Ecosite Phase:** f3 horsetail shrubland

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Understory Tree</b>					Ecological Status Score: 15-20
BALSAM POPLAR ( <i>Populus balsamifera</i> )	1.6	0.0-5.0	33		Moisture Regime: Mesic (fresh) (1), Subhygric (moderately moist) (1)
ASPEN ( <i>Populus tremuloides</i> )	1.6	0.0-5.0	33		Nutrient Regime: Mesotrophic (medium) (1), Permesotrophic (rich) (1)
<b>Tall Shrub (2 to 5m)</b>					Elevation (range): 1273 (1241-1328) M
DOUGLAS HAWTHORN ( <i>Crataegus douglasii</i> )	32.0	0.0-96.0	33		Slope (%): 0.5 - 2.49 (2), 10 - 15.99 (1)
<b>Medium Shrub (0.5 to 2 m)</b>					Aspect: Easterly (2), Northerly (1)
ROUND-LEAVED HAWTHORN ( <i>Crataegus rotundifolia</i> )	46.6	0.0-70.0	67		Topographic Position: Midslope (3)
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	11.3	1.0-30.0	100		<b>Soil Variables</b>
CHOKE CHERRY ( <i>Prunus virginiana</i> )	3.6	0.0-10.0	67		Soil Drainage: Imperfectly drained (2), Well drained (1)
PRICKLY ROSE ( <i>Rosa acicularis</i> )	2.0	0.0-3.0	67		Soil Subgroup: GLEYED REGO BLACK CHERNOZEM (1), GLEYED DARK GRAY LUVISOL (1)
BEAKED WILLOW ( <i>Salix bebbiana</i> )	1.0	0.0-3.0	33		Surface Texture:
<b>Tall Forb (&gt;= 30 cm)</b>					Effective Texture:
SPREADING SWEET CICELY ( <i>Osmorhiza depauperata</i> )	5.5	0.0-16.0	67		Depth to Mottles/Gley:
COW PARSNIP ( <i>Heraclium lanatum</i> )	4.6	1.0-10.0	100		Organic Thickness: 0 - 5 cm (2)
WILD WHITE GERANIUM ( <i>Geranium richardsonii</i> )	3.3	0.0-10.0	33		Parent Material: Fluvial (2), Lacustrine (1)
COMMON NETTLE ( <i>Urtica dioica</i> )	1.3	0.0-3.0	67		Soil Type:
MEADOW HORSETAIL ( <i>Equisetum pratense</i> )	1.0	0.0-3.0	33		Humus Form
<b>Low Forb (&lt; 30 cm)</b>					<b>LFH Thickness</b>
WESTERN CANADA VIOLET ( <i>Viola canadensis</i> )	9.3	0.0-25.0	67		<b>Mean</b>
COMMON YARROW ( <i>Achillea millefolium</i> )	3.5	0.0-10.0	67		<b>Min</b>
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	2.3	1.0-3.0	100		<b>Max</b>
COMMON DANDELION ( <i>Taraxacum officinale</i> )	2.3	1.0-3.0	100		<b>Count</b>
<b>Graminoid</b>					cm:
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	11.0	0.0-30.0	67		0.00
SPRENGEL'S SEDGE ( <i>Carex sprengelii</i> )	7.5	0.5-20.0	100		0.00
					0.00
					0

## g fen (subhydrich/rich) (n=5)

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

### General Description

---

The rich and poor fen are combined in this ecosite. The fen ecosite is generally characterized by flowing oxygenated water and alkaline, nutrient-rich conditions. This ecosite occupies level, depressional and lower slope positions where impeded drainage or high water tables enhance the accumulation of organic matter consisting of sedges, golden moss, tufted moss, and brown moss. Black spruce, white spruce, and/or tamarack dominate the sparse canopy on the treed phase, although there were no communities described in the treed phase of this ecosection. Willow forms the canopy of the shrubby phase and sedges dominate the graminoid phase of this ecosite.



### Environmental Variables

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**Moisture Regime:** Subhydrich (moderately wet) (2), Subhygric (moderately moist) (1), Hydrich (wet) (1), Hygric (moist) (1)

**Nutrient Regime:** Permesotrophic (rich) (3), Submesotrophic (poor) (1), Eutrophic (very rich) (1)

**Elevation (range):** 1210.67 (1191-1221) M

**Slope (%):** level (4), nearly level (1)

**Aspect:** Level (4), Southerly (1)

**Topographic Position:** Depression (2), Level (1), Toe (1)

### Soil Variables

---

**Soil Drainage:** Poorly drained (2), Very poorly drained (1), Imperfectly drained (1)

**Soil Subgroup:** REGO GLEYSOL (1)

**Surface Texture:** Silt (2), Organic (1)

**Effective Texture:**

**Depth to Mottles/Gley:**

**Organic Thickness:** 0 - 5 cm (5)

**Parent Material:** Fluvial (1)

**Soil Type:**

**Humus Form**

### Successional Relationships

---

On calcareous materials black spruce may be replaced by white spruce as the climax tree species on the treed phase. Species composition and direction of succession changes with changing hydrologic regime. As with other wetlands, fens have slow successional rates so recovery from disturbance may also be slow.

### Indicator Species

---

#### Shrub

BEAKED WILLOW

*Salix bebbiana*

MYRTLE-LEAVED WILLOW

*Salix myrtillofolia*

FLAT-LEAVED WILLOW

*Salix planifolia*

#### Graminoid

WIRE RUSH

*Juncus balticus*

BLUEJOINT

*Calamagrostis canadensis*

WATER SEDGE

*Carex aquatilis*

AWNED SEDGE

*Carex atherodes*

SMALL BOTTLE SEDGE

*Carex utriculata*

# g1 treed fen (n=0)

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** g fen (subhydric/rich)

## General Description

---

A number of ecological site phases currently have no data. These ecological site phases have been created as place holders because they were described in the other ecosections.

## Characteristic Species

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## Environmental Variables

---

Moisture Regime:

Nutrient Regime:

Elevation (range):

Slope (%):

Aspect:

Topographic Position:

## Soil Variables

---

Soil Drainage:

Soil Subgroup:

Surface Texture:

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness:

Parent Material:

Soil Type:

Humus Form

## g2 shrubby fen (n=1)

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** g fen (subhydric/rich)

### Characteristic Species

#### Tree

- [ 5.0 ] WHITE SPRUCE  
*Picea glauca*

#### Shrub

- [ 30.0 ] FLAT-LEAVED WILLOW\*  
*Salix planifolia*
- [ 20.0 ] MYRTLE-LEAVED WILLOW\*  
*Salix myrtillifolia*
- [ 10.0 ] FALSE MOUNTAIN WILLOW  
*Salix pseudomonticola*
- [ 10.0 ] BEAKED WILLOW\*  
*Salix bebbiana*
- [ 3.0 ] RED-OSIER DOGWOOD  
*Cornus stolonifera*

#### Forb

- [ 20.0 ] WHITE CLOVER  
*Trifolium repens*
- [ 3.0 ] COMMON DANDELION  
*Taraxacum officinale*
- [ 3.0 ] COMMON HORSETAIL  
*Equisetum arvense*
- [ 3.0 ] LATE GOLDENROD  
*Solidago gigantea*

#### Graminoid

- [ 10.0 ] TIMOTHY  
*Phleum pratense*
- [ 10.0 ] KENTUCKY BLUEGRASS  
*Poa pratensis*
- [ 3.0 ] REDTOP  
*Agrostis stolonifera*
- [ 3.0 ] SMALL BOTTLE SEDGE\*  
*Carex utriculata*
- [ 3.0 ] REED CANARY GRASS  
*Phalaris arundinacea*

### Environmental Variables

Moisture Regime: Hygric (moist) (1)  
Nutrient Regime: Permesotrophic (rich) (1)  
Elevation (range): 1191 (1191-1191) M  
Slope (%): nearly level (1)  
Aspect: Southerly (1)  
Topographic Position: Toe (1)

### Soil Variables

Soil Drainage: Poorly drained (1)  
Soil Subgroup: REGO GLEYSOL (1)  
Surface Texture:  
Effective Texture:  
Depth to Mottles/Gley:  
Organic Thickness: 0 - 5 cm (1)  
Parent Material: Fluvial (1)  
Soil Type:  
Humus Form

## Mcb10 Flat leaved willow/Timothy (n=1)

### (*Salix planifolia*/*Phleum pratense*)

This community type represents a disturbed willow shrubland. *Salix planifolia* prefers areas where the water table is shallow, and is found adjacent to riparian areas, fens, swamps and lakeshores. Heavy grazing of this type has affected the understory vegetation allowing an increase in quackgrass and Kentucky bluegrass on the drier areas. The proximity to water and shallow water table would explain the heavy use by livestock as well as the high production. Care must be taken to ensure that the riparian habitat is not over-used by livestock.

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** g fen (subhydric/rich)

**Ecosite Phase:** g2 shrubby fen

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Understory Tree</b>				Ecological Status Score: 20-27
WHITE SPRUCE ( <i>Picea glauca</i> )	5.0	5.0-5.0	100	Moisture Regime: Hygric (moist) (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Nutrient Regime: Permesotrophic (rich) (1)
FLAT-LEAVED WILLOW ( <i>Salix planifolia</i> )	30.0	30.0-30.0	100	Elevation (range): 1191 (1191-1191) M
MYRTLE-LEAVED WILLOW ( <i>Salix myrtillifolia</i> )	20.0	20.0-20.0	100	Slope (%): 0.5 - 2.49 (1)
BEAKED WILLOW ( <i>Salix bebbiana</i> )	10.0	10.0-10.0	100	Aspect: Southerly (1)
FALSE MOUNTAIN WILLOW ( <i>Salix pseudomonticola</i> )	10.0	10.0-10.0	100	Topographic Position: Toe (1)
RED-OSIER DOGWOOD ( <i>Cornus stolonifera</i> )	3.0	3.0-3.0	100	<b>Soil Variables</b>
<b>Tall Forb (&gt;= 30 cm)</b>				Soil Drainage: Poorly drained (1)
COMMON HORSETAIL ( <i>Equisetum arvense</i> )	3.0	3.0-3.0	100	Soil Subgroup: REGO GLEYSOL (1)
LATE GOLDENROD ( <i>Solidago gigantea</i> )	3.0	3.0-3.0	100	Surface Texture:
<b>Low Forb (&lt; 30 cm)</b>				Effective Texture:
WHITE CLOVER ( <i>Trifolium repens</i> )	20.0	20.0-20.0	100	Depth to Mottles/Gley:
COMMON DANDELION ( <i>Taraxacum officinale</i> )	3.0	3.0-3.0	100	Organic Thickness: 0 - 5 cm (1)
<b>Graminoid</b>				Parent Material: Fluvial (1)
TIMOTHY ( <i>Phleum pratense</i> )	10.0	10.0-10.0	100	Soil Type:
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	10.0	10.0-10.0	100	Humus Form
REDTOP ( <i>Agrostis stolonifera</i> )	3.0	3.0-3.0	100	
SMALL BOTTLE SEDGE ( <i>Carex utriculata</i> )	3.0	3.0-3.0	100	
REED CANARY GRASS ( <i>Phalaris arundinacea</i> )	3.0	3.0-3.0	100	

### g3 graminoid fen (n=4)

Natural Subregion: Montane

Ecosection: Mc Montane Cypress Hills Ecosection

Ecotope: g fen (subhydric/rich)

#### Characteristic Species

##### Forb

- [ 1.5 ] WATER SMARTWEED  
*Polygonum amphibium*
- [ 0.2 ] COMMON HORSETAIL  
*Equisetum arvense*

##### Graminoid

- [ 48.7 ] WIRE RUSH\*  
*Juncus balticus*
- [ 26.2 ] AWNED SEDGE\*  
*Carex atherodes*
- [ 16.7 ] SMALL BOTTLE SEDGE  
*Carex utriculata*
- [ 5.0 ] WATER SEDGE\*  
*Carex aquatilis*
- [ 1.5 ] TUFTED HAIR GRASS  
*Deschampsia cespitosa*
- [ 0.5 ] BROOK GRASS  
*Catabrosa aquatica*
- [ 0.2 ] BLUEJOINT\*  
*Calamagrostis canadensis*
- [ 0.2 ] NORTHERN REED GRASS  
*Calamagrostis inexpectata*
- [ 0.2 ] TIMOTHY  
*Phleum pratense*

#### Environmental Variables

Moisture Regime: Subhydric (moderately wet) (2), Hydric (wet) (1), Subhydric (moderately moist) (1)

Nutrient Regime: Permesotrophic (rich) (2), Submesotrophic (poor) (1), Eutrophic (very rich) (1)

Elevation (range): 1220 (1219-1221) M

Slope (%): level (4)

Aspect: Level (4)

Topographic Position: Depression (2), Level (1)

#### Soil Variables

Soil Drainage: Imperfectly drained (1), Poorly drained (1), Very poorly drained (1)

Soil Subgroup:

Surface Texture: Silt (2), Organic (1)

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (4)

Parent Material:

Soil Type:

Humus Form

## Mca15 Sedge meadows (n=3)

### (*Carex aquatilis*-*Carex utriculata*)

This community type is found in all subregions of Alberta. Wet conditions and periodic flooding result in the formation of sedge meadows. Willow will invade into the drier edges of these meadows to form the Willow/Sedge community types. These community types are quite productive producing nearly 2000 kg/ha of forage, but the high water table in the spring and summer when these meadows are most palatable limits livestock use. A study in the Yukon found that crude protein on these meadows declined from a high of 10% in May to less than 5% in September (Bailey et al. 1992). As a result, these meadows would be rated as secondary or non-use range.

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** g fen (subhydric/rich)

**Ecosite Phase:** g3 graminoid fen

#### Plant Composition

#### Canopy Cover (%)

	Mean	Range	Const.
<b>Graminoid</b>			
AWNED SEDGE ( <i>Carex atherodes</i> )	52.5	0.0-97.5	67
SMALL BOTTLE SEDGE ( <i>Carex utriculata</i> )	33.5	0.5-60.0	100
WATER SEDGE ( <i>Carex aquatilis</i> )	10.1	0.0-30.0	67
BROOK GRASS ( <i>Catabrosa aquatica</i> )	1.0	0.0-3.0	33

#### Environmental Variables

Ecological Status Score: 40

Moisture Regime: Subhydric (moderately wet) (2), Hydric (wet) (1)

Nutrient Regime: Permesotrophic (rich) (2), Eutrophic (very rich) (1)

Elevation (range): 1220 (1219-1221) M

Slope (%): 0 - 0.49 (3)

Aspect: Level (3)

Topographic Position: Depression (2)

#### Soil Variables

Soil Drainage: Poorly drained (1), Very poorly drained (1)

Soil Subgroup:

Surface Texture: Organic (1), Silt (1)

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (3)

Parent Material:

Soil Type:

Humus Form



## Mca16 Baltic rush (n=1)

### (*Juncus balticus*)

Depending on seasonal moisture regime varying amounts of sedge or conversely grass species such as northern reed grass will be associated with this community. Generally, sites which have been more heavily grazed will also include Kentucky bluegrass and foxtail barley. This community type can be found in bands around ponds and depressional areas.

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** g fen (subhydic/rich)

**Ecosite Phase:** g3 graminoid fen

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Tall Forb (&gt;= 30 cm)</b>				Ecological Status Score: 40
WATER SMARTWEED ( <i>Polygonum amphibium</i> )	3.0	3.0-3.0	100	Moisture Regime: Subhydic (moderately moist) (1)
COMMON HORSETAIL ( <i>Equisetum arvense</i> )	0.5	0.5-0.5	100	Nutrient Regime: Submesotrophic (poor) (1)
<b>Graminoid</b>				Elevation (range): 1221 (1221-1221) M
WIRE RUSH ( <i>Juncus balticus</i> )	97.5	97.5-97.5	100	Slope (%): 0 - 0.49 (1)
TUFTED HAIR GRASS ( <i>Deschampsia cespitosa</i> )	3.0	3.0-3.0	100	Aspect: Level (1)
BLUEJOINT ( <i>Calamagrostis canadensis</i> )	0.5	0.5-0.5	100	Topographic Position: Level (1)
NORTHERN REED GRASS ( <i>Calamagrostis inexpansa</i> )	0.5	0.5-0.5	100	<b>Soil Variables</b>
TIMOTHY ( <i>Phleum pratense</i> )	0.5	0.5-0.5	100	Soil Drainage: Imperfectly drained (1)
				Soil Subgroup:
				Surface Texture: Silt (1)
				Effective Texture:
				Depth to Mottles/Gley:
				Organic Thickness: 0 - 5 cm (1)
				Parent Material:
				Soil Type:
				Humus Form

## h marsh (hydric/rich) (n=3)

**Natural Subregion:** Montane

### General Description

---

The marsh ecosite is found in level and depressional areas along shorelines of water bodies and in riparian zone. The water is above the rooting zone for at least part of the growing season. These ecosites are dominated by a wide variety of emergent sedges and rushes. This ecosite is not common in the Montane subregion, but can be found in the Cypress Hills in southern Alberta.



### Successional Relationships

---

The marsh ecosite characterizes the beginning stages of hydrarch succession. It can be thought of as successional stable with changes in plant community composition being determined largely by disturbance regime.

### Indicator Species

---

#### Forb

COMMON CATTAIL  
*Typha latifolia*

#### Graminoid

GREAT BULRUSH  
*Scirpus acutus*  
CREEPING SPIKE-RUSH  
*Eleocharis palustris*

**Ecosection:** Mc Montane Cypress Hills Ecosection

### Environmental Variables

---

Moisture Regime: Hydric (wet) (1), Hygric (moist) (1)  
Nutrient Regime: Eutrophic (very rich) (2), Permesotrophic (rich) (1)  
Elevation (range): 1271 (1219-1375) M  
Slope (%): level (3)  
Aspect: Level (3)  
Topographic Position: Depression (1), Level (0)

### Soil Variables

---

Soil Drainage: Very poorly drained (2), Poorly drained (1)  
Soil Subgroup:  
Surface Texture:  
Effective Texture:  
Depth to Mottles/Gley:  
Organic Thickness: 0 - 5 cm (2)  
Parent Material:  
Soil Type:  
Humus Form

# h1 marsh (n=3)

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** h marsh (hydric/rich)

## Characteristic Species

### Forb

- [ 32.5 ] COMMON CATTAIL\*  
*Typha latifolia*

### Graminoid

- [ 32.5 ] CREEPING SPIKE-RUSH\*  
*Eleocharis palustris*
- [ 32.5 ] GREAT BULRUSH\*  
*Scirpus acutus*

## Environmental Variables

Moisture Regime: Hygric (moist) (1), Hydric (wet) (1)

Nutrient Regime: Eutrophic (very rich) (2), Permesotrophic (rich) (1)

Elevation (range): 1271 (1219-1375) M

Slope (%): level (3)

Aspect: Level (3)

Topographic Position: Depression (1), Level (0)

## Soil Variables

Soil Drainage: Very poorly drained (2), Poorly drained (1)

Soil Subgroup:

Surface Texture:

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (2)

Parent Material:

Soil Type:

Humus Form

## Mca17 Creeping spike rush (n=1)

### (*Eleocharis palustris*)

Thompson and Hansen (2002) described this type on somewhat alkaline sites in narrow bands along streams, rivers, lake margins and reservoirs. These sites are subject to yearly flooding. Typically these sites are almost pure stands of creeping spike rush. Creeping spike rush is generally unpalatable to livestock and the wet conditions limit livestock use. This community type should be rated as non-use.

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** h marsh (hydric/rich)

**Ecosite Phase:** h1 marsh

#### Plant Composition

#### Canopy Cover (%)

#### Environmental Variables

	Canopy Cover (%)			
	Mean	Range	Const.	
<b>Graminoid</b>				Ecological Status Score: 40
CREEPING SPIKE-RUSH ( <i>Eleocharis palustris</i> )	97.5	97.5-97.5	100	Moisture Regime: Hygric (moist) (1)
				Nutrient Regime: Permesotrophic (rich) (1)
				Elevation (range): 1375 (1375-1375) M
				Slope (%): 0 - 0.49 (1)
				Aspect: Level (1)
				Topographic Position: Depression (1)

#### Soil Variables

Soil Drainage: Poorly drained (1)

Soil Subgroup:

Surface Texture:

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness:

Parent Material:

Soil Type:

Humus Form

## Mca18 Great bulrush (n=1)

### (*Scirpus acutus*)

This community type occurs along the margins of ponds and lakes (Thompson and Hansen 2002). Great bulrush tends to be found growing in the water. Often the water is up to 2 m deep. The wet conditions and unpalatability of great bulrush limits the use of this community type. This community should be rated as non-use.

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** h marsh (hydric/rich)

**Ecosite Phase:** h1 marsh

#### Plant Composition

#### Canopy Cover (%)

#### Environmental Variables

	Canopy Cover (%)			
	Mean	Range	Const.	
<b>Graminoid</b>				Ecological Status Score: 40
GREAT BULRUSH ( <i>Scirpus acutus</i> )	97.5	97.5-97.5	100	Moisture Regime: Hydric (wet) (1)
				Nutrient Regime: Eutrophic (very rich) (1)
				Elevation (range): 1219 (1219-1219) M
				Slope (%): 0 - 0.49 (1)
				Aspect: Level (1)
				Topographic Position: Level (0)

#### Soil Variables

Soil Drainage: Very poorly drained (1)

Soil Subgroup:

Surface Texture:

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (1)

Parent Material:

Soil Type:

Humus Form

## Mca19 Cattail (n=1)

*(Typha latifolia)*

This community type is associated with standing water. Thompson and Hansen (2002) have found that the saturated or inundated conditions tend to limit species diversity. The wet conditions limit use by domestic livestock and this community type should be rated as non-use.

**Natural Subregion:** Montane

**Ecosection:** Mc Montane Cypress Hills Ecosection

**Ecosite:** h marsh (hydric/rich)

**Ecosite Phase:** h1 marsh

### Plant Composition

### Canopy Cover (%)

### Environmental Variables

	Canopy Cover (%)			
	Mean	Range	Const.	
<b>Tall Forb (&gt;= 30 cm)</b>				Ecological Status Score: 40
COMMON CATTAIL				Moisture Regime: Hydric (wet) (0)
<i>(Typha latifolia)</i>	97.5	97.5-97.5	100	Nutrient Regime: Eutrophic (very rich) (1)

Elevation (range): 1219 (1219-1219) M

Slope (%): 0 - 0.49 (1)

Aspect: Level (1)

Topographic Position: Level (0)

### Soil Variables

Soil Drainage: Very poorly drained (1)

Soil Subgroup:

Surface Texture:

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (1)

Parent Material:

Soil Type:

Humus Form

# Mn Montane North Ecosection (n=512)

Natural Subregion: Montane

## General Description

The Montane Natural Subregion includes three distinct ecosections. The Montane North Ecosection represents areas of Montane north of the Bow River Valley along the foothills into the Main Ranges along major east-west river valleys including the North Saskatchewan, Athabasca and Smoky Rivers, with a small outlier in the Red Deer River valley at the Ya-Ha-Tinda Ranch. In this ecosection the Montane subregion is bounded on the east by the Upper and Lower Foothills subregions and by the Subalpine subregion at its upper elevational limits to the west. This ecosection includes the Banff Mountains, Berland Upland, Jasper Mountains, Obed Upland, Ram River Foothills and the Willmore Foothills ecodistricts.



The high winds that are characteristic of the Athabasca River Valley redistribute fine-textured parent materials such as calcareous glacial silts. The open woodlands characteristic of steeper slopes and the valley bottom location are typical of the Montane North Ecosection.



## Environmental Variables

Elevation (range): 1248 (310-1960) M

## Ecological Sites

## Site Count

a	limber pine/juniper (subxeric/poor)	15
aa	junegrass-wheat grass (subxeric/medium)	23
b	bearberry (submesic/poor)	73
c	hairy wildrye (submesic/medium)	58
cc	rough fescue grassland (submesic/rich)	10
d	Canada buffaloberry-rose (mesic/medium)	249
e	alder-willow (mesic/rich)	25
f	balsam poplar (subhygric/rich)	4
g	meadow (subhygric/very rich)	4
h	horsetail (hygric/rich)	22
ij	fen (subhydric/rich)	27
k	marsh (hydric/rich)	2

## a limber pine/juniper (subxeric/poor) (n=15)

Natural Subregion: Montane

Ecosection: Mn Montane North Ecosection

### General Description

Dry site conditions and exposure to westerly winds characterize this ecosite. The tree canopy is generally open and a well-developed grass layer is present. This ecosite commonly occurs on exposed ridge tops or upper slope positions within the subregion. Soils are often shallow to bedrock. The limber pine dominated phase of this ecological site is rare in the northern ecosection and only a small number of limber pine dominated sites were described in the Kootenay Plains west of Rocky Mountain House within the North Saskatchewan River Valley. The majority of this ecological site is dominated by juniper and bearberry shrublands which occur on steep south and west facing slopes.



### Successional Relationships

Open Douglas-fir and limber pine stands with grassland and shrubland vegetation form an edaphic climax on these sites. Exposure and drought limit the establishment and growth rates of tree species.

### Indicator Species

#### Tree

LIMBER PINE  
*Pinus flexilis*

#### Shrub

GROUND JUNIPER  
*Juniperus communis*  
COMMON BEARBERRY  
*Arctostaphylos uva-ursi*

#### Forb

PASTURE SAGEWORT  
*Artemisia frigida*

#### Graminoid

JUNE GRASS  
*Koeleria macrantha*  
RUSH-LIKE SEDGE  
*Carex scirpoidea*

Site Index at 50 Years	Height (m)	Variation (m)	Count
LOGEPOLE PINE <i>(Pinus contorta)</i>	5.80	0.00	0
DOUGLAS-FIR <i>(Pseudotsuga menziesii)</i>	6.00	0.20	0

### Environmental Variables

Moisture Regime: Subxeric (moderately dry) (8), Xeric (dry) (3), Submesic (moderately fresh) (2)

Nutrient Regime: Mesotrophic (medium) (5), Submesotrophic (poor) (3)

Elevation (range): 1275 (1000-1480) M

Slope (%): steep slope (7), very steep slope (3), very strong slope (3), strong slope (1), nearly level (1)

Aspect: Southerly (8), Westerly (3), Northerly (2), Easterly (1)

Topographic Position: Midslope (3), Upper Slope (3)

### Soil Variables

Soil Drainage: Very rapidly drained (4), Well drained (3), Rapidly drained (3)

Soil Subgroup: ORTHIC REGOSOL (10), ORTHIC EUTRIC BRUNISOL (2), ORTHIC MELANIC BRUNISOL (1), CUMULIC REGOSOL (1)

Surface Texture: Sandy loam (2), Silt loam (1), Clay (1), Loamy sand (1)

Effective Texture: Sandy loam (2), Fine sandy loam (1), Loam (1), Loamy sand (1)

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (15)

Parent Material: Colluvial (6), Eolian (5), Rock (5), Fluvial (3), Glaciofluvial (3), Morainal (3), Sapolite (1)

Soil Type:

Humus Form MULL-LIKE MODER (1), RHIZOMULL (1)

LFH Thickness	Mean	Min	Max	Count
cm:	4.00	1.00	7.00	2



# a1 limber pine/juniper Pf (n=3)

**Natural Subregion:** Montane  
**Ecosection:** Mn Montane North Ecosection

**Ecosite:** a limber pine/juniper (subxeric/poor)

## Characteristic Species

### Tree

- [ 14.9 ] LIMBER PINE\*  
*Pinus flexilis*
- [ 1.0 ] WHITE SPRUCE  
*Picea glauca*

### Shrub

- [ 18.6 ] COMMON BEARBERRY\*  
*Arctostaphylos uva-ursi*
- [ 11.0 ] CREEPING JUNIPER  
*Juniperus horizontalis*
- [ 3.0 ] SHRUBBY CINQUEFOIL  
*Potentilla fruticosa*

### Forb

- [ 2.3 ] PASTURE SAGEWORT\*  
*Artemisia frigida*
- [ 1.0 ] TUFTED FLEABANE  
*Erigeron caespitosus*

### Graminoid

- [ 4.0 ] JUNE GRASS\*  
*Koeleria macrantha*
- [ 2.0 ] WESTERN WHEAT GRASS  
*Agropyron smithii*
- [ 1.6 ] NORTHERN WHEAT GRASS  
*Agropyron dasystachyum*

## Environmental Variables

Moisture Regime: Xeric (dry) (1), Subxeric (moderately dry) (1)  
 Nutrient Regime: Submesotrophic (poor) (1), Mesotrophic (medium) (1)  
 Elevation (range): 1398 (1372-1433) M  
 Slope (%): very strong slope (2), nearly level (1)  
 Aspect: Southerly (3)  
 Topographic Position: Midslope (2)

## Soil Variables

Soil Drainage: Well drained (2)  
 Soil Subgroup: ORTHIC REGOSOL (3)  
 Surface Texture: Silt loam (1), Loamy sand (1)  
 Effective Texture: Loamy sand (1), Sandy loam (1)  
 Depth to Mottles/Gley:  
 Organic Thickness: 0 - 5 cm (3)  
 Parent Material: Glaciofluvial (2), Rock (1), Saprolite (1), Eolian (1)  
 Soil Type:  
 Humus Form

LFH Thickness	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

# Mne1 Pf/Juniper-Bearberry (n=3)

## (*Pinus flexilis*/*Juniperus horizontalis*-*Arctostaphylos uva-ursi*)

This community type occurs on steep, exposed ridge tops and upper slope positions within the Montane subregion. It is characterized by dry site conditions and exposure to westerly winds. Soils are often shallow to bedrock (Archibald et al 1996). This community often forms an edaphic climax on these sites. Limber pine is normally associated with high elevations or timberline where it attains a Krummholz form (Kuchar 1973). This community type is more common in the Montane South Ecosession and it appears the northern limit of this species is within the Kootenay Plains. Limber pine, bearberry, juniper and the other associated species of this community type are all well adapted to the low moisture levels, high light intensity, heat and low soil nutrient levels which occur on these erosional, south-facing scarps (Kuchar 1973).

**Natural Subregion:** Montane

**Ecosession:** Mn Montane North Ecosession

**Ecosite:** a limber pine/juniper (subxeric/poor)

**Ecosite Phase:** a1 limber pine/juniper Pf

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 25
LIMBER PINE ( <i>Pinus flexilis</i> )	8.3	4.0-15.0	100	Moisture Regime: Xeric (dry) (1), Subxeric (moderately dry) (1)
<b>Understory Tree</b>				Nutrient Regime: Submesotrophic (poor) (1), Mesotrophic (medium) (1)
LIMBER PINE ( <i>Pinus flexilis</i> )	4.0	0.0-12.0	33	Elevation (range): 1398 (1372-1433) M
WHITE SPRUCE ( <i>Picea glauca</i> )	1.0	0.0-3.0	33	Slope (%): 31 - 45.99 (2), 0.5 - 2.49 (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Aspect: Southerly (3)
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	18.6	12.0-30.0	100	Topographic Position: Midslope (2)
CREeping JUNIPER ( <i>Juniperus horizontalis</i> )	11.0	0.0-18.0	67	<b>Soil Variables</b>
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	3.0	0.0-6.0	67	Soil Drainage: Well drained (2)
LIMBER PINE ( <i>Pinus flexilis</i> )	2.6	1.0-6.0	100	Soil Subgroup: ORTHIC REGOSOL (3)
<b>Low Forb (&lt; 30 cm)</b>				Surface Texture: Silt loam (1), Loamy sand (1)
PASTURE SAGEWORT ( <i>Artemisia frigida</i> )	2.3	0.0-4.0	67	Effective Texture: Loamy sand (1), Sandy loam (1)
TUFTED FLEABANE ( <i>Erigeron caespitosus</i> )	1.0	0.0-2.0	67	Depth to Mottles/Gley:
<b>Graminoid</b>				Organic Thickness: 0 - 5 cm (3)
JUNE GRASS ( <i>Koeleria macrantha</i> )	4.0	1.0-6.0	100	Parent Material: Glaciofluvial (2), Saprolite (1), Rock (1), Eolian (1)
WESTERN WHEAT GRASS ( <i>Agropyron smithii</i> )	2.0	0.0-6.0	33	Soil Type:
NORTHERN WHEAT GRASS ( <i>Agropyron dasystachyum</i> )	1.6	0.0-5.0	33	Humus Form
				<b>LFH Thickness</b>
				<b>Mean</b>
				<b>Min</b>
				<b>Max</b>
				<b>Count</b>
				cm:
				0.00
				0.00
				0.00
				0

## a2 juniper/bearberry shrub (n=12)

**Natural Subregion:** Montane  
**Ecosection:** Mn Montane North Ecosection

**Ecosite:** a limber pine/juniper (subxeric/poor)

### Characteristic Species

#### Shrub

- [ 23.1 ] COMMON BEARBERRY\*  
*Arctostaphylos uva-ursi*
- [ 4.9 ] GROUND JUNIPER\*  
*Juniperus communis*
- [ 3.1 ] CREEPING JUNIPER  
*Juniperus horizontalis*
- [ 2.6 ] SHRUBBY CINQUEFOIL  
*Potentilla fruticosa*
- [ 0.8 ] CANADA BUFFALOBERRY  
*Shepherdia canadensis*

#### Forb

- [ 2.6 ] SMALL-LEAVED PUSSYTOES  
*Antennaria parvifolia*
- [ 1.2 ] PASTURE SAGEWORT\*  
*Artemisia frigida*

#### Graminoid

- [ 2.0 ] HAIRY WILD RYE  
*Elymus innovatus*
- [ 1.3 ] RUSH-LIKE SEDGE\*  
*Carex scirpoidea*
- [ 1.2 ] NORTHERN WHEAT GRASS  
*Agropyron dasystachyum*
- [ 1.2 ] JUNE GRASS\*  
*Koeleria macrantha*

### Environmental Variables

Moisture Regime: Subxeric (moderately dry) (7), Submesic (moderately fresh) (2), Xeric (dry) (2)

Nutrient Regime: Mesotrophic (medium) (4), Submesotrophic (poor) (2)

Elevation (range): 1152 (1000-1480) M

Slope (%): steep slope (7), very steep slope (3), very strong slope (1), strong slope (1)

Aspect: Southerly (5), Westerly (3), Northerly (2), Easterly (1)

Topographic Position: Upper Slope (3), Midslope (1)

### Soil Variables

Soil Drainage: Very rapidly drained (4), Rapidly drained (3), Well drained (1)

Soil Subgroup: ORTHIC REGOSOL (7), ORTHIC EUTRIC BRUNISOL (2), ORTHIC MELANIC BRUNISOL (1), CUMULIC REGOSOL (1)

Surface Texture: Sandy loam (2), Clay (1)

Effective Texture: Loam (1), Sandy loam (1), Fine sandy loam (1)

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (12)

Parent Material: Colluvial (6), Eolian (4), Rock (4), Morainal (3), Fluvial (3), Glaciofluvial (1)

Soil Type:

Humus Form RHIZOMULL (1), MULL-LIKE MODER (1)

### LFH Thickness

	Mean	Min	Max	Count
cm:	4.00	1.00	7.00	2

## Mna7 Bearberry/Juniper (slope) (n=12)

(*Arctostaphylos uva-ursi*/*Juniperus spp.*)

This community type represents the forest-grassland ecotone on dry, rocky south facing slopes throughout the Jasper river valleys. Indeed many of the stands described in this community type were placed into Douglas fir and spruce forest types described by Corns and Achuff (1982). Lane et al. (2000), described a similar community type Low northern sedge/Bearberry on rocky hilltops in the Lower Foothills subregion near Hinton.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** a limber pine/juniper (subxeric/poor)

**Ecosite Phase:** a2 juniper/bearberry shrub

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Medium Shrub (0.5 to 2 m)</b>				Ecological Status Score: 40
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	23.1	1.0-75.0	100	Moisture Regime: Subxeric (moderately dry) (7), Submesic (moderately fresh) (2), Xeric (dry) (2)
GROUND JUNIPER ( <i>Juniperus communis</i> )	4.9	0.0-15.0	75	Nutrient Regime: Mesotrophic (medium) (4), Submesotrophic (poor) (2)
CREEPING JUNIPER ( <i>Juniperus horizontalis</i> )	3.1	0.0-30.0	17	Elevation (range): 1152 (1000-1480) M
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	2.6	0.0-10.0	83	Slope (%): 46 - 70.99 (7), 71 - 100.99 (3), 16 - 30.99 (1), 31 - 45.99 (1)
CANADA BUFFALOBERRY ( <i>Shepherdia canadensis</i> )	0.8	0.0-5.0	33	Aspect: Southerly (5), Westerly (3), Northerly (2), Easterly (1)
<b>Low Forb (&lt; 30 cm)</b>				Topographic Position: Upper Slope (3), Midslope (1)
SMALL-LEAVED PUSSYTOES ( <i>Antennaria parvifolia</i> )	2.6	0.0-30.0	25	<b>Soil Variables</b>
PASTURE SAGEWORT ( <i>Artemisia frigida</i> )	1.2	0.0-10.0	50	Soil Drainage: Very rapidly drained (4), Rapidly drained (3), Well drained (1)
<b>Graminoid</b>				Soil Subgroup: ORTHIC REGOSOL (7), ORTHIC EUTRIC BRUNISOL (2), ORTHIC MELANIC BRUNISOL (1), CUMULIC REGOSOL (1)
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	2.0	0.0-8.0	58	Surface Texture: Sandy loam (2), Clay (1)
RUSH-LIKE SEDGE ( <i>Carex scirpoidea</i> )	1.3	0.0-10.0	42	Effective Texture: Fine sandy loam (1), Loam (1), Sandy loam (1)
NORTHERN WHEAT GRASS ( <i>Agropyron dasystachyum</i> )	1.2	0.0-8.0	33	Depth to Mottles/Gley:
JUNE GRASS ( <i>Koeleria macrantha</i> )	1.2	0.0-10.0	42	Organic Thickness: 0 - 5 cm (12)
				Parent Material: Colluvial (6), Rock (4), Eolian (4), Fluvial (3), Morainal (3), Glaciofluvial (1)
				Soil Type:
				Humus Form RHIZOMULL (1), MULL-LIKE MODER (1)
				<b>LFH Thickness</b>
				<b>Mean</b> <b>Min</b> <b>Max</b> <b>Count</b>
				cm:                    4.00    1.00    7.00    2

## aa junegrass-wheat grass (subxeric/medium) (n=23)

**Natural Subregion:** Montane

### General Description

This ecosite is located on steep to shallow, south and west facing slopes throughout the Athabasca, North Saskatchewan and Smoky River valleys and the Jasper Mountain ecodistrict. The soils are regosolic and brunisolic, with medium nutrient regimes and generally have subxeric moisture regimes. The grassland communities of the northern mountain valleys are often dominated by northern wheat grass, june grass, fringed sage, western porcupine grass, sheep fescue, upland sedge, juniper and bearberry species. Grasslands are not nearly as extensive in the northern ecosection of the Montane with the majority of grassland communities in the north falling within this ecological site.



### Successional Relationships

Due to the nature of the site grasslands often remain the climax vegetation on these sites. On moister sites shrubs such as saskatoon, silverberry, snowberry and rose, often invade the site with succession to Douglas fir or Lodgepole pine. Heavy grazing pressure on the grasslands can often lead to a degraded site that is dominated by fringed sage, sedge, and little club-moss. On moister sites receiving heavy grazing pressure timothy and Kentucky bluegrass can often invade into this ecosite.

### Indicator Species

#### Shrub

PRICKLY ROSE

*Rosa acicularis*

SNOWBERRY (BUCKBRUSH)

*Symphoricarpos occidentalis*

SASKATOON

*Amelanchier alnifolia*

SILVERBERRY

*Elaeagnus commutata*

#### Forb

PASTURE SAGEWORT

*Artemisia frigida*

#### Graminoid

NORTHERN WHEAT GRASS

*Agropyron dasystachyum*

JUNE GRASS

*Koeleria macrantha*

PURPLE REED GRASS

*Calamagrostis purpurascens*

**Ecosection:** Mn Montane North Ecosection

### Environmental Variables

Moisture Regime: Subxeric (moderately dry) (14), Submesic (moderately fresh) (3), Xeric (dry) (2), Mesic (fresh) (1)

Nutrient Regime: Mesotrophic (medium) (10), Submesotrophic (poor) (4), Permesotrophic (rich) (1)

Elevation (range): 1249 (990-1720) M

Slope (%): steep slope (5), very strong slope (5), nearly level (4), very gentle slope (3), moderate slope (2), strong slope (1), very steep slope (1)

Aspect: Southerly (11), Westerly (5), Easterly (4)

Topographic Position: Midslope (5), Upper Slope (5), Level (4), Lower Slope (1)

### Soil Variables

Soil Drainage: Well drained (9), Rapidly drained (6), Moderately well drained (1)

Soil Subgroup: ORTHIC EUTRIC BRUNISOL (7), ORTHIC HUMIC REGOSOL (5), ORTHIC REGOSOL (5), CUMULIC REGOSOL (1), DARK GRAY LUVISOL (1)

Surface Texture: Loamy sand (3), Silt loam (3), Silty clay loam (2), Sand (1), Sandy loam (1)

Effective Texture: Sandy loam (4), Loamy sand (2), Sand (1), Silt loam (1), Silty clay loam (1), Clay loam (1)

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (22)

Parent Material: Fluvial (6), Rock (6), Eolian (5), Glaciofluvial (4), Morainal (4), Colluvial (1)

Soil Type:

Humus Form RHIZOMULL (4), FIBRIMOR (1)

### LFH Thickness

	Mean	Min	Max	Count
cm:	3.67	1.00	8.00	9

# aa1 grassland (n=18)

**Natural Subregion:** Montane  
**Ecosection:** Mn Montane North Ecosection

**Ecosite:** aa junegrass-wheat grass (subxeric/medium)

## Characteristic Species

### Forb

- [ 13.6 ] PASTURE SAGEWORT\*  
*Artemisia frigida*
- [ 2.6 ] DILL  
*Anethum graveolens*
- [ 1.6 ] NODDING ONION  
*Allium cernuum*
- [ 1.4 ] DRAGONWORT  
*Artemisia dracunculus*
- [ 1.0 ] UNDIFFERENTIATED LOCOWEED  
*Oxytropis*

### Graminoid

- [ 23.7 ] JUNE GRASS\*  
*Koeleria macrantha*
- [ 11.0 ] NORTHERN WHEAT GRASS\*  
*Agropyron dasystachyum*
- [ 3.5 ] SLENDER WHEAT GRASS  
*Agropyron trachycaulum*
- [ 2.5 ] ROCKY MOUNTAIN FESCUE  
*Festuca saximontana*
- [ 1.8 ] AWNLESS BROME  
*Bromus inermis*
- [ 1.2 ] PURPLE REED GRASS\*  
*Calamagrostis purpurascens*
- [ 1.2 ] HOOKER'S OAT GRASS  
*Helictotrichon hookeri*
- [ 1.0 ] WESTERN WHEAT GRASS  
*Agropyron smithii*

## Environmental Variables

Moisture Regime: Subxeric (moderately dry) (9), Submesic (moderately fresh) (3), Xeric (dry) (2), Mesic (fresh) (1)

Nutrient Regime: Mesotrophic (medium) (8), Submesotrophic (poor) (2)

Elevation (range): 1271 (990-1720) M

Slope (%): nearly level (4), very strong slope (4), very gentle slope (3), moderate slope (2), very steep slope (1), strong slope (1), steep slope (1)

Aspect: Southerly (6), Westerly (5), Easterly (4)

Topographic Position: Level (4), Midslope (3), Upper Slope (2), Lower Slope (1)

## Soil Variables

Soil Drainage: Well drained (7), Rapidly drained (3), Moderately well drained (1)

Soil Subgroup: ORTHIC EUTRIC BRUNISOL (5), ORTHIC HUMIC REGOSOL (5), ORTHIC REGOSOL (4), CUMULIC REGOSOL (1)

Surface Texture: Silt loam (3), Loamy sand (3), Silty clay loam (2), Sand (1)

Effective Texture: Sandy loam (3), Loamy sand (2), Sand (1), Clay loam (1), Silt loam (1), Silty clay loam (1)

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (17)

Parent Material: Fluvial (6), Eolian (5), Glaciofluvial (4), Rock (3), Morainal (3), Colluvial (1)

Soil Type:

Humus Form RHIZOMULL (1), FIBRIMOR (1)

## LFH Thickness

	Mean	Min	Max	Count
cm:	1.50	1.00	4.00	8

# Mna1 Fringed sage/Junegrass-Northern wheatgrass (n=15)

(*Artemisia frigida*/*Koeleria macrantha*-*Agropyron dasystachyum*)

This community type is typical of shallow to steep south facing slopes with coarse textured soils, at lower elevations in the river valleys (North Saskatchewan and Athabasca) near Banff and Jasper. It is similar to the June grass-Plains reed grass community described by Stringer (1973) near Banff and Jasper, the Purple reed grass/Fringed sage community described by Bailey et al. (1992) in the Yukon and the Fringed sage/Slender wheat grass community described by Pojar (1982) in Northern British Columbia. The prominent species of these grasslands (June grass, northern wheat grass, fringed sage, pussy toes and bearberry) are typical of xerophytic and Mixed Prairie type grasslands throughout Western Canada. The desiccating winds of the area and steep south-facing slopes would contribute to a microclimate that is similar to the Mixed Prairie subregion (Strong 1992). Grazing has also had an influence on this community type. Stringer (1973) felt that with protection from heavy wildlife grazing Plains reed grass and northern wheat grass would decrease and fringed sage and June grass would increase. Bailey et al. (1992), found that fringed sage, pussy toes, bearberry and low growing sedges increased and purple reed grass declined with increased grazing pressure on the Purple reed grass/Fringed sage community type. It would appear the dry site conditions, and heavy grazing pressure by wild ungulates have contributed to the development of this grassland community.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** aa junegrass-wheat grass (subxeric/medium)

**Ecosite Phase:** aa1 grassland

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Tall Forb (&gt;= 30 cm)</b>					Ecological Status Score: 27
DILL ( <i>Anethum graveolens</i> )	2.4	0.0-30.0	20		Moisture Regime: Subxeric (moderately dry) (7), Submesic (moderately fresh) (3), Xeric (dry) (1), Mesic (fresh) (1)
DRAGONWORT ( <i>Artemisia dracunculus</i> )	1.3	0.0-8.0	27		Nutrient Regime: Mesotrophic (medium) (7), Submesotrophic (poor) (1)
<b>Low Forb (&lt; 30 cm)</b>					Elevation (range): 1291 (990-1720) M
PASTURE SAGEWORT ( <i>Artemisia frigida</i> )	12.7	0.0-40.0	87		Slope (%): 0.5 - 2.49 (4), 2.5 - 5.99 (3), 31 - 45.99 (3), 46 - 70.99 (1), 10 - 15.99 (1), 16 - 30.99 (1)
SMALL-LEAVED PUSSYTOES ( <i>Antennaria parvifolia</i> )	2.4	0.0-30.0	20		Aspect: Easterly (4), Southerly (4), Westerly (4)
NODDING ONION ( <i>Allium cernuum</i> )	1.5	0.0-10.0	33		Topographic Position: Level (4), Midslope (2), Upper Slope (1), Lower Slope (1)
ALPINE MILK VETCH ( <i>Astragalus alpinus</i> )	1.0	0.0-15.0	13		<b>Soil Variables</b>
UNDIFFERENTIATED LOCOWEED ( <i>Oxytropis</i> )	1.0	0.0-15.0	7		Soil Drainage: Well drained (7), Moderately well drained (1), Rapidly drained (1)
<b>Graminoid</b>					Soil Subgroup: ORTHIC HUMIC REGOSOL (5), ORTHIC REGOSOL (4), ORTHIC EUTRIC BRUNISOL (3), CUMULIC REGOSOL (1)
JUNE GRASS ( <i>Koeleria macrantha</i> )	22.2	0.0-50.0	93		Surface Texture: Silt loam (3), Loamy sand (3), Silty clay loam (1), Sand (1)
NORTHERN WHEAT GRASS ( <i>Agropyron dasystachyum</i> )	10.3	0.0-39.0	60		Effective Texture: Sandy loam (3), Loamy sand (2), Sand (1), Silt loam (1), Silty clay loam (1)
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	3.3	0.0-30.0	27		Depth to Mottles/Gley:
ROCKY MOUNTAIN FESCUE ( <i>Festuca saximontana</i> )	2.4	0.0-22.0	27		Organic Thickness: 0 - 5 cm (15)
AWNLESS BROME ( <i>Bromus inermis</i> )	1.8	0.0-20.0	27		Parent Material: Fluvial (6), Eolian (5), Glaciofluvial (4), Morainal (2), Rock (2)
PURPLE REED GRASS ( <i>Calamagrostis purpurascens</i> )	1.2	0.0-8.0	27		Soil Type:
HOOKE'S OAT GRASS ( <i>Helictotrichon hookeri</i> )	1.2	0.0-18.0	7		Humus Form RHIZOMULL (1)
WESTERN WHEAT GRASS ( <i>Agropyron smithii</i> )	0.9	0.0-5.0	33		
					<b>LFH Thickness</b>
					<b>Mean</b>
					<b>Min</b>
					<b>Max</b>
					<b>Count</b>
cm:	2.00	1.00	4.00	7	

## Mna15 Western porcupine grass-Sedge (n=2)

### (*Stipa curtisetata*-*Carex obtusata*)

This community was described on the south and west facing slopes overlooking the Smoky River near Grande Cache and Solomon Creek near Brule. This community type is similar to the Western porcupine grass-Sedge dominated community described on the slopes of the Peace and Smoky Rivers in the Dry Mixedwood and Peace Parkland subregions (Stone et al. 2007). It is characteristic of the submesic, gentle to moderate slopes (5-45% or 3-24 degrees) and hillcrests of the river slopes. The site characteristics and species composition make this community type attractive to wildlife and as such can be somewhat degraded. At one site there was evidence of heavy use by elk. If left ungrazed Western porcupine grass would likely increase in cover. Continued heavy grazing pressure would cause sedge, June grass, northern and western wheat grass and fringed sage to increase as western porcupine grass declines.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** aa junegrass-wheat grass (subxeric/medium)

**Ecosite Phase:** aa1 grassland

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Medium Shrub (0.5 to 2 m)</b>				Ecological Status Score: 27-40
PRICKLY ROSE ( <i>Rosa acicularis</i> )	2.6	0.2-5.0	100	Moisture Regime: Xeric (dry) (1), Subxeric (moderately dry) (1)
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	1.7	0.0-3.4	50	Nutrient Regime: Submesotrophic (poor) (1), Mesotrophic (medium) (1)
<b>Tall Forb (&gt;= 30 cm)</b>				Elevation (range): 1192 (1175-1208) M
LOW GOLDENROD ( <i>Solidago missouriensis</i> )	1.6	0.0-3.2	50	Slope (%): 31 - 45.99 (1), 71 - 100.99 (1)
WILD BERGAMOT ( <i>Monarda fistulosa</i> )	1.5	0.0-3.0	50	Aspect: Southerly (2)
AMERICAN MILK VETCH ( <i>Astragalus americanus</i> )	1.1	0.0-2.3	50	Topographic Position: Midslope (1), Upper Slope (1)
<b>Low Forb (&lt; 30 cm)</b>				<b>Soil Variables</b>
PASTURE SAGEWORT ( <i>Artemisia frigida</i> )	4.1	3.2-5.0	100	Soil Drainage: Rapidly drained (2)
FIELD MOUSE-EAR CHICKWEED ( <i>Cerastium arvense</i> )	3.6	0.5-6.8	100	Soil Subgroup: ORTHIC EUTRIC BRUNISOL (1)
SHOWY LOCOWEED ( <i>Oxytropis splendens</i> )	1.5	1.0-2.0	100	Surface Texture: Silty clay loam (1)
SMALL-LEAVED PUSSYTOES ( <i>Antennaria parvifolia</i> )	1.3	1.0-1.6	100	Effective Texture: Clay loam (1)
<b>Graminoid</b>				Depth to Mottles/Gley:
BLUNT SEDGE ( <i>Carex obtusata</i> )	10.1	2.0-18.3	100	Organic Thickness: 0 - 5 cm (1)
WESTERN PORCUPINE GRASS ( <i>Stipa curtisetata</i> )	7.2	7.0-7.4	100	Parent Material: Colluvial (1)
WESTERN WHEAT GRASS ( <i>Agropyron smithii</i> )	4.6	0.0-9.2	50	Soil Type:
JUNE GRASS ( <i>Koeleria macrantha</i> )	3.8	1.0-6.7	100	Humus Form FIBRIMOR (1)
HOOKER'S OAT GRASS ( <i>Helictotrichon hookeri</i> )	1.0	0.0-2.1	50	
				<b>LFH Thickness</b>
				<b>Mean</b>
				<b>Min</b>
				<b>Max</b>
				<b>Count</b>
				cm:
				1.00
				1.00
				1.00
				1



## Mna5 Little club-moss/Richardson needle grass (n=1)

### (*Selaginella densa/Stipa richardsonii*)

This community type is representative of small isolated, south facing slopes within the pine-spruce-fir forests. Stringer (1973), described a similar community at higher elevations near Banff and Jasper. Stringer felt this grassland was unrelated to any grasslands in Western North America and thus seemed to be a distinct grassland type characteristic of the moister sites in the Fescue prairies-coniferous forest ecotone of Banff and Jasper

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecotope:** aa junegrass-wheat grass (subxeric/medium)

**Ecotope Phase:** aa1 grassland

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Tall Forb (&gt;= 30 cm)</b>					Ecological Status Score: 40
COMMON BLUE-EYED GRASS ( <i>Sisyrinchium montanum</i> )	2.0	2.0-2.0	100		Moisture Regime: Subxeric (moderately dry) (1)
FELWORT ( <i>Gentianella amarella</i> )	1.0	1.0-1.0	100		Nutrient Regime: Mesotrophic (medium) (0)
<b>Low Forb (&lt; 30 cm)</b>					Elevation (range): 1330 (1330-1330) M
PRAIRIE SELAGINELLA ( <i>Selaginella densa</i> )	15.0	15.0-15.0	100		Slope (%): 10 - 15.99 (1)
SMALL-LEAVED PUSSYTOES ( <i>Antennaria parvifolia</i> )	8.0	8.0-8.0	100		Aspect: Westerly (1)
CUT-LEAVED ANEMONE ( <i>Anemone multifida</i> )	5.0	5.0-5.0	100		Topographic Position:
TUFTED FLEABANE ( <i>Erigeron caespitosus</i> )	5.0	5.0-5.0	100		<b>Soil Variables</b>
UNDIFFERENTIATED STELLARIA ( <i>Stellaria</i> )	5.0	5.0-5.0	100		Soil Drainage:
CUT-LEAVED FLEABANE ( <i>Erigeron compositus</i> )	5.0	5.0-5.0	100		Soil Subgroup: ORTHIC EUTRIC BRUNISOL (1)
NODDING ONION ( <i>Allium cernuum</i> )	2.0	2.0-2.0	100		Surface Texture:
SLENDER BLUE BEARDTONGUE ( <i>Penstemon procerus</i> )	2.0	2.0-2.0	100		Effective Texture:
RAGWORT ( <i>Senecio cymbalarioides</i> )	2.0	2.0-2.0	100		Depth to Mottles/Gley:
FIELD MOUSE-EAR CHICKWEED ( <i>Cerastium arvense</i> )	1.0	1.0-1.0	100		Organic Thickness: 0 - 5 cm (1)
THREE-FLOWERED AVENS ( <i>Geum triflorum</i> )	1.0	1.0-1.0	100		Parent Material: Rock (1), Morainal (1)
NUTTALL'S SANDWORT ( <i>Minuartia nuttallii</i> )	1.0	1.0-1.0	100		Soil Type:
EARLY YELLOW LOCOWEED ( <i>Oxytropis sericea</i> )	1.0	1.0-1.0	100		Humus Form
WESTERN RIBGRASS ( <i>Plantago canescens</i> )	1.0	1.0-1.0	100		<b>LFH Thickness</b>
SPOTTED SAXIFRAGE ( <i>Saxifraga bronchialis</i> )	1.0	1.0-1.0	100		<b>Mean</b>
RED-STEMMED SAXIFRAGE ( <i>Saxifraga lyallii</i> )	1.0	1.0-1.0	100		<b>Min</b>
NARROW-PETALED STONECROP ( <i>Sedum stenopetalum</i> )	1.0	1.0-1.0	100		<b>Max</b>
COMMON DANDELION ( <i>Taraxacum officinale</i> )	1.0	1.0-1.0	100		<b>Count</b>
<b>Graminoid</b>					cm:
RICHARDSON NEEDLE GRASS ( <i>Stipa richardsonii</i> )	8.0	8.0-8.0	100		0.00
PURPLE REED GRASS ( <i>Calamagrostis purpurascens</i> )	2.0	2.0-2.0	100		0.00
JUNE GRASS ( <i>Koeleria macrantha</i> )	2.0	2.0-2.0	100		0.00
NORTHERN WHEAT GRASS ( <i>Agropyron dasystachyum</i> )	1.0	1.0-1.0	100		0
<b>Lichen</b>					
N/A ( <i>Cetraria ericetorum</i> )	5.0	5.0-5.0	100		

## aa2 rose-saskatoon shrubland (n=5)

**Natural Subregion:** Montane  
**Ecosection:** Mn Montane North Ecosection

**Ecosite:** aa junegrass-wheat grass (subxeric/medium)

### Characteristic Species

#### Tree

- [ 2.0 ] WHITE SPRUCE  
*Picea glauca*
- [ 1.0 ] ASPEN  
*Populus tremuloides*

#### Shrub

- [ 20.6 ] PRICKLY ROSE\*  
*Rosa acicularis*
- [ 18.2 ] SILVERBERRY\*  
*Elaeagnus commutata*
- [ 12.0 ] COMMON BEARBERRY  
*Arctostaphylos uva-ursi*
- [ 6.6 ] SASKATOON\*  
*Amelanchier alnifolia*
- [ 3.3 ] SNOWBERRY  
*Symphoricarpos albus*
- [ 1.4 ] SNOWBERRY (BUCKBRUSH)\*  
*Symphoricarpos occidentalis*

#### Graminoid

- [ 5.4 ] HAIRY WILD RYE  
*Elymus innovatus*
- [ 3.0 ] SLENDER WHEAT GRASS  
*Agropyron trachycaulum*
- [ 1.6 ] SUN-LOVING SEDGE  
*Carex pensylvanica*
- [ 1.2 ] JUNE GRASS  
*Koeleria macrantha*

### Environmental Variables

Moisture Regime: Subxeric (moderately dry) (5)  
 Nutrient Regime: Mesotrophic (medium) (2), Submesotrophic (poor) (2),  
 Permesotrophic (rich) (1)  
 Elevation (range): 1184 (1131-1220) M  
 Slope (%): steep slope (4), very strong slope (1)  
 Aspect: Southerly (5)  
 Topographic Position: Upper Slope (3), Midslope (2)

### Soil Variables

Soil Drainage: Rapidly drained (3), Well drained (2)  
 Soil Subgroup: ORTHIC EUTRIC BRUNISOL (2), DARK GRAY LUVISOL (1), ORTHIC  
 REGOSOL (1)  
 Surface Texture: Sandy loam (1)  
 Effective Texture: Sandy loam (1)  
 Depth to Mottles/Gley:  
 Organic Thickness: 0 - 5 cm (5)  
 Parent Material: Rock (3), Morainal (1)  
 Soil Type:  
 Humus Form RHIZOMULL (3)

LFH Thickness	Mean	Min	Max	Count
cm:	8.00	8.00	8.00	1

# Mnb1 Rose-Snowberry-Saskatoon (n=5)

(*Rosa acicularis*-*Symphoricarpos occidentalis*-*Amelanchier alnifolia*)

This community type represents the ecotone between junegrass-wheatgrass dominated grasslands and spruce and lodgepole pine dominated forests on dry south facing slopes. The presence of shrubs (saskatoon, rose, snowberry) and the grass species (hairy wildrye) indicate the transition from grasslands to a forested community type. This community type was described on the south facing slopes along the Athabasca River valley west of Brule. This community type can be dominated by rose, saskatoon, silverberry or bearberry. Succession in the absence of disturbance will be to a spruce or lodgepole pine dominated forest.

**Natural Subregion:** Montane  
**Ecosection:** Mn Montane North Ecosection

**Ecosite:** aa junegrass-wheat grass (subxeric/medium)  
**Ecosite Phase:** aa2 rose-saskatoon shrubland

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 40
WHITE SPRUCE ( <i>Picea glauca</i> )	2.0	0.0-5.0	40	Moisture Regime: Subxeric (moderately dry) (5)
ASPEN ( <i>Populus tremuloides</i> )	1.0	0.0-5.0	20	Nutrient Regime: Submesotrophic (poor) (2), Mesotrophic (medium) (2), Permesotrophic (rich) (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Elevation (range): 1184 (1131-1220) M
PRICKLY ROSE ( <i>Rosa acicularis</i> )	20.6	0.0-60.0	80	Slope (%): 46 - 70.99 (4), 31 - 45.99 (1)
SILVERBERRY ( <i>Elaeagnus commutata</i> )	18.2	0.0-75.0	60	Aspect: Southerly (5)
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	12.0	0.0-60.0	20	Topographic Position: Upper Slope (3), Midslope (2)
SASKATOON ( <i>Amelanchier alnifolia</i> )	6.6	0.0-30.0	80	<b>Soil Variables</b>
SNOWBERRY ( <i>Symphoricarpos albus</i> )	3.3	0.0-10.0	80	Soil Drainage: Rapidly drained (3), Well drained (2)
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	1.4	0.0-7.0	20	Soil Subgroup: ORTHIC EUTRIC BRUNISOL (2), DARK GRAY LUVISOL (1), ORTHIC REGOSOL (1)
<b>Graminoid</b>				Surface Texture: Sandy loam (1)
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	5.4	0.0-25.0	80	Effective Texture: Sandy loam (1)
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	3.0	0.0-10.0	40	Depth to Mottles/Gley:
SUN-LOVING SEDGE ( <i>Carex pensylvanica</i> )	1.6	0.0-8.0	20	Organic Thickness: 0 - 5 cm (5)
JUNE GRASS ( <i>Koeleria macrantha</i> )	1.2	0.0-5.0	40	Parent Material: Rock (3), Morainal (1)
				Soil Type:
				Humus Form RHIZOMULL (3)
<b>LFH Thickness</b>				
cm:				
	Mean	Min	Max	Count
	8.00	8.00	8.00	1

## b bearberry (submesic/poor) (n=73)

Natural Subregion: Montane

Ecosection: Mn Montane North Ecosection

### General Description

Dry site conditions resulting from south exposures or coarse-textured soils on fluvial floodplains are characteristic of this ecosite. Organic layers are generally thin and soils are relatively poorly developed. The presence of species such as bearberry and juniper are indicative of the dry site conditions. The treed phases of this ecological site can be found on fluvial floodplains or steep south and west facing slopes, whereas the shrubby phases (yellow mountain avens and bearberry) were only described on coarse textured fluvial floodplains. The Douglas fir dominated phase was only described on steep south and west facing slopes.



### Successional Relationships

Lodgepole pine, Douglas fir, aspen and white spruce form pure and mixed stands on this ecosite. Succession is generally toward white spruce; however, succession rates are slow. Some of the drier examples may form edaphic climax as in the limber pine/juniper ecosite. Shrub and forb layers are generally poorly developed due to the dry site conditions

### Indicator Species

#### Tree

WHITE SPRUCE  
*Picea glauca*  
LODGEPOLE PINE  
*Pinus contorta*  
BALSAM POPLAR  
*Populus balsamifera*  
DOUGLAS-FIR  
*Pseudotsuga menziesii*

#### Shrub

CANADA BUFFALOBERRY  
*Shepherdia canadensis*  
SHRUBBY CINQUEFOIL  
*Potentilla fruticosa*  
GROUND JUNIPER  
*Juniperus communis*  
CREEPING JUNIPER  
*Juniperus horizontalis*  
COMMON BEARBERRY  
*Arctostaphylos uva-ursi*  
YELLOW MOUNTAIN AVENS  
*Dryas drummondii*

#### Graminoid

HAIRY WILD RYE  
*Elymus innovatus*

Site Index at 50 Years	Height (m)	Variation (m)	Count
WHITE SPRUCE <i>(Picea glauca)</i>	12.10	1.00	0
LODGEPOLE PINE <i>(Pinus contorta)</i>	10.90	0.00	0
DOUGLAS-FIR <i>(Pseudotsuga menziesii)</i>	0.00	0.00	0
ASPEN <i>(Populus tremuloides)</i>	0.00	0.00	0

### Environmental Variables

Moisture Regime: Mesic (fresh) (22), Subxeric (moderately dry) (14), Submesic (moderately fresh) (10), Subhygric (moderately moist) (2), Xeric (dry) (2), Hygric (moist) (1)

Nutrient Regime: Mesotrophic (medium) (16), Submesotrophic (poor) (15)

Elevation (range): 1226 (990-1630) M

Slope (%): very gentle slope (15), gentle slope (13), nearly level (11), strong slope (7), steep slope (6), level (5), moderate slope (4), very steep slope (2), very strong slope (2)

Aspect: Easterly (29), Westerly (16), Southerly (12), Northerly (4), Level (1)

Topographic Position: Level (11), Midslope (9), Upper Slope (4), Toe (3), Lower Slope (2)

### Soil Variables

Soil Drainage: Well drained (18), Rapidly drained (13), Very rapidly drained (9), Imperfectly drained (3), Moderately well drained (1)

Soil Subgroup: ORTHIC EUTRIC BRUNISOL (26), ORTHIC REGOSOL (18), CUMULIC REGOSOL (5), BRUNISOLIC GRAY LUVISOL (4), ORTHIC HUMIC REGOSOL (3), ORTHIC GRAY LUVISOL (2), REGO GLEYSOL (2), ELUVIATED EUTRIC BRUNISOL (1), ORTHIC GLEYSOL (1)

Surface Texture: Sandy loam (6), Silt loam (6), Fine sand (5), Loamy sand (5), Very fine sandy loam (3), Loam (2), Loamy coarse sand (1), Fine sandy loam (1), Silty clay loam (1), Silt (1)

Effective Texture: Sandy loam (10), Fine sand (5), Silt loam (4), Loamy sand (4), Very fine sandy loam (2), Silt (2), Loam (1), Silty clay loam (1), Very Fine Sandy Clay (1), Very Fine Sandy Clay Loam (1)

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (71)

Parent Material: Fluvial (23), Morainal (18), Rock (16), Glaciofluvial (16), Eolian (12), Colluvial (6), Fluviolacustrine (2), Saprolite (1), Tephra (1), Glaciolacustrine (1)

Soil Type: Dry/Coarse (3), Dry/Sandy (2), Moist/Silty-Loamy (2), Very Dry/Coarse (1), Very Dry/Silty-Loamy (1), Dry/Silty-Loamy (1), Moist/Sandy (1)

Humus Form FIBRIMOR (5), RAW MODER (2), RHIZOMULL (1), MULL-LIKE MODER (1)

LFH Thickness	Mean	Min	Max	Count
cm:	3.20	1.00	9.00	29

# b1 bearberry PI-Sw (n=48)

Natural Subregion: Montane  
 Ecoregion: Mn Montane North Ecoregion

Ecosite: b bearberry (submesic/poor)

## Characteristic Species

### Tree

- [ 11.5 ] LODGEPOLE PINE\*  
*Pinus contorta*
- [ 9.8 ] WHITE SPRUCE\*  
*Picea glauca*
- [ 2.1 ] ASPEN  
*Populus tremuloides*

### Shrub

- [ 20.9 ] COMMON BEARBERRY\*  
*Arctostaphylos uva-ursi*
- [ 9.0 ] CANADA BUFFALOBERRY  
*Shepherdia canadensis*
- [ 5.8 ] GROUND JUNIPER\*  
*Juniperus communis*
- [ 4.0 ] CREEPING JUNIPER\*  
*Juniperus horizontalis*
- [ 2.7 ] PRICKLY ROSE  
*Rosa acicularis*
- [ 2.4 ] SHRUBBY CINQUEFOIL  
*Potentilla fruticosa*
- [ 1.5 ] TWINFLOWER  
*Linnaea borealis*

### Forb

- [ 1.4 ] WHITE CAMAS  
*Zigadenus elegans*

### Moss and Liverwort

- [ 3.2 ] N/A  
*Thuidium abietinum*
- [ 2.0 ] SCHREBER'S MOSS  
*Pleurozium schreberi*
- [ 1.1 ] STAIR-STEP MOSS  
*Hylocomium splendens*

### Graminoid

- [ 8.8 ] HAIRY WILD RYE  
*Elymus innovatus*

## Environmental Variables

Moisture Regime: Mesic (fresh) (18), Subxeric (moderately dry) (7), Submesic (moderately fresh) (7), Subhygric (moderately moist) (2), Xeric (dry) (1)  
 Nutrient Regime: Mesotrophic (medium) (11), Submesotrophic (poor) (8)  
 Elevation (range): 1216 (998-1630) M  
 Slope (%): very gentle slope (8), gentle slope (7), nearly level (7), strong slope (6), steep slope (4), level (4), moderate slope (3), very steep slope (2), very strong slope (2)  
 Aspect: Easterly (15), Southerly (10), Westerly (9), Northerly (4), Level (1)  
 Topographic Position: Midslope (7), Upper Slope (4), Level (4), Lower Slope (2), Toe (1)

## Soil Variables

Soil Drainage: Well drained (13), Rapidly drained (9), Very rapidly drained (2), Imperfectly drained (1)  
 Soil Subgroup: ORTHIC EUTRIC BRUNISOL (22), ORTHIC REGOSOL (10), BRUNISOLIC GRAY LUVISOL (4), CUMULIC REGOSOL (3), ORTHIC GLEYSOL (1), ORTHIC GRAY LUVISOL (1)  
 Surface Texture: Silt loam (5), Sandy loam (4), Loam (2), Loamy sand (2), Very fine sandy loam (2), Silt (1), Fine sandy loam (1), Loamy coarse sand (1), Fine sand (1)  
 Effective Texture: Sandy loam (6), Loamy sand (3), Silt loam (3), Very fine sandy loam (2), Silt (2), Loam (1), Fine sand (1), Very Fine Sandy Clay Loam (1)  
 Depth to Mottles/Gley:  
 Organic Thickness: 0 - 5 cm (48)  
 Parent Material: Morainal (15), Glaciofluvial (13), Fluvial (12), Rock (11), Eolian (10), Colluvial (4), Tephra (1), Saprolite (1), Glaciolacustrine (1), Fluvialacustrine (1)  
 Soil Type: Dry/Coarse (3), Dry/Sandy (2), Moist/Silty-Loamy (2), Moist/Sandy (1), Very Dry/Silty-Loamy (1), Very Dry/Coarse (1), Dry/Silty-Loamy (1)  
 Humus Form FIBRIMOR (4), MULL-LIKE MODER (1), RHIZOMULL (1)

## LFH Thickness

	Mean	Min	Max	Count
cm:	3.00	1.00	9.00	18

## Mne2 PI/Bearberry-Juniper (n=30)

(*Pinus contorta*/*Arctostaphylos uva-ursi*-*Juniperus spp.*)

This community type is similar to the Limber pine/Juniper-Bearberry community type previously described, but occurs on slightly richer and better developed soils. Dry site conditions from south exposures or coarse-textured soils are characteristic of this community type (Archibald et al. 1996). The dry site conditions limit the amount of forage this site can produce and the steep slope limits access for livestock.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** b bearberry (submesic/poor)

**Ecosite Phase:** b1 bearberry PI-Sw

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Overstory Tree</b>					Ecological Status Score: 25
LOGEPOLE PINE ( <i>Pinus contorta</i> )	22.6	5.0-52.0	100		Moisture Regime: Mesic (fresh) (9), Submesic (moderately fresh) (6), Subxeric (moderately dry) (4), Xeric (dry) (1)
<b>Understory Tree</b>					Nutrient Regime: Submesotrophic (poor) (5), Mesotrophic (medium) (5)
LOGEPOLE PINE ( <i>Pinus contorta</i> )	3.4	0.0-45.0	37		Elevation (range): 1324 (1040-1630) M
<b>Medium Shrub (0.5 to 2 m)</b>					Slope (%): 2.5 - 5.99 (5), 16 - 30.99 (4), 0 - 0.49 (3), 0.5 - 2.49 (3), 6 - 9.99 (3), 10 - 15.99 (3), 46 - 70.99 (3), 31 - 45.99 (2)
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	23.5	1.0-55.0	100		Aspect: Southerly (9), Westerly (7), Easterly (7), Level (1)
CANADA BUFFALOBERRY ( <i>Shepherdia canadensis</i> )	12.9	1.0-35.0	100		Topographic Position: Level (3), Midslope (3), Upper Slope (2), Lower Slope (2), Toe (1)
GROUND JUNIPER ( <i>Juniperus communis</i> )	6.6	0.0-25.0	80		<b>Soil Variables</b>
TWINFLOWER ( <i>Linnaea borealis</i> )	3.3	0.0-20.0	60		Soil Drainage: Rapidly drained (7), Well drained (6)
PRICKLY ROSE ( <i>Rosa acicularis</i> )	3.1	0.0-15.0	87		Soil Subgroup: ORTHIC EUTRIC BRUNISOL (18), BRUNISOLIC GRAY LUVISOL (4), ORTHIC REGOSOL (3), ORTHIC GRAY LUVISOL (1)
CREEPING JUNIPER ( <i>Juniperus horizontalis</i> )	1.9	0.0-20.0	37		Surface Texture: Silt loam (4), Sandy loam (4), Loamy coarse sand (1), Loamy sand (1), Loam (1)
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	1.0	0.0-12.0	40		Effective Texture: Sandy loam (5), Silt loam (3), Loamy sand (2), Loam (1)
<b>Graminoid</b>					Depth to Mottles/Gley:
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	8.9	1.0-30.0	100		Organic Thickness: 0 - 5 cm (30)
<b>Moss</b>					Parent Material: Glaciofluvial (12), Morainal (12), Rock (11), Eolian (3), Fluvial (3), Colluvial (2), Saprolite (1), Tephra (1), Glaciolacustrine (1)
STAIR-STEP MOSS ( <i>Hylocomium splendens</i> )	2.4	0.0-36.0	40		Soil Type: Dry/Coarse (3), Dry/Sandy (2), Moist/Silty-Loamy (2), Very Dry/Silty-Loamy (1), Moist/Sandy (1), Very Dry/Coarse (1), Dry/Silty-Loamy (1)
SCHREBER'S MOSS ( <i>Pleurozium schreberi</i> )	1.7	0.0-10.0	27		Humus Form FIBRIMOR (3)
<b>Lichen</b>					
UNDIFFERENTIATED CLADONIA ( <i>Cladonia</i> )	1.0	0.0-30.0	7		
					<b>LFH Thickness</b>
					<b>Mean</b>
					<b>Min</b>
					<b>Max</b>
					<b>Count</b>
					cm:
					2.00
					1.00
					4.00
					10

## Mne4 Sw/Bearberry-Juniper (n=18)

(*Picea glauca*/*Arctostaphylos uva-ursi*-*Juniperus spp.*)

This community type is similar to the Sw/bearberry community described in the Upper Foothills subregion. This type represents dry, sandy ridges with poor nutrient regimes; as indicated by the high abundance of bearberry. These sites are often windswept and drought-prone. If this community type is located near a physical feature that attracts livestock to the area it may be considered to be primary or secondary range. In other instances though, where it is not near an attractive feature, this community type would be considered non-use.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** b bearberry (submesic/poor)

**Ecosite Phase:** b1 bearberry PI-Sw

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Overstory Tree</b>					Ecological Status Score: 25
WHITE SPRUCE ( <i>Picea glauca</i> )	15.2	1.0-30.0	100		Moisture Regime: Mesic (fresh) (9), Subxeric (moderately dry) (3), Subhygric (moderately moist) (2), Submesic (moderately fresh) (1)
WHITE BIRCH ( <i>Betula papyrifera</i> )	2.2	0.0-10.0	28		Nutrient Regime: Mesotrophic (medium) (6), Submesotrophic (poor) (3)
<b>Understory Tree</b>					Elevation (range): 1108 (998-1494) M
WHITE SPRUCE ( <i>Picea glauca</i> )	4.5	0.0-25.0	50		Slope (%): 0.5 - 2.49 (4), 6 - 9.99 (4), 2.5 - 5.99 (3), 16 - 30.99 (2), 71 - 100.99 (2), 46 - 70.99 (1), 0 - 0.49 (1)
<b>Tall Shrub (2 to 5m)</b>					Aspect: Easterly (8), Northerly (4), Westerly (2), Southerly (1)
SASKATOON ( <i>Amelanchier alnifolia</i> )	1.1	0.0-10.0	11		Topographic Position: Midslope (4), Upper Slope (2), Level (1)
<b>Medium Shrub (0.5 to 2 m)</b>					<b>Soil Variables</b>
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	19.2	0.0-40.0	83		Soil Drainage: Well drained (7), Very rapidly drained (2), Rapidly drained (2), Imperfectly drained (1)
CREEPING JUNIPER ( <i>Juniperus horizontalis</i> )	6.1	0.0-35.0	72		Soil Subgroup: ORTHIC REGOSOL (7), ORTHIC EUTRIC BRUNISOL (4), CUMULIC REGOSOL (3), ORTHIC GLEYSOL (1)
GROUND JUNIPER ( <i>Juniperus communis</i> )	5.5	0.0-20.0	78		Surface Texture: Very fine sandy loam (2), Silt loam (1), Silt (1), Loam (1), Loamy sand (1), Fine sand (1), Fine sandy loam (1)
CANADA BUFFALOBERRY ( <i>Shepherdia canadensis</i> )	5.1	0.0-25.0	89		Effective Texture: Very fine sandy loam (2), Silt (2), Fine sand (1), Loamy sand (1), Very Fine Sandy Clay Loam (1), Sandy loam (1)
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	4.0	0.0-35.0	72		Depth to Mottles/Gley:
PRICKLY ROSE ( <i>Rosa acicularis</i> )	2.2	0.0-10.0	89		Organic Thickness: 0 - 5 cm (18)
<b>Tall Forb (&gt;= 30 cm)</b>					Parent Material: Fluvial (9), Eolian (7), Morainal (3), Colluvial (2), Fluviolacustrine (1), Glaciofluvial (1)
WHITE CAMAS ( <i>Zigadenus elegans</i> )	2.8	0.0-20.0	61		Soil Type:
ALPINE HEDYSARUM ( <i>Hedysarum alpinum</i> )	1.3	0.0-10.0	56		Humus Form MULL-LIKE MODER (1), FIBRIMOR (1), RHIZOMULL (1)
<b>Graminoid</b>					
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	7.6	0.0-45.0	89		
RUSH-LIKE SEDGE ( <i>Carex scirpoidea</i> )	1.8	0.0-22.0	28		
<b>Moss</b>					
N/A ( <i>Thuidium abietinum</i> )	6.5	0.0-60.0	50		
SCHREBER'S MOSS ( <i>Pleurozium schreberi</i> )	2.3	0.0-15.0	22		
					<b>LFH Thickness</b>
					<b>Mean</b> <b>Min</b> <b>Max</b> <b>Count</b>
					cm:                    4.00    1.00    9.00    8

## b2 bearberry Aw (n=2)

**Natural Subregion:** Montane  
**Ecosection:** Mn Montane North Ecosection

**Ecosite:** b bearberry (submesic/poor)

### Characteristic Species

#### Tree

[ 22.5 ] ASPEN\*  
*Populus tremuloides*

[ 1.0 ] BALSAM POPLAR  
*Populus balsamifera*

#### Shrub

[ 30.0 ] COMMON BEARBERRY\*  
*Arctostaphylos uva-ursi*

[ 2.0 ] PRICKLY ROSE  
*Rosa acicularis*

[ 1.0 ] GROUND JUNIPER  
*Juniperus communis*

#### Forb

[ 1.0 ] WILD STRAWBERRY  
*Fragaria virginiana*

[ 1.0 ] COMMON YARROW  
*Achillea millefolium*

#### Graminoid

[ 10.5 ] HAIRY WILD RYE\*  
*Elymus innovatus*

### Environmental Variables

Moisture Regime:

Nutrient Regime:

Elevation (range): 1305 (1200-1410) M

Slope (%): gentle slope (1), steep slope (1)

Aspect: Westerly (2)

Topographic Position:

### Soil Variables

Soil Drainage:

Soil Subgroup: CUMULIC REGOSOL (1), ORTHIC REGOSOL (1)

Surface Texture:

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (2)

Parent Material: Rock (1), Colluvial (1), Fluvial (1)

Soil Type:

Humus Form

### LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0



# Mnc1 Aw/Bearberry/Hairy wildrye (n=2)

(*Populus tremuloides*/*Arctostaphylos uva-ursi*/*Elymus innovatus*)

This community type occupies dry, upper slope and hilltop positions. The soils on this community type are fairly well developed and the moisture conditions are high enough to favour the growth of aspen. In years of drought aspen will likely die back in this community type. Frequent fire also tends to control the spread of aspen. The lack of fire in the last 50 years has allowed growth of aspen into many of these grasslands. Aspen ingrowth causes a 50% decline in forage productivity and a loss in soil productivity.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** b bearberry (submesic/poor)

**Ecosite Phase:** b2 bearberry Aw

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 25
ASPEN ( <i>Populus tremuloides</i> )	22.5	20.0-25.0	100	Moisture Regime:
<b>Understory Tree</b>				Nutrient Regime:
BALSAM POPLAR ( <i>Populus balsamifera</i> )	1.0	0.0-2.0	50	Elevation (range): 1305 (1200-1410) M
<b>Medium Shrub (0.5 to 2 m)</b>				Slope (%): 6 - 9.99 (1), 46 - 70.99 (1)
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	30.0	10.0-50.0	100	Aspect: Westerly (2)
PRICKLY ROSE ( <i>Rosa acicularis</i> )	2.0	1.0-3.0	100	Topographic Position:
GROUND JUNIPER ( <i>Juniperus communis</i> )	1.0	1.0-1.0	100	
<b>Low Forb (&lt; 30 cm)</b>				<b>Soil Variables</b>
COMMON YARROW ( <i>Achillea millefolium</i> )	1.0	1.0-1.0	100	Soil Drainage:
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	1.0	1.0-1.0	100	Soil Subgroup: CUMULIC REGOSOL (1), ORTHIC REGOSOL (1)
<b>Graminoid</b>				Surface Texture:
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	10.5	1.0-20.0	100	Effective Texture:
				Depth to Mottles/Gley:
				Organic Thickness: 0 - 5 cm (2)
				Parent Material: Colluvial (1), Fluvial (1), Rock (1)
				Soil Type:
				Humus Form
				<b>LFH Thickness</b>
				<b>Mean</b>
				<b>Min</b>
				<b>Max</b>
				<b>Count</b>
cm:	0.00	0.00	0.00	0

### b3 bearberry Aw-Sw-PI (n=3)

Natural Subregion: Montane  
Ecosection: Mn Montane North Ecosection

Ecosite: b bearberry (submesic/poor)

#### Characteristic Species

##### Tree

- [ 12.0 ] ASPEN\*  
*Populus tremuloides*
- [ 10.5 ] LODGEPOLE PINE\*  
*Pinus contorta*
- [ 5.0 ] BALSAM POPLAR  
*Populus balsamifera*
- [ 4.5 ] WHITE SPRUCE\*  
*Picea glauca*

##### Shrub

- [ 33.5 ] COMMON BEARBERRY\*  
*Arctostaphylos uva-ursi*
- [ 6.0 ] CANADA BUFFALOBERRY  
*Shepherdia canadensis*
- [ 5.0 ] BOG CRANBERRY  
*Vaccinium vitis-idaea*
- [ 2.5 ] CREEPING JUNIPER  
*Juniperus horizontalis*
- [ 2.5 ] SHRUBBY CINQUEFOIL  
*Potentilla fruticosa*
- [ 2.5 ] DWARF BILBERRY  
*Vaccinium caespitosum*

##### Forb

- [ 2.5 ] WHITE CAMAS  
*Zigadenus elegans*
- [ 2.0 ] ALPINE HEDYSARUM  
*Hedysarum alpinum*
- [ 1.5 ] SHOWY ASTER  
*Aster conspicuus*

##### Lichen

- [ 1.5 ] STUDDERED LEATHER LICHEN  
*Peltigera aphthosa*

##### Graminoid

- [ 6.0 ] HAIRY WILD RYE  
*Elymus innovatus*

#### Environmental Variables

Moisture Regime: Submesic (moderately fresh) (2)  
Nutrient Regime: Submesotrophic (poor) (1), Mesotrophic (medium) (1)  
Elevation (range): 1213 (1050-1350) M  
Slope (%): gentle slope (1)  
Aspect: Easterly (2)  
Topographic Position: Level (1)

#### Soil Variables

Soil Drainage: Imperfectly drained (1), Rapidly drained (1)  
Soil Subgroup: ORTHIC EUTRIC BRUNISOL (1), ORTHIC HUMIC REGOSOL (1)  
Surface Texture: Very fine sandy loam (1), Sandy loam (1)  
Effective Texture: Sandy loam (1), Very Fine Sandy Clay (1)  
Depth to Mottles/Gley:  
Organic Thickness: 0 - 5 cm (3)  
Parent Material: Morainal (2), Rock (2), Eolian (1), Fluvial (1)  
Soil Type:  
Humus Form RAW MODER (1)

#### LFH Thickness

	Mean	Min	Max	Count
cm:	4.00	4.00	4.00	1

# Mnd1 Aw-Sw-PI/Bearberry (n=3)

## (*Populus tremuloides*-*Picea glauca*-*Pinus contorta*/*Arctostaphylos uva-ursi*)

This community represents an aspen dominated community type that is undergoing succession to lodgepole pine and white spruce. It is part of the bearberry ecosite described by Archibald et al. (1996). This ecosite occupies dry upper slope positions with south exposures and coarse textured fluvial soils. Forage production on this site will be low because of the dry site conditions.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** b bearberry (submesic/poor)

**Ecosite Phase:** b3 bearberry Aw-Sw-PI

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables				
	Mean	Range							
<b>Overstory Tree</b>					Ecological Status Score: 25				
WHITE SPRUCE ( <i>Picea glauca</i> )	3.3	0.0-8.0		67	Moisture Regime: Submesic (moderately fresh) (2)				
ASPEN ( <i>Populus tremuloides</i> )	3.3	0.0-10.0		33	Nutrient Regime: Submesotrophic (poor) (1), Mesotrophic (medium) (1)				
WHITE BIRCH ( <i>Betula papyrifera</i> )	2.6	0.0-8.0		33	Elevation (range): 1213 (1050-1350) M				
LOGEPOLE PINE ( <i>Pinus contorta</i> )	1.6	0.0-5.0		33	Slope (%): 6 - 9.99 (1)				
<b>Understory Tree</b>					Aspect: Easterly (2)				
LOGEPOLE PINE ( <i>Pinus contorta</i> )	3.6	0.0-10.0		67	Topographic Position: Level (1)				
WHITE SPRUCE ( <i>Picea glauca</i> )	2.0	2.0-2.0		100	<b>Soil Variables</b>				
<b>Tall Shrub (2 to 5m)</b>					Soil Drainage: Rapidly drained (1), Imperfectly drained (1)				
WATER BIRCH ( <i>Betula occidentalis</i> )	1.0	0.0-3.0		33	Soil Subgroup: ORTHIC EUTRIC BRUNISOL (1), ORTHIC HUMIC REGOSOL (1)				
<b>Medium Shrub (0.5 to 2 m)</b>					Surface Texture: Sandy loam (1), Very fine sandy loam (1)				
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	25.6	7.0-60.0		100	Effective Texture: Very Fine Sandy Clay (1), Sandy loam (1)				
GROUND JUNIPER ( <i>Juniperus communis</i> )	5.0	0.0-15.0		33	Depth to Mottles/Gley:				
CANADA BUFFALOBERRY ( <i>Shepherdia canadensis</i> )	4.6	2.0-7.0		100	Organic Thickness: 0 - 5 cm (3)				
BALSAM POPLAR ( <i>Populus balsamifera</i> )	3.5	0.0-10.0		67	Parent Material: Morainal (2), Rock (2), Eolian (1), Fluvial (1)				
BOG CRANBERRY ( <i>Vaccinium vitis-idaea</i> )	3.3	0.0-10.0		33	Soil Type:				
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	1.8	0.0-5.0		67	Humus Form RAW MODER (1)				
CREEPING JUNIPER ( <i>Juniperus horizontalis</i> )	1.6	0.0-5.0		33	<b>LFH Thickness</b>				
PRICKLY ROSE ( <i>Rosa acicularis</i> )	1.3	0.0-3.0		67					
<b>Tall Forb (&gt;= 30 cm)</b>					cm:				
ALPINE HEDYSARUM ( <i>Hedysarum alpinum</i> )	3.0	0.0-5.0		67	Mean	Min	Max	Count	
WHITE CAMAS ( <i>Zigadenus elegans</i> )	2.0	0.0-5.0		67	4.00	4.00	4.00	1	
<b>Graminoid</b>									
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	4.1	0.5-7.0		100					

## b4 yellow mountain avens (n=10)

**Natural Subregion:** Montane  
**Ecosection:** Mn Montane North Ecosection

**Ecosite:** b bearberry (submesic/poor)

### Characteristic Species

#### Tree

- [ 1.8 ] BALSAM POPLAR\*  
*Populus balsamifera*
- [ 1.4 ] WATER BIRCH  
*Betula occidentalis*
- [ 1.4 ] WHITE SPRUCE\*  
*Picea glauca*

#### Shrub

- [ 24.5 ] YELLOW MOUNTAIN AVENS\*  
*Dryas drummondii*
- [ 14.5 ] COMMON BEARBERRY\*  
*Arctostaphylos uva-ursi*
- [ 2.5 ] ENTIRE-LEAVED MOUNTAIN AVENS  
*Dryas integrifolia*
- [ 1.7 ] GROUND JUNIPER  
*Juniperus communis*
- [ 1.6 ] RIVER ALDER  
*Alnus tenuifolia*
- [ 0.8 ] SHRUBBY CINQUEFOIL  
*Potentilla fruticosa*
- [ 0.8 ] SHORT-CAPSULED WILLOW  
*Salix brachycarpa*
- [ 0.8 ] FARR'S WILLOW  
*Salix farriae*

#### Moss and Liverwort

- [ 1.6 ] N/A  
*Catoscopium nigratum*

#### Graminoid

- [ 0.6 ] RUSH-LIKE SEDGE  
*Carex scirpoidea*

### Environmental Variables

Moisture Regime: Subxeric (moderately dry) (3), Mesic (fresh) (2), Hygric (moist) (1)  
 Nutrient Regime: Submesotrophic (poor) (3)  
 Elevation (range): 1169 (990-1410) M  
 Slope (%): gentle slope (4), very gentle slope (3), moderate slope (1), level (1), nearly level (1)  
 Aspect: Easterly (8), Westerly (2)  
 Topographic Position: Level (3), Toe (1)

### Soil Variables

Soil Drainage: Very rapidly drained (6), Well drained (1), Imperfectly drained (1)  
 Soil Subgroup: ORTHIC REGOSOL (5), REGO GLEYSOL (2), ELUVIATED EUTRIC BRUNISOL (1)  
 Surface Texture: Fine sand (2), Silty clay loam (1)  
 Effective Texture: Fine sand (2), Silty clay loam (1)  
 Depth to Mottles/Gley:  
 Organic Thickness: 0 - 5 cm (9)  
 Parent Material: Fluvial (5), Fluvioaquatic (1)  
 Soil Type:  
 Humus Form FIBRIMOR (1)

### LFH Thickness

	Mean	Min	Max	Count
cm:	3.00	2.00	3.00	3

## Mnb2 Yellow mountain avens (n=3)

### (*Dryas drummondii*)

Yellow mountain avens grows favorably on open, well-drained sites and is typical of dry, gravelly river flats throughout Alberta. Willoughby (2007) described a Balsam poplar-White spruce/Willow/Yellow mountain avens community type that is similar, but successionaly more mature in the Upper Foothills subregion. In the absence of disturbance, bearberry, willow, white spruce and balsam poplar will increase causing mountain avens to decrease as the site becomes shaded. Eventually this site will succeed to a white spruce/buffaloberry dominated forest. This community appears to be not as successionaly advanced as the Yellow Mountain Avens-Bearberry dominated community type.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** b bearberry (submesic/poor)

**Ecosite Phase:** b4 yellow mountain avens

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 40
BALSAM POPLAR ( <i>Populus balsamifera</i> )	1.6	0.0-5.0	33	Moisture Regime: Mesic (fresh) (2), Hygric (moist) (1)
<b>Tall Shrub (2 to 5m)</b>				Nutrient Regime:
WHITE SPRUCE ( <i>Picea glauca</i> )	1.3	0.0-3.0	67	Elevation (range): 1330 (1210-1410) M
<b>Medium Shrub (0.5 to 2 m)</b>				Slope (%): 10 - 15.99 (1), 0.5 - 2.49 (1), 0 - 0.49 (1)
YELLOW MOUNTAIN AVENS ( <i>Dryas drummondii</i> )	17.6	3.0-25.0	100	Aspect: Easterly (2), Westerly (1)
ENTIRE-LEAVED MOUNTAIN AVENS ( <i>Dryas integrifolia</i> )	5.0	0.0-10.0	67	Topographic Position:
RIVER ALDER ( <i>Alnus tenuifolia</i> )	3.3	0.0-10.0	33	<b>Soil Variables</b>
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	1.6	0.0-3.0	67	Soil Drainage: Imperfectly drained (1)
SHORT-CAPSULED WILLOW ( <i>Salix brachycarpa</i> )	1.6	0.0-5.0	33	Soil Subgroup: REGO GLEYSOL (2), ORTHIC REGOSOL (1)
FARR'S WILLOW ( <i>Salix farriae</i> )	1.6	0.0-5.0	33	Surface Texture:
<b>Tall Forb (&gt;= 30 cm)</b>				Effective Texture:
STICKY FALSE ASPHODEL ( <i>Tofieldia glutinosa</i> )	1.0	0.0-3.0	33	Depth to Mottles/Gley:
WESTERN PAINTBRUSH ( <i>Castilleja occidentalis</i> )	0.6	0.0-1.0	67	Organic Thickness: 0 - 5 cm (3)
<b>Low Forb (&lt; 30 cm)</b>				Parent Material: Fluvial (2), Fluvio-lacustrine (1)
SHOWY EVERLASTING ( <i>Antennaria pulcherrima</i> )	1.6	0.0-5.0	33	Soil Type:
SMALL-FLOWERED ANEMONE ( <i>Anemone parviflora</i> )	0.6	0.0-1.0	67	Humus Form
<b>Graminoid</b>				<b>LFH Thickness</b>
RUSH-LIKE SEDGE ( <i>Carex scirpoidea</i> )	1.3	0.0-4.0	33	Mean
<b>Moss</b>				Min
N/A ( <i>Catoscopium nigratum</i> )	3.3	0.0-10.0	33	Max
				Count
				cm:
				0.00
				0.00
				0.00
				0

## Mnb3 Yellow mountain avens-Bearberry (n=7)

### (*Dryas drummondii*-*Arctostaphylos uva-ursi*)

Yellow mountain avens grows favorably on open, well-drained sites and is typical of dry, gravelly river flats throughout Alberta. Willoughby (2007) described a Balsam poplar-White spruce/Willow/Yellow mountain avens community type that is similar, but successional more mature in the Upper Foothills subregion. In the absence of disturbance, bearberry, willow, white spruce and balsam poplar will increase causing mountain avens to decrease as the site becomes shaded. Eventually this site will succeed to a white spruce/buffaloberry dominated forest. This community appears to be successional more advanced than the Yellow Mountain Avens dominated community type.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** b bearberry (submesic/poor)

**Ecosite Phase:** b4 yellow mountain avens

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 40
WHITE SPRUCE ( <i>Picea glauca</i> )	2.8	0.0-10.0	71	Moisture Regime: Subxeric (moderately dry) (3)
BALSAM POPLAR ( <i>Populus balsamifera</i> )	2.1	0.0-5.0	43	Nutrient Regime: Submesotrophic (poor) (3)
<b>Tall Shrub (2 to 5m)</b>				Elevation (range): 1009 (990-1020) M
WATER BIRCH ( <i>Betula occidentalis</i> )	2.8	0.0-15.0	57	Slope (%): 6 - 9.99 (4), 2.5 - 5.99 (3)
RIVER ALDER ( <i>Alnus tenuifolia</i> )	2.1	0.0-15.0	14	Aspect: Easterly (6), Westerly (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Topographic Position: Level (3), Toe (1)
YELLOW MOUNTAIN AVENS ( <i>Dryas drummondii</i> )	31.4	20.0-50.0	100	<b>Soil Variables</b>
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	29.1	2.0-60.0	100	Soil Drainage: Very rapidly drained (6), Well drained (1)
GROUND JUNIPER ( <i>Juniperus communis</i> )	3.4	0.0-10.0	71	Soil Subgroup: ORTHIC REGOSOL (4), ELUVIATED EUTRIC BRUNISOL (1)
<b>Graminoid</b>				Surface Texture: Fine sand (2), Silty clay loam (1)
BLUNT SEDGE ( <i>Carex obtusata</i> )	0.7	0.0-5.0	14	Effective Texture: Fine sand (2), Silty clay loam (1)
				Depth to Mottles/Gley:
				Organic Thickness: 0 - 5 cm (6)
				Parent Material: Fluvial (3)
				Soil Type:
				Humus Form FIBRIMOR (1)
				<b>LFH Thickness</b>
				<b>Mean</b>
				<b>Min</b>
				<b>Max</b>
				<b>Count</b>
cm:	3.00	2.00	3.00	3

## b5 bearberry shrubland (n=8)

**Natural Subregion:** Montane  
**Ecosection:** Mn Montane North Ecosection

**Ecosite:** b bearberry (submesic/poor)

### Characteristic Species

#### Tree

- [ 2.9 ] WHITE SPRUCE  
*Picea glauca*
- [ 1.5 ] WHITE BIRCH  
*Betula papyrifera*

#### Shrub

- [ 15.6 ] COMMON BEARBERRY\*  
*Arctostaphylos uva-ursi*
- [ 12.6 ] CREEPING JUNIPER\*  
*Juniperus horizontalis*
- [ 8.8 ] GROUND JUNIPER  
*Juniperus communis*
- [ 1.3 ] SHRUBBY CINQUEFOIL\*  
*Potentilla fruticosa*

#### Forb

- [ 2.1 ] PASTURE SAGEWORT  
*Artemisia frigida*
- [ 1.1 ] ALPINE EVERLASTING  
*Antennaria alpina*

#### Graminoid

- [ 15.3 ] NORTHERN WHEAT GRASS  
*Agropyron dasystachyum*
- [ 4.1 ] PURPLE REED GRASS  
*Calamagrostis purpurascens*
- [ 2.7 ] JUNE GRASS  
*Koeleria macrantha*
- [ 1.7 ] HAIRY WILD RYE  
*Elymus innovatus*

### Environmental Variables

Moisture Regime: Subxeric (moderately dry) (3), Mesic (fresh) (2), Xeric (dry) (1), Submesic (moderately fresh) (1)

Nutrient Regime: Mesotrophic (medium) (4), Submesotrophic (poor) (3)

Elevation (range): 1259 (1040-1405) M

Slope (%): very gentle slope (4), nearly level (3)

Aspect: Easterly (4), Westerly (3)

Topographic Position: Level (3), Midslope (2), Toe (1)

### Soil Variables

Soil Drainage: Well drained (3), Rapidly drained (3), Very rapidly drained (1), Moderately well drained (1)

Soil Subgroup: ORTHIC EUTRIC BRUNISOL (3), ORTHIC HUMIC REGOSOL (2), CUMULIC REGOSOL (1), ORTHIC REGOSOL (1)

Surface Texture: Loamy sand (3), Fine sand (2), Silt loam (1), Sandy loam (1)

Effective Texture: Sandy loam (3), Fine sand (2), Loamy sand (1), Silt loam (1)

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (7)

Parent Material: Fluvial (4), Glaciofluvial (3), Eolian (1)

Soil Type:

Humus Form RAW MODER (1)

### LFH Thickness

	Mean	Min	Max	Count
cm:	3.00	2.00	5.00	7

## Mna2 Bearberry/Juniper-Shrubby cinquefoil (fluvial) (n=8)

(*Arctostaphylos uva-ursi*/*Juniperus spp.*-*Potentilla fruticosa*)

This community type is similar to the Juniper-Bearberry dominated community type that was described on dry, rocky south facing slopes throughout the Jasper river valleys. However, this community type is found on fluvial sites with gravelly soils and shallow slopes. Sub-surface flow through coarse substrate provides habitat suitable for species whose roots reach groundwater. Surface is subxeric characterized by juniper and bearberry. In the absence of disturbance this site will likely succeed to spruce and lodgepole pine dominated forest. Indeed many of the stands described in this community type were placed into Douglas fir and spruce forest types described by Corns and Achuff (1982).

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** b bearberry (submesic/poor)

**Ecosite Phase:** b5 bearberry shrubland

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 40
WHITE SPRUCE ( <i>Picea glauca</i> )	2.9	0.0-10.0	50	Moisture Regime: Subxeric (moderately dry) (3), Mesic (fresh) (2), Submesic (moderately fresh) (1), Xeric (dry) (1)
WHITE BIRCH ( <i>Betula papyrifera</i> )	1.5	0.0-5.0	38	Nutrient Regime: Mesotrophic (medium) (4), Submesotrophic (poor) (3)
<b>Medium Shrub (0.5 to 2 m)</b>				Elevation (range): 1259 (1040-1405) M
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	15.6	2.0-30.0	100	Slope (%): 2.5 - 5.99 (4), 0.5 - 2.49 (3)
CREEPING JUNIPER ( <i>Juniperus horizontalis</i> )	12.6	0.0-25.0	88	Aspect: Easterly (4), Westerly (3)
GROUND JUNIPER ( <i>Juniperus communis</i> )	8.8	0.0-25.0	63	Topographic Position: Level (3), Midslope (2), Toe (1)
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	1.3	0.5-2.0	100	<b>Soil Variables</b>
<b>Low Forb (&lt; 30 cm)</b>				Soil Drainage: Rapidly drained (3), Well drained (3), Very rapidly drained (1), Moderately well drained (1)
PASTURE SAGEWORT ( <i>Artemisia frigida</i> )	2.1	0.0-5.0	63	Soil Subgroup: ORTHIC EUTRIC BRUNISOL (3), ORTHIC HUMIC REGOSOL (2), CUMULIC REGOSOL (1), ORTHIC REGOSOL (1)
ALPINE EVERLASTING ( <i>Antennaria alpina</i> )	1.1	0.0-9.0	13	Surface Texture: Loamy sand (3), Fine sand (2), Silt loam (1), Sandy loam (1)
<b>Graminoid</b>				Effective Texture: Sandy loam (3), Fine sand (2), Loamy sand (1), Silt loam (1)
NORTHERN WHEAT GRASS ( <i>Agropyron dasystachyum</i> )	15.3	0.0-60.0	63	Depth to Mottles/Gley:
PURPLE REED GRASS ( <i>Calamagrostis purpurascens</i> )	4.1	0.0-23.0	25	Organic Thickness: 0 - 5 cm (7)
JUNE GRASS ( <i>Koeleria macrantha</i> )	2.7	0.0-13.0	75	Parent Material: Fluvial (4), Glaciofluvial (3), Eolian (1)
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	1.7	0.0-12.0	38	Soil Type: Humus Form RAW MODER (1)
				<b>LFH Thickness</b>
				<b>Mean</b> <b>Min</b> <b>Max</b> <b>Count</b>
				cm:            3.00    2.00    5.00    7



## b6 bearberry Fd (n=2)

**Natural Subregion:** Montane  
**Ecosection:** Mn Montane North Ecosection

**Ecosite:** b bearberry (submesic/poor)

### Characteristic Species

#### Tree

- [ 15.0 ] DOUGLAS-FIR\*  
*Pseudotsuga menziesii*
- [ 10.0 ] LODGEPOLE PINE  
*Pinus contorta*

#### Shrub

- [ 17.5 ] GROUND JUNIPER\*  
*Juniperus communis*
- [ 3.0 ] CANADA BUFFALOBERRY  
*Shepherdia canadensis*
- [ 3.0 ] PRICKLY ROSE  
*Rosa acicularis*
- [ 3.0 ] COMMON BEARBERRY\*  
*Arctostaphylos uva-ursi*
- [ 2.0 ] TWINFLOWER  
*Linnaea borealis*
- [ 1.0 ] WHITE MEADOWSWEET  
*Spiraea betulifolia*

#### Forb

- [ 1.0 ] SHOWY ASTER  
*Aster conspicuus*

#### Graminoid

- [ 7.5 ] HAIRY WILD RYE  
*Elymus innovatus*
- [ 1.5 ] BEAUTIFUL SEDGE  
*Carex concinna*

### Environmental Variables

Moisture Regime: Subxeric (moderately dry) (1)

Nutrient Regime:

Elevation (range): 1265 (1250-1280) M

Slope (%): strong slope (1), steep slope (1)

Aspect: Southerly (2)

Topographic Position:

### Soil Variables

Soil Drainage: Well drained (1)

Soil Subgroup: ORTHIC GRAY LUVISOL (1), ORTHIC REGOSOL (1)

Surface Texture:

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (2)

Parent Material: Rock (2), Morainal (1), Colluvial (1)

Soil Type:

Humus Form

### LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

## Mne3 Fd-PI/Bearberry (n=2)

### (*Pseudotsuga menziesii*-*Pinus contorta*/*Arctostaphylos uva-ursi*)

This community type occurs on steep, exposed ridge tops and upper slope positions within the Montane subregion. It is characterized by dry site conditions and exposure to westerly winds. Soils are often shallow to bedrock (Archibald et al 1996). This community often forms an edaphic climax on these sites. Bearberry, juniper and the other associated species of this community type are all well adapted to the low moisture levels, high light intensity, heat and low soil nutrient levels which occur on these erosional, south-facing scarps (Kuchar 1973).

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** b bearberry (submesic/poor)

**Ecosite Phase:** b6 bearberry Fd

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 25
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	12.5	10.0-15.0	100	Moisture Regime: Subxeric (moderately dry) (1)
LOGEPOLE PINE ( <i>Pinus contorta</i> )	10.0	0.0-20.0	50	Nutrient Regime:
				Elevation (range): 1265 (1250-1280) M
				Slope (%): 16 - 30.99 (1), 46 - 70.99 (1)
<b>Understory Tree</b>				Aspect: Southerly (2)
LOGEPOLE PINE ( <i>Pinus contorta</i> )	7.5	0.0-15.0	50	Topographic Position:
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	2.5	0.0-5.0	50	
<b>Medium Shrub (0.5 to 2 m)</b>				<b>Soil Variables</b>
GROUND JUNIPER ( <i>Juniperus communis</i> )	17.5	5.0-30.0	100	Soil Drainage: Well drained (1)
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	3.0	1.0-5.0	100	Soil Subgroup: ORTHIC GRAY LUVISOL (1), ORTHIC REGOSOL (1)
PRICKLY ROSE ( <i>Rosa acicularis</i> )	3.0	1.0-5.0	100	Surface Texture:
CANADA BUFFALOBERRY ( <i>Shepherdia canadensis</i> )	3.0	1.0-5.0	100	Effective Texture:
TWINFLOWER ( <i>Linnaea borealis</i> )	2.0	1.0-3.0	100	Depth to Mottles/Gley:
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	1.0	1.0-1.0	100	Organic Thickness: 0 - 5 cm (2)
				Parent Material: Rock (2), Colluvial (1), Morainal (1)
<b>Tall Forb (&gt;= 30 cm)</b>				Soil Type:
SHOWY ASTER ( <i>Aster conspicuus</i> )	1.0	1.0-1.0	100	Humus Form
<b>Graminoid</b>				
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	7.5	5.0-10.0	100	
BEAUTIFUL SEDGE ( <i>Carex concinna</i> )	1.5	1.0-2.0	100	
				<b>LFH Thickness</b>
				<b>Mean</b>
				<b>Min</b>
				<b>Max</b>
				<b>Count</b>
				cm:
				0.00
				0.00
				0.00
				0

## c hairy wildrye (submesic/medium) (n=58)

Natural Subregion: Montane

Ecosection: Mn Montane North Ecosection

### General Description

This ecosite represents relatively dry conditions for the subregion but not as dry as the two ecosites previously described. Sites were usually described on shallow to steep slopes with southerly and westerly aspects with mostly eolian or colluvial parent material. Stands usually have closed canopies. Understory vegetation is generally sparse; however hairy wild rye cover is extensive (>15%) and Canada buffaloberry is only a minor component of the understory (<10% cover).



Site Index at 50 Years	Height (m)	Variation (m)	Count
WHITE SPRUCE ( <i>Picea glauca</i> )	11.00	0.60	0
LODGEPOLE PINE ( <i>Pinus contorta</i> )	12.20	0.40	0
ASPEN ( <i>Populus tremuloides</i> )	13.60	3.70	0

### Environmental Variables

Moisture Regime: Mesic (fresh) (23), Submesic (moderately fresh) (8), Subseric (moderately dry) (3), Subhygric (moderately moist) (1)

Nutrient Regime: Mesotrophic (medium) (8), Submesotrophic (poor) (7), Eutrophic (very rich) (1)

Elevation (range): 1154 (870-1700) M

Slope (%): very gentle slope (13), gentle slope (10), moderate slope (6), nearly level (2), very strong slope (6), strong slope (5), level (3), steep slope (2), very steep slope (2), extreme slope (1)

Aspect: Southerly (18), Westerly (14), Easterly (8), Northerly (8), Level (2)

Topographic Position: Upper Slope (5), Lower Slope (4), Midslope (2), Level (1)

### Soil Variables

Soil Drainage: Well drained (26), Rapidly drained (4), Very rapidly drained (1), Imperfectly drained (1)

Soil Subgroup: ORTHIC EUTRIC BRUNISOL (15), CUMULIC REGOSOL (14), ORTHIC REGOSOL (6), ORTHIC HUMIC REGOSOL (5), ORTHIC GRAY LUVISOL (4), BRUNISOLIC GRAY LUVISOL (4), CUMULIC HUMIC REGOSOL (2), ELUVIATED EUTRIC BRUNISOL (1), GLEYED CUMULIC HUMIC REGOSOL (1), GLEYED ELUVIATED EUTRIC BRUNISOL (1), ORTHIC DYSTRIC BRUNISOL (1), ORTHIC MELANIC BRUNISOL (1)

Surface Texture: Very fine sandy loam (3), Sandy loam (2), Silt (1), Silt loam (1), Loamy fine sand (1), Loamy sand (1), Sandy clay loam (1)

Effective Texture: Loamy very fine sand (2), Silt loam (2), Very fine sandy loam (1), Loamy fine sand (1), Loamy sand (1), Sandy clay loam (1), Sandy loam (1), Silt (1)

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (55)

Parent Material: Eolian (35), Morainal (24), Fluvial (12), Colluvial (6), Glaciofluvial (4), Rock (4)

Soil Type: Moist/Coarse (1)

Humus Form RAW MODER (2), FIBRIMOR (1)

LFH Thickness	Mean	Min	Max	Count
cm:	4.43	1.00	10.00	9

### Successional Relationships

Lodgepole pine, Douglas-fir and aspen form pure and mixed stands on this ecosite. Succession is toward white spruce, however, succession rates are slow due to the dry nature of the ecosite. Douglas fir in the North Saskatchewan river valley forms pure and mixed stands on this ecosite. Douglas fir was infrequent in the Athabasca River valley between Hinton and Jasper. Shrub and forb layers may be very sparse depending on canopy closure, particularly in Douglas-fir stands.

### Indicator Species

#### Tree

WHITE SPRUCE

*Picea glauca*

LODGEPOLE PINE

*Pinus contorta*

BALSAM POPLAR

*Populus balsamifera*

ASPEN

*Populus tremuloides*

DOUGLAS-FIR

*Pseudotsuga menziesii*

#### Shrub

GROUND JUNIPER

*Juniperus communis*

COMMON BEARBERRY

*Arctostaphylos uva-ursi*

YELLOW MOUNTAIN AVENS

*Dryas drummondii*

#### Graminoid

HAIRY WILD RYE

*Elymus innovatus*

# c1 hairy wildrye Fd (n=4)

**Natural Subregion:** Montane  
**Ecosection:** Mn Montane North Ecosection

**Ecosite:** c hairy wildrye (submesic/medium)

## Characteristic Species

### Tree

- [ 30.0 ] DOUGLAS-FIR\*  
*Pseudotsuga menziesii*
- [ 3.0 ] LODGEPOLE PINE\*  
*Pinus contorta*
- [ 1.2 ] WHITE SPRUCE  
*Picea glauca*

### Shrub

- [ 3.0 ] CANADA BUFFALOBERRY  
*Shepherdia canadensis*
- [ 2.5 ] TWINFLOWER  
*Linnaea borealis*
- [ 2.2 ] GROUND JUNIPER  
*Juniperus communis*
- [ 2.0 ] WHITE MEADOWSWEET  
*Spiraea betulifolia*
- [ 1.7 ] PRICKLY ROSE  
*Rosa acicularis*
- [ 1.7 ] COMMON BEARBERRY  
*Arctostaphylos uva-ursi*

### Forb

- [ 3.7 ] SHOWY ASTER  
*Aster conspicuus*
- [ 1.5 ] WILD STRAWBERRY  
*Fragaria virginiana*
- [ 1.0 ] CREAM-COLORED VETCHLING  
*Lathyrus ochroleucus*

### Lichen

- [ 1.5 ] STUDDERED LEATHER LICHEN  
*Peltigera aphthosa*

### Moss and Liverwort

- [ 1.7 ] STAIR-STEP MOSS  
*Hylocomium splendens*

### Graminoid

- [ 17.5 ] HAIRY WILD RYE  
*Elymus innovatus*
- [ 12.5 ] WHEAT GRASS SPECIES  
*Agropyron*

## Environmental Variables

Moisture Regime: Mesic (fresh) (2), Subxeric (moderately dry) (1)  
 Nutrient Regime:  
 Elevation (range): 1208 (1030-1370) M  
 Slope (%): very strong slope (2), moderate slope (1), strong slope (1)  
 Aspect: Westerly (3), Southerly (1)  
 Topographic Position:

## Soil Variables

Soil Drainage:  
 Soil Subgroup: ORTHIC EUTRIC BRUNISOL (3), ORTHIC GRAY LUVISOL (1)  
 Surface Texture:  
 Effective Texture:  
 Depth to Mottles/Gley:  
 Organic Thickness: 0 - 5 cm (4)  
 Parent Material: Eolian (3), Morainal (2), Rock (2), Colluvial (1)  
 Soil Type:  
 Humus Form

## LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

## Mne5 Fd/Hairy wildrye/Moss (n=4)

(*Pseudotsuga menziesii*/*Elymus innovatus*/*Hylocomium splendens*)

This community type occurs on steep, dry sites throughout the subregion. Douglas fir is usually restricted to steep, south facing slopes, shallow rocky soils and coarse-textured outwash in valley bottoms (Strong 1992). The soils of this type are not as rich as the Buffaloberry dominated ecosite, but are better developed than the bearberry and limber pine dominated ecosites. This community has a high cover of Douglas fir and a very sparse understory.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** c hairy wildrye (submesic/medium)

**Ecosite Phase:** c1 hairy wildrye Fd

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables				
	Mean	Range							
<b>Overstory Tree</b>					Ecological Status Score: 25				
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	20.0	0.0-35.0		75	Moisture Regime: Mesic (fresh) (2), Subxeric (moderately dry) (1)				
LOGEPOLE PINE ( <i>Pinus contorta</i> )	3.0	0.0-5.0		75	Nutrient Regime:				
<b>Understory Tree</b>					Elevation (range): 1208 (1030-1370) M				
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	10.0	0.0-35.0		75	Slope (%): 31 - 45.99 (2), 10 - 15.99 (1), 16 - 30.99 (1)				
<b>Medium Shrub (0.5 to 2 m)</b>					Aspect: Westerly (3), Southerly (1)				
CANADA BUFFALOBERRY ( <i>Shepherdia canadensis</i> )	3.0	1.0-5.0		100	Topographic Position:				
TWINFLOWER ( <i>Linnaea borealis</i> )	2.5	1.0-5.0		100	<b>Soil Variables</b>				
GROUND JUNIPER ( <i>Juniperus communis</i> )	2.2	1.0-5.0		100	Soil Drainage:				
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	2.0	1.0-5.0		100	Soil Subgroup: ORTHIC EUTRIC BRUNISOL (3), ORTHIC GRAY LUVISOL (1)				
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	1.7	0.0-5.0		75	Surface Texture:				
PRICKLY ROSE ( <i>Rosa acicularis</i> )	1.7	1.0-3.0		100	Effective Texture:				
WHITE SPRUCE ( <i>Picea glauca</i> )	1.2	0.0-5.0		25	Depth to Mottles/Gley:				
<b>Tall Forb (&gt;= 30 cm)</b>					Organic Thickness: 0 - 5 cm (4)				
SHOWY ASTER ( <i>Aster conspicuus</i> )	3.7	1.0-7.0		100	Parent Material: Eolian (3), Morainal (2), Rock (2), Colluvial (1)				
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	1.0	1.0-1.0		100	Soil Type:				
<b>Low Forb (&lt; 30 cm)</b>					Humus Form				
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	1.5	0.0-4.0		75	<b>LFH Thickness</b>				
<b>Graminoid</b>									
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	17.5	5.0-40.0		100	Mean				
WHEAT GRASS SPECIES ( <i>Agropyron</i> )	12.5	0.0-50.0		25	Min				
<b>Moss</b>					Max				
STAIR-STEP MOSS ( <i>Hylocomium splendens</i> )	1.7	0.0-5.0		75	Count				
<b>Lichen</b>									
STUDED LEATHER LICHEN ( <i>Peltigera aphthosa</i> )	1.5	0.0-5.0		50	cm:				
					0.00	0.00	0.00	0	

## c2 hairy wildrye PI-Sw (n=48)

**Natural Subregion:** Montane  
**Ecosection:** Mn Montane North Ecosection

**Ecosite:** c hairy wildrye (submesic/medium)

### Characteristic Species

#### Tree

- [ 15.4 ] WHITE SPRUCE  
*Picea glauca*
- [ 10.2 ] LODGEPOLE PINE  
*Pinus contorta*

#### Shrub

- [ 7.1 ] SILVERBERRY  
*Elaeagnus commutata*
- [ 4.1 ] YELLOW MOUNTAIN AVENS\*  
*Dryas drummondii*
- [ 3.9 ] TWINFLOWER  
*Linnaea borealis*
- [ 3.6 ] COMMON BEARBERRY  
*Arctostaphylos uva-ursi*
- [ 2.9 ] PRICKLY ROSE  
*Rosa acicularis*
- [ 2.3 ] CANADA BUFFALOBERRY  
*Shepherdia canadensis*
- [ 1.0 ] GROUND JUNIPER\*  
*Juniperus communis*
- [ 1.0 ] CREEPING JUNIPER  
*Juniperus horizontalis*
- [ 1.0 ] SHRUBBY CINQUEFOIL  
*Potentilla fruticosa*

#### Forb

- [ 1.8 ] SHOWY ASTER  
*Aster conspicuus*

#### Moss and Liverwort

- [ 6.5 ] N/A  
*Thuidium abietinum*
- [ 4.7 ] STAIR-STEP MOSS  
*Hylocomium splendens*
- [ 4.5 ] SCHREBER'S MOSS  
*Pleurozium schreberi*

#### Graminoid

- [ 18.4 ] HAIRY WILD RYE\*  
*Elymus innovatus*
- [ 1.5 ] BRISTLE-LEAVED SEDGE  
*Carex eburnea*

### Environmental Variables

Moisture Regime: Mesic (fresh) (18), Submesic (moderately fresh) (4), Subxeric (moderately dry) (2), Subhygric (moderately moist) (1)  
 Nutrient Regime: Submesotrophic (poor) (5), Mesotrophic (medium) (4)  
 Elevation (range): 1119 (870-1460) M  
 Slope (%): very gentle slope (13), gentle slope (9), moderate slope (5), nearly level (5), strong slope (4), very strong slope (3), level (3), steep slope (2), very steep slope (1), extreme slope (1)  
 Aspect: Southerly (16), Westerly (10), Northerly (8), Easterly (6), Level (2)  
 Topographic Position: Upper Slope (4), Midslope (2), Lower Slope (2)

### Soil Variables

Soil Drainage: Well drained (21), Rapidly drained (2), Very rapidly drained (1), Imperfectly drained (1)  
 Soil Subgroup: CUMULIC REGOSOL (12), ORTHIC EUTRIC BRUNISOL (11), ORTHIC REGOSOL (5), ORTHIC HUMIC REGOSOL (3), BRUNISOLIC GRAY LUVISOL (3), ORTHIC GRAY LUVISOL (3), CUMULIC HUMIC REGOSOL (2), ORTHIC DYSTRIC BRUNISOL (1), ELUVIATED EUTRIC BRUNISOL (1), GLEYED ELUVIATED EUTRIC BRUNISOL (1), GLEYED CUMULIC HUMIC REGOSOL (1), ORTHIC MELANIC BRUNISOL (1)  
 Surface Texture: Silt loam (1), Silt (1), Sandy loam (1), Loamy fine sand (1), Loamy sand (1)  
 Effective Texture: Loamy sand (1), Silt (1), Sandy loam (1), Loamy fine sand (1), Silt loam (1)  
 Depth to Mottles/Gley:  
 Organic Thickness: 0 - 5 cm (44)  
 Parent Material: Eolian (29), Morainal (21), Fluvial (10), Glaciofluvial (3), Colluvial (3), Rock (1)  
 Soil Type: Moist/Coarse (1)  
 Humus Form FIBRIMOR (1)

### LFH Thickness

	Mean	Min	Max	Count
cm:	5.25	1.00	10.00	5

## Mne7 Sw/Hairy wildrye (n=27)

### (*Picea glauca*/*Elymus innovatus*)

This community is typical of the spruce dominated community types on steep or shallow slopes with coarse textured soils with south and west facing aspects in the Northern Montane ecosection. They tend to be dry sites, that are well drained with poor to medium nutrient regimes. The shrub layer tends to be poorly developed and the understory is dominated by hairy wildrye. Forage production on these sites tends to be low because of the closed canopy cover. Succession in the absence of disturbance will be lodgepole pine to white spruce.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** c hairy wildrye (submesic/medium)

**Ecosite Phase:** c2 hairy wildrye PI-Sw

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Overstory Tree</b>					Ecological Status Score: 25
WHITE SPRUCE ( <i>Picea glauca</i> )	23.5	0.0-50.0	93		Moisture Regime: Mesic (fresh) (8), Submesic (moderately fresh) (2), Subhygric (moderately moist) (1)
ENGELMANN X WHITE SPRUCE ( <i>Picea engelmannii x glauca</i> )	0.9	0.0-25.0	4		Nutrient Regime: Submesotrophic (poor) (2), Mesotrophic (medium) (2)
<b>Understory Tree</b>					Elevation (range): 1091 (975-1372) M
WHITE SPRUCE ( <i>Picea glauca</i> )	2.8	0.0-29.0	30		Slope (%): 2.5 - 5.99 (8), 6 - 9.99 (6), 10 - 15.99 (3), 0 - 0.49 (2), 0.5 - 2.49 (2), 46 - 70.99 (2), 71 - 100.99 (1), > 100.99 (1), 16 - 30.99 (1), 31 - 45.99 (1)
<b>Medium Shrub (0.5 to 2 m)</b>					Aspect: Southerly (11), Northerly (6), Easterly (3), Westerly (3), Level (1)
PRICKLY ROSE ( <i>Rosa acicularis</i> )	5.1	1.0-35.0	100		Topographic Position: Lower Slope (1), Midslope (1), Upper Slope (1)
TWINFLOWER ( <i>Linnaea borealis</i> )	2.9	0.0-40.0	59		<b>Soil Variables</b>
CANADA BUFFALOBERRY ( <i>Shepherdia canadensis</i> )	2.4	0.0-10.0	93		Soil Drainage: Well drained (16), Imperfectly drained (1), Very rapidly drained (1), Rapidly drained (1)
CREeping JUNIPER ( <i>Juniperus horizontalis</i> )	2.2	0.0-43.0	33		Soil Subgroup: CUMULIC REGOSOL (12), ORTHIC REGOSOL (3), ORTHIC EUTRIC BRUNISOL (3), ORTHIC HUMIC REGOSOL (3), CUMULIC HUMIC REGOSOL (2), GLEYED CUMULIC HUMIC REGOSOL (1), ORTHIC MELANIC BRUNISOL (1)
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	1.6	0.0-5.0	82		Surface Texture: Silt (1), Loamy fine sand (1)
GROUND JUNIPER ( <i>Juniperus communis</i> )	1.5	0.0-6.3	63		Effective Texture: Loamy fine sand (1), Silt (1)
<b>Tall Forb (&gt;= 30 cm)</b>					Depth to Mottles/Gley:
YELLOW HEDYSARUM ( <i>Hedysarum sulphurescens</i> )	1.2	0.0-20.0	48		Organic Thickness: 0 - 5 cm (25)
SHOWY ASTER ( <i>Aster conspicuus</i> )	1.1	0.0-20.0	33		Parent Material: Eolian (22), Morainal (10), Fluvial (4), Colluvial (3), Glaciofluvial (2)
<b>Graminoid</b>					Soil Type:
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	35.8	4.0-70.0	100		Humus Form FIBRIMOR (1)
BRISTLE-LEAVED SEDGE ( <i>Carex eburnea</i> )	4.6	0.0-60.0	59		<b>LFH Thickness</b>
<b>Moss</b>					<b>Mean</b> <b>Min</b> <b>Max</b> <b>Count</b>
N/A ( <i>Thuidium abietinum</i> )	19.5	0.0-75.0	70		cm: 8.00 7.00 10.00 2
SCHREBER'S MOSS ( <i>Pleurozium schreberi</i> )	5.6	0.0-85.0	33		
STAIR-STEP MOSS ( <i>Hylocomium splendens</i> )	4.4	0.0-20.0	41		
<b>Lichen</b>					
STUDDed LEATHER LICHEN ( <i>Peltigera aphthosa</i> )	1.6	0.0-42.0	7		

## Mne8 Sw/Yellow Mountain Avens-Silverberry (fluvial) (n=3)

(*Picea glauca*/*Dryas drummondii*-*Elaeagnus commutata*)

This community type is found on fluvial sites with gravelly soils and shallow slopes. Sub-surface flow through coarse substrate provides habitat suitable for species whose roots reach groundwater (spruce, silverberry). However, the surface is subxeric characterized by yellow mountain avens. In the absence of disturbance the yellow mountain avens dominated community types will succeed to this community type.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** c hairy wildrye (submesic/medium)

**Ecosite Phase:** c2 hairy wildrye PI-Sw

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Overstory Tree</b>					Ecological Status Score: 40
WHITE SPRUCE ( <i>Picea glauca</i> )	11.3	1.0-18.0	100		Moisture Regime: Subxeric (moderately dry) (1), Mesic (fresh) (1)
<b>Understory Tree</b>					Nutrient Regime: Mesotrophic (medium) (1)
WHITE SPRUCE ( <i>Picea glauca</i> )	6.3	0.0-10.0	67		Elevation (range): 1081 (870-1372) M
ASPEN ( <i>Populus tremuloides</i> )	1.6	0.0-5.0	33		Slope (%): 0.5 - 2.49 (1), 2.5 - 5.99 (1)
BALSAM POPLAR ( <i>Populus balsamifera</i> )	1.0	0.0-3.0	33		Aspect: Northerly (1), Westerly (1)
<b>Tall Shrub (2 to 5m)</b>					Topographic Position: Upper Slope (1)
WHITE SPRUCE ( <i>Picea glauca</i> )	6.6	0.0-20.0	33		<b>Soil Variables</b>
<b>Medium Shrub (0.5 to 2 m)</b>					Soil Drainage: Well drained (1)
SILVERBERRY ( <i>Elaeagnus commutata</i> )	19.3	5.0-38.0	100		Soil Subgroup: ORTHIC REGOSOL (2), ORTHIC EUTRIC BRUNISOL (1)
YELLOW MOUNTAIN AVENS ( <i>Dryas drummondii</i> )	8.3	0.0-20.0	67		Surface Texture: Loamy sand (1)
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	7.0	1.0-15.0	100		Effective Texture: Loamy sand (1)
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	2.0	0.0-6.0	33		Depth to Mottles/Gley:
PRICKLY ROSE ( <i>Rosa acicularis</i> )	1.6	0.0-5.0	33		Organic Thickness: 0 - 5 cm (3)
GROUND JUNIPER ( <i>Juniperus communis</i> )	1.3	0.0-3.0	67		Parent Material: Fluvial (3)
CANADA BUFFALOBERRY ( <i>Shepherdia canadensis</i> )	1.0	0.0-2.0	67		Soil Type:
<b>Tall Forb (&gt;= 30 cm)</b>					Humus Form
ASCENDING PURPLE MILK VETCH ( <i>Astragalus striatus</i> )	2.3	0.0-7.0	33		<b>LFH Thickness</b>
<b>Low Forb (&lt; 30 cm)</b>					Mean
SHOWY LOCOWEED ( <i>Oxytropis splendens</i> )	1.6	0.0-5.0	33		Min
COMMON YARROW ( <i>Achillea millefolium</i> )	1.0	0.0-2.0	67		Max
EARLY YELLOW LOCOWEED ( <i>Oxytropis sericea</i> )	1.0	0.0-3.0	33		Count
<b>Graminoid</b>					cm:
BEAUTIFUL SEDGE ( <i>Carex concinna</i> )	5.0	0.0-15.0	33		1.00
AWNLESS BROME ( <i>Bromus inermis</i> )	1.6	0.0-5.0	33		1.00
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	1.6	0.0-3.0	67		1.00
					1



## Mne6 PI/Hairy wildrye (n=15)

### (*Pinus contorta*/*Elymus innovatus*)

This community is typical of the pine dominated community types on steep or shallow slopes with coarse textured soils with south and west facing aspects in the Northern Montane ecosection. They tend to be dry sites, that are well drained with poor to medium nutrient regimes. The shrub layer tends to be poorly developed and the understory is dominated by hairy wildrye. Forage production on these sites tends to be low because of the closed canopy cover. Succession in the absence of disturbance will be to white spruce.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** c hairy wildrye (submesic/medium)

**Ecosite Phase:** c2 hairy wildrye PI-Sw

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Overstory Tree</b>					Ecological Status Score: 25
LOGEPOLE PINE ( <i>Pinus contorta</i> )	29.6	5.0-45.0	100		Moisture Regime: Mesic (fresh) (9)
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	1.5	0.0-10.0	33		Nutrient Regime: Mesotrophic (medium) (1)
<b>Understory Tree</b>					Elevation (range): 1272 (1130-1460) M
LOGEPOLE PINE ( <i>Pinus contorta</i> )	3.4	0.0-35.0	40		Slope (%): 16 - 30.99 (3), 6 - 9.99 (3), 10 - 15.99 (2), 31 - 45.99 (2), 0.5 - 2.49 (2), 2.5 - 5.99 (1), 0 - 0.49 (1)
WHITE SPRUCE ( <i>Picea glauca</i> )	2.0	0.0-15.0	33		Aspect: Westerly (6), Southerly (3), Easterly (2), Level (1), Northerly (1)
<b>Medium Shrub (0.5 to 2 m)</b>					Topographic Position: Upper Slope (1)
TWINFLOWER ( <i>Linnaea borealis</i> )	8.4	0.0-35.0	93		<b>Soil Variables</b>
PRICKLY ROSE ( <i>Rosa acicularis</i> )	3.6	0.0-15.0	93		Soil Drainage: Well drained (2)
CANADA BUFFALOBERRY ( <i>Shepherdia canadensis</i> )	3.6	0.0-10.0	80		Soil Subgroup: ORTHIC EUTRIC BRUNISOL (6), BRUNISOLIC GRAY LUVISOL (3), ORTHIC GRAY LUVISOL (3), ORTHIC DYSTRIC BRUNISOL (1), ELUVIATED EUTRIC BRUNISOL (1), GLEYED ELUVIATED EUTRIC BRUNISOL (1)
RIVER ALDER ( <i>Alnus tenuifolia</i> )	2.2	0.0-23.0	13		Surface Texture: Sandy loam (1)
GROUND JUNIPER ( <i>Juniperus communis</i> )	1.5	0.0-10.0	73		Effective Texture: Sandy loam (1)
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	1.2	0.0-4.0	73		Depth to Mottles/Gley:
LOW-BUSH CRANBERRY ( <i>Viburnum edule</i> )	1.1	0.0-7.0	33		Organic Thickness: 0 - 5 cm (15)
GREEN ALDER ( <i>Alnus crispa</i> )	1.0	0.0-9.0	27		Parent Material: Morainal (11), Eolian (7), Fluvial (3), Glaciofluvial (1), Rock (1)
<b>Low Shrub (&lt; 0.5m)</b>					Soil Type: Moist/Coarse (1)
DEWBERRY ( <i>Rubus pubescens</i> )	1.1	0.0-10.0	20		Humus Form
<b>Tall Forb (&gt;= 30 cm)</b>					<b>LFH Thickness</b>
SHOWY ASTER ( <i>Aster conspicuus</i> )	4.2	0.0-20.0	87		Mean
<b>Low Forb (&lt; 30 cm)</b>					Min
BUNCHBERRY ( <i>Cornus canadensis</i> )	1.7	0.0-5.0	53		Max
HEART-LEAVED ARNICA ( <i>Arnica cordifolia</i> )	1.4	0.0-10.0	53		Count
ONE-SIDED WINTERGREEN ( <i>Orthilia secunda</i> )	1.2	0.0-7.0	67		cm:
<b>Graminoid</b>					4.00
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	18.4	10.0-30.0	100		4.00
<b>Moss</b>					4.00
STAIR-STEP MOSS ( <i>Hylocomium splendens</i> )	9.1	0.0-35.0	80		1
SCHREBER'S MOSS ( <i>Pleurozium schreberi</i> )	7.4	0.0-30.0	67		

## Mnf1 Juniper/Hairy wildrye (Sw) (n=3)

(*Juniperus spp./Elymus innovatus(Picea glauca)*)

This community represents a harvested Sw/ Hairy wildrye community along the north shore of Brule Lake. It is characteristic of the fine-textured, calcareous loess deposits, which have blown down the Athabasca river valley from Jasper National Park. The soils of this community have a high pH (8) which supports a good cover of hairy wildrye. This community type is extremely slow growing. When harvested, the cutblocks resemble native grasslands. This community is very similar to the rose/ hairy wildrye community, but appears to be a later successional stage. This community type was described in older cutblocks (35 yrs) than the rose/ hairy wildrye community type (Mnf2). As succession occurs on these cutblocks it appears that juniper and grass cover increase, causing a corresponding increase in forage production. .

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** c hairy wildrye (submesic/medium)

**Ecosite Phase:** c2 hairy wildrye Pl-Sw

### Plant Composition

### Canopy Cover (%)

	Mean	Range	Const.
<b>Overstory Tree</b>			
WHITE SPRUCE ( <i>Picea glauca</i> )	13.3	10.0-15.0	100
BALSAM POPLAR ( <i>Populus balsamifera</i> )	8.3	0.0-15.0	67
<b>Tall Shrub (2 to 5m)</b>			
SALIX SPECIES ( <i>Salix</i> )	10.0	0.0-15.0	67
WATER BIRCH ( <i>Betula occidentalis</i> )	8.3	0.0-25.0	33
<b>Medium Shrub (0.5 to 2 m)</b>			
CREeping JUNIPER ( <i>Juniperus horizontalis</i> )	13.1	0.0-27.7	67
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	11.1	8.0-15.0	100
PRICKLY ROSE ( <i>Rosa acicularis</i> )	7.1	1.0-10.5	100
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	4.5	1.0-6.7	100
GROUND JUNIPER ( <i>Juniperus communis</i> )	3.3	0.0-10.0	33
CANADA BUFFALOBERRY ( <i>Shepherdia canadensis</i> )	2.0	0.0-6.0	33
<b>Tall Forb (&gt;= 30 cm)</b>			
NORTHERN HEDYSARUM ( <i>Hedysarum boreale</i> )	4.9	0.0-7.7	67
WHITE CAMAS ( <i>Zigadenus elegans</i> )	2.4	0.5-4.0	100
<b>Low Forb (&lt; 30 cm)</b>			
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	5.8	0.5-10.3	100
SHOWY LOCOWEED ( <i>Oxytropis splendens</i> )	2.4	0.5-3.7	100
<b>Graminoid</b>			
SEDGE SPECIES ( <i>Carex</i> )	6.6	0.0-15.5	67
BLUNT SEDGE ( <i>Carex obtusata</i> )	5.0	0.0-15.0	33
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	3.6	0.0-7.6	67
JUNE GRASS ( <i>Koeleria macrantha</i> )	2.1	0.0-3.5	67

### Environmental Variables

Ecological Status Score: 25

Moisture Regime: Submesic (moderately fresh) (2), Subxeric (moderately dry) (1)

Nutrient Regime: Submesotrophic (poor) (3)

Elevation (range): 1034 (1001-1066) M

Slope (%): 2.5 - 5.99 (3)

Aspect: Southerly (2), Easterly (1)

Topographic Position: Lower Slope (1), Midslope (1), Upper Slope (1)

### Soil Variables

Soil Drainage: Well drained (2), Rapidly drained (1)

Soil Subgroup: ORTHIC EUTRIC BRUNISOL (1)

Surface Texture: Silt loam (1)

Effective Texture: Silt loam (1)

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (1)

Parent Material:

Soil Type:

Humus Form

### LFH Thickness

	Mean	Min	Max	Count
cm:	8.00	8.00	8.00	1

### c3 hairy wildrye Aw (n=3)

**Natural Subregion:** Montane  
**Ecosection:** Mn Montane North Ecosection

**Ecosite:** c hairy wildrye (submesic/medium)

#### Characteristic Species

##### Tree

- [ 12.5 ] ASPEN\*  
*Populus tremuloides*
- [ 3.5 ] BALSAM POPLAR\*  
*Populus balsamifera*
- [ 2.5 ] WATER BIRCH  
*Betula occidentalis*
- [ 1.1 ] BALSAM POPLAR  
*Populus balsamifera*

##### Shrub

- [ 5.5 ] CANADA BUFFALOBERRY  
*Shepherdia canadensis*
- [ 5.0 ] GROUND JUNIPER\*  
*Juniperus communis*
- [ 4.5 ] SNOWBERRY (BUCKBRUSH)  
*Symphoricarpos occidentalis*
- [ 4.0 ] SALIX SPECIES  
*Salix*
- [ 3.5 ] COMMON BEARBERRY  
*Arctostaphylos uva-ursi*
- [ 3.0 ] PRICKLY ROSE  
*Rosa acicularis*

##### Forb

- [ 10.5 ] CREAM-COLORED VETCHLING  
*Lathyrus ochroleucus*
- [ 5.0 ] COMMON RED PAINTBRUSH  
*Castilleja miniata*
- [ 3.5 ] LARGE NORTHERN ASTER  
*Aster modestus*
- [ 3.0 ] WILD VETCH  
*Vicia americana*
- [ 2.5 ] COMMON FIREWEED  
*Epilobium angustifolium*
- [ 2.5 ] NORTHERN BEDSTRAW  
*Galium boreale*
- [ 2.0 ] WILD STRAWBERRY  
*Fragaria virginiana*

##### Graminoid

- [ 17.0 ] HAIRY WILD RYE  
*Elymus innovatus*
- [ 14.5 ] NORTHERN AWNLESS BROME  
*Bromus inermis ssp. pumpellianus*

#### Environmental Variables

Moisture Regime: Submesic (moderately fresh) (2), Mesic (fresh) (2)  
 Nutrient Regime: Mesotrophic (medium) (2), Submesotrophic (poor) (2)  
 Elevation (range): 1167 (914-1700) M  
 Slope (%): gentle slope (1)  
 Aspect: Easterly (1)  
 Topographic Position: Lower Slope (2), Level (1)

#### Soil Variables

Soil Drainage: Rapidly drained (2), Well drained (2)  
 Soil Subgroup: CUMULIC REGOSOL (2), ORTHIC REGOSOL (1), ORTHIC HUMIC REGOSOL (1)  
 Surface Texture: Very fine sandy loam (2)  
 Effective Texture: Loamy very fine sand (2)  
 Depth to Mottles/Gley:  
 Organic Thickness: 0 - 5 cm (4)  
 Parent Material: Fluvial (2), Rock (1), Colluvial (1), Eolian (1)  
 Soil Type:  
 Humus Form RAW MODER (1)

LFH Thickness	Mean	Min	Max	Count
cm:	3.00	3.00	3.00	2

## Mnc2 Aw/Hairy wildrye (n=1)

### (*Populus tremuloides*/*Elymus innovatus*)

This community type occupies dry, upper slope and hilltop positions or level areas with coarse textured soils. The soils on this community type are fairly well developed and the moisture conditions are high enough to favour the growth of aspen. The forb and shrub layer is not well developed in this community type and the understory is dominated by graminoid species. In years of drought aspen will likely die back in this community type. Frequent fire also tends to control the spread of aspen.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** c hairy wildrye (submesic/medium)

**Ecosite Phase:** c3 hairy wildrye Aw

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Overstory Tree</b>					Ecological Status Score: 25
ASPEN ( <i>Populus tremuloides</i> )	25.0	25.0-25.0	100		Moisture Regime: Mesic (fresh) (2)
BALSAM POPLAR ( <i>Populus balsamifera</i> )	2.0	2.0-2.0	100		Nutrient Regime: Mesotrophic (medium) (2)
<b>Understory Tree</b>					Elevation (range): 1307 (914-1700) M
BALSAM POPLAR ( <i>Populus balsamifera</i> )	2.2	2.2-2.2	100		Slope (%):
<b>Medium Shrub (0.5 to 2 m)</b>					Aspect:
CANADA BUFFALOBERRY ( <i>Shepherdia canadensis</i> )	10.0	10.0-10.0	100		Topographic Position: Level (1), Lower Slope (1)
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	9.0	9.0-9.0	100		
SALIX SPECIES ( <i>Salix</i> )	8.0	8.0-8.0	100		
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	6.0	6.0-6.0	100		
PRICKLY ROSE ( <i>Rosa acicularis</i> )	6.0	6.0-6.0	100		
<b>Tall Forb (&gt;= 30 cm)</b>					
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	21.0	21.0-21.0	100		
COMMON RED PAINTBRUSH ( <i>Castilleja miniata</i> )	10.0	10.0-10.0	100		
LARGE NORTHERN ASTER ( <i>Aster modestus</i> )	7.0	7.0-7.0	100		
WILD VETCH ( <i>Vicia americana</i> )	6.0	6.0-6.0	100		
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	5.0	5.0-5.0	100		
RED CLOVER ( <i>Trifolium pratense</i> )	2.0	2.0-2.0	100		
<b>Low Forb (&lt; 30 cm)</b>					
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	5.0	5.0-5.0	100		
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	4.0	4.0-4.0	100		
COMMON YARROW ( <i>Achillea millefolium</i> )	1.0	1.0-1.0	100		
YELLOW FALSE DANDELION ( <i>Agoseris glauca</i> )	1.0	1.0-1.0	100		
<b>Graminoid</b>					
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	34.0	34.0-34.0	100		
NORTHERN AAWNLESS BROME ( <i>Bromus inermis</i> ssp. <i>pumpellianus</i> )	29.0	29.0-29.0	100		

Soil Variables				
Soil Drainage: Well drained (2)				
Soil Subgroup: CUMULIC REGOSOL (1), ORTHIC REGOSOL (1)				
Surface Texture:				
Effective Texture:				
Depth to Mottles/Gley:				
Organic Thickness: 0 - 5 cm (2)				
Parent Material: Colluvial (1), Fluvial (1), Rock (1)				
Soil Type:				
Humus Form				
LFH Thickness	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

## Mnc3 Pb/Juniper (fluvial) (n=2)

(*Populus tremuloides*/*Juniperus spp.*)

This community type is found on fluvial sites with gravelly soils and shallow slopes. Sub-surface flow through coarse substrate provides habitat suitable for species whose roots reach groundwater (balsam poplar). However, the surface is subxeric characterized by juniper and bearberry. In the absence of disturbance this community type will succeed to white spruce.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** c hairy wildrye (submesic/medium)

**Ecosite Phase:** c3 hairy wildrye Aw

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Overstory Tree</b>					Ecological Status Score: 40
WATER BIRCH ( <i>Betula occidentalis</i> )	5.0	5.0-5.0	100		Moisture Regime: Submesic (moderately fresh) (2)
BALSAM POPLAR ( <i>Populus balsamifera</i> )	5.0	5.0-5.0	100		Nutrient Regime: Submesotrophic (poor) (2)
WHITE SPRUCE ( <i>Picea glauca</i> )	1.0	1.0-1.0	100		Elevation (range): 1028 (1028-1028) M
<b>Tall Shrub (2 to 5m)</b>					Slope (%): 6 - 9.99 (1)
BALSAM POPLAR ( <i>Populus balsamifera</i> )	1.0	1.0-1.0	100		Aspect: Easterly (1)
ASPEN ( <i>Populus tremuloides</i> )	1.0	1.0-1.0	100		Topographic Position: Lower Slope (1)
<b>Medium Shrub (0.5 to 2 m)</b>					<b>Soil Variables</b>
GROUND JUNIPER ( <i>Juniperus communis</i> )	10.0	10.0-10.0	100		Soil Drainage: Rapidly drained (2)
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	1.0	1.0-1.0	100		Soil Subgroup: ORTHIC HUMIC REGOSOL (1), CUMULIC REGOSOL (1)
BALSAM POPLAR ( <i>Populus balsamifera</i> )	1.0	1.0-1.0	100		Surface Texture: Very fine sandy loam (2)
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	1.0	1.0-1.0	100		Effective Texture: Loamy very fine sand (2)
CANADA BUFFALOBERRY ( <i>Shepherdia canadensis</i> )	1.0	1.0-1.0	100		Depth to Mottles/Gley:
<b>Tall Forb (&gt;= 30 cm)</b>					Organic Thickness: 0 - 5 cm (2)
ALPINE HEDYSARUM ( <i>Hedysarum alpinum</i> )	3.0	3.0-3.0	100		Parent Material: Eolian (1), Fluvial (1)
STAR-FLOWERED SOLOMON'S-SEAL ( <i>Smilacina stellata</i> )	1.0	1.0-1.0	100		Soil Type:
<b>Low Forb (&lt; 30 cm)</b>					Humus Form RAW MODER (1)
PURPLE MILK VETCH ( <i>Astragalus dasyglottis</i> )	1.0	1.0-1.0	100		<b>LFH Thickness</b>
EARLY BLUE VIOLET ( <i>Viola adunca</i> )	1.0	1.0-1.0	100		<b>Mean</b>
<b>Graminoid</b>					<b>Min</b>
NORTHERN WHEAT GRASS ( <i>Agropyron dasystachyum</i> )	1.0	1.0-1.0	100		<b>Max</b>
BRISTLE-LEAVED SEDGE ( <i>Carex eburnea</i> )	1.0	1.0-1.0	100		<b>Count</b>
					cm: 3.00 3.00 3.00 2

## c4 hairy wildrye Aw-Sw-PI-Fd (n=1)

**Natural Subregion:** Montane  
**Ecosection:** Mn Montane North Ecosection

**Ecosite:** c hairy wildrye (submesic/medium)

### Characteristic Species

#### Tree

- [ 20.0 ] WHITE SPRUCE\*  
*Picea glauca*
- [ 8.0 ] WHITE BIRCH  
*Betula papyrifera*
- [ 5.0 ] ASPEN  
*Populus tremuloides*
- [ 1.0 ] WATER BIRCH  
*Betula occidentalis*

#### Shrub

- [ 20.0 ] GROUND JUNIPER\*  
*Juniperus communis*
- [ 5.0 ] COMMON BEARBERRY  
*Arctostaphylos uva-ursi*
- [ 5.0 ] SASKATOON  
*Amelanchier alnifolia*
- [ 1.0 ] CANADA BUFFALOBERRY  
*Shepherdia canadensis*

#### Moss and Liverwort

- [ 10.0 ] SCHREBER'S MOSS  
*Pleurozium schreberi*

#### Graminoid

- [ 2.0 ] HAIRY WILD RYE\*  
*Elymus innovatus*

### Environmental Variables

Moisture Regime: Mesic (fresh) (1)  
 Nutrient Regime: Mesotrophic (medium) (1)  
 Elevation (range): 1070 (1070-1070) M  
 Slope (%): very steep slope (1)  
 Aspect: Easterly (1)  
 Topographic Position:

### Soil Variables

Soil Drainage: Well drained (1)  
 Soil Subgroup: ORTHIC HUMIC REGOSOL (1)  
 Surface Texture: Very fine sandy loam (1)  
 Effective Texture: Very fine sandy loam (1)  
 Depth to Mottles/Gley:  
 Organic Thickness: 0 - 5 cm (1)  
 Parent Material: Colluvial (1)  
 Soil Type:  
 Humus Form RAW MODER (1)

### LFH Thickness

	Mean	Min	Max	Count
cm:	4.00	4.00	4.00	1

## Mnd2 Sw-Bw/Juniper-Bearberry (n=1)

(*Picea glauca*-*Betula papyrifera*/*Juniperus spp.*-*Arctostaphylos uva-ursi*)

This community represents an deciduous dominated community type that is undergoing succession to white spruce. It is part of the hairy wildrye ecosite described by Archibald et al. (1996). This ecosite occupies dry upper slope positions with south exposures and coarse textured soils. Forage production on this site will be low because of the dry site conditions and livestock will have a difficulty accessing the upper slope position. This community should be rated as secondary range

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** c hairy wildrye (submesic/medium)

**Ecosite Phase:** c4 hairy wildrye Aw-Sw-PI-Fd

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 25
WHITE SPRUCE ( <i>Picea glauca</i> )	20.0	20.0-20.0	100	Moisture Regime: Mesic (fresh) (1)
WHITE BIRCH ( <i>Betula papyrifera</i> )	8.0	8.0-8.0	100	Nutrient Regime: Mesotrophic (medium) (1)
ASPEN ( <i>Populus tremuloides</i> )	5.0	5.0-5.0	100	Elevation (range): 1070 (1070-1070) M
<b>Tall Shrub (2 to 5m)</b>				Slope (%): 71 - 100.99 (1)
WATER BIRCH ( <i>Betula occidentalis</i> )	1.0	1.0-1.0	100	Aspect: Easterly (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Topographic Position:
GROUND JUNIPER ( <i>Juniperus communis</i> )	20.0	20.0-20.0	100	<b>Soil Variables</b>
SASKATOON ( <i>Amelanchier alnifolia</i> )	5.0	5.0-5.0	100	Soil Drainage: Well drained (1)
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	5.0	5.0-5.0	100	Soil Subgroup: ORTHIC HUMIC REGOSOL (1)
CANADA BUFFALOBERRY ( <i>Shepherdia canadensis</i> )	1.0	1.0-1.0	100	Surface Texture: Very fine sandy loam (1)
<b>Graminoid</b>				Effective Texture: Very fine sandy loam (1)
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	2.0	2.0-2.0	100	Depth to Mottles/Gley:
<b>Moss</b>				Organic Thickness: 0 - 5 cm (1)
SCHREBER'S MOSS ( <i>Pleurozium schreberi</i> )	10.0	10.0-10.0	100	Parent Material: Colluvial (1)
				Soil Type:
				Humus Form RAW MODER (1)
				<b>LFH Thickness</b>
				<b>Mean</b>
				<b>Min</b>
				<b>Max</b>
				<b>Count</b>
				cm:
				4.00
				4.00
				4.00
				1

## c5 shrubland-grassland (n=2)

**Natural Subregion:** Montane  
**Ecosection:** Mn Montane North Ecosection

**Ecosite:** c hairy wildrye (submesic/medium)

### Characteristic Species

#### Tree

- [ 10.0 ] WHITE SPRUCE  
*Picea glauca*
- [ 2.5 ] LODGEPOLE PINE  
*Pinus contorta*

#### Shrub

- [ 25.0 ] COMMON BEARBERRY\*  
*Arctostaphylos uva-ursi*
- [ 16.5 ] CANADA BUFFALOBERRY  
*Shepherdia canadensis*
- [ 6.0 ] CREEPING JUNIPER  
*Juniperus horizontalis*
- [ 5.0 ] GROUND JUNIPER  
*Juniperus communis*
- [ 1.5 ] COMMON WILD ROSE  
*Rosa woodsii*
- [ 1.0 ] SHRUBBY CINQUEFOIL  
*Potentilla fruticosa*

#### Forb

- [ 4.5 ] EARLY YELLOW LOCOWEED  
*Oxytropis sericea*
- [ 2.0 ] SHOWY LOCOWEED  
*Oxytropis splendens*
- [ 2.0 ] ALPINE HEDYSARUM  
*Hedysarum alpinum*
- [ 1.5 ] DILL  
*Anethum graveolens*
- [ 1.5 ] MOUNTAIN GOLDENROD  
*Solidago spathulata*
- [ 1.0 ] CUT-LEAVED ANEMONE  
*Anemone multifida*

#### Lichen

- [ 8.0 ] UNDIFFERENTIATED CLADONIA  
*Cladonia*

#### Graminoid

- [ 6.0 ] HAIRY WILD RYE\*  
*Elymus innovatus*

### Environmental Variables

Moisture Regime: Submesic (moderately fresh) (2)  
 Nutrient Regime: Eutrophic (very rich) (1), Mesotrophic (medium) (1)  
 Elevation (range): 1296 (1220-1372) M  
 Slope (%): very strong slope (1), nearly level (1)  
 Aspect: Westerly (1), Southerly (1)  
 Topographic Position: Upper Slope (1)

### Soil Variables

Soil Drainage: Well drained (2)  
 Soil Subgroup: ORTHIC EUTRIC BRUNISOL (1), BRUNISOLIC GRAY LUVISOL (1)  
 Surface Texture: Sandy loam (1), Sandy clay loam (1)  
 Effective Texture: Sandy clay loam (1), Silt loam (1)  
 Depth to Mottles/Gley:  
 Organic Thickness: 0 - 5 cm (2)  
 Parent Material: Eolian (2), Morainal (1), Glaciofluvial (1)  
 Soil Type:  
 Humus Form

### LFH Thickness

	Mean	Min	Max	Count
cm:	3.00	3.00	3.00	1



## Mnb5 Buffaloberry-Bearberry (n=2)

### (*Shepherdia canadensis*-*Arctostaphylos uva-ursi*)

This community type was described at two spots one in the Athabasca River valley and one near Kootenay Plains. It appears to represent early successional white spruce dominated forests on eolian and glaciofluvial parent materials on shallow to steep slopes. White spruce is sparse and growth is slow in this community type because of the dry site conditions at the surface.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** c hairy wildrye (submesic/medium)

**Ecosite Phase:** c5 shrubland-grassland

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Overstory Tree</b>					Ecological Status Score: 40
WHITE SPRUCE ( <i>Picea glauca</i> )	5.0	5.0-5.0	100		Moisture Regime: Submesic (moderately fresh) (2)
LOGEPOLE PINE ( <i>Pinus contorta</i> )	2.5	0.0-5.0	50		Nutrient Regime: Mesotrophic (medium) (1), Eutrophic (very rich) (1)
<b>Understory Tree</b>					Elevation (range): 1296 (1220-1372) M
WHITE SPRUCE ( <i>Picea glauca</i> )	3.0	0.0-6.0	50		Slope (%): 0.5 - 2.49 (1), 31 - 45.99 (1)
<b>Tall Shrub (2 to 5m)</b>					Aspect: Southerly (1), Westerly (1)
WHITE SPRUCE ( <i>Picea glauca</i> )	2.0	0.0-4.0	50		Topographic Position: Upper Slope (1)
<b>Medium Shrub (0.5 to 2 m)</b>					<b>Soil Variables</b>
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	25.0	10.0-40.0	100		Soil Drainage: Well drained (2)
CANADA BUFFALOBERRY ( <i>Shepherdia canadensis</i> )	16.5	15.0-18.0	100		Soil Subgroup: ORTHIC EUTRIC BRUNISOL (1), BRUNISOLIC GRAY LUVISOL (1)
CREeping JUNIPER ( <i>Juniperus horizontalis</i> )	6.0	5.0-7.0	100		Surface Texture: Sandy loam (1), Sandy clay loam (1)
GROUND JUNIPER ( <i>Juniperus communis</i> )	5.0	0.0-10.0	50		Effective Texture: Sandy clay loam (1), Silt loam (1)
COMMON WILD ROSE ( <i>Rosa woodsii</i> )	1.5	0.0-3.0	50		Depth to Mottles/Gley:
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	1.0	0.0-2.0	50		Organic Thickness: 0 - 5 cm (2)
<b>Tall Forb (&gt;= 30 cm)</b>					Parent Material: Eolian (2), Glaciofluvial (1), Morainal (1)
ALPINE HEDYSARUM ( <i>Hedysarum alpinum</i> )	2.0	0.0-4.0	50		Soil Type:
DILL ( <i>Anethum graveolens</i> )	1.5	0.0-3.0	50		Humus Form
<b>Low Forb (&lt; 30 cm)</b>					<b>LFH Thickness</b>
EARLY YELLOW LOCOWEED ( <i>Oxytropis sericea</i> )	4.5	0.0-9.0	50		<b>Mean</b>
SHOWY LOCOWEED ( <i>Oxytropis splendens</i> )	2.0	1.0-3.0	100		<b>Min</b>
MOUNTAIN GOLDENROD ( <i>Solidago spathulata</i> )	1.5	1.0-2.0	100		<b>Max</b>
CUT-LEAVED ANEMONE ( <i>Anemone multifida</i> )	1.0	1.0-1.0	100		<b>Count</b>
<b>Graminoid</b>					cm:
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	6.0	2.0-10.0	100		3.00
<b>Lichen</b>					3.00
UNDIFFERENTIATED CLADONIA ( <i>Cladonia</i> )	8.0	0.0-16.0	50		3.00
					1

# cc rough fescue grassland (submesic/rich) (n=10)

Natural Subregion: Montane

Ecosection: Mn Montane North Ecosection

## General Description

This ecosite is typical of south and west facing slopes and lower slope positions throughout the Montane subregion from an elevation of 1300 m to 1900 m. The only area where this ecological site occurs in the Montane North Ecosection is found near the Ya Ha Tinda ranch west of Sundre. This ecosite is usually dominated by grass species because of the dry site conditions and westerly winds. The soils of this ecosite are dominated by deep black chernozemic soils. A number of rough fescue dominated sites have not had the species composition change in over 30 years of no disturbance indicating the climax nature of this ecosite in the Upper Foothills subregion adjacent to the Ya Ha Tinda ranch (Willoughby 2007).



## Environmental Variables

Moisture Regime: Subxeric (moderately dry) (5), Submesic (moderately fresh) (4), Mesic (fresh) (1)  
Nutrient Regime: Mesotrophic (medium) (10)  
Elevation (range): 1575 (1474-1700) M  
Slope (%): moderate slope (2), nearly level (2), strong slope (1), very gentle slope (1), very strong slope (1)  
Aspect: Southerly (7)  
Topographic Position: Level (5), Lower Slope (3), Crest (1), Depression (1)

## Soil Variables

Soil Drainage: Rapidly drained (7), Well drained (2), Moderately well drained (1)  
Soil Subgroup:  
Surface Texture:  
Effective Texture:  
Depth to Mottles/Gley:  
Organic Thickness:  
Parent Material:  
Soil Type:  
Humus Form

## Successional Relationships

Due to the nature of the site grasslands often remain the climax vegetation on these sites. On moister sites shrubs and trees such as saskatoon, snowberry, chokecherry and aspen often invade the site with succession to Lodgepole pine in the northern ecosection. Heavy grazing pressure on these grasslands can often lead to a degraded site that is dominated by Kentucky bluegrass, timothy and clover species. Many sites within this ecosite in the southern ecosection have been cultivated and are dominated by cereal crops and smooth brome.

## LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

## Indicator Species

### Shrub

SHRUBBY CINQUEFOIL

*Potentilla fruticosa*

BOG BIRCH

*Betula glandulosa*

### Graminoid

ROUGH FESCUE

*Festuca scabrella*

JUNE GRASS

*Koeleria macrantha*

FRINGED BROME

*Bromus ciliatus*

THREAD-LEAVED SEDGE

*Carex filifolia*

PRESL SEDGE

*Carex preslii*

# cc1 rough fescue (n=8)

Natural Subregion: Montane  
 Ecoregion: Mn Montane North Ecoregion

Ecosite: cc rough fescue grassland (submesic/rich)

## Characteristic Species

### Shrub

- [ 2.4 ] SHRUBBY CINQUEFOIL\*  
*Potentilla fruticosa*

### Forb

- [ 9.4 ] EARLY YELLOW LOCOWEED  
*Oxytropis sericea*
- [ 8.9 ] THREE-FLOWERED AVENS  
*Geum triflorum*
- [ 2.8 ] ALPINE HEDYSARUM  
*Hedysarum alpinum*
- [ 2.7 ] WOOLLY PUSSYTOES  
*Antennaria lanata*
- [ 2.2 ] COMMON YARROW  
*Achillea millefolium*
- [ 1.6 ] CUT-LEAVED ANEMONE  
*Anemone multifida*
- [ 1.5 ] YELLOW FALSE DANDELION  
*Agoseris glauca*
- [ 1.3 ] HAREBELL  
*Campanula rotundifolia*

### Graminoid

- [ 10.6 ] ROUGH FESCUE\*  
*Festuca scabrella*
- [ 7.8 ] THREAD-LEAVED SEDGE\*  
*Carex filifolia*
- [ 5.9 ] FRINGED BROME\*  
*Bromus ciliatus*
- [ 5.3 ] JUNE GRASS\*  
*Koeleria macrantha*
- [ 2.8 ] NORTHERN WHEAT GRASS  
*Agropyron dasystachyum*
- [ 2.0 ] SPIKE TRisetum  
*Trisetum spicatum*
- [ 2.0 ] WHEELER'S BLUEGRASS  
*Poa nervosa*
- [ 1.6 ] SANDBERG BLUEGRASS  
*Poa sandbergii*
- [ 1.4 ] PRESL SEDGE\*  
*Carex preslii*
- [ 1.2 ] HAIRY WILD RYE  
*Elymus innovatus*
- [ 1.1 ] WIRE RUSH  
*Juncus balticus*

## Environmental Variables

Moisture Regime: Subxeric (moderately dry) (5), Submesic (moderately fresh) (3)  
 Nutrient Regime: Mesotrophic (medium) (8)  
 Elevation (range): 1580 (1474-1700) M  
 Slope (%): moderate slope (2), very strong slope (1), very gentle slope (1), strong slope (1), nearly level (1)  
 Aspect: Southerly (6)  
 Topographic Position: Level (4), Lower Slope (3), Crest (1)

## Soil Variables

Soil Drainage: Rapidly drained (7), Well drained (1)  
 Soil Subgroup:  
 Surface Texture:  
 Effective Texture:  
 Depth to Mottles/Gley:  
 Organic Thickness:  
 Parent Material:  
 Soil Type:  
 Humus Form

LFH Thickness	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

# Mna11 Rough fescue-Fringed brome-Sedge (n=4)

(*Festuca campestris*-*Bromus ciliatus*-*Carex spp.*)

This community type represents coarse textured fluvial areas and moister south and west facing slopes in the Ya Ha Tinda area west of Sundre. The increased moisture on these spots favours the growth of fringed brome. On the drier south and west facing slopes these grasslands are dominated by rough fescue, sedge and june grass. The forage production on this community type tends to be slightly higher than the Rough fescue-Sedge-June grass dominated community type, making this community type one of the most important foraging areas for wildlife. The rough fescue grasslands in the Ya Ha Tinda area are extensively utilized by elk and domestic horses. It is not clear how this heavy grazing pressure has affected the species composition of these grasslands. It is likely that rough fescue cover would increase if the grazing pressure was reduced on these grasslands (Willoughby 1992).

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** cc rough fescue grassland (submesic/rich)

**Ecosite Phase:** cc1 rough fescue

## Plant Composition

## Canopy Cover (%)

	Mean	Range	Const.
<b>Medium Shrub (0.5 to 2 m)</b>			
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	1.8	0.0-2.8	75
<b>Tall Forb (&gt;= 30 cm)</b>			
ALPINE HEDYSARUM ( <i>Hedysarum alpinum</i> )	3.7	0.0-9.6	75
<b>Low Forb (&lt; 30 cm)</b>			
THREE-FLOWERED AVENS ( <i>Geum triflorum</i> )	11.8	0.0-20.5	75
EARLY YELLOW LOCOWEED ( <i>Oxytropis sericea</i> )	8.7	1.7-27.8	100
COMMON YARROW ( <i>Achillea millefolium</i> )	3.3	0.0-8.9	50
WOOLLY PUSSYTOES ( <i>Antennaria lanata</i> )	2.3	0.0-9.3	25
CUT-LEAVED ANEMONE ( <i>Anemone multifida</i> )	1.9	0.0-3.8	75
SHOWY LOCOWEED ( <i>Oxytropis splendens</i> )	1.9	0.0-6.8	75
YELLOW FALSE DANDELION ( <i>Agoseris glauca</i> )	1.7	0.0-4.5	75
HAREBELL ( <i>Campanula rotundifolia</i> )	1.1	0.2-3.3	100
<b>Graminoid</b>			
FRINGED BROME ( <i>Bromus ciliatus</i> )	11.9	8.8-17.8	100
THREAD-LEAVED SEDGE ( <i>Carex filifolia</i> )	10.2	6.1-14.5	100
ROUGH FESCUE ( <i>Festuca scabrella</i> )	8.3	4.5-11.1	100
WHEELER'S BLUEGRASS ( <i>Poa nervosa</i> )	4.0	0.0-16.2	25
JUNE GRASS ( <i>Koeleria macrantha</i> )	3.8	2.9-6.2	100
SANDBERG BLUEGRASS ( <i>Poa sandbergii</i> )	3.2	0.0-8.8	75
GRACEFUL SEDGE ( <i>Carex praegracilis</i> )	2.9	0.0-11.0	50
NORTHERN WHEAT GRASS ( <i>Agropyron dasystachyum</i> )	2.8	0.7-7.3	100
SPIKE TRisetum ( <i>Trisetum spicatum</i> )	2.5	1.2-3.4	100

## Environmental Variables

Ecological Status Score: 27-40  
 Moisture Regime: Subxeric (moderately dry) (2), Submesic (moderately fresh) (2)  
 Nutrient Regime: Mesotrophic (medium) (4)  
 Elevation (range): 1638 (1600-1700) M  
 Slope (%): 0.5 - 2.49 (1), 2.5 - 5.99 (1), 10 - 15.99 (1), 16 - 30.99 (1)  
 Aspect: Southerly (4)  
 Topographic Position: Level (2), Lower Slope (2)

## Soil Variables

Soil Drainage: Rapidly drained (4)  
 Soil Subgroup:  
 Surface Texture:  
 Effective Texture:  
 Depth to Mottles/Gley:  
 Organic Thickness:  
 Parent Material:  
 Soil Type:  
 Humus Form

## LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

## Mna12 Rough fescue-Sedge-Junegrass (n=2)

(*Festuca campestris*-*Carex spp.*-*Koeleria macrantha*)

This community type is distinguished from the other rough fescue dominated community type in the Ya Ha Tinda by the lack of fringed brome and the increased cover of june grass. This community type tends to occupy steeper, morainal and colluvial slopes and has a drier moisture regime than the previously described rough fescue community type. Morgantini and Russell (1983) found that the rough fescue dominated community types were the primary foraging areas for elk. As a result this community type should be rated as primary range. The rough fescue grasslands in the Ya Ha Tinda area are extensively utilized by elk and domestic horses. It is not clear how this heavy grazing pressure has affected the species composition of these grasslands. It is likely rough fescue cover would increase if the grazing pressure was reduced on these grasslands (Willoughby 1992).

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** cc rough fescue grassland (submesic/rich)

**Ecosite Phase:** cc1 rough fescue

### Plant Composition

### Canopy Cover (%)

	Mean	Range	Const.
<b>Medium Shrub (0.5 to 2 m)</b>			
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	3.0	1.6-4.5	100
<b>Tall Forb (&gt;= 30 cm)</b>			
ALPINE HEDYSARUM ( <i>Hedysarum alpinum</i> )	1.9	0.5-3.3	100
<b>Low Forb (&lt; 30 cm)</b>			
EARLY YELLOW LOCOWEED ( <i>Oxytropis sericea</i> )	10.1	7.6-12.6	100
THREE-FLOWERED AVENS ( <i>Geum triflorum</i> )	6.1	0.0-12.3	50
WOOLLY PUSSYTOES ( <i>Antennaria lanata</i> )	3.2	2.9-3.5	100
HAREBELL ( <i>Campanula rotundifolia</i> )	1.5	1.0-2.0	100
YELLOW FALSE DANDELION ( <i>Agoseris glauca</i> )	1.3	0.2-2.5	100
CUT-LEAVED ANEMONE ( <i>Anemone multifida</i> )	1.3	1.3-1.3	100
ALPINE GOLDENROD ( <i>Solidago multiradiata</i> )	1.2	0.0-2.5	50
COMMON YARROW ( <i>Achillea millefolium</i> )	1.1	0.0-2.2	50
<b>Graminoid</b>			
ROUGH FESCUE ( <i>Festuca scabrella</i> )	13.0	7.8-18.2	100
JUNE GRASS ( <i>Koeleria macrantha</i> )	6.8	3.6-10.0	100
THREAD-LEAVED SEDGE ( <i>Carex filifolia</i> )	5.4	5.2-5.7	100
NORTHERN WHEAT GRASS ( <i>Agropyron dasystachyum</i> )	2.9	2.1-3.8	100
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	2.4	0.0-4.9	50
WIRE RUSH ( <i>Juncus balticus</i> )	2.2	0.0-4.4	50
SPIKE TRisetum ( <i>Trisetum spicatum</i> )	1.5	0.6-2.5	100

### Environmental Variables

Ecological Status Score: 27-40  
 Moisture Regime: Subxeric (moderately dry) (2)  
 Nutrient Regime: Mesotrophic (medium) (2)  
 Elevation (range): 1625 (1600-1650) M  
 Slope (%): 10 - 15.99 (1), 31 - 45.99 (1)  
 Aspect: Southerly (2)  
 Topographic Position: Crest (1), Lower Slope (1)

### Soil Variables

Soil Drainage: Rapidly drained (2)  
 Soil Subgroup:  
 Surface Texture:  
 Effective Texture:  
 Depth to Mottles/Gley:  
 Organic Thickness:  
 Parent Material:  
 Soil Type:  
 Humus Form

### LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

## Mna13 Sedge-June grass (n=2)

(*Carex filifolia*-*Koeleria macrantha*)

This community type was described on the west side of the Ya Ha Tinda ranch. It is closer to the ranch buildings and therefore is more extensively utilized by horses. It was described on coarse textured fluvial areas. The parent material and ecological conditions are similar to the Rough fescue-Fringed brome-Sedge dominated community type. It appears that the heavier grazing pressure on this community type causes rough fescue to decline and allows sedge and junegrass to increase. The forage production on this community type is about half of the rough fescue dominated community types, indicating that some type of rest would benefit this grassland.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** cc rough fescue grassland (submesic/rich)

**Ecosite Phase:** cc1 rough fescue

Plant Composition	Canopy Cover (%)		
	Mean	Range	Const.
<b>Medium Shrub (0.5 to 2 m)</b>			
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	7.6	5.8-9.5	100
<b>Tall Forb (&gt;= 30 cm)</b>			
NORTHERN VALERIAN ( <i>Valeriana dioica</i> )	1.9	0.0-3.8	50
WHITE CAMAS ( <i>Zigadenus elegans</i> )	1.1	0.0-2.2	50
<b>Low Forb (&lt; 30 cm)</b>			
SHOWY LOCOWEED ( <i>Oxytropis splendens</i> )	3.2	0.3-6.2	100
CUT-LEAVED ANEMONE ( <i>Anemone multifida</i> )	3.1	2.3-3.9	100
THREE-FLOWERED AVENS ( <i>Geum triflorum</i> )	2.1	1.5-2.8	100
EARLY YELLOW LOCOWEED ( <i>Oxytropis sericea</i> )	1.8	0.5-3.1	100
PASTURE SAGEWORT ( <i>Artemisia frigida</i> )	1.4	0.0-2.9	50
<b>Graminoid</b>			
SEDEGE SPECIES ( <i>Carex</i> )	6.3	6.0-6.6	100
JUNE GRASS ( <i>Koeleria macrantha</i> )	5.2	4.2-6.2	100
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	3.3	2.6-4.1	100
ROCKY MOUNTAIN FESCUE ( <i>Festuca saximontana</i> )	2.9	1.2-4.6	100
SANDBERG BLUEGRASS ( <i>Poa sandbergii</i> )	1.2	1.0-1.5	100
QUACK GRASS ( <i>Agropyron repens</i> )	1.0	0.0-2.1	50

### Environmental Variables

Ecological Status Score: 20-27

Moisture Regime: Submesic (moderately fresh) (1), Subxeric (moderately dry) (1)

Nutrient Regime: Mesotrophic (medium) (2)

Elevation (range): 1477 (1474-1480) M

Slope (%):

Aspect:

Topographic Position: Level (2)

### Soil Variables

Soil Drainage: Well drained (1), Rapidly drained (1)

Soil Subgroup:

Surface Texture:

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness:

Parent Material:

Soil Type:

Humus Form

LFH Thickness	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

## cc2 shrubland (n=2)

**Natural Subregion:** Montane  
**Ecosection:** Mn Montane North Ecosection

**Ecosite:** cc rough fescue grassland (submesic/rich)

### Characteristic Species

#### Shrub

- [ 30.0 ] BOG BIRCH\*  
*Betula glandulosa*
- [ 7.0 ] SHRUBBY CINQUEFOIL  
*Potentilla fruticosa*

#### Forb

- [ 4.0 ] CUT-LEAVED ANEMONE  
*Anemone multifida*
- [ 4.0 ] HEART-LEAVED ALEXANDER  
*Zizia aptera*
- [ 3.0 ] WILD VETCH  
*Vicia americana*
- [ 3.0 ] THREE-FLOWERED AVENS  
*Geum triflorum*
- [ 3.0 ] COMMON YARROW  
*Achillea millefolium*
- [ 2.0 ] SMALL-LEAVED PUSSYTOES  
*Antennaria parvifolia*

#### Graminoid

- [ 12.0 ] SEDGE SPECIES  
*Carex*
- [ 4.0 ] ROCKY MOUNTAIN FESCUE  
*Festuca saximontana*
- [ 3.0 ] JUNE GRASS  
*Koeleria macrantha*
- [ 2.0 ] FOOTHILLS ROUGH FESCUE  
*Festuca campestris*

### Environmental Variables

Moisture Regime: Mesic (fresh) (1), Submesic (moderately fresh) (1)  
 Nutrient Regime: Mesotrophic (medium) (2)  
 Elevation (range): 1563 (1476-1650) M  
 Slope (%): nearly level (1)  
 Aspect: Southerly (1)  
 Topographic Position: Depression (1), Level (1)

### Soil Variables

Soil Drainage: Well drained (1), Moderately well drained (1)  
 Soil Subgroup:  
 Surface Texture:  
 Effective Texture:  
 Depth to Mottles/Gley:  
 Organic Thickness:  
 Parent Material:  
 Soil Type:  
 Humus Form

### LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

# Mna10 Bog birch/Sedge-Rough fescue (n=2)

(*Betula glandulosa*/*Carex spp.*-*Festuca scabrella*)

This community type represents the invasion of bog birch onto the rough fescue grasslands. This community type is found scattered throughout the grasslands in the Ya Ha Tinda on slightly moister sites. It also appears to be transitional to many of the forested stands in the area. This community type is very similar to the Bog birch/Rough fescue community type described by Willoughby (2007) in the Upper Foothills subregion. He felt that the lack of fire on this community type allowed bog birch cover to expand, reducing forage productivity for wildlife and domestic livestock. In one study, burning bog birch twice in 3 year intervals controlled birch growth and increased total forage production by over 40% compared to the unburned control (Bork 1990).

**Natural Subregion:** Montane  
**Ecosection:** Mn Montane North Ecosection

**Ecosite:** cc rough fescue grassland (submesic/rich)  
**Ecosite Phase:** cc2 shrubland

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Medium Shrub (0.5 to 2 m)</b>				Ecological Status Score: 24
BOG BIRCH ( <i>Betula glandulosa</i> )	16.9	4.3-29.5	100	Moisture Regime: Submesic (moderately fresh) (1), Mesic (fresh) (1)
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	3.9	0.6-7.3	100	Nutrient Regime: Mesotrophic (medium) (2)
DWARF BILBERRY ( <i>Vaccinium caespitosum</i> )	2.0	0.0-4.0	50	Elevation (range): 1563 (1476-1650) M
<b>Tall Forb (&gt;= 30 cm)</b>				Slope (%): 0.5 - 2.49 (1)
WILD VETCH ( <i>Vicia americana</i> )	4.0	3.1-5.0	100	Aspect: Southerly (1)
HEART-LEAVED ALEXANDER ( <i>Zizia aptera</i> )	2.0	0.1-3.9	100	Topographic Position: Level (1), Depression (1)
TALL LARKSPUR ( <i>Delphinium glaucum</i> )	1.6	1.0-2.3	100	
<b>Low Forb (&lt; 30 cm)</b>				<b>Soil Variables</b>
THREE-FLOWERED AVENS ( <i>Geum triflorum</i> )	3.1	3.1-3.1	100	Soil Drainage: Well drained (1), Moderately well drained (1)
YELLOW FALSE DANDELION ( <i>Agoseris glauca</i> )	1.3	0.8-1.8	100	Soil Subgroup:
EARLY YELLOW LOCOWEED ( <i>Oxytropis sericea</i> )	1.3	1.1-1.6	100	Surface Texture:
ROSY PUSSYTOES ( <i>Antennaria rosea</i> )	1.1	0.0-2.3	50	Effective Texture:
<b>Graminoid</b>				Depth to Mottles/Gley:
NORTHERN WHEAT GRASS ( <i>Agropyron dasystachyum</i> )	6.4	2.1-10.7	100	Organic Thickness:
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	6.1	1.5-10.8	100	Parent Material:
SEDGE SPECIES ( <i>Carex</i> )	5.7	0.0-11.5	50	Soil Type:
ROUGH FESCUE ( <i>Festuca scabrella</i> )	4.6	1.5-7.7	100	Humus Form
PRESL SEDGE ( <i>Carex preslii</i> )	3.5	0.0-7.0	50	
JUNE GRASS ( <i>Koeleria macrantha</i> )	2.1	1.6-2.7	100	
ROCKY MOUNTAIN FESCUE ( <i>Festuca saximontana</i> )	2.0	0.2-3.9	100	
SIMPLE BOG-SEDGE ( <i>Kobresia simpliciuscula</i> )	1.7	0.0-3.5	50	
<b>Moss</b>				<b>LFH Thickness</b>
UNDIFFERENTIATED MOSS - ALL GENERA (Moss)	5.5	0.0-11.0	50	Mean
				Min
				Max
				Count
				cm:
				0.00
				0.00
				0.00
				0



## cc3 rough fescue Pl-Sw (n=0)

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** cc rough fescue grassland (submesic/rich)

### General Description

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A number of ecological site phases currently have no data. These ecological site phases have been created as place holders because they were described in adjacent ecosections.

### Characteristic Species

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### Environmental Variables

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Moisture Regime:

Nutrient Regime:

Elevation (range):

Slope (%):

Aspect:

Topographic Position:

### Soil Variables

---

Soil Drainage:

Soil Subgroup:

Surface Texture:

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness:

Parent Material:

Soil Type:

Humus Form

### LFH Thickness

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	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

## cc4 rough fescue Aw (n=0)

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** cc rough fescue grassland (submesic/rich)

### General Description

---

A number of ecological site phases currently have no data. These ecological site phases have been created as place holders because they were described in adjacent ecosections.

### Characteristic Species

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### Environmental Variables

---

Moisture Regime:

Nutrient Regime:

Elevation (range):

Slope (%):

Aspect:

Topographic Position:

### Soil Variables

---

Soil Drainage:

Soil Subgroup:

Surface Texture:

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness:

Parent Material:

Soil Type:

Humus Form

### LFH Thickness

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	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

## d Canada buffaloberry-rose (mesic/medium) (n=249)

Natural Subregion: Montane

Ecosection: Mn Montane North Ecosection

### General Description

The mesic ecosite for the subregion supports a variety of plant communities throughout the extent of the northern ecosection of this subregion. These sites generally occur in lower valley locations, usually on gentle slopes. This ecosite commonly develops on fluvial materials, on calcareous eolian deposits that are overlying till (Athabasca river valley), or on till parent materials (Beckingham et al. 1996). In the Montane North Ecosection hairy wildrye replaces pinegrass on these mesic sites.

Forested stands on these sites may consist of lodgepole pine, spruce, Douglas fir and aspen mixtures and the understory tends to be dominated by hairy wildrye (<10% cover), Canada buffaloberry, rose, snowberry and feather moss species.



### Successional Relationships

Lodgepole pine, Douglas-fir and white spruce form pure and mixed stands on this ecosite. Succession is toward white spruce and/or Douglas-fir; however, the extensive fire and disturbance history in the area has resulted in a predominance of lodgepole pine and occasional Douglas-fir stands. Grassland and shrubland communities are rare and dominated by hairy wildrye in this ecological site. It is believed that these grassland communities will eventually succeed to forest.

### Indicator Species

#### Tree

WHITE SPRUCE  
*Picea glauca*  
LODGEPOLE PINE  
*Pinus contorta*  
ASPEN  
*Populus tremuloides*  
DOUGLAS-FIR  
*Pseudotsuga menziesii*

#### Shrub

CANADA BUFFALOBERRY  
*Shepherdia canadensis*  
BEAKED WILLOW  
*Salix bebbiana*  
SNOWBERRY  
*Symphoricarpos albus*  
GREEN ALDER  
*Alnus crispa*

#### Moss and Liverwort

STAIR-STEP MOSS  
*Hylocomium splendens*

#### Graminoid

HAIRY WILD RYE  
*Elymus innovatus*

Site Index at 50 Years	Height (m)	Variation (m)	Count
WHITE SPRUCE <i>(Picea glauca)</i>	12.80	1.20	0
LODGEPOLE PINE <i>(Pinus contorta)</i>	19.60	0.00	0
ASPEN <i>(Populus tremuloides)</i>	12.20	0.80	0

### Environmental Variables

Moisture Regime: Mesic (fresh) (143), Submesic (moderately fresh) (16), Subxeric (moderately dry) (10), Subhygric (moderately moist) (9), Hygric (moist) (2)

Nutrient Regime: Mesotrophic (medium) (44), Submesotrophic (poor) (14), Permesotrophic (rich) (10), Eutrophic (very rich) (1)

Elevation (range): 1281 (310-1960) M

Slope (%): strong slope (47), very gentle slope (39), gentle slope (38), moderate slope (31), very strong slope (24), steep slope (19), nearly level (17), level (12), very steep slope (6)

Aspect: Easterly (73), Southerly (57), Westerly (43), Northerly (28), Level (20)

Topographic Position: Midslope (16), Upper Slope (9), Level (9), Lower Slope (9), Crest (2), Toe (2), Depression (1)

### Soil Variables

Soil Drainage: Well drained (85), Moderately well drained (18), Rapidly drained (15), Very rapidly drained (6), Imperfectly drained (4), Poorly drained (1)

Soil Subgroup: ORTHIC EUTRIC BRUNISOL (75), BRUNISOLIC GRAY LUVISOL (27), ELUVIATED EUTRIC BRUNISOL (27), CUMULIC REGOSOL (26), ORTHIC REGOSOL (24), ORTHIC DYSTRIC BRUNISOL (10), ORTHIC HUMIC REGOSOL (7), ORTHIC GRAY LUVISOL (4), ELUVIATED DYSTRIC BRUNISOL (2), ORTHIC MELANIC BRUNISOL (2), CUMULIC HUMIC REGOSOL (2), GLEYED EUTRIC BRUNISOL (2), GLEYED MELANIC BRUNISOL (1), GLEYED BRUNISOLIC GRAY LUVISOL (1), ELUVIATED BROWN CHERNOZEM (1), ORTHIC HUMIC GLEYSOL (1)

Surface Texture: Silt loam (18), Sandy loam (5), Clay loam (4), Loam (4), Loamy fine sand (3), Fine sand (3), Sandy clay loam (3), Silty clay loam (2), Very fine sand (2), Clay (1), Loamy sand (1)

Effective Texture: Sandy loam (17), Silt loam (5), Clay loam (5), Fine sand (5), Loam (2), Loamy sand (2), Sandy clay loam (2), Very fine sand (2), Silty clay loam (1), Silt (1), Sandy clay (1), Loamy fine sand (1), Fine Sandy Clay Loam (1), Fine sandy loam (1)

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (224)

Parent Material: Morainal (126), Eolian (74), Rock (49), Fluvial (46), Glaciofluvial (41), Colluvial (7), Fluvioacustrine (3), Saprolite (2), Residual (1)

Soil Type: Moist/Coarse (1), Moist/Silty-Loamy (1)

Humus Form FIBRIMOR (5), HUMIFIBRIMOR (3), RAW MODER (2), FIBRIHUMIMOR (1), MULL-LIKE MODER (1)

LFH Thickness	Mean	Min	Max	Count
cm:	5.86	1.00	18.00	46

# d1 Canada buffaloberry Fd (n=6)

Natural Subregion: Montane  
 Ecoregion: Mn Montane North Ecoregion

Ecosite: d Canada buffaloberry-rose (mesic/medium)

## Characteristic Species

### Tree

- [ 38.6 ] DOUGLAS-FIR\*  
*Pseudotsuga menziesii*
- [ 2.3 ] LODGEPOLE PINE  
*Pinus contorta*
- [ 1.5 ] SUBALPINE FIR  
*Abies lasiocarpa*
- [ 1.4 ] WHITE SPRUCE  
*Picea glauca*

### Shrub

- [ 7.5 ] SNOWBERRY  
*Symphoricarpos albus*
- [ 3.8 ] TWINFLOWER  
*Linnaea borealis*
- [ 2.2 ] PRICKLY ROSE  
*Rosa acicularis*
- [ 1.5 ] LOW-BUSH CRANBERRY  
*Viburnum edule*
- [ 1.3 ] CANADA BUFFALOBERRY\*  
*Shepherdia canadensis*

### Forb

- [ 3.3 ] ONE-SIDED WINTERGREEN  
*Orthilia secunda*
- [ 2.7 ] HEART-LEAVED ARNICA  
*Arnica cordifolia*
- [ 2.1 ] BUNCHBERRY  
*Cornus canadensis*
- [ 1.3 ] SHOWY ASTER  
*Aster conspicuus*

### Moss and Liverwort

- [ 37.3 ] STAIR-STEP MOSS\*  
*Hylocomium splendens*
- [ 21.2 ] N/A  
*Thuidium abietinum*
- [ 1.6 ] SCHREBER'S MOSS  
*Pleurozium schreberi*

### Graminoid

- [ 8.0 ] HAIRY WILD RYE  
*Elymus innovatus*

## Environmental Variables

Moisture Regime: Mesic (fresh) (4)  
 Nutrient Regime:  
 Elevation (range): 1274 (1030-1660) M  
 Slope (%): steep slope (5), gentle slope (1)  
 Aspect: Easterly (4), Westerly (2)  
 Topographic Position:

## Soil Variables

Soil Drainage: Well drained (1)  
 Soil Subgroup: ORTHIC EUTRIC BRUNISOL (3), BRUNISOLIC GRAY LUVISOL (2), ORTHIC REGOSOL (1)  
 Surface Texture:  
 Effective Texture:  
 Depth to Mottles/Gley:  
 Organic Thickness: 0 - 5 cm (6)  
 Parent Material: Morainal (3), Fluvial (2), Rock (2), Colluvial (1), Eolian (1)  
 Soil Type:  
 Humus Form

## LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

# Mne10 Fd/Moss (n=5)

## (*Pseudotsuga menziesii*/*Hylocomium splendens*)

This community was described on mesic Montane to Lower subalpine sites on various slopes with northerly and easterly aspects (Holland and Coen 1982) along the Athabasca River valley in Jasper. The soils can be Brunisols, Regosols or Luvisols and can occur on fluvial and morainal land forms (Holland and Coen 1982).

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** d Canada buffaloberry-rose (mesic/medium)

**Ecosite Phase:** d1 Canada buffaloberry Fd

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Overstory Tree</b>					Ecological Status Score: 25
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	19.2	6.0-35.0	100		Moisture Regime: Mesic (fresh) (4)
LOGEPOLE PINE ( <i>Pinus contorta</i> )	4.6	0.0-15.0	60		Nutrient Regime:
WHITE SPRUCE ( <i>Picea glauca</i> )	2.8	0.0-10.0	40		Elevation (range): 1518 (1370-1660) M
<b>Understory Tree</b>					Slope (%): 46 - 70.99 (5)
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	3.0	0.0-10.0	40		Aspect: Easterly (3), Westerly (2)
<b>Tall Shrub (2 to 5m)</b>					Topographic Position:
SUBALPINE FIR ( <i>Abies lasiocarpa</i> )	3.0	0.0-15.0	20		<b>Soil Variables</b>
<b>Medium Shrub (0.5 to 2 m)</b>					Soil Drainage: Well drained (1)
LOW-BUSH CRANBERRY ( <i>Viburnum edule</i> )	3.0	0.0-15.0	20		Soil Subgroup: ORTHIC EUTRIC BRUNISOL (2), BRUNISOLIC GRAY LUVISOL (2), ORTHIC REGOSOL (1)
TWINFLOWER ( <i>Linnaea borealis</i> )	2.6	0.0-5.0	80		Surface Texture:
CANADA BUFFALOBERRY ( <i>Shepherdia canadensis</i> )	2.6	0.0-6.0	80		Effective Texture:
GREEN ALDER ( <i>Alnus crispa</i> )	1.4	0.0-5.0	60		Depth to Mottles/Gley:
PRICKLY ROSE ( <i>Rosa acicularis</i> )	1.4	0.0-4.0	60		Organic Thickness: 0 - 5 cm (5)
GROUND JUNIPER ( <i>Juniperus communis</i> )	1.2	0.0-4.0	40		Parent Material: Morainal (3), Rock (2), Colluvial (1), Eolian (1), Fluvial (1)
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	1.0	0.0-5.0	20		Soil Type:
<b>Tall Forb (&gt;= 30 cm)</b>					Humus Form
SHOWY ASTER ( <i>Aster conspicuus</i> )	1.6	0.0-5.0	40		<b>LFH Thickness</b>
<b>Low Forb (&lt; 30 cm)</b>					Mean
HEART-LEAVED ARNICA ( <i>Arnica cordifolia</i> )	5.4	0.0-20.0	60		Min
BUNCHBERRY ( <i>Cornus canadensis</i> )	4.2	0.0-20.0	40		Max
ONE-SIDED WINTERGREEN ( <i>Orthilia secunda</i> )	1.6	0.0-5.0	80		Count
<b>Graminoid</b>					cm:
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	6.0	0.0-20.0	80		0.00
<b>Moss</b>					0.00
STAIR-STEP MOSS ( <i>Hylocomium splendens</i> )	34.6	3.0-70.0	100		0.00
SCHREBER'S MOSS ( <i>Pleurozium schreberi</i> )	3.2	0.0-10.0	60		0
N/A ( <i>Thuidium abietinum</i> )	2.4	0.0-12.0	20		
<b>Lichen</b>					
STUDED LEATHER LICHEN ( <i>Peltigera aphthosa</i> )	1.8	0.0-4.0	80		

# Mne9 Fd/Snowberry (n=1)

## (*Pseudotsuga menziesii*/*Symphoricarpos occidentalis*)

This community type was described on moderate south and westerly facing slopes with fluvial parent materials in the Athabasca river valley of Jasper National Park (Holland and Coen 1982). Snowberry is generally indicative of nutrient rich seepage areas in the Montane subregion and generally forms thickets in the lower slope positions. The snowberry in this community type consists of small individual plants that are uniformly scattered throughout the community. Archibald et al. (1996) did not recognize this community type and placed it within the hairy wildrye (submesic/medium) ecosite because of the moderate slopes the community was described on. However, the high constancy of snowberry in this community type appears to indicate slightly higher moisture and nutrients.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** d Canada buffaloberry-rose (mesic/medium)

**Ecosite Phase:** d1 Canada buffaloberry Fd

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 25
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	55.0	55.0-55.0	100	Moisture Regime:
<b>Understory Tree</b>				Nutrient Regime:
WHITE SPRUCE ( <i>Picea glauca</i> )	2.0	2.0-2.0	100	Elevation (range): 1030 (1030-1030) M
<b>Medium Shrub (0.5 to 2 m)</b>				Slope (%): 6 - 9.99 (1)
SNOWBERRY ( <i>Symphoricarpos albus</i> )	15.0	15.0-15.0	100	Aspect: Easterly (1)
TWINFLOWER ( <i>Linnaea borealis</i> )	5.0	5.0-5.0	100	Topographic Position:
PRICKLY ROSE ( <i>Rosa acicularis</i> )	3.0	3.0-3.0	100	
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	1.0	1.0-1.0	100	
TWINING HONEYSUCKLE ( <i>Lonicera dioica</i> )	1.0	1.0-1.0	100	
<b>Tall Forb (&gt;= 30 cm)</b>				
SHOWY ASTER ( <i>Aster conspicuus</i> )	1.0	1.0-1.0	100	
WILD VETCH ( <i>Vicia americana</i> )	1.0	1.0-1.0	100	
<b>Low Forb (&lt; 30 cm)</b>				
ONE-SIDED WINTERGREEN ( <i>Orthilia secunda</i> )	5.0	5.0-5.0	100	
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	1.0	1.0-1.0	100	
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	1.0	1.0-1.0	100	
NORTHERN BASTARD TOADFLAX ( <i>Geocaulon lividum</i> )	1.0	1.0-1.0	100	
GREENISH-FLOWERED WINTERGREEN ( <i>Pyrola chlorantha</i> )	1.0	1.0-1.0	100	
<b>Graminoid</b>				
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	10.0	10.0-10.0	100	
<b>Moss</b>				
STAIR-STEP MOSS ( <i>Hylocomium splendens</i> )	40.0	40.0-40.0	100	
N/A ( <i>Thuidium abietinum</i> )	40.0	40.0-40.0	100	
<b>Lichen</b>				
UNDIFFERENTIATED PELTIGERA ( <i>Peltigera</i> )	3.0	3.0-3.0	100	
				<b>Soil Variables</b>
				Soil Drainage:
				Soil Subgroup: ORTHIC EUTRIC BRUNISOL (1)
				Surface Texture:
				Effective Texture:
				Depth to Mottles/Gley:
				Organic Thickness: 0 - 5 cm (1)
				Parent Material: Fluvial (1)
				Soil Type:
				Humus Form
				<b>LFH Thickness</b>
				<b>Mean</b>
				<b>Min</b>
				<b>Max</b>
				<b>Count</b>
				cm: 0.00 0.00 0.00 0

## d2 Canada buffaloberry PI (n=108)

**Natural Subregion:** Montane  
**Ecosection:** Mn Montane North Ecosection

**Ecosite:** d Canada buffaloberry-rose (mesic/medium)

### Characteristic Species

#### Tree

- [ 32.7 ] LODGEPOLE PINE\*  
*Pinus contorta*
- [ 3.5 ] WHITE SPRUCE  
*Picea glauca*

#### Shrub

- [ 12.5 ] GREEN ALDER\*  
*Alnus crispa*
- [ 10.3 ] CANADA BUFFALOBERRY\*  
*Shepherdia canadensis*
- [ 6.8 ] FALSE AZALEA  
*Menziesia ferruginea*
- [ 5.9 ] TWINFLOWER  
*Linnaea borealis*
- [ 3.3 ] GROUSEBERRY  
*Vaccinium scoparium*
- [ 1.4 ] PRICKLY ROSE  
*Rosa acicularis*
- [ 1.3 ] WHITE MEADOWSWEET  
*Spiraea betulifolia*
- [ 1.1 ] COMMON LABRADOR TEA  
*Ledum groenlandicum*

#### Forb

- [ 3.7 ] SHOWY ASTER  
*Aster conspicuus*
- [ 2.9 ] BUNCHBERRY  
*Cornus canadensis*

#### Moss and Liverwort

- [ 23.0 ] STAIR-STEP MOSS  
*Hylocomium splendens*
- [ 12.1 ] SCHREBER'S MOSS  
*Pleurozium schreberi*
- [ 1.9 ] N/A  
*Thuidium abietinum*
- [ 1.6 ] KNIGHT'S PLUME MOSS  
*Ptilium crista-castrensis*

#### Graminoid

- [ 7.5 ] HAIRY WILD RYE  
*Elymus innovatus*

### Environmental Variables

Moisture Regime: Mesic (fresh) (64), Submesic (moderately fresh) (6), Subxeric (moderately dry) (4), Subhygric (moderately moist) (2), Hygric (moist) (2)

Nutrient Regime: Mesotrophic (medium) (13), Submesotrophic (poor) (1), Permesotrophic (rich) (1)

Elevation (range): 1337 (1310-1830) M

Slope (%): strong slope (23), very gentle slope (19), very strong slope (16), gentle slope (15), moderate slope (13), steep slope (7), nearly level (6), level (5)

Aspect: Southerly (31), Westerly (25), Easterly (25), Northerly (7), Level (6)

Topographic Position: Upper Slope (5), Level (3), Lower Slope (3), Midslope (3), Depression (1), Toe (1)

### Soil Variables

Soil Drainage: Well drained (33), Moderately well drained (5), Rapidly drained (5), Imperfectly drained (2)

Soil Subgroup: ORTHIC EUTRIC BRUNISOL (40), BRUNISOLIC GRAY LUVISOL (17), ELUVIATED EUTRIC BRUNISOL (17), ORTHIC DYSTRIC BRUNISOL (9), ORTHIC REGOSOL (8), ORTHIC GRAY LUVISOL (3), GLEYED EUTRIC BRUNISOL (1), CUMULIC REGOSOL (1), GLEYED BRUNISOLIC GRAY LUVISOL (1), ELUVIATED BROWN CHERNOZEM (1), ELUVIATED DYSTRIC BRUNISOL (1)

Surface Texture: Silt loam (9), Sandy loam (3), Clay loam (1)

Effective Texture: Sandy loam (9), Silt loam (2), Silt (1), Fine sandy loam (1)

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (104)

Parent Material: Morainal (71), Rock (29), Eolian (27), Glaciofluvial (20), Fluvial (13), Fluvioacustrine (2), Colluvial (2), Saprolite (1)

Soil Type:

Humus Form FIBRIMOR (2)

### LFH Thickness

	Mean	Min	Max	Count
cm:	4.00	2.00	6.00	13

# Mne11 PI/Buffaloberry-Rose/Moss (n=98)

## (*Pinus contorta*/*Shepherdia canadensis*-*Rosa acicularis*/*Hylocomium splendens*)

This community is one of several community types which represent the mesic/medium ecosite for the Montane North ecosection. These sites can be dominated by Douglas fir, white spruce, aspen or lodgepole pine. The understory can be dominated by Canada buffaloberry, hairy wildrye or feather moss depending on the successional status of the stand. Canada buffaloberry is well adapted to growing on dry rocky slopes and loamy to coarse-textured parent materials. Succession in the absence of disturbance will be to white spruce. This community type produces little forage for domestic livestock and should be considered non-use.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** d Canada buffaloberry-rose (mesic/medium)

**Ecosite Phase:** d2 Canada buffaloberry PI

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 25
LOGEPOLE PINE ( <i>Pinus contorta</i> )	30.5	0.0-65.0	99	Moisture Regime: Mesic (fresh) (57), Submesic (moderately fresh) (6), Subxeric (moderately dry) (4), Subhygric (moderately moist) (2), Hygric (moist) (2)
WHITE SPRUCE ( <i>Picea glauca</i> )	2.5	0.0-45.0	33	Nutrient Regime: Mesotrophic (medium) (12), Permesotrophic (rich) (1), Submesotrophic (poor) (1)
<b>Understory Tree</b>				Elevation (range): 1336 (310-1830) M
LOGEPOLE PINE ( <i>Pinus contorta</i> )	3.6	0.0-40.0	40	Slope (%): 16 - 30.99 (19), 2.5 - 5.99 (18), 6 - 9.99 (15), 31 - 45.99 (14), 10 - 15.99 (12), 0.5 - 2.49 (6), 46 - 70.99 (5), 0 - 0.49 (5)
<b>Medium Shrub (0.5 to 2 m)</b>				Aspect: Southerly (30), Westerly (25), Easterly (19), Northerly (7), Level (4)
CANADA BUFFALOBERRY ( <i>Shepherdia canadensis</i> )	19.0	0.0-80.0	92	Topographic Position: Upper Slope (5), Level (3), Lower Slope (3), Midslope (3), Toe (1), Depression (1)
TWINFLOWER ( <i>Linnaea borealis</i> )	6.2	0.0-25.0	85	
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	4.0	0.0-35.0	64	
GROUND JUNIPER ( <i>Juniperus communis</i> )	2.5	0.0-18.0	60	
PRICKLY ROSE ( <i>Rosa acicularis</i> )	2.4	0.0-15.0	85	
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	1.5	0.0-30.0	38	
<b>Tall Forb (&gt;= 30 cm)</b>				<b>Soil Variables</b>
SHOWY ASTER ( <i>Aster conspicuus</i> )	4.8	0.0-30.0	75	Soil Drainage: Well drained (31), Rapidly drained (5), Moderately well drained (4), Imperfectly drained (2)
<b>Low Forb (&lt; 30 cm)</b>				Soil Subgroup: ORTHIC EUTRIC BRUNISOL (35), BRUNISOLIC GRAY LUVISOL (16), ELUVIATED EUTRIC BRUNISOL (16), ORTHIC REGOSOL (8), ORTHIC DYSTRIC BRUNISOL (6), ORTHIC GRAY LUVISOL (3), ELUVIATED BROWN CHERNOZEM (1), ELUVIATED DYSTRIC BRUNISOL (1), GLEYED EUTRIC BRUNISOL (1), CUMULIC REGOSOL (1), GLEYED BRUNISOLIC GRAY LUVISOL (1)
BUNCHBERRY ( <i>Cornus canadensis</i> )	1.8	0.0-20.0	41	Surface Texture: Silt loam (9), Sandy loam (3), Clay loam (1)
HEART-LEAVED ARNICA ( <i>Arnica cordifolia</i> )	1.6	0.0-10.0	48	Effective Texture: Sandy loam (9), Silt loam (2), Fine sandy loam (1), Silt (1)
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	0.8	0.0-7.0	59	Depth to Mottles/Gley:
<b>Graminoid</b>				Organic Thickness: 0 - 5 cm (94)
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	10.2	0.0-50.0	96	Parent Material: Morainal (63), Rock (26), Eolian (25), Glaciofluvial (19), Fluvial (13), Fluviolacustrine (2), Colluvial (2), Saprolite (1)
<b>Moss</b>				Soil Type:
STAIR-STEP MOSS ( <i>Hylocomium splendens</i> )	21.3	0.0-90.0	83	Humus Form FIBRIMOR (2)
SCHREBER'S MOSS ( <i>Pleurozium schreberi</i> )	10.8	0.0-62.0	71	
KNIGHT'S PLUME MOSS ( <i>Ptilium crista-castrensis</i> )	1.5	0.0-15.0	42	
				<b>LFH Thickness</b>
				<b>Mean</b>
				<b>Min</b>
				<b>Max</b>
				<b>Count</b>
				cm:
				4.00
				2.00
				6.00
				13



## Mne12 PI/Alder (n=7)

### (*Pinus contorta*/*Alnus crispa*)

This community type occurs on mesic Montane to Lower Subalpine level to steeply sloping sites with northerly or easterly aspects near Jasper. Soils are generally well drained Brunisols on morainal parent materials. This community type is distinguished from other Lodgepole pine dominated stands by the dominance of green alder in the understory.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** d Canada buffaloberry-rose (mesic/medium)

**Ecosite Phase:** d2 Canada buffaloberry PI

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Overstory Tree</b>					Ecological Status Score: 25
LOGEPOLE PINE ( <i>Pinus contorta</i> )	29.4	6.0-50.0	100		Moisture Regime: Mesic (fresh) (5)
WHITE SPRUCE ( <i>Picea glauca</i> )	3.5	0.0-25.0	14		Nutrient Regime: Mesotrophic (medium) (1)
<b>Understory Tree</b>					Elevation (range): 1335 (1180-1460) M
WHITE SPRUCE ( <i>Picea glauca</i> )	4.7	0.0-25.0	57		Slope (%): 16 - 30.99 (3), 31 - 45.99 (2), 2.5 - 5.99 (1), 46 - 70.99 (1)
<b>Tall Shrub (2 to 5m)</b>					Aspect: Easterly (6), Level (1)
GREEN ALDER ( <i>Alnus crispa</i> )	1.4	0.0-10.0	14		Topographic Position:
<b>Medium Shrub (0.5 to 2 m)</b>					<b>Soil Variables</b>
GREEN ALDER ( <i>Alnus crispa</i> )	27.4	10.0-50.0	100		Soil Drainage: Well drained (1), Moderately well drained (1)
TWINFLOWER ( <i>Linnaea borealis</i> )	5.5	1.0-10.0	100		Soil Subgroup: ORTHIC EUTRIC BRUNISOL (5), BRUNISOLIC GRAY LUVISOL (1), ORTHIC DYSTRIC BRUNISOL (1)
FALSE AZALEA ( <i>Menziesia ferruginea</i> )	2.0	0.0-10.0	71		Surface Texture:
PRICKLY ROSE ( <i>Rosa acicularis</i> )	2.0	0.0-5.0	86		Effective Texture:
COMMON LABRADOR TEA ( <i>Ledum groenlandicum</i> )	1.2	0.0-5.0	57		Depth to Mottles/Gley:
<b>Tall Forb (&gt;= 30 cm)</b>					Organic Thickness: 0 - 5 cm (7)
SHOWY ASTER ( <i>Aster conspicuus</i> )	1.5	0.0-5.0	43		Parent Material: Morainal (5), Rock (3), Eolian (2), Glaciofluvial (1)
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	1.0	0.0-5.0	43		Soil Type:
<b>Low Forb (&lt; 30 cm)</b>					Humus Form
BUNCHBERRY ( <i>Cornus canadensis</i> )	3.1	1.0-15.0	100		
HEART-LEAVED ARNICA ( <i>Arnica cordifolia</i> )	1.4	0.0-3.0	86		
<b>Graminoid</b>					
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	4.1	0.0-8.0	86		
<b>Moss</b>					
STAIR-STEP MOSS ( <i>Hylocomium splendens</i> )	42.8	0.0-85.0	86		
SCHREBER'S MOSS ( <i>Pleurozium schreberi</i> )	15.5	0.0-60.0	71		
N/A ( <i>Thuidium abietinum</i> )	5.8	0.0-40.0	29		
KNIGHT'S PLUME MOSS ( <i>Ptilium crista-castrensis</i> )	3.5	0.0-5.0	86		
<b>Lichen</b>					
STUDDERED LEATHER LICHEN ( <i>Peltigera aphthosa</i> )	1.0	0.0-2.0	86		

LFH Thickness	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

## Mne13 PI/False azalea-Grouseberry (n=3)

### (*Pinus contorta*/*Menziesia ferruginea*-*Vaccinium scoparium*)

The presence of false azalea and grouseberry in this community type indicate the transition to the Subalpine subregion. This community type represents the modal conditions for the Subalpine subregion at mid to lower elevations. Lodgepole pine, Engelmann and white spruce, and subalpine fir can all occur as the dominant tree species on this ecological site in the subalpine. In general succession is from lodgepole pine to Engelmann spruce and subalpine fir. However, lodgepole pine is the most common tree species because of the frequency of fire.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** d Canada buffaloberry-rose (mesic/medium)

**Ecosite Phase:** d2 Canada buffaloberry PI

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 25
LOGEPOLE PINE ( <i>Pinus contorta</i> )	30.0	20.0-50.0	100	Moisture Regime: Mesic (fresh) (2)
<b>Understory Tree</b>				Nutrient Regime:
LOGEPOLE PINE ( <i>Pinus contorta</i> )	8.0	2.0-20.0	100	Elevation (range): 1340 (1180-1490) M
<b>Medium Shrub (0.5 to 2 m)</b>				Slope (%): 10 - 15.99 (1), 16 - 30.99 (1), 46 - 70.99 (1)
FALSE AZALEA ( <i>Menziesia ferruginea</i> )	18.6	1.0-30.0	100	Aspect: Level (1), Southerly (1)
CANADA BUFFALOBERRY ( <i>Shepherdia canadensis</i> )	12.0	0.0-35.0	67	Topographic Position:
GREEN ALDER ( <i>Alnus crispa</i> )	10.3	0.0-30.0	67	<b>Soil Variables</b>
GROUSEBERRY ( <i>Vaccinium scoparium</i> )	10.0	0.0-30.0	33	Soil Drainage: Well drained (1)
TWINFLOWER ( <i>Linnaea borealis</i> )	6.0	1.0-15.0	100	Soil Subgroup: ORTHIC DYSTRIC BRUNISOL (2), ELUVIATED EUTRIC BRUNISOL (1)
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	2.6	0.0-7.0	67	Surface Texture:
COMMON LABRADOR TEA ( <i>Ledum groenlandicum</i> )	2.3	0.0-4.0	67	Effective Texture:
SCOULER'S WILLOW ( <i>Salix scouleriana</i> )	2.0	0.0-6.0	33	Depth to Mottles/Gley:
SUBALPINE FIR ( <i>Abies lasiocarpa</i> )	1.0	1.0-1.0	100	Organic Thickness: 0 - 5 cm (3)
<b>Tall Forb (&gt;= 30 cm)</b>				Parent Material: Morainal (3)
SHOWY ASTER ( <i>Aster conspicuus</i> )	5.0	0.0-15.0	33	Soil Type:
<b>Low Forb (&lt; 30 cm)</b>				Humus Form
BUNCHBERRY ( <i>Cornus canadensis</i> )	4.0	1.0-10.0	100	<b>LFH Thickness</b>
ONE-SIDED WINTERGREEN ( <i>Orthilia secunda</i> )	1.3	0.0-3.0	67	Mean
<b>Graminoid</b>				Min
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	8.3	0.0-25.0	33	Max
<b>Moss</b>				Count
SCHREBER'S MOSS ( <i>Pleurozium schreberi</i> )	10.0	5.0-15.0	100	cm:
STAIR-STEP MOSS ( <i>Hylocomium splendens</i> )	5.0	0.0-15.0	33	0.00
<b>Lichen</b>				0.00
STUDDERED LEATHER LICHEN ( <i>Peltigera aphthosa</i> )	1.0	1.0-1.0	100	0.00
				0

### d3 Canada buffaloberry Sw (n=88)

Natural Subregion: Montane  
 Ecoregion: Mn Montane North Ecoregion

Ecosite: d Canada buffaloberry-rose (mesic/medium)

#### Characteristic Species

- Tree**
- [ 16.5 ] ENGELMANN X WHITE SPRUCE  
*Picea engelmannii x glauca*
  - [ 12.5 ] WHITE SPRUCE\*  
*Picea glauca*
  - [ 7.6 ] SUBALPINE FIR\*  
*Abies lasiocarpa*
  - [ 3.0 ] LODGEPOLE PINE  
*Pinus contorta*

- Shrub**
- [ 16.4 ] FALSE AZALEA  
*Menziesia ferruginea*
  - [ 7.0 ] GREEN ALDER\*  
*Alnus crispa*
  - [ 5.9 ] CANADA BUFFALOBERRY\*  
*Shepherdia canadensis*
  - [ 3.1 ] TWINFLOWER  
*Linnaea borealis*
  - [ 2.0 ] SALIX SPECIES  
*Salix*

- Forb**
- [ 2.8 ] BUNCHBERRY  
*Cornus canadensis*

- Lichen**
- [ 1.1 ] STUDDERED LEATHER LICHEN  
*Peltigera aphthosa*

- Moss and Liverwort**
- [ 38.2 ] STAIR-STEP MOSS\*  
*Hylocomium splendens*
  - [ 12.1 ] SCHREBER'S MOSS  
*Pleurozium schreberi*
  - [ 6.0 ] N/A  
*Thuidium abietinum*
  - [ 5.0 ] KNIGHT'S PLUME MOSS  
*Ptilium crista-castrensis*

- Graminoid**
- [ 2.6 ] HAIRY WILD RYE  
*Elymus innovatus*

#### Environmental Variables

Moisture Regime: Mesic (fresh) (56), Submesic (moderately fresh) (7), Subhygric (moderately moist) (4), Subxeric (moderately dry) (4)  
 Nutrient Regime: Mesotrophic (medium) (19), Submesotrophic (poor) (10), Permesotrophic (rich) (5)  
 Elevation (range): 1301 (920-1960) M  
 Slope (%): strong slope (17), very gentle slope (12), gentle slope (11), moderate slope (9), nearly level (9), very strong slope (8), steep slope (6), level (6), very steep slope (6)  
 Aspect: Easterly (32), Northerly (15), Southerly (14), Level (12), Westerly (11)  
 Topographic Position: Midslope (8), Level (5), Upper Slope (4), Lower Slope (4), Crest (2), Toe (1)

#### Soil Variables

Soil Drainage: Well drained (36), Rapidly drained (6), Moderately well drained (6), Very rapidly drained (5), Imperfectly drained (2), Poorly drained (1)  
 Soil Subgroup: ORTHIC EUTRIC BRUNISOL (22), CUMULIC REGOSOL (22), ORTHIC REGOSOL (11), ELUVIATED EUTRIC BRUNISOL (7), GLEYED EUTRIC BRUNISOL (1), ORTHIC DYSTRIC BRUNISOL (1), BRUNISOLIC GRAY LUVISOL (1), ORTHIC GRAY LUVISOL (1), ORTHIC HUMIC GLEYSOL (1), CUMULIC HUMIC REGOSOL (1), ORTHIC HUMIC REGOSOL (1), GLEYED MELANIC BRUNISOL (1), ORTHIC MELANIC BRUNISOL (1)  
 Surface Texture: Silt loam (5), Loamy fine sand (3), Loam (3), Clay loam (2), Very fine sand (2), Silty clay loam (1), Sandy loam (1)  
 Effective Texture: Clay loam (4), Silt loam (3), Very fine sand (2), Fine sand (2), Loam (2), Sandy loam (2), Loamy fine sand (1), Silty clay loam (1)  
 Depth to Mottles/Gley:  
 Organic Thickness: 0 - 5 cm (76)  
 Parent Material: Morainal (35), Eolian (35), Fluvial (18), Glaciofluvial (13), Rock (10), Colluvial (3), Residual (1), Fluviolacustrine (1)  
 Soil Type: Moist/Silty-Loamy (1), Moist/Coarse (1)  
 Humus Form HUMIFIBRIMOR (3), FIBRIMOR (3), RAW MODER (1)

LFH Thickness	Mean	Min	Max	Count
cm:	9.00	1.00	18.00	17

# Mne14 Sw/Buffaloberry-Rose/Moss (n=41)

(*Picea glauca*/*Shepherdia canadensis*-*Rosa acicularis*/*Hylocomium splendens*)

This community is one of several community types which represent the mesic/medium ecosite for the Montane North ecosection. These sites can be dominated by Douglas fir, white spruce, aspen or lodgepole pine. The understory can be dominated by Canada buffaloberry, hairy wildrye or feather moss depending on the successional status of the stand. Canada buffaloberry is well adapted to growing on dry rocky slopes. Succession in the absence of disturbance will be to this community type.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** d Canada buffaloberry-rose (mesic/medium)

**Ecosite Phase:** d3 Canada buffaloberry Sw

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Overstory Tree</b>					Ecological Status Score: 25
WHITE SPRUCE ( <i>Picea glauca</i> )	16.0	0.0-65.0	83		Moisture Regime: Mesic (fresh) (31), Subxeric (moderately dry) (3), Submesic (moderately fresh) (2)
ENGELMANN X WHITE SPRUCE ( <i>Picea engelmannii</i> x <i>glauca</i> )	1.3	0.0-30.0	5		Nutrient Regime: Submesotrophic (poor) (8), Mesotrophic (medium) (6), Permesotrophic (rich) (2)
LODGEPOLE PINE ( <i>Pinus contorta</i> )	1.3	0.0-15.0	32		Elevation (range): 1176 (970-1460) M
<b>Understory Tree</b>					Slope (%): 16 - 30.99 (9), 2.5 - 5.99 (7), 10 - 15.99 (6), 0.5 - 2.49 (5), 6 - 9.99 (5), 46 - 70.99 (3), 71 - 100.99 (2), 31 - 45.99 (1)
WHITE SPRUCE ( <i>Picea glauca</i> )	8.7	0.0-30.0	68		Aspect: Easterly (15), Southerly (8), Northerly (8), Level (4), Westerly (3)
<b>Medium Shrub (0.5 to 2 m)</b>					Topographic Position: Midslope (4), Lower Slope (2), Upper Slope (1), Toe (1), Crest (1)
CANADA BUFFALOBERRY ( <i>Shepherdia canadensis</i> )	17.2	0.0-80.0	78		
TWINFLOWER ( <i>Linnaea borealis</i> )	5.1	0.0-38.0	71		<b>Soil Variables</b>
GROUND JUNIPER ( <i>Juniperus communis</i> )	4.5	0.0-30.0	76		Soil Drainage: Well drained (13), Very rapidly drained (5), Rapidly drained (4), Moderately well drained (2)
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	3.5	0.0-30.0	63		Soil Subgroup: CUMULIC REGOSOL (13), ORTHIC EUTRIC BRUNISOL (9), ORTHIC REGOSOL (9), ELUVIATED EUTRIC BRUNISOL (3), ORTHIC HUMIC REGOSOL (1), ORTHIC MELANIC BRUNISOL (1)
PRICKLY ROSE ( <i>Rosa acicularis</i> )	3.2	0.0-20.0	78		Surface Texture: Loamy fine sand (3), Loam (2), Very fine sand (2), Silt loam (2), Sandy loam (1), Silty clay loam (1), Clay loam (1)
<b>Tall Forb (&gt;= 30 cm)</b>					Effective Texture: Clay loam (4), Very fine sand (2), Fine sand (2), Loamy fine sand (1), Sandy loam (1), Silt loam (1), Silty clay loam (1)
SHOWY ASTER ( <i>Aster conspicuus</i> )	2.3	0.0-30.0	46		Depth to Mottles/Gley:
<b>Low Forb (&lt; 30 cm)</b>					Organic Thickness: 0 - 5 cm (40)
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	1.1	0.0-6.0	61		Parent Material: Eolian (23), Morainal (15), Fluvial (10), Glaciofluvial (6), Rock (4), Residual (1)
<b>Graminoid</b>					Soil Type:
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	7.1	0.0-40.0	90		Humus Form HUMIFIBRIMOR (2), FIBRIMOR (1), RAW MODER (1)
<b>Moss</b>					
N/A ( <i>Thuidium abietinum</i> )	15.2	0.0-70.0	59		
SCHREBER'S MOSS ( <i>Pleurozium schreberi</i> )	10.7	0.0-90.0	34		
STAIR-STEP MOSS ( <i>Hylocomium splendens</i> )	7.5	0.0-75.0	32		
					<b>LFH Thickness</b>
					Mean    Min    Max    Count
					cm:            8.00    1.00    16.00    12

## Mne16 Se/False azalea (n=1)

### (*Picea engelmannii*/*Menziesia ferruginea*)

The presence of false azalea and grouseberry in this community type indicate the transition to the Subalpine subregion. This community type represents the modal conditions for the Subalpine subregion at mid to lower elevations. Lodgepole pine, Engelmann and white spruce, and subalpine fir can all occur as the dominant tree species on this ecological site in the subalpine. In general succession is from lodgepole pine to Engelmann spruce and subalpine fir. However, lodgepole pine is the most common tree species because of the frequency of fire.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** d Canada buffaloberry-rose (mesic/medium)

**Ecosite Phase:** d3 Canada buffaloberry Sw

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Overstory Tree</b>					Ecological Status Score: 25
ENGELMANN SPRUCE ( <i>Picea engelmannii</i> )	20.0	20.0-20.0	100		Moisture Regime:
LOGEPOLE PINE ( <i>Pinus contorta</i> )	5.0	5.0-5.0	100		Nutrient Regime:
<b>Understory Tree</b>					Elevation (range): 1490 (1490-1490) M
ENGELMANN SPRUCE ( <i>Picea engelmannii</i> )	10.0	10.0-10.0	100		Slope (%): 31 - 45.99 (1)
LOGEPOLE PINE ( <i>Pinus contorta</i> )	10.0	10.0-10.0	100		Aspect: Easterly (1)
SUBALPINE FIR ( <i>Abies lasiocarpa</i> )	1.0	1.0-1.0	100		Topographic Position:
<b>Tall Shrub (2 to 5m)</b>					<b>Soil Variables</b>
ENGELMANN SPRUCE ( <i>Picea engelmannii</i> )	1.0	1.0-1.0	100		Soil Drainage: Well drained (1)
<b>Medium Shrub (0.5 to 2 m)</b>					Soil Subgroup: ELUVIATED EUTRIC BRUNISOL (1)
FALSE AZALEA ( <i>Menziesia ferruginea</i> )	80.0	80.0-80.0	100		Surface Texture:
COMMON LABRADOR TEA ( <i>Ledum groenlandicum</i> )	2.0	2.0-2.0	100		Effective Texture:
TWINFLOWER ( <i>Linnaea borealis</i> )	1.0	1.0-1.0	100		Depth to Mottles/Gley:
GROUSEBERRY ( <i>Vaccinium scoparium</i> )	1.0	1.0-1.0	100		Organic Thickness: 0 - 5 cm (1)
BOG CRANBERRY ( <i>Vaccinium vitis-idaea</i> )	1.0	1.0-1.0	100		Parent Material: Morainal (1)
<b>Low Forb (&lt; 30 cm)</b>					Soil Type:
HEART-LEAVED ARNICA ( <i>Arnica cordifolia</i> )	3.0	3.0-3.0	100		Humus Form
<b>Moss</b>					<b>LFH Thickness</b>
STAIR-STEP MOSS ( <i>Hylocomium splendens</i> )	50.0	50.0-50.0	100		<b>Mean</b>
SCHREBER'S MOSS ( <i>Pleurozium schreberi</i> )	30.0	30.0-30.0	100		<b>Min</b>
KNIGHT'S PLUME MOSS ( <i>Ptilium crista-castrensis</i> )	10.0	10.0-10.0	100		<b>Max</b>
					<b>Count</b>
				cm:	0.00
					0.00
					0.00
					0

## Mne18 Sw(Fa)/Moss (n=6)

### (*Picea glauca*(*Abies lasiocarpa*)/*Hylocomium splendens*)

This community type is similar to the previously described Sw/Moss community, but represents further succession in transition to the Subalpine subregion. This community was described on more northerly and easterly aspects, which probably escaped fire and disturbance, allowing succession to occur. Note, as succession occurs there is a corresponding drop in forage productivity from 500-600 kg/ha in the PI community types to 201 kg/ha in this community type.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** d Canada buffaloberry-rose (mesic/medium)

**Ecosite Phase:** d3 Canada buffaloberry Sw

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Overstory Tree</b>					Ecological Status Score: 25
SUBALPINE FIR ( <i>Abies lasiocarpa</i> )	18.8	0.0-40.0	83		Moisture Regime: Mesic (fresh) (5)
WHITE SPRUCE ( <i>Picea glauca</i> )	10.0	0.0-30.0	50		Nutrient Regime: Submesotrophic (poor) (1), Mesotrophic (medium) (1), Permesotrophic (rich) (1)
ENGELMANN SPRUCE ( <i>Picea engelmannii</i> )	4.1	0.0-25.0	17		Elevation (range): 1420 (1127-1960) M
ENGELMANN X WHITE SPRUCE ( <i>Picea engelmannii x glauca</i> )	1.1	0.0-7.0	17		Slope (%): 16 - 30.99 (4), 0.5 - 2.49 (1), 6 - 9.99 (1)
<b>Understory Tree</b>					Aspect: Easterly (4), Southerly (1), Westerly (1)
SUBALPINE FIR ( <i>Abies lasiocarpa</i> )	1.1	0.0-2.0	67		Topographic Position: Lower Slope (1)
<b>Tall Shrub (2 to 5m)</b>					<b>Soil Variables</b>
SUBALPINE FIR ( <i>Abies lasiocarpa</i> )	1.3	0.0-5.0	50		Soil Drainage: Well drained (3), Imperfectly drained (1), Poorly drained (1)
<b>Medium Shrub (0.5 to 2 m)</b>					Soil Subgroup: ELUVIATED EUTRIC BRUNISOL (1), ORTHIC EUTRIC BRUNISOL (1), ORTHIC HUMIC GLEYSOL (1), CUMULIC REGOSOL (1)
SUBALPINE FIR ( <i>Abies lasiocarpa</i> )	18.3	0.0-88.0	67		Surface Texture:
ENGELMANN SPRUCE ( <i>Picea engelmannii</i> )	3.8	0.0-18.0	33		Effective Texture:
TWINFLOWER ( <i>Linnaea borealis</i> )	1.7	0.0-4.0	83		Depth to Mottles/Gley:
<b>Tall Forb (&gt;= 30 cm)</b>					Organic Thickness: 0 - 5 cm (5)
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	1.1	0.0-4.0	67		Parent Material: Fluvial (3), Morainal (3), Rock (2)
<b>Low Forb (&lt; 30 cm)</b>					Soil Type:
BUNCHBERRY ( <i>Cornus canadensis</i> )	9.5	0.0-25.0	83		Humus Form
ONE-SIDED WINTERGREEN ( <i>Orthilia secunda</i> )	1.3	0.0-5.0	67		<b>LFH Thickness</b>
ALPINE WORMWOOD ( <i>Artemisia norvegica</i> )	1.3	0.0-8.0	17		<b>Mean</b>
<b>Moss</b>					<b>Min</b>
STAIR-STEP MOSS ( <i>Hylocomium splendens</i> )	29.3	0.0-70.0	83		<b>Max</b>
SCHREBER'S MOSS ( <i>Pleurozium schreberi</i> )	20.1	0.0-40.0	83		<b>Count</b>
KNIGHT'S PLUME MOSS ( <i>Ptilium crista-castrensis</i> )	8.3	0.0-25.0	67		cm:
<b>Lichen</b>					0.00
STUDED LEATHER LICHEN ( <i>Peltigera aphthosa</i> )	1.5	0.5-5.0	100		0.00
					0.00
					0

# Mne15 Sw/Alder (n=1)

## (*Picea glauca*/*Alnus crispa*)

This community type seems to form on slopes that have coarse soils and underground seepage. The underground seepage makes this community type fairly moist and nutrient rich. The high amount of moisture allows green alder to proliferate.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** d Canada buffaloberry-rose (mesic/medium)

**Ecosite Phase:** d3 Canada buffaloberry Sw

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables				
	Mean	Range							
<b>Overstory Tree</b>					Ecological Status Score: 25				
ENGELMANN X WHITE SPRUCE ( <i>Picea engelmannii x glauca</i> )	35.0	35.0-35.0		100	Moisture Regime: Subhygric (moderately moist) (1)				
LOGEPOLE PINE ( <i>Pinus contorta</i> )	5.0	5.0-5.0		100	Nutrient Regime:				
<b>Tall Shrub (2 to 5m)</b>					Elevation (range): 1400 (1400-1400) M				
ENGELMANN X WHITE SPRUCE ( <i>Picea engelmannii x glauca</i> )	5.0	5.0-5.0		100	Slope (%): 16 - 30.99 (1)				
<b>Medium Shrub (0.5 to 2 m)</b>					Aspect: Easterly (1)				
GREEN ALDER ( <i>Alnus crispa</i> )	35.0	35.0-35.0		100	Topographic Position:				
SALIX SPECIES ( <i>Salix</i> )	10.0	10.0-10.0		100	<b>Soil Variables</b>				
CANADA BUFFALOBERRY ( <i>Shepherdia canadensis</i> )	10.0	10.0-10.0		100	Soil Drainage: Moderately well drained (1)				
TWINFLOWER ( <i>Linnaea borealis</i> )	4.0	4.0-4.0		100	Soil Subgroup: ORTHIC EUTRIC BRUNISOL (1)				
COMMON LABRADOR TEA ( <i>Ledum groenlandicum</i> )	3.0	3.0-3.0		100	Surface Texture:				
FALSE AZALEA ( <i>Menziesia ferruginea</i> )	2.0	2.0-2.0		100	Effective Texture:				
ROCK WILLOW ( <i>Salix vestita</i> )	2.0	2.0-2.0		100	Depth to Mottles/Gley:				
<b>Low Forb (&lt; 30 cm)</b>					Organic Thickness: 0 - 5 cm (1)				
DWARF SCOURING-RUSH ( <i>Equisetum scirpoides</i> )	4.0	4.0-4.0		100	Parent Material: Morainal (1)				
ONE-SIDED WINTERGREEN ( <i>Orthilia secunda</i> )	4.0	4.0-4.0		100	Soil Type:				
BUNCHBERRY ( <i>Cornus canadensis</i> )	3.0	3.0-3.0		100	Humus Form				
<b>Graminoid</b>					<b>LFH Thickness</b>				
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	3.0	3.0-3.0		100	Mean	Min	Max	Count	
BEAUTIFUL SEDGE ( <i>Carex concinna</i> )	2.0	2.0-2.0		100	cm:	0.00	0.00	0.00	0
<b>Moss</b>									
STAIR-STEP MOSS ( <i>Hylocomium splendens</i> )	50.0	50.0-50.0		100					
KNIGHT'S PLUME MOSS ( <i>Ptilium crista-castrensis</i> )	5.0	5.0-5.0		100					
<b>Lichen</b>									
STUDDERED LEATHER LICHEN ( <i>Peltigera aphthosa</i> )	3.0	3.0-3.0		100					

# Mne17 Sw(Se)/Moss (n=30)

## (*Picea glauca*(*Picea engelmannii*)/*Hylocomium splendens*)

This community type is similar to the previously described PI/Moss community, but represents further succession. This community was described on more northerly and easterly aspects, which probably escaped fire and disturbance, allowing succession to occur. Note, as succession occurs there is a corresponding drop in forage productivity from 500-600 kg/ha in the PI community types to 201 kg/ha in this community type.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** d Canada buffaloberry-rose (mesic/medium)

**Ecosite Phase:** d3 Canada buffaloberry Sw

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Overstory Tree</b>					Ecological Status Score: 25 Moisture Regime: Mesic (fresh) (17), Subhygric (moderately moist) (3) Nutrient Regime: Mesotrophic (medium) (4), Permesotrophic (rich) (2) Elevation (range): 1266 (920-1520) M Slope (%): 31 - 45.99 (6), 6 - 9.99 (5), 71 - 100.99 (4), 46 - 70.99 (3), 16 - 30.99 (3), 0.5 - 2.49 (3), 2.5 - 5.99 (3), 10 - 15.99 (2) Aspect: Easterly (11), Level (6), Northerly (6), Westerly (5), Southerly (1) Topographic Position: Midslope (3), Upper Slope (2)
WHITE SPRUCE ( <i>Picea glauca</i> )	23.2	0.0-70.0	70		
ENGELMANN X WHITE SPRUCE ( <i>Picea engelmannii</i> x <i>glauca</i> )	4.1	0.0-63.0	10		
LODGEPOLE PINE ( <i>Pinus contorta</i> )	3.8	0.0-20.0	47		
ENGELMANN SPRUCE ( <i>Picea engelmannii</i> )	2.5	0.0-40.0	10		
SUBALPINE FIR ( <i>Abies lasiocarpa</i> )	1.4	0.0-12.0	27		
<b>Understory Tree</b>					
WHITE SPRUCE ( <i>Picea glauca</i> )	5.1	0.0-40.0	50		
ENGELMANN SPRUCE ( <i>Picea engelmannii</i> )	3.4	0.0-42.0	13		
LODGEPOLE PINE ( <i>Pinus contorta</i> )	1.1	0.0-20.0	13		
<b>Medium Shrub (0.5 to 2 m)</b>					
TWINFLOWER ( <i>Linnaea borealis</i> )	3.7	0.5-20.0	100		
CANADA BUFFALOBERRY ( <i>Shepherdia canadensis</i> )	2.4	0.0-15.0	67		
PRICKLY ROSE ( <i>Rosa acicularis</i> )	1.1	0.0-6.0	53		
<b>Graminoid</b>					
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	3.2	0.0-25.0	83		
<b>Moss</b>					
STAIR-STEP MOSS ( <i>Hylocomium splendens</i> )	55.9	0.0-98.0	93		
N/A ( <i>Thuidium abietinum</i> )	14.7	0.0-65.0	57		
SCHREBER'S MOSS ( <i>Pleurozium schreberi</i> )	4.6	0.0-30.0	43		
KNIGHT'S PLUME MOSS ( <i>Ptilium crista-castrensis</i> )	2.0	0.0-29.0	50		
<b>Lichen</b>					
STUDDERED LEATHER LICHEN ( <i>Peltigera aphthosa</i> )	1.1	0.0-8.0	57		
<b>Soil Variables</b>					
Soil Drainage: Well drained (12), Moderately well drained (3), Imperfectly drained (1)					
Soil Subgroup: ORTHIC EUTRIC BRUNISOL (11), CUMULIC REGOSOL (8), ORTHIC REGOSOL (2), ELUVIATED EUTRIC BRUNISOL (2), GLEYED EUTRIC BRUNISOL (1), BRUNISOLIC GRAY LUVISOL (1), ORTHIC GRAY LUVISOL (1), CUMULIC HUMIC REGOSOL (1), GLEYED MELANIC BRUNISOL (1), ORTHIC DYSTRIC BRUNISOL (1)					
Surface Texture: Silt loam (3), Loam (1), Clay loam (1)					
Effective Texture: Silt loam (2), Loam (2), Sandy loam (1)					
Depth to Mottles/Gley:					
Organic Thickness: 0 - 5 cm (29)					
Parent Material: Morainal (15), Eolian (12), Glaciofluvial (7), Fluvial (5), Rock (4), Colluvial (3), Fluvio-lacustrine (1)					
Soil Type: Moist/Silty-Loamy (1), Moist/Coarse (1)					
Humus Form FIBRIMOR (2), HUMIFIBRIMOR (1)					
<b>LFH Thickness</b>					
cm:	Mean	Min	Max	Count	
	10.00	6.00	18.00	5	



## Mnf2 Rose/Hairy wildrye (Sw) (n=9)

(*Rosa acicularis*/*Elymus innovatus* (*Picea glauca*))

This community type represents Sw/Buffaloberry-Rose community that were harvested 20 years ago near the community of Brule near the east gates of Jasper National Park. It is very similar to the previously described juniper/ hairy wildrye community (Mnf1), but lacks the cover of juniper. As succession occurs grass density will decrease causing forage productivity to decrease.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** d Canada buffaloberry-rose (mesic/medium)

**Ecosite Phase:** d3 Canada buffaloberry Sw

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Overstory Tree</b>					Ecological Status Score: 25 Moisture Regime: Submesic (moderately fresh) (5), Mesic (fresh) (3), Subxeric (moderately dry) (1) Nutrient Regime: Mesotrophic (medium) (8), Submesotrophic (poor) (1) Elevation (range): 1059 (1036-1096) M Slope (%): 0 - 0.49 (6), 2.5 - 5.99 (2), 10 - 15.99 (1) Aspect: Southerly (4), Level (2), Westerly (2), Northerly (1) Topographic Position: Level (5), Crest (1), Lower Slope (1), Midslope (1), Upper Slope (1)
WHITE SPRUCE ( <i>Picea glauca</i> )	8.7	0.0-20.0	89		
BALSAM POPLAR ( <i>Populus balsamifera</i> )	6.0	0.0-15.0	78		
<b>Understory Tree</b>					
WHITE SPRUCE ( <i>Picea glauca</i> )	1.6	0.0-15.0	11		
<b>Tall Shrub (2 to 5m)</b>					
SALIX SPECIES ( <i>Salix</i> )	6.4	0.0-10.0	78		
<b>Medium Shrub (0.5 to 2 m)</b>					
CANADA BUFFALOBERRY ( <i>Shepherdia canadensis</i> )	5.9	0.0-16.0	78		
PRICKLY ROSE ( <i>Rosa acicularis</i> )	4.0	0.0-13.0	89		
CREEPING JUNIPER ( <i>Juniperus horizontalis</i> )	2.1	0.0-7.5	67		
<b>Tall Forb (&gt;= 30 cm)</b>					
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	3.4	0.0-8.2	67		
STAR-FLOWERED SOLOMON'S-SEAL ( <i>Smilacina stellata</i> )	2.5	0.0-6.3	67		
<b>Low Forb (&lt; 30 cm)</b>					
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	4.4	0.8-11.4	100		
COMMON DANDELION ( <i>Taraxacum officinale</i> )	3.7	0.2-8.1	100		
ALPINE MILK VETCH ( <i>Astragalus alpinus</i> )	3.4	0.0-8.0	89		
ASTER SPECIES ( <i>Aster</i> )	3.3	0.0-11.8	89		
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	2.9	0.0-6.9	89		
SHOWY LOCOWEED ( <i>Oxytropis splendens</i> )	1.9	0.0-4.0	67		
<b>Graminoid</b>					
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	24.6	4.9-40.9	100		
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	4.2	0.0-10.1	78		
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	3.6	0.0-8.3	89		
SEDGE SPECIES ( <i>Carex</i> )	2.6	0.0-7.1	67		
AWNLESS BROME ( <i>Bromus inermis</i> )	2.3	0.5-8.2	100		
<b>Soil Variables</b>					
Soil Drainage: Well drained (7), Rapidly drained (2)					
Soil Subgroup:					
Surface Texture:					
Effective Texture:					
Depth to Mottles/Gley:					
Organic Thickness:					
Parent Material:					
Soil Type:					
Humus Form					
<b>LFH Thickness</b>					
cm:	Mean	Min	Max	Count	
	0.00	0.00	0.00	0	

## d4 Canada buffaloberry Aw (n=28)

**Natural Subregion:** Montane  
**Ecosection:** Mn Montane North Ecosection

**Ecosite:** d Canada buffaloberry-rose (mesic/medium)

### Characteristic Species

#### Tree

- [ 43.6 ] ASPEN\*  
*Populus tremuloides*
- [ 4.8 ] BALSAM POPLAR  
*Populus balsamifera*
- [ 1.0 ] WHITE SPRUCE  
*Picea glauca*

#### Shrub

- [ 6.9 ] PRICKLY ROSE\*  
*Rosa acicularis*
- [ 6.8 ] CANADA BUFFALOBERRY\*  
*Shepherdia canadensis*
- [ 1.3 ] COMMON WILD ROSE  
*Rosa woodsii*
- [ 1.2 ] DEWBERRY  
*Rubus pubescens*

#### Forb

- [ 4.6 ] SHOWY ASTER  
*Aster conspicuus*
- [ 2.6 ] COMMON FIREWEED  
*Epilobium angustifolium*
- [ 1.7 ] CREAM-COLORED VETCHLING  
*Lathyrus ochroleucus*
- [ 1.7 ] WESTERN CANADA VIOLET  
*Viola canadensis*
- [ 1.2 ] TALL LUNGWORT  
*Mertensia paniculata*
- [ 1.1 ] RED AND WHITE BANE BERRY  
*Actaea rubra*
- [ 1.1 ] NORTHERN BEDSTRAW  
*Galium boreale*
- [ 1.1 ] WILD STRAWBERRY  
*Fragaria virginiana*
- [ 1.1 ] VEINY MEADOW RUE  
*Thalictrum venulosum*
- [ 1.0 ] TALL LARKSPUR  
*Delphinium glaucum*

#### Graminoid

- [ 15.1 ] HAIRY WILD RYE\*  
*Elymus innovatus*
- [ 1.6 ] SLENDER WHEAT GRASS  
*Agropyron trachycaulum*

### Environmental Variables

Moisture Regime: Mesic (fresh) (11), Subhygric (moderately moist) (2), Submesic (moderately fresh) (2), Subxeric (moderately dry) (1)

Nutrient Regime: Mesotrophic (medium) (8), Permesotrophic (rich) (3), Submesotrophic (poor) (2)

Elevation (range): 1182 (1000-1450) M

Slope (%): moderate slope (8), gentle slope (6), strong slope (4), very gentle slope (4), level (1), steep slope (1), nearly level (1)

Aspect: Southerly (9), Easterly (5), Northerly (5), Westerly (3), Level (1)

Topographic Position: Midslope (5)

### Soil Variables

Soil Drainage: Well drained (10), Moderately well drained (5), Rapidly drained (2)

Soil Subgroup: ORTHIC EUTRIC BRUNISOL (9), BRUNISOLIC GRAY LUVISOL (7), ORTHIC REGOSOL (4), CUMULIC REGOSOL (1), ELUVIATED DYSTRIC BRUNISOL (1), ELUVIATED EUTRIC BRUNISOL (1)

Surface Texture: Sandy clay loam (3), Silt loam (2), Silty clay loam (1), Sandy loam (1), Loamy sand (1), Loam (1), Clay (1)

Effective Texture: Sandy loam (4), Sandy clay loam (2), Loamy sand (2), Sandy clay (1), Clay loam (1)

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (25)

Parent Material: Morainal (13), Fluvial (8), Glaciofluvial (7), Rock (6), Eolian (5), Colluvial (1)

Soil Type:

Humus Form RAW MODER (1)

### LFH Thickness

	Mean	Min	Max	Count
cm:	7.00	2.00	18.00	10

## Mnc4 Aw/Buffaloberry-Rose (n=28)

### (*Populus tremuloides*/*Shepherdia canadensis*-*Rosa acicularis*)

This community, dominated by a aspen overstory and an understory of Canada buffaloberry, rose and hairy wildrye, and represents a mid-seral successional stage of the Sw/buffaloberry dominated community types. This community type was described on well drained, shallow to moderate slopes, with various parent materials and loamy to sandy loam soils. The forage productivity of this community type is moderate.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecotope:** d Canada buffaloberry-rose (mesic/medium)

**Ecotope Phase:** d4 Canada buffaloberry Aw

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Overstory Tree</b>					Ecological Status Score: 25 Moisture Regime: Mesic (fresh) (11), Submesic (moderately fresh) (2), Subhygric (moderately moist) (2), Subxeric (moderately dry) (1) Nutrient Regime: Mesotrophic (medium) (8), Permesotrophic (rich) (3), Submesotrophic (poor) (2) Elevation (range): 1182 (1000-1450) M Slope (%): 10 - 15.99 (8), 6 - 9.99 (6), 2.5 - 5.99 (4), 16 - 30.99 (4), 46 - 70.99 (1), 0 - 0.49 (1), 0.5 - 2.49 (1) Aspect: Southerly (9), Northerly (5), Easterly (5), Westerly (3), Level (1) Topographic Position: Midslope (5)
ASPEN ( <i>Populus tremuloides</i> )	39.2	10.0-88.0	100		
BALSAM POPLAR ( <i>Populus balsamifera</i> )	4.8	0.0-42.0	39		
WHITE SPRUCE ( <i>Picea glauca</i> )	1.0	0.0-15.0	29		
<b>Understory Tree</b>					
ASPEN ( <i>Populus tremuloides</i> )	4.4	0.0-29.0	54		
<b>Medium Shrub (0.5 to 2 m)</b>					
PRICKLY ROSE ( <i>Rosa acicularis</i> )	6.9	0.0-60.0	79		
CANADA BUFFALOBERRY ( <i>Shepherdia canadensis</i> )	6.8	0.0-45.0	75		
COMMON WILD ROSE ( <i>Rosa woodsii</i> )	1.3	0.0-15.0	21		
<b>Low Shrub (&lt; 0.5m)</b>					
DEWBERRY ( <i>Rubus pubescens</i> )	1.2	0.0-30.0	18		
<b>Tall Forb (&gt;= 30 cm)</b>					
SHOWY ASTER ( <i>Aster conspicuus</i> )	4.6	0.0-25.0	75		
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	2.6	0.0-30.0	54		
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	1.7	0.0-10.0	71		
TALL LUNGWORT ( <i>Mertensia paniculata</i> )	1.2	0.0-10.0	39		
RED AND WHITE BANE BERRY ( <i>Actaea rubra</i> )	1.1	0.0-25.0	21		
VEINY MEADOW RUE ( <i>Thalictrum venulosum</i> )	1.1	0.0-7.0	32		
TALL LARKSPUR ( <i>Delphinium glaucum</i> )	1.0	0.0-7.0	43		
<b>Low Forb (&lt; 30 cm)</b>					
WESTERN CANADA VIOLET ( <i>Viola canadensis</i> )	1.7	0.0-25.0	29		
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	1.1	0.0-5.8	71		
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	1.1	0.0-4.6	86		
<b>Graminoid</b>					
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	15.1	0.0-55.0	86		
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	1.6	0.0-42.0	7		
				Soil Variables	
				Soil Drainage: Well drained (10), Moderately well drained (5), Rapidly drained (2)	
				Soil Subgroup: ORTHIC EUTRIC BRUNISOL (9), BRUNISOLIC GRAY LUVISOL (7), ORTHIC REGOSOL (4), ELUVIATED DYSTRIC BRUNISOL (1), ELUVIATED EUTRIC BRUNISOL (1), CUMULIC REGOSOL (1)	
				Surface Texture: Sandy clay loam (3), Silt loam (2), Sandy loam (1), Silty clay loam (1), Loam (1), Loamy sand (1), Clay (1)	
				Effective Texture: Sandy loam (4), Sandy clay loam (2), Loamy sand (2), Clay loam (1), Sandy clay (1)	
				Depth to Mottles/Gley:	
				Organic Thickness: 0 - 5 cm (25)	
				Parent Material: Morainal (13), Fluvial (8), Glaciofluvial (7), Rock (6), Eolian (5), Colluvial (1)	
				Soil Type:	
				Humus Form RAW MODER (1)	
				<b>LFH Thickness</b>	
				<b>Mean</b> <b>Min</b> <b>Max</b> <b>Count</b>	
				cm:                    7.00    2.00    18.00    10	

## d5 Canada buffaloberry shrubland (n=5)

**Natural Subregion:** Montane  
**Ecosection:** Mn Montane North Ecosection

**Ecosite:** d Canada buffaloberry-rose (mesic/medium)

### Characteristic Species

#### Tree

- [ 5.0 ] ASPEN  
*Populus tremuloides*
- [ 3.0 ] WHITE SPRUCE  
*Picea glauca*

#### Shrub

- [ 15.0 ] CANADA BUFFALOBERRY\*  
*Shepherdia canadensis*
- [ 15.0 ] BEAKED WILLOW\*  
*Salix bebbiana*
- [ 5.0 ] SALIX SPECIES  
*Salix*
- [ 2.0 ] SHRUBBY CINQUEFOIL  
*Potentilla fruticosa*
- [ 2.0 ] CREEPING JUNIPER  
*Juniperus horizontalis*
- [ 2.0 ] GROUND JUNIPER  
*Juniperus communis*
- [ 2.0 ] COMMON BEARBERRY  
*Arctostaphylos uva-ursi*

#### Forb

- [ 10.0 ] WILD STRAWBERRY  
*Fragaria virginiana*
- [ 5.0 ] ALPINE HEDYSARUM  
*Hedysarum alpinum*
- [ 5.0 ] NORTHERN BEDSTRAW  
*Galium boreale*
- [ 5.0 ] LINDLEY'S ASTER  
*Aster ciliolatus*
- [ 5.0 ] COMMON YARROW  
*Achillea millefolium*
- [ 3.0 ] COMMON FIREWEED  
*Epilobium angustifolium*
- [ 3.0 ] SHOWY LOCOWEED  
*Oxytropis splendens*
- [ 2.0 ] WHITE CAMAS  
*Zigadenus elegans*
- [ 2.0 ] ALPINE GOLDENROD  
*Solidago multiradiata*
- [ 2.0 ] CREAM-COLORED VETCHLING  
*Lathyrus ochroleucus*

#### Graminoid

- [ 60.0 ] HAIRY WILD RYE\*  
*Elymus innovatus*
- [ 3.0 ] TIMOTHY  
*Phleum pratense*

### Environmental Variables

Moisture Regime: Mesic (fresh) (3), Subxeric (moderately dry) (1)  
 Nutrient Regime: Mesotrophic (medium) (2), Submesotrophic (poor) (1), Eutrophic (very rich) (1)  
 Elevation (range): 1059 (998-1201) M  
 Slope (%): gentle slope (3), very gentle slope (1)  
 Aspect: Easterly (3), Southerly (1)  
 Topographic Position: Lower Slope (1), Level (1)

### Soil Variables

Soil Drainage: Rapidly drained (2), Very rapidly drained (1), Moderately well drained (1)  
 Soil Subgroup: ORTHIC HUMIC REGOSOL (3), CUMULIC HUMIC REGOSOL (1)  
 Surface Texture: Fine sand (3), Silt loam (1)  
 Effective Texture: Fine sand (3), Sandy loam (1)  
 Depth to Mottles/Gley:  
 Organic Thickness: 0 - 5 cm (4)  
 Parent Material: Fluvial (2), Morainal (1), Eolian (1)  
 Soil Type:  
 Humus Form FIBRIHUMIMOR (1)

### LFH Thickness

	Mean	Min	Max	Count
cm:	2.50	1.00	5.00	4

## Mnb6 Beaked willow-Canada buffaloberry/Hairy wildrye (n=1)

(*Salix bebbiana*-*Shepherdia canadensis*/*Elymus innovatus*)

This community type represents moist pockets of shrubland in shallow gullies and shallow depressional areas within the spruce and pine dominated forests on shallow slopes with morainal and fluvial parent materials. Sub-surface flow through coarse substrate provides habitat suitable for species whose roots reach groundwater (willow). However, the surface is subxeric characterized by bearberry and juniper. Pine, spruce and aspen ingrowth could result in the succession of these sites to form the Pl/buffaloberry, Aw/buffaloberry and Sw/buffaloberry dominated community types.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** d Canada buffaloberry-rose (mesic/medium)

**Ecosite Phase:** d5 Canada buffaloberry shrubland

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Tall Shrub (2 to 5m)</b>				Ecological Status Score: 40
BEAKED WILLOW ( <i>Salix bebbiana</i> )	15.0	15.0-15.0	100	Moisture Regime: Mesic (fresh) (1)
ASPEN ( <i>Populus tremuloides</i> )	5.0	5.0-5.0	100	Nutrient Regime: Eutrophic (very rich) (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Elevation (range): 1060 (1060-1060) M
CANADA BUFFALOBERRY ( <i>Shepherdia canadensis</i> )	15.0	15.0-15.0	100	Slope (%): 2.5 - 5.99 (1)
SALIX SPECIES ( <i>Salix</i> )	5.0	5.0-5.0	100	Aspect: Southerly (1)
WHITE SPRUCE ( <i>Picea glauca</i> )	3.0	3.0-3.0	100	Topographic Position:
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	2.0	2.0-2.0	100	<b>Soil Variables</b>
GROUND JUNIPER ( <i>Juniperus communis</i> )	2.0	2.0-2.0	100	Soil Drainage: Moderately well drained (1)
CREeping JUNIPER ( <i>Juniperus horizontalis</i> )	2.0	2.0-2.0	100	Soil Subgroup: CUMULIC HUMIC REGOSOL (1)
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	2.0	2.0-2.0	100	Surface Texture: Silt loam (1)
<b>Tall Forb (&gt;= 30 cm)</b>				Effective Texture: Sandy loam (1)
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	5.0	5.0-5.0	100	Depth to Mottles/Gley:
ALPINE HEDYSARUM ( <i>Hedysarum alpinum</i> )	5.0	5.0-5.0	100	Organic Thickness: 0 - 5 cm (1)
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	3.0	3.0-3.0	100	Parent Material: Morainal (1)
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	2.0	2.0-2.0	100	Soil Type:
WHITE CAMAS ( <i>Zigadenus elegans</i> )	2.0	2.0-2.0	100	Humus Form
<b>Low Forb (&lt; 30 cm)</b>				<b>LFH Thickness</b>
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	10.0	10.0-10.0	100	Mean
COMMON YARROW ( <i>Achillea millefolium</i> )	5.0	5.0-5.0	100	Min
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	5.0	5.0-5.0	100	Max
SHOWY LOCOWEED ( <i>Oxytropis splendens</i> )	3.0	3.0-3.0	100	Count
ALPINE GOLDENROD ( <i>Solidago multiradiata</i> )	2.0	2.0-2.0	100	cm:
<b>Graminoid</b>				1.00
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	60.0	60.0-60.0	100	1.00
TIMOTHY ( <i>Phleum pratense</i> )	3.0	3.0-3.0	100	1.00
				1

## Mnb8 Chokecherry-Saskatoon (n=4)

(*Prunus virginiana*-*Amelanchier alnifolia*)

This community type was described near the east gates of Jasper National park in the Athabasca river valley. Chokecherry dominated plant communities occur on fluvial and eolian parent materials where underground seepage provides additional moisture for deeper rooted species. At the surface the soils are coarse textured and rapidly drained which favours the growth of bearberry and sedge species. In the absence of disturbance chokecherry dominated communities can undergo succession to pure or mixed aspen, balsam poplar and white spruce in the Athabasca river valley near Hinton, succession to lodgepole pine is unlikely because of the extremely calcareous soils. Chokecherry and saskatoon dominate this community. Prickly rose and snowberry are other common shrubs.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** d Canada buffaloberry-rose (mesic/medium)

**Ecosite Phase:** d5 Canada buffaloberry shrubland

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 40
WHITE SPRUCE ( <i>Picea glauca</i> )	3.5	0.0-10.0	75	Moisture Regime: Mesic (fresh) (2), Subxeric (moderately dry) (1)
<b>Tall Shrub (2 to 5m)</b>				Nutrient Regime: Mesotrophic (medium) (2), Submesotrophic (poor) (1)
WATER BIRCH ( <i>Betula occidentalis</i> )	1.2	0.0-5.0	25	Elevation (range): 1059 (998-1201) M
<b>Medium Shrub (0.5 to 2 m)</b>				Slope (%): 6 - 9.99 (3)
CHOKE CHERRY ( <i>Prunus virginiana</i> )	23.7	10.0-30.0	100	Aspect: Easterly (3)
SASKATOON ( <i>Amelanchier alnifolia</i> )	22.0	3.0-35.0	100	Topographic Position: Level (1), Lower Slope (1)
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	12.0	0.0-40.0	75	<b>Soil Variables</b>
PRICKLY ROSE ( <i>Rosa acicularis</i> )	3.1	0.5-10.0	100	Soil Drainage: Rapidly drained (2), Very rapidly drained (1)
SNOWBERRY ( <i>Symphoricarpos albus</i> )	1.5	0.0-5.0	75	Soil Subgroup: ORTHIC HUMIC REGOSOL (3)
WATER BIRCH ( <i>Betula occidentalis</i> )	1.0	0.0-2.0	50	Surface Texture: Fine sand (3)
<b>Graminoid</b>				Effective Texture: Fine sand (3)
SEDGE SPECIES ( <i>Carex</i> )	5.2	0.0-20.0	50	Depth to Mottles/Gley:
BRISTLE-LEAVED SEDGE ( <i>Carex eburnea</i> )	2.7	0.0-5.0	75	Organic Thickness: 0 - 5 cm (3)
				Parent Material: Fluvial (2), Eolian (1)
				Soil Type:
				Humus Form FIBRIHUMIMOR (1)
				<b>LFH Thickness</b>
				<b>Mean</b>
				<b>Min</b>
				<b>Max</b>
				<b>Count</b>
				cm:
				4.00
				3.00
				5.00
				3

## d6 hairy wildrye grassland (n=1)

**Natural Subregion:** Montane  
**Ecosection:** Mn Montane North Ecosection

**Ecosite:** d Canada buffaloberry-rose (mesic/medium)

### Characteristic Species

#### Shrub

- [ 1.0 ] TWINFLOWER  
*Linnaea borealis*
- [ 1.0 ] DWARF RASPBERRY  
*Rubus arcticus*

#### Forb

- [ 6.0 ] TALL LUNGWORT  
*Mertensia paniculata*
- [ 5.0 ] SMOOTH ASTER  
*Aster laevis*
- [ 4.0 ] PALMATE-LEAVED COLTSFOOT  
*Petasites palmatus*
- [ 2.0 ] COMMON RED PAINTBRUSH  
*Castilleja miniata*
- [ 2.0 ] SHOWY ASTER  
*Aster conspicuus*
- [ 1.0 ] WHITE CAMAS  
*Zigadenus elegans*
- [ 1.0 ] WILD VETCH  
*Vicia americana*
- [ 1.0 ] UNDIFFERENTIATED GOLDENROD  
*Solidago*
- [ 1.0 ] FEW-FLOWERED RAGWORT  
*Senecio pauciflorus*
- [ 1.0 ] BISHOP'S-CAP  
*Mitella nuda*
- [ 1.0 ] CREAM-COLORED VETCHLING  
*Lathyrus ochroleucus*

#### Graminoid

- [ 2.0 ] HAIRY WILD RYE\*  
*Elymus innovatus*
- [ 1.0 ] SEDGE SPECIES  
*Carex*

### Environmental Variables

Moisture Regime: Mesic (fresh) (0)  
 Nutrient Regime: Mesotrophic (medium) (0)  
 Elevation (range): 1460 (1460-1460) M  
 Slope (%): gentle slope (1)  
 Aspect: Southerly (1)  
 Topographic Position:

### Soil Variables

Soil Drainage:  
 Soil Subgroup:  
 Surface Texture:  
 Effective Texture:  
 Depth to Mottles/Gley:  
 Organic Thickness: 0 - 5 cm (1)  
 Parent Material: Saprolite (1), Rock (1)  
 Soil Type:  
 Humus Form

### LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

## Mna3 Hairy wildrye/Aster (n=1)

### (*Elymus innovatus*/*Aster laevis*)

This community type was described in the North Saskatchewan river valley on a shallow, south facing slope. Soils were poorly developed and shallow to bedrock. The presence of aster and tall lungwort described in this community type suggests that there is sufficient moisture to support forest growth on mesic grasslands, as they are constituents of mesic forest communities in the vicinity.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** d Canada buffaloberry-rose (mesic/medium)

**Ecosite Phase:** d6 hairy wildrye grassland

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables				
	Mean	Range							
<b>Medium Shrub (0.5 to 2 m)</b>					Ecological Status Score: 40				
TWINFLOWER ( <i>Linnaea borealis</i> )	1.0	1.0-1.0		100	Moisture Regime: Mesic (fresh) (0)				
<b>Low Shrub (&lt; 0.5m)</b>					Nutrient Regime: Mesotrophic (medium) (0)				
DWARF RASPBERRY ( <i>Rubus arcticus</i> )	1.0	1.0-1.0		100	Elevation (range): 1460 (1460-1460) M				
<b>Tall Forb (&gt;= 30 cm)</b>					Slope (%): 6 - 9.99 (1)				
TALL LUNGWORT ( <i>Mertensia paniculata</i> )	6.0	6.0-6.0		100	Aspect: Southerly (1)				
SMOOTH ASTER ( <i>Aster laevis</i> )	5.0	5.0-5.0		100	Topographic Position:				
SHOWY ASTER ( <i>Aster conspicuus</i> )	2.0	2.0-2.0		100	<b>Soil Variables</b>				
COMMON RED PAINTBRUSH ( <i>Castilleja miniata</i> )	2.0	2.0-2.0		100	Soil Drainage:				
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	1.0	1.0-1.0		100	Soil Subgroup:				
UNDIFFERENTIATED GOLDENROD ( <i>Solidago</i> )	1.0	1.0-1.0		100	Surface Texture:				
WILD VETCH ( <i>Vicia americana</i> )	1.0	1.0-1.0		100	Effective Texture:				
WHITE CAMAS ( <i>Zigadenus elegans</i> )	1.0	1.0-1.0		100	Depth to Mottles/Gley:				
<b>Low Forb (&lt; 30 cm)</b>					Organic Thickness: 0 - 5 cm (1)				
PALMATE-LEAVED COLTSFOOT ( <i>Petasites palmatus</i> )	4.0	4.0-4.0		100	Parent Material: Saprolite (1), Rock (1)				
BISHOP'S-CAP ( <i>Mitella nuda</i> )	1.0	1.0-1.0		100	Soil Type:				
FEW-FLOWERED RAGWORT ( <i>Senecio pauciflorus</i> )	1.0	1.0-1.0		100	Humus Form				
<b>Graminoid</b>					<b>LFH Thickness</b>				
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	2.0	2.0-2.0		100	<b>Mean</b>	<b>Min</b>	<b>Max</b>	<b>Count</b>	
SEDGE SPECIES ( <i>Carex</i> )	1.0	1.0-1.0		100	cm:	0.00	0.00	0.00	0



# d8 Canada buffaloberry Aw-Pl-Sw-Fd (n=11)

Natural Subregion: Montane  
 Ecoregion: Mn Montane North Ecoregion

Ecosite: d Canada buffaloberry-rose (mesic/medium)

## Characteristic Species

### Tree

- [ 19.7 ] ASPEN  
*Populus tremuloides*
- [ 19.5 ] WHITE SPRUCE  
*Picea glauca*
- [ 1.0 ] BALSAM POPLAR  
*Populus balsamifera*

### Shrub

- [ 17.7 ] CANADA BUFFALOBERRY\*  
*Shepherdia canadensis*
- [ 7.5 ] GREEN ALDER\*  
*Alnus crispa*
- [ 6.6 ] TWINFLOWER  
*Linnaea borealis*
- [ 5.5 ] PRICKLY ROSE\*  
*Rosa acicularis*
- [ 3.4 ] COMMON BEARBERRY  
*Arctostaphylos uva-ursi*
- [ 2.0 ] TWINING HONEYSUCKLE  
*Lonicera dioica*
- [ 1.5 ] RED-OSIER DOGWOOD  
*Cornus stolonifera*

### Forb

- [ 2.4 ] SHOWY ASTER  
*Aster conspicuus*
- [ 1.5 ] NORTHERN BASTARD TOADFLAX  
*Geocaulon lividum*
- [ 1.4 ] CREAM-COLORED VETCHLING  
*Lathyrus ochroleucus*
- [ 1.1 ] WILD STRAWBERRY  
*Fragaria virginiana*

### Moss and Liverwort

- [ 3.1 ] STAIR-STEP MOSS  
*Hylocomium splendens*
- [ 1.7 ] N/A  
*Thuidium abietinum*

### Graminoid

- [ 20.0 ] HAIRY WILD RYE\*  
*Elymus innovatus*

## Environmental Variables

Moisture Regime: Mesic (fresh) (5), Submesic (moderately fresh) (1), Subhygric (moderately moist) (1)  
 Nutrient Regime: Mesotrophic (medium) (2), Permesotrophic (rich) (1)  
 Elevation (range): 1174 (999-1270) M  
 Slope (%): very gentle slope (3), strong slope (3), moderate slope (1), gentle slope (1), nearly level (1)  
 Aspect: Easterly (4), Westerly (2), Level (1), Southerly (1), Northerly (1)  
 Topographic Position: Lower Slope (1)

## Soil Variables

Soil Drainage: Well drained (5), Moderately well drained (1)  
 Soil Subgroup: ORTHIC HUMIC REGOSOL (3), CUMULIC REGOSOL (2), ELUVIATED EUTRIC BRUNISOL (2), ORTHIC EUTRIC BRUNISOL (1), ORTHIC MELANIC BRUNISOL (1)  
 Surface Texture: Silt loam (1), Clay loam (1)  
 Effective Texture: Sandy loam (1), Fine Sandy Clay Loam (1)  
 Depth to Mottles/Gley:  
 Organic Thickness: 0 - 5 cm (8)  
 Parent Material: Eolian (5), Morainal (3), Fluvial (3), Rock (1), Glaciofluvial (1)  
 Soil Type:  
 Humus Form MULL-LIKE MODER (1)

LFH Thickness	Mean	Min	Max	Count
cm:	7.00	5.00	9.00	2

## Mnd3 Aw-Sw/Alder (n=1)

### (*Populus tremuloides*-*Picea glauca*/*Alnus crispa*)

This community type occurs on mesic Montane to Lower Subalpine level to steeply sloping sites with northerly or easterly aspects near Jasper. Soils are generally well drained Brunisols on morainal parent materials. This community type is distinguished from other mixedwood dominated stands by the dominance of green alder in the understory.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** d Canada buffaloberry-rose (mesic/medium)

**Ecosite Phase:** d8 Canada buffaloberry Aw-PI-Sw-Fd

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Overstory Tree</b>					Ecological Status Score: 25
WHITE SPRUCE ( <i>Picea glauca</i> )	20.0	20.0-20.0	100		Moisture Regime: Mesic (fresh) (1)
ASPEN ( <i>Populus tremuloides</i> )	15.0	15.0-15.0	100		Nutrient Regime:
<b>Understory Tree</b>					Elevation (range): 1200 (1200-1200) M
ASPEN ( <i>Populus tremuloides</i> )	7.0	7.0-7.0	100		Slope (%): 16 - 30.99 (1)
<b>Tall Shrub (2 to 5m)</b>					Aspect: Northerly (1)
WHITE SPRUCE ( <i>Picea glauca</i> )	10.0	10.0-10.0	100		Topographic Position:
<b>Medium Shrub (0.5 to 2 m)</b>					<b>Soil Variables</b>
CANADA BUFFALOBERRY ( <i>Shepherdia canadensis</i> )	25.0	25.0-25.0	100		Soil Drainage:
GREEN ALDER ( <i>Alnus crispa</i> )	15.0	15.0-15.0	100		Soil Subgroup: CUMULIC REGOSOL (1)
TWINFLOWER ( <i>Linnaea borealis</i> )	10.0	10.0-10.0	100		Surface Texture:
PRICKLY ROSE ( <i>Rosa acicularis</i> )	6.0	6.0-6.0	100		Effective Texture:
TWINING HONEYSUCKLE ( <i>Lonicera dioica</i> )	4.0	4.0-4.0	100		Depth to Mottles/Gley:
RED-OSIER DOGWOOD ( <i>Cornus stolonifera</i> )	3.0	3.0-3.0	100		Organic Thickness: 0 - 5 cm (1)
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	2.0	2.0-2.0	100		Parent Material: Eolian (1), Morainal (1)
LOW-BUSH CRANBERRY ( <i>Viburnum edule</i> )	1.0	1.0-1.0	100		Soil Type:
<b>Tall Forb (&gt;= 30 cm)</b>					Humus Form
WHITE CAMAS ( <i>Zigadenus elegans</i> )	1.0	1.0-1.0	100		
<b>Low Forb (&lt; 30 cm)</b>					
NORTHERN BASTARD TOADFLAX ( <i>Geocaulon lividum</i> )	3.0	3.0-3.0	100		
<b>Graminoid</b>					
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	30.0	30.0-30.0	100		
<b>Moss</b>					
N/A ( <i>Thuidium abietinum</i> )	2.0	2.0-2.0	100		
					<b>LFH Thickness</b>
					<b>Mean</b>
					<b>Min</b>
					<b>Max</b>
					<b>Count</b>
cm:					0.00
					0.00
					0.00
					0

## Mnd4 Aw-Sw-PI/Buffaloberry-Rose (n=10)

(*Populus tremuloides*-*Picea glauca*-*Pinus contorta*/*Shepherdia canadensis*-*Rosa acicularis*)

This community is one of several community types which represent the mesic/medium ecosite for the Montane northern ecosection. These sites can be dominated by Douglas fir, white spruce, aspen or lodgepole pine or a mixture of all species. The understory can be dominated by Canada buffaloberry, hairy wildrye or feather moss depending on the successional status of the stand. Canada buffaloberry is well adapted to growing on dry rocky slopes. Succession in the absence of disturbance will be to white spruce.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** d Canada buffaloberry-rose (mesic/medium)

**Ecosite Phase:** d8 Canada buffaloberry Aw-PI-Sw-Fd

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 25
ASPEN ( <i>Populus tremuloides</i> )	17.5	5.0-40.0	100	Moisture Regime: Mesic (fresh) (4), Subhygric (moderately moist) (1), Submesic (moderately fresh) (1)
WHITE SPRUCE ( <i>Picea glauca</i> )	9.1	0.0-20.0	90	Nutrient Regime: Mesotrophic (medium) (2), Permesotrophic (rich) (1)
LODGEPOLE PINE ( <i>Pinus contorta</i> )	1.7	0.0-7.0	40	Elevation (range): 1148 (999-1270) M
<b>Understory Tree</b>				Slope (%): 2.5 - 5.99 (3), 16 - 30.99 (2), 0.5 - 2.49 (1), 6 - 9.99 (1), 10 - 15.99 (1)
BALSAM POPLAR ( <i>Populus balsamifera</i> )	2.0	0.0-20.0	10	Aspect: Easterly (4), Westerly (2), Southerly (1), Level (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Topographic Position: Lower Slope (1)
CANADA BUFFALOBERRY ( <i>Shepherdia canadensis</i> )	10.4	0.0-40.0	80	<b>Soil Variables</b>
PRICKLY ROSE ( <i>Rosa acicularis</i> )	5.0	2.0-13.0	100	Soil Drainage: Well drained (5), Moderately well drained (1)
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	4.9	0.0-40.0	50	Soil Subgroup: ORTHIC HUMIC REGOSOL (3), ELUVIATED EUTRIC BRUNISOL (2), ORTHIC MELANIC BRUNISOL (1), CUMULIC REGOSOL (1), ORTHIC EUTRIC BRUNISOL (1)
TWINFLOWER ( <i>Linnaea borealis</i> )	3.2	0.0-20.0	70	Surface Texture: Silt loam (1), Clay loam (1)
<b>Tall Forb (&gt;= 30 cm)</b>				Effective Texture: Fine Sandy Clay Loam (1), Sandy loam (1)
SHOWY ASTER ( <i>Aster conspicuus</i> )	4.8	0.0-15.0	80	Depth to Mottles/Gley:
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	2.9	0.0-10.0	70	Organic Thickness: 0 - 5 cm (7)
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	1.7	0.0-7.0	80	Parent Material: Eolian (4), Fluvial (3), Morainal (2), Rock (1), Glaciofluvial (1)
TALL LUNGWORT ( <i>Mertensia paniculata</i> )	1.3	0.0-8.0	50	Soil Type:
<b>Low Forb (&lt; 30 cm)</b>				Humus Form MULL-LIKE MODER (1)
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	2.2	0.0-5.0	90	<b>LFH Thickness</b>
PALMATE-LEAVED COLTSFOOT ( <i>Petasites palmatus</i> )	1.2	0.0-5.0	40	Mean
BUNCHBERRY ( <i>Cornus canadensis</i> )	1.1	0.0-5.0	30	Min
<b>Graminoid</b>				Max
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	10.1	1.0-35.0	100	Count
BLUEJOINT ( <i>Calamagrostis canadensis</i> )	1.6	0.0-16.2	10	cm:
<b>Moss</b>				7.00
STAIR-STEP MOSS ( <i>Hylocomium splendens</i> )	6.3	0.0-50.0	40	5.00
N/A ( <i>Thuidium abietinum</i> )	1.4	0.0-10.0	30	9.00
				2

## d9 industrial/tame (n=2)

**Natural Subregion:** Montane  
**Ecosection:** Mn Montane North Ecosection

**Ecosite:** d Canada buffaloberry-rose (mesic/medium)

### Characteristic Species

#### Shrub

- [ 2.0 ] SALIX SPECIES  
*Salix*

#### Forb

- [ 2.0 ] COMMON FIREWEED  
*Epilobium angustifolium*
- [ 1.0 ] TALL LARKSPUR  
*Delphinium glaucum*

#### Graminoid

- [ 18.0 ] CREEPING RED FESCUE  
*Festuca rubra*
- [ 10.0 ] HAIRY WILD RYE  
*Elymus innovatus*
- [ 8.0 ] TIMOTHY  
*Phleum pratense*
- [ 6.0 ] SEDGE SPECIES  
*Carex*
- [ 2.0 ] KENTUCKY BLUEGRASS  
*Poa pratensis*

### Environmental Variables

Moisture Regime: Mesic (fresh) (0)  
Nutrient Regime: Mesotrophic (medium) (0)  
Elevation (range): 1593 (1565-1620) M  
Slope (%): very strong slope (0)  
Aspect:  
Topographic Position:

### Soil Variables

Soil Drainage: Imperfectly drained (0), Well drained (0)  
Soil Subgroup:  
Surface Texture:  
Effective Texture:  
Depth to Mottles/Gley:  
Organic Thickness:  
Parent Material:  
Soil Type:  
Humus Form

### LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

# Mna14 Creeping red fescue-Timothy-Kentucky bluegrass (n=2)

(*Festuca rubra-Phleum pratense-Poa pratensis*)

This community type represents spruce cutblocks that were harvested and seeded to creeping red fescue and timothy. This seeding was done in order to increase the forage supply for wintering elk and alleviate the pressure on the rough fescue dominated grasslands around the Ya Ha Tinda ranch. This seeding has increased the forage supply of the area, but it has been found that elk do not prefer to graze these sites. The agronomic species seeded into these cutblocks have also been found to be invasive (Gerling et al. 1996). Further range improvement should probably be done with a native seed mix.

**Natural Subregion:** Montane  
**Ecosection:** Mn Montane North Ecosection

**Ecosite:** d Canada buffaloberry-rose (mesic/medium)  
**Ecosite Phase:** d9 industrial/tame

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables					
	Mean	Range								
<b>Medium Shrub (0.5 to 2 m)</b>					Ecological Status Score: 12					
SALIX SPECIES ( <i>Salix</i> )	2.0	0.0-2.0		100	Moisture Regime: Mesic (fresh) (0)					
<b>Tall Forb (&gt;= 30 cm)</b>					Nutrient Regime: Mesotrophic (medium) (0)					
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	2.0	0.0-0.0		50	Elevation (range): 1593 (1565-1620) M					
TALL LARKSPUR ( <i>Delphinium glaucum</i> )	1.0	0.0-2.0		50	Slope (%): 31 - 45.99 (0)					
<b>Graminoid</b>					Aspect:					
CREEPING RED FESCUE ( <i>Festuca rubra</i> )	18.0	15.0-21.0		100	Topographic Position:					
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	10.0	8.0-11.0		100	<b>Soil Variables</b>					
TIMOTHY ( <i>Phleum pratense</i> )	8.0	7.0-9.0		100	Soil Drainage: Imperfectly drained (0), Well drained (0)					
SEDGE SPECIES ( <i>Carex</i> )	6.0	1.0-11.0		100	Soil Subgroup:					
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	2.0	0.0-3.0		50	Surface Texture:					
					Effective Texture:					
					Depth to Mottles/Gley:					
					Organic Thickness:					
					Parent Material:					
					Soil Type:					
					Humus Form					
					<b>LFH Thickness</b>					
					<b>Mean</b>	<b>Min</b>	<b>Max</b>	<b>Count</b>		
cm:					0.00	0.00	0.00	0		

## e alder-willow (mesic/rich) (n=25)

Natural Subregion: Montane

### General Description

The alder-willow ecosite is mesic and nutrient rich. These sites are commonly found in mid or lower slope topographic positions where they receive nutrient-rich seepage waters for a portion of the growing season. Morainal parent materials with northerly aspects and fluvial sites are common and plant communities tend to be high in species richness, cover and diversity. Based on tree growth (site index) this ecosite tends to be the most productive ecosite in the northern ecosection of the Montane natural subregion.



### Successional Relationships

Succession proceeds slowly after disturbance due to the proliferation of grass, forb and shrub cover. This profusion of vegetation cover can make tree establishment difficult and can reduce early growth rates. Tall willows may become established as a tree layer on some of these sites and a willow phase has been recognized. Once tree seedlings become established, high growth rates can be expected. White spruce is the expected climax species.

### Indicator Species

#### Tree

ENGELMANN SPRUCE  
*Picea engelmannii*  
WHITE SPRUCE  
*Picea glauca*  
BALSAM POPLAR  
*Populus balsamifera*  
ASPEN  
*Populus tremuloides*

#### Shrub

THIMBLEBERRY  
*Rubus parviflorus*  
SCOULER'S WILLOW  
*Salix scouleriana*  
CHOKE CHERRY  
*Prunus virginiana*  
GREEN ALDER  
*Alnus crispa*  
RIVER ALDER  
*Alnus tenuifolia*  
SASKATOON  
*Amelanchier alnifolia*

Ecosection: Mn Montane North Ecosection

Site Index at 50 Years	Height (m)	Variation (m)	Count
WHITE SPRUCE <i>(Picea glauca)</i>	14.30	0.90	0
BALSAM POPLAR <i>(Populus balsamifera)</i>	18.00	1.40	0
ASPEN <i>(Populus tremuloides)</i>	20.20	1.80	0

### Environmental Variables

Moisture Regime: Mesic (fresh) (13), Subhygric (moderately moist) (5), Subhydryc (moderately wet) (1)

Nutrient Regime: Mesotrophic (medium) (7), Permesotrophic (rich) (5)

Elevation (range): 1202 (999-1580) M

Slope (%): moderate slope (8), gentle slope (6), level (2), strong slope (2), very gentle slope (2), very steep slope (1)

Aspect: Easterly (11), Northerly (4), Southerly (3)

Topographic Position: Lower Slope (4), Midslope (2), Toe (1), Crest (1)

### Soil Variables

Soil Drainage: Well drained (8), Rapidly drained (5), Very rapidly drained (2), Imperfectly drained (1), Moderately well drained (1), Poorly drained (1)

Soil Subgroup: ORTHIC EUTRIC BRUNISOL (5), CUMULIC REGOSOL (4), ORTHIC REGOSOL (4), BRUNISOLIC GRAY LUVISOL (2), ORTHIC HUMIC REGOSOL (2), ORTHIC MELANIC BRUNISOL (1), GLEYED DYSTRIC BRUNISOL (1), GLEYED CUMULIC REGOSOL (1)

Surface Texture: Silt loam (2), Very fine sandy loam (1), Clay loam (1), Loamy sand (1)

Effective Texture: Fine sand (2), Loamy sand (1), Sandy clay loam (1), Silt loam (1)

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (22)

Parent Material: Fluvial (8), Eolian (4), Morainal (4), Fluviolacustrine (3), Colluvial (2), Rock (1), Tephra (1)

Soil Type:

Humus Form RAW MODER (1)

LFH Thickness	Mean	Min	Max	Count
cm:	8.00	5.00	10.00	5

# e1 alder-willow PI (n=1)

Natural Subregion: Montane  
Ecosection: Mn Montane North Ecosection

Ecosite: e alder-willow (mesic/rich)

## General Description

## Environmental Variables

### Characteristic Species

#### Tree

- [ 35.0 ] LODGEPOLE PINE  
*Pinus contorta*
- [ 15.0 ] WHITE SPRUCE  
*Picea glauca*

#### Shrub

- [ 30.0 ] SMOOTH WILLOW  
*Salix glauca*
- [ 10.0 ] BARCLAY'S WILLOW  
*Salix barclayi*
- [ 5.0 ] DWARF BILBERRY  
*Vaccinium caespitosum*
- [ 5.0 ] BEAKED WILLOW  
*Salix bebbiana*
- [ 5.0 ] COMMON LABRADOR TEA  
*Ledum groenlandicum*
- [ 5.0 ] GROUND JUNIPER  
*Juniperus communis*
- [ 2.0 ] PRICKLY ROSE  
*Rosa acicularis*
- [ 2.0 ] TWINFLOWER  
*Linnaea borealis*
- [ 1.0 ] SHRUBBY CINQUEFOIL  
*Potentilla fruticosa*

#### Forb

- [ 3.0 ] DWARF SCOURING-RUSH  
*Equisetum scirpoides*
- [ 2.0 ] WILD STRAWBERRY  
*Fragaria virginiana*
- [ 2.0 ] BUNCHBERRY  
*Cornus canadensis*

#### Moss and Liverwort

- [ 30.0 ] STAIR-STEP MOSS  
*Hylocomium splendens*
- [ 20.0 ] SCHREBER'S MOSS  
*Pleurozium schreberi*

#### Graminoid

- [ 20.0 ] HAIRY WILD RYE  
*Elymus innovatus*

Moisture Regime: Mesic (fresh) (1)

Nutrient Regime:

Elevation (range): 1340 (1340-1340) M

Slope (%): very gentle slope (1)

Aspect: Easterly (1)

Topographic Position:

### Soil Variables

Soil Drainage: Rapidly drained (1)

Soil Subgroup: ORTHIC EUTRIC BRUNISOL (1)

Surface Texture:

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (1)

Parent Material: Tephra (1), Fluvial (1)

Soil Type:

Humus Form

### LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

## Mne26 PI/Willow/Hairy wildrye (n=1)

(*Pinus contorta*/*Salix glauca*/*Elymus innovatus*)

This community type was described on fluvial parent material within the Athabasca river valley near Jasper. There is seepage of water at depth which favours the growth of willow, but the surface is coarse textured and dry which favours the growth of hairy wildrye.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** e alder-willow (mesic/rich)

**Ecosite Phase:** e1 alder-willow PI

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables				
	Mean	Range							
<b>Overstory Tree</b>					Ecological Status Score: 25				
LOGEPOLE PINE ( <i>Pinus contorta</i> )	20.0	20.0-20.0		100	Moisture Regime: Mesic (fresh) (1)				
<b>Understory Tree</b>					Nutrient Regime:				
LOGEPOLE PINE ( <i>Pinus contorta</i> )	15.0	15.0-15.0		100	Elevation (range): 1340 (1340-1340) M				
WHITE SPRUCE ( <i>Picea glauca</i> )	5.0	5.0-5.0		100	Slope (%): 2.5 - 5.99 (1)				
<b>Tall Shrub (2 to 5m)</b>					Aspect: Easterly (1)				
WHITE SPRUCE ( <i>Picea glauca</i> )	10.0	10.0-10.0		100	Topographic Position:				
<b>Medium Shrub (0.5 to 2 m)</b>					<b>Soil Variables</b>				
SMOOTH WILLOW ( <i>Salix glauca</i> )	30.0	30.0-30.0		100	Soil Drainage: Rapidly drained (1)				
BARCLAY'S WILLOW ( <i>Salix barclayi</i> )	10.0	10.0-10.0		100	Soil Subgroup: ORTHIC EUTRIC BRUNISOL (1)				
GROUND JUNIPER ( <i>Juniperus communis</i> )	5.0	5.0-5.0		100	Surface Texture:				
COMMON LABRADOR TEA ( <i>Ledum groenlandicum</i> )	5.0	5.0-5.0		100	Effective Texture:				
BEAKED WILLOW ( <i>Salix bebbiana</i> )	5.0	5.0-5.0		100	Depth to Mottles/Gley:				
DWARF BILBERRY ( <i>Vaccinium caespitosum</i> )	5.0	5.0-5.0		100	Organic Thickness: 0 - 5 cm (1)				
TWINFLOWER ( <i>Linnaea borealis</i> )	2.0	2.0-2.0		100	Parent Material: Fluvial (1), Tephra (1)				
PRICKLY ROSE ( <i>Rosa acicularis</i> )	2.0	2.0-2.0		100	Soil Type:				
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	1.0	1.0-1.0		100	Humus Form				
<b>Low Forb (&lt; 30 cm)</b>					<b>LFH Thickness</b>				
DWARF SCOURING-RUSH ( <i>Equisetum scirpoides</i> )	3.0	3.0-3.0		100	<b>Mean</b>	<b>Min</b>	<b>Max</b>	<b>Count</b>	
BUNCHBERRY ( <i>Cornus canadensis</i> )	2.0	2.0-2.0		100	cm:	0.00	0.00	0.00	0
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	2.0	2.0-2.0		100					
<b>Graminoid</b>									
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	20.0	20.0-20.0		100					
<b>Moss</b>									
STAIR-STEP MOSS ( <i>Hylocomium splendens</i> )	30.0	30.0-30.0		100					
SCHREBER'S MOSS ( <i>Pleurozium schreberi</i> )	20.0	20.0-20.0		100					



## e2 alder-willow Aw (n=14)

**Natural Subregion:** Montane  
**Ecosection:** Mn Montane North Ecosection

**Ecosite:** e alder-willow (mesic/rich)

### Characteristic Species

#### Tree

- [ 17.1 ] ASPEN\*  
*Populus tremuloides*
- [ 16.8 ] BALSAM POPLAR\*  
*Populus balsamifera*
- [ 1.7 ] WHITE BIRCH  
*Betula papyrifera*
- [ 1.3 ] WHITE SPRUCE  
*Picea glauca*

#### Shrub

- [ 13.1 ] CANADA BUFFALOBERRY  
*Shepherdia canadensis*
- [ 5.6 ] SASKATOON\*  
*Amelanchier alnifolia*
- [ 2.6 ] PRICKLY ROSE  
*Rosa acicularis*
- [ 2.5 ] SASKATOON  
*Amelanchier alnifolia*
- [ 1.5 ] CHOKE CHERRY\*  
*Prunus virginiana*
- [ 1.3 ] TWINFLOWER  
*Linnaea borealis*
- [ 1.2 ] GREEN ALDER  
*Alnus crispa*

#### Forb

- [ 1.9 ] WILD SARSAPARILLA  
*Aralia nudicaulis*

#### Graminoid

- [ 6.1 ] HAIRY WILD RYE  
*Elymus innovatus*

### Environmental Variables

Moisture Regime: Mesic (fresh) (9), Subhygric (moderately moist) (1)  
Nutrient Regime: Mesotrophic (medium) (6), Permesotrophic (rich) (2)  
Elevation (range): 1106 (999-1260) M  
Slope (%): gentle slope (6), moderate slope (5), strong slope (1)  
Aspect: Easterly (8), Southerly (3), Northerly (2)  
Topographic Position: Lower Slope (3), Midslope (2), Toe (1)

### Soil Variables

Soil Drainage: Well drained (7), Very rapidly drained (2), Rapidly drained (1)  
Soil Subgroup: CUMULIC REGOSOL (3), ORTHIC HUMIC REGOSOL (2), ORTHIC REGOSOL (2), ORTHIC EUTRIC BRUNISOL (2), BRUNISOLIC GRAY LUVISOL (1)  
Surface Texture: Silt loam (2), Very fine sandy loam (1), Clay loam (1)  
Effective Texture: Fine sand (2), Sandy clay loam (1), Silt loam (1)  
Depth to Mottles/Gley:  
Organic Thickness: 0 - 5 cm (11)  
Parent Material: Fluvial (5), Eolian (3), Morainal (1), Colluvial (1)  
Soil Type:  
Humus Form RAW MODER (1)

LFH Thickness	Mean	Min	Max	Count
cm:	8.00	5.00	10.00	4

## Mnc5 Pb-Aw/Canada buffaloberry (n=4)

### (*Populus balsamifera*-*Populus tremuloides*/*Shepherdia canadensis*)

This community is one of several community types which represent the subhygric/rich ecosite for the northern ecosection of the Montane subregion (Archibald et al. 1996). The presence of balsam poplar distinguishes this community type from the Aw/Buffaloberry dominated community and likely indicates some seepage at depth in the soil profile. The understory is dominated by Canada buffaloberry which indicates that the soil surface is slightly drier than the other deciduous dominated community types in this ecological site. Succession of this community type will likely be to white spruce. This community type was described on moderate to strong slopes with northerly and easterly aspects.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** e alder-willow (mesic/rich)

**Ecosite Phase:** e2 alder-willow Aw

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 25
BALSAM POPLAR ( <i>Populus balsamifera</i> )	32.5	0.0-45.0	75	Moisture Regime: Mesic (fresh) (1), Subhygric (moderately moist) (1)
ASPEN ( <i>Populus tremuloides</i> )	1.2	0.0-5.0	25	Nutrient Regime:
<b>Tall Shrub (2 to 5m)</b>				Elevation (range): 1186 (1126-1260) M
RIVER ALDER ( <i>Alnus tenuifolia</i> )	1.2	0.0-5.0	50	Slope (%): 10 - 15.99 (1), 16 - 30.99 (1)
BALSAM POPLAR ( <i>Populus balsamifera</i> )	1.2	0.0-5.0	25	Aspect: Northerly (2), Easterly (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Topographic Position:
CANADA BUFFALOBERRY ( <i>Shepherdia canadensis</i> )	26.2	0.0-70.0	100	<b>Soil Variables</b>
TWINFLOWER ( <i>Linnaea borealis</i> )	2.7	0.0-10.0	50	Soil Drainage:
GREEN ALDER ( <i>Alnus crispa</i> )	2.5	0.0-10.0	25	Soil Subgroup: BRUNISOLIC GRAY LUVISOL (1), CUMULIC REGOSOL (1), ORTHIC REGOSOL (1)
PRICKLY ROSE ( <i>Rosa acicularis</i> )	2.2	0.0-5.0	75	Surface Texture:
SCOULER'S WILLOW ( <i>Salix scouleriana</i> )	1.7	0.0-5.0	50	Effective Texture:
BRACTED HONEYSUCKLE ( <i>Lonicera involucrata</i> )	1.0	0.0-3.0	50	Depth to Mottles/Gley:
<b>Tall Forb (&gt;= 30 cm)</b>				Organic Thickness: 0 - 5 cm (3)
TALL LUNGWORT ( <i>Mertensia paniculata</i> )	1.0	0.0-3.0	50	Parent Material: Fluvial (2), Morainal (1), Eolian (1)
<b>Low Forb (&lt; 30 cm)</b>				Soil Type:
BUNCHBERRY ( <i>Cornus canadensis</i> )	1.5	0.0-5.0	50	Humus Form
<b>Graminoid</b>				<b>LFH Thickness</b>
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	11.2	0.0-30.0	50	Mean
				Min
				Max
				Count
				cm: 0.00 0.00 0.00 0

## Mnc6 Aw/Saskatoon-Chokecherry (n=10)

(*Populus tremuloides*/*Amelanchier alnifolia*-*Prunus virginiana*)

This community type was found on mesic, well drained east and south facing slopes, with fluvial and eolian parent materials that overlook lakes, rivers and streams. It appears that seepage occurs at times throughout the year which favours the growth of saskatoon and chokecherry. Because this plant community has a rather dense shrub cover, stocking rate should consider forage access. Saskatoon provides important browse for wild ungulates. It is also palatable to livestock.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** e alder-willow (mesic/rich)

**Ecosite Phase:** e2 alder-willow Aw

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Overstory Tree</b>					Ecological Status Score: 25
ASPEN ( <i>Populus tremuloides</i> )	31.1	10.0-50.0	100		Moisture Regime: Mesic (fresh) (8)
WHITE BIRCH ( <i>Betula papyrifera</i> )	3.4	0.0-15.0	50		Nutrient Regime: Mesotrophic (medium) (6), Permesotrophic (rich) (2)
BALSAM POPLAR ( <i>Populus balsamifera</i> )	1.2	0.0-6.0	30		Elevation (range): 1027 (999-1052) M
<b>Understory Tree</b>					Slope (%): 6 - 9.99 (6), 10 - 15.99 (4)
WHITE SPRUCE ( <i>Picea glauca</i> )	2.7	0.0-8.0	60		Aspect: Easterly (7), Southerly (3)
ASPEN ( <i>Populus tremuloides</i> )	2.0	0.0-10.0	20		Topographic Position: Lower Slope (3), Midslope (2), Toe (1)
<b>Tall Shrub (2 to 5m)</b>					<b>Soil Variables</b>
SASKATOON ( <i>Amelanchier alnifolia</i> )	5.0	0.0-15.0	40		Soil Drainage: Well drained (7), Very rapidly drained (2), Rapidly drained (1)
<b>Medium Shrub (0.5 to 2 m)</b>					Soil Subgroup: ORTHIC EUTRIC BRUNISOL (2), ORTHIC HUMIC REGOSOL (2), CUMULIC REGOSOL (2), ORTHIC REGOSOL (1)
SASKATOON ( <i>Amelanchier alnifolia</i> )	11.3	5.0-35.0	100		Surface Texture: Silt loam (2), Very fine sandy loam (1), Clay loam (1)
CHOKE CHERRY ( <i>Prunus virginiana</i> )	3.1	0.0-10.0	40		Effective Texture: Fine sand (2), Sandy clay loam (1), Silt loam (1)
PRICKLY ROSE ( <i>Rosa acicularis</i> )	3.0	0.0-13.4	90		Depth to Mottles/Gley:
RED-OSIER DOGWOOD ( <i>Cornus stolonifera</i> )	1.6	0.0-8.0	50		Organic Thickness: 0 - 5 cm (8)
TWINING HONEYSUCKLE ( <i>Lonicera dioica</i> )	1.1	0.0-3.0	80		Parent Material: Fluvial (3), Eolian (2), Colluvial (1)
<b>Tall Forb (&gt;= 30 cm)</b>					Soil Type:
WILD SARSAPARILLA ( <i>Aralia nudicaulis</i> )	3.8	0.0-13.0	50		Humus Form RAW MODER (1)
VEINY MEADOW RUE ( <i>Thalictrum venulosum</i> )	1.3	0.0-3.0	90		
<b>Graminoid</b>					<b>LFH Thickness</b>
SEDGE SPECIES ( <i>Carex</i> )	1.7	0.0-14.4	30		<b>Mean</b> <b>Min</b> <b>Max</b> <b>Count</b>
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	1.1	0.0-3.0	90		cm: 8.00 5.00 10.00 4

## e3 alder-willow Sw (n=6)

**Natural Subregion:** Montane  
**Ecosection:** Mn Montane North Ecosection

**Ecosite:** e alder-willow (mesic/rich)

### Characteristic Species

#### Tree

- [ 11.5 ] WHITE SPRUCE  
*Picea glauca*
- [ 6.2 ] ENGELMANN SPRUCE\*  
*Picea engelmannii*
- [ 5.6 ] WATER BIRCH  
*Betula occidentalis*

#### Shrub

- [ 13.3 ] RED-OSIER DOGWOOD  
*Cornus stolonifera*
- [ 12.5 ] BEAKED WILLOW  
*Salix bebbiana*
- [ 4.1 ] SASKATOON\*  
*Amelanchier alnifolia*
- [ 2.7 ] LOW-BUSH CRANBERRY  
*Viburnum edule*
- [ 1.0 ] SNOWBERRY  
*Symphoricarpos albus*

#### Forb

- [ 1.2 ] COMMON HORSETAIL  
*Equisetum arvense*

#### Moss and Liverwort

- [ 5.1 ] N/A  
*Thuidium abietinum*
- [ 5.0 ] N/A  
*Bryum pseudotriquetrum*

#### Graminoid

- [ 9.8 ] HAIRY WILD RYE  
*Elymus innovatus*
- [ 2.5 ] WIRE RUSH  
*Juncus balticus*
- [ 1.2 ] BRISTLE-LEAVED SEDGE  
*Carex eburnea*

### Environmental Variables

Moisture Regime: Subhygric (moderately moist) (3), Mesic (fresh) (2), Subhygric (moderately wet) (1)

Nutrient Regime: Permesotrophic (rich) (2), Mesotrophic (medium) (1)

Elevation (range): 1107 (1000-1340) M

Slope (%): level (2), very gentle slope (1), moderate slope (1)

Aspect: Northerly (1)

Topographic Position: Lower Slope (1), Crest (1)

### Soil Variables

Soil Drainage: Rapidly drained (3), Well drained (1), Imperfectly drained (1), Poorly drained (1)

Soil Subgroup: ORTHIC REGOSOL (2), ORTHIC EUTRIC BRUNISOL (1), CUMULIC REGOSOL (1), GLEYED CUMULIC REGOSOL (1)

Surface Texture: Loamy sand (1)

Effective Texture: Loamy sand (1)

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (6)

Parent Material: Fluviolacustrine (3), Eolian (1), Fluvial (1)

Soil Type:

Humus Form

### LFH Thickness

	Mean	Min	Max	Count
cm:	8.00	8.00	8.00	1

## Mne20 Sw/Red osier dogwood (n=4)

### (*Picea glauca*/*Cornus stolonifera*)

This community type was described on fluvial sites with shallow to moderate slopes and mesic to subhygric moisture regimes. Succession on the red osier dogwood dominated ecosites will be from aspen to pine and then to white spruce (Archibald et al. 1996). The northerly aspect of this particular community type has allowed the site to escape disturbance by fire and succession has occurred to white spruce.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** e alder-willow (mesic/rich)

**Ecosite Phase:** e3 alder-willow Sw

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Overstory Tree</b>					Ecological Status Score: 25
WHITE SPRUCE ( <i>Picea glauca</i> )	10.0	0.0-20.0	50		Moisture Regime: Subhygric (moderately moist) (3), Mesic (fresh) (1)
ENGELMANN X WHITE SPRUCE ( <i>Picea engelmannii x glauca</i> )	6.2	0.0-25.0	25		Nutrient Regime: Permesotrophic (rich) (2), Mesotrophic (medium) (1)
ENGELMANN SPRUCE ( <i>Picea engelmannii</i> )	6.2	0.0-25.0	25		Elevation (range): 1044 (1010-1063) M
BALSAM POPLAR ( <i>Populus balsamifera</i> )	1.7	0.0-5.0	50		Slope (%): 2.5 - 5.99 (1), 10 - 15.99 (1)
<b>Tall Shrub (2 to 5m)</b>					Aspect: Northerly (1)
WATER BIRCH ( <i>Betula occidentalis</i> )	11.2	0.0-30.0	75		Topographic Position: Crest (1), Lower Slope (1)
RIVER ALDER ( <i>Alnus tenuifolia</i> )	2.0	0.0-8.0	25		
<b>Medium Shrub (0.5 to 2 m)</b>					<b>Soil Variables</b>
RED-OSIER DOGWOOD ( <i>Cornus stolonifera</i> )	26.7	2.0-50.0	100		Soil Drainage: Rapidly drained (2), Well drained (1), Imperfectly drained (1)
SASKATOON ( <i>Amelanchier alnifolia</i> )	8.3	0.0-30.0	75		Soil Subgroup: ORTHIC EUTRIC BRUNISOL (1), GLEYED CUMULIC REGOSOL (1), ORTHIC REGOSOL (1)
LOW-BUSH CRANBERRY ( <i>Viburnum edule</i> )	5.5	1.0-10.0	100		Surface Texture: Loamy sand (1)
PRICKLY ROSE ( <i>Rosa acicularis</i> )	5.2	1.0-10.0	100		Effective Texture: Loamy sand (1)
SNOWBERRY ( <i>Symphoricarpos albus</i> )	2.1	0.0-4.0	75		Depth to Mottles/Gley:
NORTHERN GOOSEBERRY ( <i>Ribes oxycanthoides</i> )	1.0	0.0-2.0	50		Organic Thickness: 0 - 5 cm (4)
<b>Tall Forb (&gt;= 30 cm)</b>					Parent Material: Eolian (1), Fluvial (1), Fluvio-lacustrine (1)
COMMON HORSETAIL ( <i>Equisetum arvense</i> )	2.5	0.0-10.0	25		Soil Type:
STAR-FLOWERED SOLOMON'S-SEAL ( <i>Smilacina stellata</i> )	1.0	1.0-1.0	100		Humus Form
<b>Graminoid</b>					<b>LFH Thickness</b>
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	4.7	1.0-10.0	100		Mean
BRISTLE-LEAVED SEDGE ( <i>Carex eburnea</i> )	2.5	0.0-10.0	25		Min
<b>Moss</b>					Max
N/A ( <i>Thuidium abietinum</i> )	10.2	0.0-40.0	50		Count
					cm:
					8.00
					8.00
					8.00
					1

## Mne21 Sw/Willow/Hairy wildrye (n=2)

(*Picea glauca*/*Salix bebbiana*/*Elymus innovatus*)

This community type was described on fluviolacustrine parent material within the Athabasca river valley near Jasper. There is seepage of water at depth which favours the growth of white spruce and willow, but the surface is coarse textured and dry which favours the growth of hairy wildrye. The presence of *Bryum pseudotriquetrum* also indicates that these sites periodically accumulate water.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** e alder-willow (mesic/rich)

**Ecosite Phase:** e3 alder-willow Sw

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Overstory Tree</b>					Ecological Status Score: 25
WHITE SPRUCE ( <i>Picea glauca</i> )	5.0	5.0-5.0	100		Moisture Regime: Mesic (fresh) (1), Subhydric (moderately wet) (1)
LOGEPOLE PINE ( <i>Pinus contorta</i> )	5.0	0.0-10.0	50		Nutrient Regime:
<b>Understory Tree</b>					Elevation (range): 1170 (1000-1340) M
WHITE SPRUCE ( <i>Picea glauca</i> )	10.0	5.0-15.0	100		Slope (%): 0 - 0.49 (2)
LOGEPOLE PINE ( <i>Pinus contorta</i> )	7.5	0.0-15.0	50		Aspect:
<b>Tall Shrub (2 to 5m)</b>					Topographic Position:
WHITE SPRUCE ( <i>Picea glauca</i> )	4.5	4.0-5.0	100		<b>Soil Variables</b>
<b>Medium Shrub (0.5 to 2 m)</b>					Soil Drainage: Rapidly drained (1), Poorly drained (1)
BEAKED WILLOW ( <i>Salix bebbiana</i> )	12.5	0.0-25.0	50		Soil Subgroup: CUMULIC REGOSOL (1), ORTHIC REGOSOL (1)
SMOOTH WILLOW ( <i>Salix glauca</i> )	7.5	0.0-15.0	50		Surface Texture:
FARR'S WILLOW ( <i>Salix farriae</i> )	5.0	0.0-10.0	50		Effective Texture:
DWARF BIRCH ( <i>Betula pumila</i> )	3.0	1.0-5.0	100		Depth to Mottles/Gley:
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	3.0	1.0-5.0	100		Organic Thickness: 0 - 5 cm (2)
MYRTLE-LEAVED WILLOW ( <i>Salix myrtillifolia</i> )	2.5	0.0-5.0	50		Parent Material: Fluviolacustrine (2)
<b>Low Shrub (&lt; 0.5m)</b>					Soil Type:
DWARF RASPBERRY ( <i>Rubus arcticus</i> )	5.0	0.0-10.0	50		Humus Form
<b>Tall Forb (&gt;= 30 cm)</b>					<b>LFH Thickness</b>
TALL LARKSPUR ( <i>Delphinium glaucum</i> )	2.5	0.0-5.0	50		Mean
ALPINE HEDYSARUM ( <i>Hedysarum alpinum</i> )	2.5	0.0-5.0	50		Min
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	1.5	0.0-3.0	50		Max
<b>Graminoid</b>					Count
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	20.0	15.0-25.0	100		cm:
WHITE-GRAINED MOUNTAIN RICE GRASS ( <i>Oryzopsis asperifolia</i> )	5.0	0.0-10.0	50		0.00
<b>Moss</b>					0.00
N/A ( <i>Brachythecium groenlandicum</i> )	20.0	0.0-40.0	50		0.00
<b>Lichen</b>					0.00
DOG LICHEN ( <i>Peltigera canina</i> )	2.5	0.0-5.0	50		0

## e4 alder-willow shrub (n=4)

**Natural Subregion:** Montane  
**Ecosection:** Mn Montane North Ecosection

**Ecosite:** e alder-willow (mesic/rich)

### Characteristic Species

#### Tree

- [ 5.0 ] LODGEPOLE PINE  
*Pinus contorta*

#### Shrub

- [ 15.0 ] RIVER ALDER\*  
*Alnus tenuifolia*
- [ 15.0 ] SCOULER'S WILLOW\*  
*Salix scouleriana*
- [ 12.0 ] GREEN ALDER\*  
*Alnus crispa*
- [ 10.0 ] WILD RED RASPBERRY  
*Rubus idaeus*
- [ 8.7 ] PRICKLY ROSE  
*Rosa acicularis*
- [ 7.5 ] THIMBLEBERRY\*  
*Rubus parviflorus*
- [ 6.2 ] DEWBERRY  
*Rubus pubescens*
- [ 5.0 ] SCOULER'S WILLOW  
*Salix scouleriana*
- [ 3.5 ] SCOULER'S WILLOW  
*Salix scouleriana*

#### Forb

- [ 2.5 ] COMMON HORSETAIL  
*Equisetum arvense*
- [ 2.2 ] BUNCHBERRY  
*Cornus canadensis*

#### Moss and Liverwort

- [ 2.5 ] SCHREBER'S MOSS  
*Pleurozium schreberi*

#### Graminoid

- [ 2.5 ] HAIRY WILD RYE  
*Elymus innovatus*
- [ 2.2 ] BLUEJOINT  
*Calamagrostis canadensis*

### Environmental Variables

Moisture Regime: Mesic (fresh) (1), Subhygric (moderately moist) (1)

Nutrient Regime: Permesotrophic (rich) (1)

Elevation (range): 1323 (1190-1580) M

Slope (%): moderate slope (2), very steep slope (1), strong slope (1)

Aspect: Easterly (2), Northerly (1)

Topographic Position:

### Soil Variables

Soil Drainage: Moderately well drained (1)

Soil Subgroup: GLEYED DYSTRIC BRUNISOL (1), ORTHIC EUTRIC BRUNISOL (1), BRUNISOLIC GRAY LUVISOL (1), ORTHIC MELANIC BRUNISOL (1)

Surface Texture:

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (4)

Parent Material: Morainal (3), Rock (1), Colluvial (1), Fluvial (1)

Soil Type:

Humus Form

### LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

# Mnb10 Scouler's willow- Green alder (n=3)

## (*Salix scouleriana* - *Alnus crispa*)

This community type is characteristic of nutrient-rich seepage areas in the Athabasca river valley near Jasper. It was described on morainal parent material on moderate slopes with northerly aspects. This community is very similar to the River alder-Thimbleberry dominated community type which was described on similar sites.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** e alder-willow (mesic/rich)

**Ecosite Phase:** e4 alder-willow shrub

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Understory Tree</b>					Ecological Status Score: 40 Moisture Regime: Mesic (fresh) (1), Subhygric (moderately moist) (1) Nutrient Regime: Permesotrophic (rich) (1) Elevation (range): 1347 (1190-1580) M Slope (%): 10 - 15.99 (1), 16 - 30.99 (1), 71 - 100.99 (1) Aspect: Easterly (2), Northerly (1) Topographic Position:
SCOULER'S WILLOW ( <i>Salix scouleriana</i> )	4.6	0.0-14.0	33		
<b>Tall Shrub (2 to 5m)</b>					<b>Soil Variables</b>
GREEN ALDER ( <i>Alnus crispa</i> )	6.6	0.0-20.0	33		
SCOULER'S WILLOW ( <i>Salix scouleriana</i> )	6.6	0.0-20.0	33		Soil Drainage: Moderately well drained (1) Soil Subgroup: ORTHIC EUTRIC BRUNISOL (1), BRUNISOLIC GRAY LUVISOL (1), ORTHIC MELANIC BRUNISOL (1) Surface Texture: Effective Texture: Depth to Mottles/Gley: Organic Thickness: 0 - 5 cm (3) Parent Material: Morainal (2), Rock (1), Colluvial (1), Fluvial (1) Soil Type: Humus Form
<b>Medium Shrub (0.5 to 2 m)</b>					<b>LFH Thickness</b>
GREEN ALDER ( <i>Alnus crispa</i> )	29.3	3.0-80.0	100		
SCOULER'S WILLOW ( <i>Salix scouleriana</i> )	23.3	0.0-60.0	67		cm:
WILD RED RASPBERRY ( <i>Rubus idaeus</i> )	13.6	0.0-40.0	67		Mean
PRICKLY ROSE ( <i>Rosa acicularis</i> )	5.0	0.0-15.0	33		Min
LOW-BUSH CRANBERRY ( <i>Viburnum edule</i> )	1.3	0.0-3.0	67		Max
<b>Tall Forb (&gt;= 30 cm)</b>					Count
VEINY MEADOW RUE ( <i>Thalictrum venulosum</i> )	8.0	0.0-20.0	67		0
RED AND WHITE BANE BERRY ( <i>Actaea rubra</i> )	3.6	0.0-10.0	67		
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	1.6	0.0-3.0	67		
COW PARSNIP ( <i>Heraclium lanatum</i> )	1.3	0.0-2.0	67		
TALL LUNGWORT ( <i>Mertensia paniculata</i> )	1.3	0.0-3.0	67		
<b>Low Forb (&lt; 30 cm)</b>					
WESTERN CANADA VIOLET ( <i>Viola canadensis</i> )	5.0	0.0-15.0	33		
BUNCHBERRY ( <i>Cornus canadensis</i> )	2.3	0.0-5.0	67		
HEART-LEAVED ARNICA ( <i>Arnica cordifolia</i> )	1.3	0.0-2.0	67		
PALMATE-LEAVED COLTSFOOT ( <i>Petasites palmatus</i> )	1.3	0.0-3.0	67		
<b>Graminoid</b>					
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	3.6	1.0-5.0	100		
BLUEJOINT ( <i>Calamagrostis canadensis</i> )	1.6	0.0-5.0	33		



## Mnb9 River alder-Thimbleberry (n=1)

### (*Alnus tenuifolia*-*Rubus parviflorus*)

This community type is characteristic of nutrient-rich seepage areas in the Athabasca river valley near Jasper. It was described on morainal parent material on moderate slopes with northerly aspects. This community is very similar to the Scouler's willow/Alder dominated community type which was described on similar sites.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** e alder-willow (mesic/rich)

**Ecosite Phase:** e4 alder-willow shrub

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 40
LODGEPOLE PINE ( <i>Pinus contorta</i> )	10.0	10.0-10.0	100	Moisture Regime:
<b>Understory Tree</b>				Nutrient Regime:
RIVER ALDER ( <i>Alnus tenuifolia</i> )	5.0	5.0-5.0	100	Elevation (range): 1300 (1300-1300) M
<b>Tall Shrub (2 to 5m)</b>				Slope (%): 10 - 15.99 (1)
RIVER ALDER ( <i>Alnus tenuifolia</i> )	25.0	25.0-25.0	100	Aspect:
<b>Medium Shrub (0.5 to 2 m)</b>				Topographic Position:
THIMBLEBERRY ( <i>Rubus parviflorus</i> )	15.0	15.0-15.0	100	<b>Soil Variables</b>
GREEN ALDER ( <i>Alnus crispa</i> )	10.0	10.0-10.0	100	Soil Drainage:
PRICKLY ROSE ( <i>Rosa acicularis</i> )	10.0	10.0-10.0	100	Soil Subgroup: GLEYED DYSTRIC BRUNISOL (1)
LOW-BUSH CRANBERRY ( <i>Viburnum edule</i> )	2.0	2.0-2.0	100	Surface Texture:
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	1.0	1.0-1.0	100	Effective Texture:
<b>Low Shrub (&lt; 0.5m)</b>				Depth to Mottles/Gley:
DEWBERRY ( <i>Rubus pubescens</i> )	10.0	10.0-10.0	100	Organic Thickness: 0 - 5 cm (1)
<b>Tall Forb (&gt;= 30 cm)</b>				Parent Material: Morainal (1)
COMMON HORSETAIL ( <i>Equisetum arvense</i> )	5.0	5.0-5.0	100	Soil Type:
<b>Low Forb (&lt; 30 cm)</b>				Humus Form
BUNCHBERRY ( <i>Cornus canadensis</i> )	1.0	1.0-1.0	100	<b>LFH Thickness</b>
KIDNEY-LEAVED VIOLET ( <i>Viola renifolia</i> )	1.0	1.0-1.0	100	<b>Mean</b>
<b>Graminoid</b>				<b>Min</b>
BLUEJOINT ( <i>Calamagrostis canadensis</i> )	2.0	2.0-2.0	100	<b>Max</b>
<b>Moss</b>				<b>Count</b>
SCHREBER'S MOSS ( <i>Pleurozium schreberi</i> )	5.0	5.0-5.0	100	cm: 0.00 0.00 0.00 0

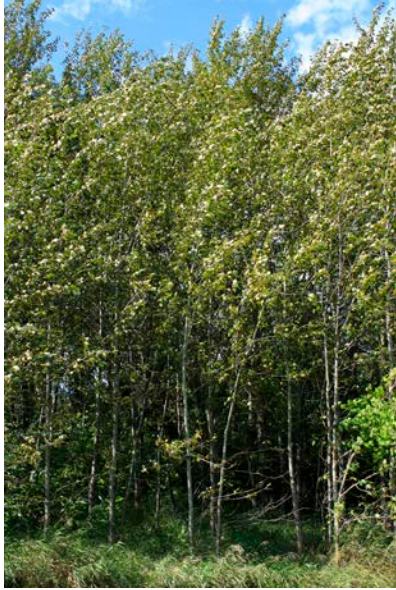
## f balsam poplar (subhygric/rich) (n=4)

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

### General Description

This ecosite occurs on a variety of parent materials and is usually associated with steeper slopes and fluvial floodplains. Seepage can be expected in spring or after heavy rainfall. The presence of balsam poplar indicates the enhanced moisture regime.



### Environmental Variables

Moisture Regime: Mesic (fresh) (4)

Nutrient Regime: Permesotrophic (rich) (2), Mesotrophic (medium) (1)

Elevation (range): 1211 (1029-1372) M

Slope (%): very strong slope (2), nearly level (1), strong slope (1)

Aspect: Northerly (3), Easterly (1)

Topographic Position: Level (1), Lower Slope (1)

### Soil Variables

Soil Drainage: Very rapidly drained (2), Well drained (1), Moderately well drained (1)

Soil Subgroup: ORTHIC REGOSOL (2), ORTHIC EUTRIC BRUNISOL (1), ORTHIC GRAY LUVISOL (1)

Surface Texture: Fine sand (1), Loam (1), Silt loam (1)

Effective Texture: Clay loam (1), Fine sand (1), Loamy sand (1)

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (4)

Parent Material: Eolian (2), Fluvial (1), Morainal (1), Colluvial (1)

Soil Type:

Humus Form FIBRIMOR (1)

### Successional Relationships

Balsam poplar is a pioneer species on this ecosite. White spruce is the expected climax species; however, its establishment may be slow due to high vegetation competition.

LFH Thickness	Mean	Min	Max	Count
cm:	5.00	3.00	11.00	3

### Indicator Species

#### Tree

BALSAM POPLAR  
*Populus balsamifera*

#### Shrub

BEAKED WILLOW  
*Salix bebbiana*  
RED-OSIER DOGWOOD  
*Cornus stolonifera*  
SILVERBERRY  
*Elaeagnus commutata*

# f1 balsam poplar (n=4)

**Natural Subregion:** Montane  
**Ecosection:** Mn Montane North Ecosection

**Ecosite:** f balsam poplar (subhygric/rich)

## Characteristic Species

### Tree

- [ 18.6 ] BALSAM POPLAR\*  
*Populus balsamifera*
- [ 5.0 ] ASPEN  
*Populus tremuloides*
- [ 5.0 ] WHITE BIRCH  
*Betula papyrifera*

### Shrub

- [ 17.5 ] SILVERBERRY\*  
*Elaeagnus commutata*
- [ 13.3 ] CHOKE CHERRY  
*Prunus virginiana*
- [ 9.1 ] RED-OSIER DOGWOOD\*  
*Cornus stolonifera*
- [ 5.5 ] PRICKLY ROSE  
*Rosa acicularis*
- [ 5.0 ] SALIX SPECIES  
*Salix*
- [ 4.0 ] LOW-BUSH CRANBERRY  
*Viburnum edule*
- [ 1.8 ] BEAKED WILLOW\*  
*Salix bebbiana*
- [ 1.5 ] SNOWBERRY  
*Symphoricarpos albus*

### Forb

- [ 3.5 ] EARLY YELLOW LOCOWEED  
*Oxytropis sericea*
- [ 2.6 ] SHOWY ASTER  
*Aster conspicuus*
- [ 2.6 ] WILD SARSAPARILLA  
*Aralia nudicaulis*
- [ 2.5 ] WESTERN CANADA VIOLET  
*Viola canadensis*
- [ 2.5 ] VEINY MEADOW RUE  
*Thalictrum venulosum*

### Graminoid

- [ 13.0 ] NORTHERN WHEAT GRASS  
*Agropyron dasystachyum*
- [ 5.0 ] HAIRY WILD RYE  
*Elymus innovatus*

## Environmental Variables

Moisture Regime: Mesic (fresh) (4)  
 Nutrient Regime: Permesotrophic (rich) (2), Mesotrophic (medium) (1)  
 Elevation (range): 1211 (1029-1372) M  
 Slope (%): very strong slope (2), strong slope (1), nearly level (1)  
 Aspect: Northerly (3), Easterly (1)  
 Topographic Position: Lower Slope (1), Level (1)

## Soil Variables

Soil Drainage: Very rapidly drained (2), Well drained (1), Moderately well drained (1)  
 Soil Subgroup: ORTHIC REGOSOL (2), ORTHIC EUTRIC BRUNISOL (1), ORTHIC GRAY LUVISOL (1)  
 Surface Texture: Silt loam (1), Loam (1), Fine sand (1)  
 Effective Texture: Loamy sand (1), Fine sand (1), Clay loam (1)  
 Depth to Mottles/Gley:  
 Organic Thickness: 0 - 5 cm (4)  
 Parent Material: Eolian (2), Morainal (1), Colluvial (1), Fluvial (1)  
 Soil Type:  
 Humus Form FIBRIMOR (1)

## LFH Thickness

	Mean	Min	Max	Count
cm:	5.00	3.00	11.00	3

## Mnc7 Pb-Aw/Red osier dogwood (n=3)

(*Populus balsamifera*-*Populus tremuloides*/*Cornus stolonifera*)

Beckingham and Archibald (1996) and Thompson and Hansen (2002) found this community type on mid to lower slope topographic positions or near wetlands, water bodies or water courses where they receive nutrient-rich seepage or flood waters for a portion of the growing season.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** f balsam poplar (subhygric/rich)

**Ecosite Phase:** f1 balsam poplar

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Overstory Tree</b>					Ecological Status Score: 25
BALSAM POPLAR ( <i>Populus balsamifera</i> )	13.3	10.0-15.0	100		Moisture Regime: Mesic (fresh) (3)
WHITE BIRCH ( <i>Betula papyrifera</i> )	10.0	10.0-10.0	100		Nutrient Regime: Permesotrophic (rich) (2)
ASPEN ( <i>Populus tremuloides</i> )	10.0	0.0-30.0	33		Elevation (range): 1050 (1029-1060) M
<b>Understory Tree</b>					Slope (%): 31 - 45.99 (2), 16 - 30.99 (1)
BALSAM POPLAR ( <i>Populus balsamifera</i> )	4.0	2.0-5.0	100		Aspect: Northerly (2), Easterly (1)
<b>Tall Shrub (2 to 5m)</b>					Topographic Position: Lower Slope (1)
BEAKED WILLOW ( <i>Salix bebbiana</i> )	3.6	0.0-10.0	67		<b>Soil Variables</b>
<b>Medium Shrub (0.5 to 2 m)</b>					Soil Drainage: Very rapidly drained (2), Moderately well drained (1)
CHOKE CHERRY ( <i>Prunus virginiana</i> )	26.6	0.0-40.0	67		Soil Subgroup: ORTHIC REGOSOL (2), ORTHIC GRAY LUVISOL (1)
RED-OSIER DOGWOOD ( <i>Cornus stolonifera</i> )	18.3	15.0-25.0	100		Surface Texture: Loam (1), Fine sand (1)
LOW-BUSH CRANBERRY ( <i>Viburnum edule</i> )	8.0	2.0-20.0	100		Effective Texture: Clay loam (1), Fine sand (1)
PRICKLY ROSE ( <i>Rosa acicularis</i> )	3.0	2.0-5.0	100		Depth to Mottles/Gley:
SNOWBERRY ( <i>Symphoricarpos albus</i> )	3.0	2.0-5.0	100		Organic Thickness: 0 - 5 cm (3)
<b>Low Shrub (&lt; 0.5m)</b>					Parent Material: Eolian (2), Colluvial (1), Morainal (1)
DEWBERRY ( <i>Rubus pubescens</i> )	2.3	0.0-7.0	33		Soil Type:
<b>Tall Forb (&gt;= 30 cm)</b>					Humus Form FIBRIMOR (1)
WILD SARSAPARILLA ( <i>Aralia nudicaulis</i> )	5.3	0.0-8.0	67		<b>LFH Thickness</b>
VEINY MEADOW RUE ( <i>Thalictrum venulosum</i> )	5.0	0.0-15.0	33		Mean
SHOWY ASTER ( <i>Aster conspicuus</i> )	3.3	0.0-10.0	33		Min
MEADOW HORSETAIL ( <i>Equisetum pratense</i> )	1.6	0.0-5.0	33		Max
<b>Low Forb (&lt; 30 cm)</b>					Count
WESTERN CANADA VIOLET ( <i>Viola canadensis</i> )	5.0	0.0-15.0	33		cm:
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	2.0	0.5-5.0	100		7.00
PALMATE-LEAVED COLTSFOOT ( <i>Petasites palmatus</i> )	1.3	0.0-4.0	33		3.00
					11.00
					2

# Mnc8 Pb/Willow-Silverberry (n=1)

(*Populus balsamifera*/*Salix spp.-Elaeagnus commutata*)

This community type is found on fluvial sites with gravelly soils and shallow slopes. Sub-surface flow through coarse substrate provides habitat suitable for species whose roots reach groundwater (balsam poplar, silverberry). However, the surface is mesic to submesic characterized by fringed sage, juniper and hairy wildrye. In the absence of disturbance this community type will succeed to a spruce dominated community type.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** f balsam poplar (subhygric/rich)

**Ecosite Phase:** f1 balsam poplar

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables	
	Mean	Range				
<b>Overstory Tree</b>					Ecological Status Score: 25	
BALSAM POPLAR ( <i>Populus balsamifera</i> )	20.0	20.0-20.0		100	Moisture Regime: Mesic (fresh) (1)	
<b>Tall Shrub (2 to 5m)</b>					Nutrient Regime: Mesotrophic (medium) (1)	
SALIX SPECIES ( <i>Salix</i> )	10.0	10.0-10.0		100	Elevation (range): 1372 (1372-1372) M	
<b>Medium Shrub (0.5 to 2 m)</b>					Slope (%): 0.5 - 2.49 (1)	
SILVERBERRY ( <i>Elaeagnus commutata</i> )	35.0	35.0-35.0		100	Aspect: Northerly (1)	
PRICKLY ROSE ( <i>Rosa acicularis</i> )	8.0	8.0-8.0		100	Topographic Position: Level (1)	
SILVER SAGEBRUSH ( <i>Artemisia cana</i> )	3.0	3.0-3.0		100	<b>Soil Variables</b>	
CREEPING JUNIPER ( <i>Juniperus horizontalis</i> )	3.0	3.0-3.0		100	Soil Drainage: Well drained (1)	
BALSAM POPLAR ( <i>Populus balsamifera</i> )	3.0	3.0-3.0		100	Soil Subgroup: ORTHIC EUTRIC BRUNISOL (1)	
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	2.0	2.0-2.0		100	Surface Texture: Silt loam (1)	
NORTHERN GOOSEBERRY ( <i>Ribes oxycanthoides</i> )	2.0	2.0-2.0		100	Effective Texture: Loamy sand (1)	
<b>Tall Forb (&gt;= 30 cm)</b>					Depth to Mottles/Gley:	
SHOWY ASTER ( <i>Aster conspicuus</i> )	2.0	2.0-2.0		100	Organic Thickness: 0 - 5 cm (1)	
GAILLARDIA ( <i>Gaillardia aristata</i> )	1.0	1.0-1.0		100	Parent Material: Fluvial (1)	
<b>Low Forb (&lt; 30 cm)</b>					Soil Type:	
PASTURE SAGEWORT ( <i>Artemisia frigida</i> )	8.0	8.0-8.0		100	Humus Form	
EARLY YELLOW LOCOWEED ( <i>Oxytropis sericea</i> )	7.0	7.0-7.0		100	<b>LFH Thickness</b>	
SHOWY LOCOWEED ( <i>Oxytropis splendens</i> )	2.0	2.0-2.0		100	<b>Mean</b>	
MOUNTAIN GOLDENROD ( <i>Solidago spathulata</i> )	1.0	1.0-1.0		100	<b>Min</b>	
<b>Graminoid</b>					<b>Max</b>	
NORTHERN WHEAT GRASS ( <i>Agropyron dasystachyum</i> )	26.0	26.0-26.0		100	<b>Count</b>	
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	10.0	10.0-10.0		100	cm: 3.00 3.00 3.00 1	

## g meadow (subhygric/very rich) (n=4)

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

### General Description

The meadow ecosite tends to be mesic to subhygric and occurs on fluvial parent materials where flooding and/or high water tables increase soil water content and replenish nutrients. The soils on these sites tend to have thick Ah horizons and loamy textures. This ecological site is not common in the northern ecosection and has only been described at 4 sites in the Ya Ha Tinda, Kootenay Plains and Athabasca River valley of Jasper National Park. The meadow ecological site is much more common in the adjacent Upper Foothills and Subalpine subregions (Willoughby 2007).



### Successional Relationships

The meadow ecosite is successional stable. Disturbance regime, cold air drainage, and competition from a diverse cover of shrubs, forbs and grasses slow or inhibit the establishment of trees. If trees become established, the rich, moist loamy soils are conducive to rapid growth.

### Indicator Species

#### Shrub

SMOOTH WILLOW

*Salix glauca*

BOG BIRCH

*Betula glandulosa*

#### Graminoid

SIMPLE BOG-SEDGE

*Kobresia simpliciuscula*

TUFTED HAIR GRASS

*Deschampsia cespitosa*

PRAIRIE SEDGE

*Carex prairea*

### Environmental Variables

Moisture Regime: Hygric (moist) (2), Mesic (fresh) (1), Subhygric (moderately moist) (1)

Nutrient Regime: Permesotrophic (rich) (2)

Elevation (range): 1315 (910-1650) M

Slope (%): level (1), very gentle slope (1)

Aspect: Easterly (1)

Topographic Position: Depression (1), Lower Slope (1)

### Soil Variables

Soil Drainage: Poorly drained (2), Imperfectly drained (1), Moderately well drained (1)

Soil Subgroup: REGO GLEYSOL (2), ORTHIC HUMIC GLEYSOL (1)

Surface Texture: Silt (1)

Effective Texture: Sandy clay loam (1)

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (3)

Parent Material: Fluvioacustrine (2), Glaciofluvial (1), Undifferentiated Organic (1), Eolian (1)

Soil Type:

Humus Form

### LFH Thickness

	Mean	Min	Max	Count
cm:	6.00	6.00	6.00	1

# g1 shrubby meadow (n=3)

**Natural Subregion:** Montane  
**Ecosection:** Mn Montane North Ecosection

**Ecosite:** g meadow (subhygric/very rich)

## Characteristic Species

### Tree

[ 10.0 ] WATER BIRCH  
*Betula occidentalis*

[ 2.5 ] WHITE SPRUCE  
*Picea glauca*

### Shrub

[ 19.0 ] SHRUBBY CINQUEFOIL  
*Potentilla fruticosa*

[ 15.0 ] COMMON BEARBERRY  
*Arctostaphylos uva-ursi*

[ 10.0 ] BOG BIRCH\*  
*Betula glandulosa*

[ 4.0 ] COMMON LABRADOR TEA  
*Ledum groenlandicum*

[ 3.5 ] PRICKLY ROSE  
*Rosa acicularis*

[ 2.0 ] SMOOTH WILLOW\*  
*Salix glauca*

[ 1.5 ] BASKET WILLOW  
*Salix petiolaris*

### Forb

[ 1.5 ] DILL  
*Anethum graveolens*

[ 1.0 ] STICKY FALSE ASPHODEL  
*Tofieldia glutinosa*

### Moss and Liverwort

[ 5.0 ] N/A  
*Scorpidium turgescens*

[ 2.5 ] FRAGILE SCREW MOSS  
*Tortella fragilis*

### Graminoid

[ 20.0 ] SIMPLE BOG-SEDGE\*  
*Kobresia simpliciuscula*

[ 17.5 ] TUFTED HAIR GRASS\*  
*Deschampsia cespitosa*

[ 5.0 ] RUSH-LIKE SEDGE  
*Carex scirpoidea*

[ 5.0 ] YELLOW SEDGE  
*Carex flava*

[ 1.5 ] WIRE RUSH  
*Juncus balticus*

## Environmental Variables

Moisture Regime: Hygric (moist) (2), Mesic (fresh) (1)

Nutrient Regime: Permesotrophic (rich) (1)

Elevation (range): 1203.33 (910-1480) M

Slope (%): very gentle slope (1), level (1)

Aspect: Easterly (1)

Topographic Position: Lower Slope (1)

## Soil Variables

Soil Drainage: Poorly drained (2), Imperfectly drained (1)

Soil Subgroup: REGO GLEYSOL (2), ORTHIC HUMIC GLEYSOL (1)

Surface Texture: Silt (1)

Effective Texture: Sandy clay loam (1)

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (3)

Parent Material: Fluviolacustrine (2), Glaciofluvial (1), Eolian (1), Undifferentiated Organic (1)

Soil Type:

Humus Form

## LFH Thickness

	Mean	Min	Max	Count
cm:	6.00	6.00	6.00	1

# Mnb11 Bog birch/Tufted hairgrass-Sedge (n=1)

(*Betula glandulosa/Deschampsia cespitosa-Carex spp.*)

This community is similar to the Willow-Bog birch/Tufted hairgrass community described in the Upper Foothills subregion (Willoughby 2007). This community type is found in association with the tufted hairgrass-sedge community type. Willow and bog birch encroachment into a tufted hairgrass meadow eventually results in this community type. Historically, fire has played an important role in the maintenance of the grassland community types in this subregion. Continued fire suppression will eventually allow willow and bog birch to invade many of these grassy meadows. The encroachment of willow onto the tufted hairgrass-sedge community type causes a decline in forage production from 2200 kg/ha to 1200 kg/ha for grass and forb production. Continued protection of this community type from disturbance will most likely lead to the development of a community type similar to the willow/ slender wheatgrass and then to the pussy willow shrubland both described in the Upper Foothills (Willoughby 2007). The latter community has a high cover of willow (71%) and very little forage for domestic livestock.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** g meadow (subhygric/very rich)

**Ecosite Phase:** g1 shrubby meadow

## Plant Composition

## Canopy Cover (%)

## Environmental Variables

	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Medium Shrub (0.5 to 2 m)</b>				Ecological Status Score: 40
BOG BIRCH ( <i>Betula glandulosa</i> )	20.0	20.0-20.0	100	Moisture Regime: Hygric (moist) (1)
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	10.0	10.0-10.0	100	Nutrient Regime:
WOOLLY WILLOW ( <i>Salix lanata</i> )	1.0	1.0-1.0	100	Elevation (range): 1220 (1220-1220) M
RED BEARBERRY ( <i>Arctostaphylos rubra</i> )	1.0	1.0-1.0	100	Slope (%): 2.5 - 5.99 (1)
<b>Tall Forb (&gt;= 30 cm)</b>				Aspect: Easterly (1)
WHITE CAMAS ( <i>Zigadenus elegans</i> )	1.0	1.0-1.0	100	Topographic Position:
<b>Low Forb (&lt; 30 cm)</b>				<b>Soil Variables</b>
DWARF FALSE ASPHODEL ( <i>Tofieldia pusilla</i> )	1.0	1.0-1.0	100	Soil Drainage: Poorly drained (1)
<b>Graminoid</b>				Soil Subgroup: REGO GLEYSOL (1)
TUFTED HAIR GRASS ( <i>Deschampsia cespitosa</i> )	35.0	35.0-35.0	100	Surface Texture:
YELLOW SEDGE ( <i>Carex flava</i> )	10.0	10.0-10.0	100	Effective Texture:
RUSH-LIKE SEDGE ( <i>Carex scirpoidea</i> )	10.0	10.0-10.0	100	Depth to Mottles/Gley:
TUFTED BULRUSH ( <i>Scirpus cespitosus</i> )	1.0	1.0-1.0	100	Organic Thickness: 0 - 5 cm (1)
<b>Moss</b>				Parent Material: Fluvio-lacustrine (1)
N/A ( <i>Scorpidium turgescens</i> )	10.0	10.0-10.0	100	Soil Type:
FRAGILE SCREW MOSS ( <i>Tortella fragilis</i> )	5.0	5.0-5.0	100	Humus Form
				<b>LFH Thickness</b>
				<b>Mean</b>
				<b>Min</b>
				<b>Max</b>
				<b>Count</b>
cm:	0.00	0.00	0.00	0



## Mnb12 Willow/Timothy (n=1)

(*Salix spp./Phleum pratense*)

This community type has been altered by grazing. The grazing pressure or flood disturbance has promoted the establishment of timothy, stinging nettle and dandelion. These sites are often very productive because of the higher nutrients and moisture and once Kentucky bluegrass and timothy become established these sites will be readily grazed by livestock. In the absence of disturbance this type will likely succeed to white spruce.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** g meadow (subhygric/very rich)

**Ecosite Phase:** g1 shrubby meadow

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Tall Shrub (2 to 5m)</b>				Ecological Status Score: 15-20
WHITE SPRUCE ( <i>Picea glauca</i> )	1.0	1.0-1.0	100	Moisture Regime: Mesic (fresh) (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Nutrient Regime:
TWINING HONEYSUCKLE ( <i>Lonicera dioica</i> )	25.0	25.0-25.0	100	Elevation (range): 910 (910-910) M
PRICKLY ROSE ( <i>Rosa acicularis</i> )	15.0	15.0-15.0	100	Slope (%): 0 - 0.49 (1)
BEAKED WILLOW ( <i>Salix bebbiana</i> )	14.0	14.0-14.0	100	Aspect:
WILD RED RASPBERRY ( <i>Rubus idaeus</i> )	10.0	10.0-10.0	100	Topographic Position:
RED-OSIER DOGWOOD ( <i>Cornus stolonifera</i> )	2.0	2.0-2.0	100	<b>Soil Variables</b>
<b>Tall Forb (&gt;= 30 cm)</b>				Soil Drainage: Imperfectly drained (1)
WILD VETCH ( <i>Vicia americana</i> )	6.0	6.0-6.0	100	Soil Subgroup: REGO GLEYSOL (1)
MICHAUX'S WORMWOOD ( <i>Artemisia michauxiana</i> )	3.0	3.0-3.0	100	Surface Texture:
COMMON HORSETAIL ( <i>Equisetum arvense</i> )	1.0	1.0-1.0	100	Effective Texture:
HEMP-NETTLE ( <i>Galeopsis tetrahit</i> )	1.0	1.0-1.0	100	Depth to Mottles/Gley:
STAR-FLOWERED SOLOMON'S-SEAL ( <i>Smilacina stellata</i> )	1.0	1.0-1.0	100	Organic Thickness: 0 - 5 cm (1)
<b>Low Forb (&lt; 30 cm)</b>				Parent Material: Fluviolacustrine (1)
COMMON YARROW ( <i>Achillea millefolium</i> )	2.0	2.0-2.0	100	Soil Type:
COMMON DANDELION ( <i>Taraxacum officinale</i> )	1.0	1.0-1.0	100	Humus Form
<b>Graminoid</b>				<b>LFH Thickness</b>
TIMOTHY ( <i>Phleum pratense</i> )	25.0	25.0-25.0	100	<b>Mean</b>
<b>Not Applicable</b>				<b>Min</b>
UNDIFFERENTIATED URTICA ( <i>Urtica</i> )	25.0	25.0-25.0	100	<b>Max</b>
				<b>Count</b>
				cm: 0.00 0.00 0.00 0

## Mnb7 Water birch/Bearberry/Bog sedge (n=1)

(*Betula occidentalis*/*Arctostaphylos uva-ursi*/*Kobresia myosuroides*)

This community type was described near Kootenay Plains in the North Saskatchewan river valley. This community type is found on moist lowland sites. The presence of bog sedge appears to indicate the transition to the higher subalpine subregion. Indeed, Ogilvie (1969) described bog sedge dominated community types at higher elevations in the Alpine subregion. The forage production on this community type is only moderate. Perhaps, the higher elevation and colder climate which favours the growth of bog sedge limits the total productivity of the site. Camping and grazing of these communities by horses should be restricted. .

**Natural Subregion:** Montane  
**Ecosection:** Mn Montane North Ecosection

**Ecosite:** g meadow (subhygric/very rich)  
**Ecosite Phase:** g1 shrubby meadow

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 40
WHITE SPRUCE ( <i>Picea glauca</i> )	5.0	5.0-5.0	100	Moisture Regime: Hygric (moist) (1)
<b>Understory Tree</b>				Nutrient Regime: Permesotrophic (rich) (1)
WATER BIRCH ( <i>Betula occidentalis</i> )	20.0	20.0-20.0	100	Elevation (range): 1480 (1480-1480) M
<b>Medium Shrub (0.5 to 2 m)</b>				Slope (%):
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	30.0	30.0-30.0	100	Aspect:
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	28.0	28.0-28.0	100	Topographic Position: Lower Slope (1)
COMMON LABRADOR TEA ( <i>Ledum groenlandicum</i> )	8.0	8.0-8.0	100	<b>Soil Variables</b>
PRICKLY ROSE ( <i>Rosa acicularis</i> )	7.0	7.0-7.0	100	Soil Drainage: Poorly drained (1)
SMOOTH WILLOW ( <i>Salix glauca</i> )	4.0	4.0-4.0	100	Soil Subgroup: ORTHIC HUMIC GLEYSOL (1)
BASKET WILLOW ( <i>Salix petiolaris</i> )	3.0	3.0-3.0	100	Surface Texture: Silt (1)
CANADA BUFFALOBERRY ( <i>Shepherdia canadensis</i> )	2.0	2.0-2.0	100	Effective Texture: Sandy clay loam (1)
CREeping JUNIPER ( <i>Juniperus horizontalis</i> )	1.0	1.0-1.0	100	Depth to Mottles/Gley:
<b>Tall Forb (&gt;= 30 cm)</b>				Organic Thickness: 0 - 5 cm (1)
STICKY FALSE ASPHODEL ( <i>Tofieldia glutinosa</i> )	2.0	2.0-2.0	100	Parent Material: Eolian (1), Glaciofluvial (1), Undifferentiated Organic (1)
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	1.0	1.0-1.0	100	Soil Type:
WHITE CAMAS ( <i>Zigadenus elegans</i> )	1.0	1.0-1.0	100	Humus Form
<b>Low Forb (&lt; 30 cm)</b>				<b>LFH Thickness</b>
SMALL-FLOWERED ANEMONE ( <i>Anemone parviflora</i> )	1.0	1.0-1.0	100	Mean
<b>Graminoid</b>				Min
SIMPLE BOG-SEdge ( <i>Kobresia simpliciuscula</i> )	40.0	40.0-40.0	100	Max
WIRE RUSH ( <i>Juncus balticus</i> )	3.0	3.0-3.0	100	Count
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	1.0	1.0-1.0	100	cm:

LFH Thickness	Mean	Min	Max	Count
cm:	6.00	6.00	6.00	1

## g2 grassy meadow (n=1)

Natural Subregion: Montane  
 Ecoregion: Mn Montane North Ecoregion

Ecosite: g meadow (subhygric/very rich)

### Characteristic Species

#### Shrub

- [ 1.3 ] SHRUBBY CINQUEFOIL  
*Potentilla fruticosa*

#### Forb

- [ 8.1 ] GRACEFUL CINQUEFOIL  
*Potentilla gracilis*
- [ 3.4 ] UNDIFFERENTIATED RANUNCULUS  
*Ranunculus*
- [ 3.0 ] COMMON YARROW  
*Achillea millefolium*
- [ 2.2 ] FIELD MOUSE-EAR CHICKWEED  
*Cerastium arvense*
- [ 2.1 ] ELEPHANT'S-HEAD  
*Pedicularis groenlandica*
- [ 1.8 ] YELLOW FALSE DANDELION  
*Agoseris glauca*

#### Graminoid

- [ 39.0 ] PRAIRIE SEDGE\*  
*Carex prairea*
- [ 11.6 ] TUFTED HAIR GRASS\*  
*Deschampsia cespitosa*
- [ 9.3 ] SEDGE SPECIES  
*Carex*
- [ 3.8 ] WIRE RUSH  
*Juncus balticus*
- [ 2.7 ] HAIRY WILD RYE  
*Elymus innovatus*
- [ 1.5 ] FOWL BLUEGRASS  
*Poa palustris*

### Environmental Variables

Moisture Regime: Subhygric (moderately moist) (1)  
 Nutrient Regime: Permesotrophic (rich) (1)  
 Elevation (range): 1650 (1650-1650) M  
 Slope (%):  
 Aspect:  
 Topographic Position: Depression (1)

### Soil Variables

Soil Drainage: Moderately well drained (1)  
 Soil Subgroup:  
 Surface Texture:  
 Effective Texture:  
 Depth to Mottles/Gley:  
 Organic Thickness:  
 Parent Material:  
 Soil Type:  
 Humus Form

### LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

## Mna4 Tufted hair grass-Sedge (n=1)

(*Deschampsia cespitosa*-*Carex* spp.)

This community type is very similar to the tufted hairgrass-dominated communities described in the Upper foothills and Subalpine subregions of northern Alberta (Willoughby 2001) and may indicate the transition from the Upper Foothills subregion. This community is located on moist sites that are better drained and slightly drier than the pure sedge meadows. When this community is protected from grazing and fire for 25-40 years willow and bog birch expand and tufted hairgrass and sedge decline. The decline in graminoid cover causes a decline in available forage production.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** g meadow (subhygric/very rich)

**Ecosite Phase:** g2 grassy meadow

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Medium Shrub (0.5 to 2 m)</b>				Ecological Status Score: 27-40
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	1.3	1.3-1.3	100	Moisture Regime: Subhygric (moderately moist) (1)
<b>Tall Forb (&gt;= 30 cm)</b>				Nutrient Regime: Permesotrophic (rich) (1)
GRACEFUL CINQUEFOIL ( <i>Potentilla gracilis</i> )	8.1	8.1-8.1	100	Elevation (range): 1650 (1650-1650) M
ELEPHANT'S-HEAD ( <i>Pedicularis groenlandica</i> )	2.1	2.1-2.1	100	Slope (%):
<b>Low Forb (&lt; 30 cm)</b>				Aspect:
UNDIFFERENTIATED RANUNCULUS ( <i>Ranunculus</i> )	3.4	3.4-3.4	100	Topographic Position: Depression (1)
COMMON YARROW ( <i>Achillea millefolium</i> )	3.0	3.0-3.0	100	<b>Soil Variables</b>
FIELD MOUSE-EAR CHICKWEED ( <i>Cerastium arvense</i> )	2.2	2.2-2.2	100	Soil Drainage: Moderately well drained (1)
YELLOW FALSE DANDELION ( <i>Agoseris glauca</i> )	1.8	1.8-1.8	100	Soil Subgroup:
<b>Graminoid</b>				Surface Texture:
PRAIRIE SEDGE ( <i>Carex prairea</i> )	39.0	39.0-39.0	100	Effective Texture:
TUFTED HAIR GRASS ( <i>Deschampsia cespitosa</i> )	11.6	11.6-11.6	100	Depth to Mottles/Gley:
SEDGE SPECIES ( <i>Carex</i> )	9.3	9.3-9.3	100	Organic Thickness:
WIRE RUSH ( <i>Juncus balticus</i> )	3.8	3.8-3.8	100	Parent Material:
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	2.7	2.7-2.7	100	Soil Type:
FOWL BLUEGRASS ( <i>Poa palustris</i> )	1.5	1.5-1.5	100	Humus Form
				<b>LFH Thickness</b>
				Mean
				Min
				Max
				Count
				cm:
				0.00
				0.00
				0.00
				0

## h horsetail (hygric/rich) (n=22)

Natural Subregion: Montane

### General Description

The horsetail ecosite is wet and nutrient rich. These sites are commonly found on toe and lower slope positions with fluvial parent materials where flooding or seepage periodically replenishes the substrate nutrient availability. With wet soils gleysolic soils are common and organic matter tends to accumulate. Mottles were within 25cm of the soil surface. Horsetails commonly form a blanket over the forest floor.



### Successional Relationships

Balsam poplar and willow are pioneering species on this ecosite. White spruce is the expected climax species; however, its establishment may be slow due to high vegetation competition.

### Indicator Species

#### Tree

WHITE SPRUCE  
*Picea glauca*  
BALSAM POPLAR  
*Populus balsamifera*

#### Shrub

SALIX SPECIES  
*Salix*  
SALIX SPECIES  
*Salix*

#### Forb

COMMON HORSETAIL  
*Equisetum arvense*  
MEADOW HORSETAIL  
*Equisetum pratense*  
VARIEGATED HORSETAIL  
*Equisetum variegatum*

#### Moss and Liverwort

STAIR-STEP MOSS  
*Hylocomium splendens*

#### Graminoid

RUSH-LIKE SEDGE  
*Carex scirpoidea*

Ecosection: Mn Montane North Ecosection

Site Index at 50 Years	Height (m)	Variation (m)	Count
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WHITE SPRUCE <i>(Picea glauca)</i>	6.20	0.40	0
BLACK SPRUCE <i>(Picea mariana)</i>	7.10	0.20	0

### Environmental Variables

Moisture Regime: Subhygric (moderately moist) (7), Hygric (moist) (5), Subhydric (moderately wet) (5), Hydric (wet) (1)

Nutrient Regime: Permesotrophic (rich) (8)

Elevation (range): 1140 (970-1420) M

Slope (%): level (10), nearly level (9), very gentle slope (2), moderate slope (1)

Aspect: Southerly (6), Easterly (3), Level (1), Northerly (1), Westerly (1)

Topographic Position: Lower Slope (2), Toe (2), Depression (1), Level (1)

### Soil Variables

Soil Drainage: Imperfectly drained (5), Poorly drained (3), Very poorly drained (1), Moderately well drained (1), Well drained (1)

Soil Subgroup: REGO HUMIC GLEYSOL (6), ORTHIC REGOSOL (4), GLEYED REGOSOL (2), GLEYED CUMULIC REGOSOL (2), ORTHIC GLEYSOL (2), ORTHIC HUMIC GLEYSOL (1), REGO GLEYSOL (1), TERRIC HUMISOL (1), ELUVIATED DYSTRIC BRUNISOL (1)

Surface Texture: Silty clay (3), Humic (1), Silt (1), Silt loam (1)

Effective Texture: Silty clay (3), Clay (1), Silt (1), Silt loam (1)

Depth to Mottles/Gley: 26 - 50 (1)

Organic Thickness: 0 - 5 cm (17), 26 - 39 cm (2), 6 - 15 cm (1), 60 - 79 cm (1)

Parent Material: Fluvial (8), Fluviolacustrine (7), Glaciolacustrine (3), Undifferentiated Organic (2), Eolian (2), Fen (1)

Soil Type:

Humus Form TYPICAL MODER (2), HUMIC PEATYMOR (1)

LFH Thickness	Mean	Min	Max	Count
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cm:	30.00	22.00	38.00	2
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# h1 horsetail Sw-Pb (n=3)

**Natural Subregion:** Montane  
**Ecosection:** Mn Montane North Ecosection

**Ecosite:** h horsetail (hygric/rich)

## Characteristic Species

### Tree

- [ 50.0 ] BALSAM POPLAR\*  
*Populus balsamifera*
- [ 3.3 ] WHITE SPRUCE  
*Picea glauca*
- [ 1.6 ] BLACK SPRUCE  
*Picea mariana*

### Shrub

- [ 8.3 ] SALIX SPECIES\*  
*Salix*
- [ 3.3 ] MYRTLE-LEAVED WILLOW  
*Salix myrtillifolia*
- [ 2.6 ] SNOWBERRY  
*Symphoricarpos albus*
- [ 2.6 ] COMMON LABRADOR TEA  
*Ledum groenlandicum*
- [ 2.3 ] PRICKLY ROSE  
*Rosa acicularis*
- [ 2.0 ] LOW-BUSH CRANBERRY  
*Viburnum edule*
- [ 2.0 ] DEWBERRY  
*Rubus pubescens*

### Forb

- [ 26.0 ] MEADOW HORSETAIL\*  
*Equisetum pratense*
- [ 8.6 ] COMMON HORSETAIL\*  
*Equisetum arvense*
- [ 5.3 ] TALL LUNGWORT  
*Mertensia paniculata*
- [ 1.3 ] CREAM-COLORED VETCHLING  
*Lathyrus ochroleucus*
- [ 1.3 ] PALMATE-LEAVED COLTSFOOT  
*Petasites palmatus*

### Graminoid

- [ 10.0 ] NORWAY SEDGE  
*Carex norvegica*
- [ 1.6 ] WATER SEDGE  
*Carex aquatilis*

## Environmental Variables

Moisture Regime: Hygric (moist) (1), Subhygric (moderately moist) (1)

Nutrient Regime:

Elevation (range): 1103 (980-1230) M

Slope (%): nearly level (2), moderate slope (1)

Aspect: Easterly (1), Southerly (1)

Topographic Position:

## Soil Variables

Soil Drainage:

Soil Subgroup: ORTHIC REGOSOL (2), GLEYED REGOSOL (1)

Surface Texture:

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (3)

Parent Material: Fluvial (2), Fluvio-lacustrine (1)

Soil Type:

Humus Form

## LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

## Mnc9 Pb/Horsetail (n=3)

### (*Populus balsamifera*/*Equisetum arvense*)

This community type is found on moist-rich Regosolic soils. These sites are characterized by high water tables and will likely succeed to white spruce. The shrub species richness and diversity restricts livestock access, however horses have been noticed to selectively graze different species of horsetail during the summer and winter months. This community type would be non-use for domestic cattle, however it may be used as secondary range for horses.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** h horsetail (hygric/rich)

**Ecosite Phase:** h1 horsetail Sw-Pb

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables				
	Mean	Range							
<b>Overstory Tree</b>					Ecological Status Score: 25				
BALSAM POPLAR ( <i>Populus balsamifera</i> )	45.0	30.0-55.0		100	Moisture Regime: Subhygric (moderately moist) (1), Hygric (moist) (1)				
WHITE SPRUCE ( <i>Picea glauca</i> )	3.3	0.0-10.0		33	Nutrient Regime:				
<b>Understory Tree</b>					Elevation (range): 1103 (980-1230) M				
BLACK SPRUCE ( <i>Picea mariana</i> )	1.6	0.0-5.0		33	Slope (%): 0.5 - 2.49 (2), 10 - 15.99 (1)				
<b>Medium Shrub (0.5 to 2 m)</b>					Aspect: Easterly (1), Southerly (1)				
SALIX SPECIES ( <i>Salix</i> )	8.3	0.0-25.0		33	Topographic Position:				
BALSAM POPLAR ( <i>Populus balsamifera</i> )	5.0	0.0-15.0		33	<b>Soil Variables</b>				
MYRTLE-LEAVED WILLOW ( <i>Salix myrtillifolia</i> )	3.3	0.0-10.0		33	Soil Drainage:				
COMMON LABRADOR TEA ( <i>Ledum groenlandicum</i> )	2.6	0.0-8.0		33	Soil Subgroup: ORTHIC REGOSOL (2), GLEYED REGOSOL (1)				
SNOWBERRY ( <i>Symphoricarpos albus</i> )	2.6	0.0-8.0		33	Surface Texture:				
PRICKLY ROSE ( <i>Rosa acicularis</i> )	2.3	2.0-3.0		100	Effective Texture:				
LOW-BUSH CRANBERRY ( <i>Viburnum edule</i> )	2.0	0.0-6.0		33	Depth to Mottles/Gley:				
<b>Low Shrub (&lt; 0.5m)</b>					Organic Thickness: 0 - 5 cm (3)				
DEWBERRY ( <i>Rubus pubescens</i> )	2.0	0.0-5.0		67	Parent Material: Fluvial (2), Fluvio-lacustrine (1)				
<b>Tall Forb (&gt;= 30 cm)</b>					Soil Type:				
MEADOW HORSETAIL ( <i>Equisetum pratense</i> )	26.0	3.0-60.0		100	Humus Form				
COMMON HORSETAIL ( <i>Equisetum arvense</i> )	8.6	1.0-20.0		100	<b>LFH Thickness</b>				
TALL LUNGWORT ( <i>Mertensia paniculata</i> )	5.3	0.0-15.0		67					
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	1.3	0.0-4.0		33	cm:	0.00	0.00	0.00	0
<b>Low Forb (&lt; 30 cm)</b>									
PALMATE-LEAVED COLTSFOOT ( <i>Petasites palmatus</i> )	1.3	1.0-2.0		100					
<b>Graminoid</b>									
NORWAY SEDGE ( <i>Carex norvegica</i> )	10.0	0.0-30.0		33					
WATER SEDGE ( <i>Carex aquatilis</i> )	1.6	0.0-5.0		33					

## h2 horsetail Sw (n=13)

Natural Subregion: Montane  
Ecosection: Mn Montane North Ecosection

Ecosite: h horsetail (hygric/rich)

### Characteristic Species

#### Tree

- [ 39.1 ] WHITE SPRUCE\*  
*Picea glauca*

#### Shrub

- [ 3.4 ] RIVER ALDER  
*Alnus tenuifolia*
- [ 1.6 ] LOW-BUSH CRANBERRY  
*Viburnum edule*
- [ 1.5 ] PRICKLY ROSE  
*Rosa acicularis*
- [ 1.1 ] TWINFLOWER  
*Linnaea borealis*

#### Forb

- [ 30.1 ] COMMON HORSETAIL  
*Equisetum arvense*
- [ 13.0 ] MEADOW HORSETAIL  
*Equisetum pratense*
- [ 2.3 ] TALL LUNGWORT  
*Mertensia paniculata*
- [ 1.6 ] PALMATE-LEAVED COLTSFOOT  
*Petasites palmatus*
- [ 1.2 ] COW PARSNIP  
*Heracleum lanatum*
- [ 1.0 ] BISHOP'S-CAP  
*Mitella nuda*

#### Moss and Liverwort

- [ 18.7 ] STAIR-STEP MOSS\*  
*Hylocomium splendens*
- [ 9.2 ] N/A  
*Thuidium abietinum*
- [ 3.6 ] SCHREBER'S MOSS  
*Pleurozium schreberi*

#### Graminoid

- [ 1.0 ] WATER SEDGE  
*Carex aquatilis*

### Environmental Variables

Moisture Regime: Subhygric (moderately moist) (4), Hygric (moist) (3), Subhydric (moderately wet) (3), Hydric (wet) (1)

Nutrient Regime: Permesotrophic (rich) (5)

Elevation (range): 1074 (970-1250) M

Slope (%): level (9), nearly level (3), very gentle slope (1)

Aspect: Southerly (3), Level (1), Easterly (1)

Topographic Position: Lower Slope (1), Level (1), Toe (1)

### Soil Variables

Soil Drainage: Imperfectly drained (3), Poorly drained (2), Well drained (1), Moderately well drained (1)

Soil Subgroup: REGO HUMIC GLEYSOL (5), ORTHIC GLEYSOL (2), ORTHIC REGOSOL (2), ORTHIC HUMIC GLEYSOL (1), GLEYED REGOSOL (1), GLEYED CUMULIC REGOSOL (1)

Surface Texture: Silty clay (2), Silt loam (1), Silt (1)

Effective Texture: Silty clay (2), Silt (1), Silt loam (1)

Depth to Mottles/Gley: 26 - 50 (1)

Organic Thickness: 0 - 5 cm (11), 26 - 39 cm (2)

Parent Material: Fluvial (5), Fluvio-lacustrine (4), Undifferentiated Organic (2), Eolian (2), Glaciolacustrine (2)

Soil Type:

Humus Form TYPICAL MODER (2)

### LFH Thickness

	Mean	Min	Max	Count
cm:	30.00	22.00	38.00	2



## Mne22 Sw/Horsetail (n=13)

(*Picea glauca*/*Equisetum spp.*)

This community type represents one of the wettest and most nutrient-rich forest conditions in the Montane. Seepage and high water tables can be expected. Nutrient levels are high resulting in high diversity in shrub and forb layers. Generally, there is little palatable forage for domestic livestock and this community type should be rated as non-use.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** h horsetail (hygric/rich)

**Ecosite Phase:** h2 horsetail Sw

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Overstory Tree</b>					Ecological Status Score: 25 Moisture Regime: Subhygric (moderately moist) (4), Hygric (moist) (3), Subhydric (moderately wet) (3), Hydric (wet) (1) Nutrient Regime: Permesotrophic (rich) (5) Elevation (range): 1074 (970-1250) M Slope (%): 0 - 0.49 (9), 0.5 - 2.49 (3), 2.5 - 5.99 (1) Aspect: Southerly (3), Level (1), Easterly (1) Topographic Position: Level (1), Lower Slope (1), Toe (1)
WHITE SPRUCE ( <i>Picea glauca</i> )	33.5	0.0-73.0	92		
<b>Understory Tree</b>					
WHITE SPRUCE ( <i>Picea glauca</i> )	5.6	0.0-29.0	77		
<b>Tall Shrub (2 to 5m)</b>					
RIVER ALDER ( <i>Alnus tenuifolia</i> )	3.4	0.0-20.0	31		
<b>Medium Shrub (0.5 to 2 m)</b>					
LOW-BUSH CRANBERRY ( <i>Viburnum edule</i> )	1.6	0.0-14.0	39		
PRICKLY ROSE ( <i>Rosa acicularis</i> )	1.5	0.0-6.0	62		
TWINFLOWER ( <i>Linnaea borealis</i> )	1.1	0.0-3.0	69		
<b>Tall Forb (&gt;= 30 cm)</b>					
COMMON HORSETAIL ( <i>Equisetum arvense</i> )	30.1	0.0-75.0	85		
MEADOW HORSETAIL ( <i>Equisetum pratense</i> )	13.0	0.0-63.0	46		
TALL LUNGWORT ( <i>Mertensia paniculata</i> )	2.3	0.0-13.0	54		
COW PARSNIP ( <i>Heracleum lanatum</i> )	1.2	0.0-15.0	15		
<b>Low Forb (&lt; 30 cm)</b>					
PALMATE-LEAVED COLTSFOOT ( <i>Petasites palmatus</i> )	1.6	0.0-13.0	39		
BISHOP'S-CAP ( <i>Mitella nuda</i> )	1.0	0.0-2.0	85		
<b>Graminoid</b>					
WATER SEDGE ( <i>Carex aquatilis</i> )	1.0	0.0-10.0	15		
<b>Moss</b>					
STAIR-STEP MOSS ( <i>Hylocomium splendens</i> )	18.7	0.0-93.0	46		
N/A ( <i>Thuidium abietinum</i> )	9.2	0.0-65.0	39		
SCHREBER'S MOSS ( <i>Pleurozium schreberi</i> )	3.6	0.0-20.0	46		
<b>Soil Variables</b>					
Soil Drainage: Imperfectly drained (3), Poorly drained (2), Well drained (1), Moderately well drained (1)					
Soil Subgroup: REGO HUMIC GLEYSOL (5), ORTHIC GLEYSOL (2), ORTHIC REGOSOL (2), ORTHIC HUMIC GLEYSOL (1), GLEYED REGOSOL (1), GLEYED CUMULIC REGOSOL (1)					
Surface Texture: Silty clay (2), Silt loam (1), Silt (1)					
Effective Texture: Silty clay (2), Silt (1), Silt loam (1)					
Depth to Mottles/Gley: 26 - 50 (1)					
Organic Thickness: 0 - 5 cm (11), 26 - 39 cm (2)					
Parent Material: Fluvial (5), Fluvioacustrine (4), Glaciolacustrine (2), Undifferentiated Organic (2), Eolian (2)					
Soil Type:					
Humus Form TYPICAL MODER (2)					
<b>LFH Thickness</b>					
	<b>Mean</b>	<b>Min</b>	<b>Max</b>	<b>Count</b>	
cm:	30.00	22.00	38.00	2	

### h3 horsetail shrubland (n=6)

Natural Subregion: Montane  
 Ecosession: Mn Montane North Ecosession

Ecosite: h horsetail (hygric/rich)

#### Characteristic Species

##### Tree

- [ 3.0 ] WHITE SPRUCE  
*Picea glauca*
- [ 1.0 ] BLACK SPRUCE  
*Picea mariana*

##### Shrub

- [ 15.6 ] SALIX SPECIES\*  
*Salix*
- [ 5.7 ] SALIX SPECIES  
*Salix*
- [ 3.3 ] MYRTLE-LEAVED WILLOW  
*Salix myrtillifolia*
- [ 1.8 ] RIVER ALDER  
*Alnus tenuifolia*
- [ 1.2 ] BOG BIRCH  
*Betula glandulosa*

##### Forb

- [ 12.5 ] VARIEGATED HORSETAIL\*  
*Equisetum variegatum*
- [ 10.8 ] COMMON HORSETAIL  
*Equisetum arvense*
- [ 3.7 ] WOOLLY PUSSYTOES  
*Antennaria lanata*
- [ 3.0 ] SHOWY EVERLASTING  
*Antennaria pulcherrima*
- [ 1.2 ] BRACTED LOUSEWORT  
*Pedicularis bracteosa*

##### Moss and Liverwort

- [ 8.7 ] GOLDEN MOSS  
*Tomenthypnum nitens*
- [ 6.2 ] BROWN MOSS  
*Drepanocladus*
- [ 3.7 ] BROWN MOSS  
*Drepanocladus uncinatus*
- [ 1.2 ] UNDIFFERENTIATED BRYUM  
*Bryum*

##### Graminoid

- [ 8.5 ] RUSH-LIKE SEDGE\*  
*Carex scirpoidea*
- [ 5.0 ] WIRE RUSH  
*Juncus balticus*
- [ 3.2 ] SEDGE SPECIES  
*Carex*
- [ 1.9 ] COMMON TALL MANNA GRASS  
*Glyceria grandis*

#### Environmental Variables

Moisture Regime: Subhygric (moderately moist) (2), Subhydic (moderately wet) (2), Hygric (moist) (1)

Nutrient Regime: Permesotrophic (rich) (3)

Elevation (range): 1192 (980-1420) M

Slope (%): nearly level (4), very gentle slope (1), level (1)

Aspect: Southerly (2), Easterly (1), Westerly (1), Northerly (1)

Topographic Position: Lower Slope (1), Depression (1), Toe (1)

#### Soil Variables

Soil Drainage: Imperfectly drained (2), Poorly drained (1), Very poorly drained (1)

Soil Subgroup: ELUVIATED DYSTRIC BRUNISOL (1), REGO GLEYSOL (1), REGO HUMIC GLEYSOL (1), TERRIC HUMISOL (1), GLEYED CUMULIC REGOSOL (1)

Surface Texture: Silty clay (1), Humic (1)

Effective Texture: Clay (1), Silty clay (1)

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (3), 6 - 15 cm (1), 60 - 79 cm (1)

Parent Material: Fluviolacustrine (2), Glaciolacustrine (1), Fen (1), Fluvial (1)

Soil Type:

Humus Form HUMIC PEATYMOR (1)

#### LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

# Mna6 Variegated horsetail/Rush-like sedge (n=2)

## (*Equisetum variegatum*/*Carex scirpoidea*)

This type occurs on subhygric to hygric sites with level fluvial landforms along rivers and lakeshores (Holland and Coen 1982). The soils are imperfectly to poorly drained Rego Gleysols and Eluviated Dystric Brunisols and are periodically inundated with water.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** h horsetail (hygric/rich)

**Ecosite Phase:** h3 horsetail shrubland

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Medium Shrub (0.5 to 2 m)</b>				Ecological Status Score: 40
WHITE SPRUCE ( <i>Picea glauca</i> )	3.0	1.0-5.0	100	Moisture Regime: Subhygric (moderately moist) (1)
BOG BIRCH ( <i>Betula glandulosa</i> )	2.5	0.0-5.0	50	Nutrient Regime:
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	1.5	1.0-2.0	100	Elevation (range): 1340 (1260-1420) M
SHRUBBY WILLOW ( <i>Salix arbusculoides</i> )	1.5	0.0-3.0	50	Slope (%): 0.5 - 2.49 (2)
SHORT-CAPSULED WILLOW ( <i>Salix brachycarpa</i> )	1.0	1.0-1.0	100	Aspect: Easterly (1), Southerly (1)
<b>Tall Forb (&gt;= 30 cm)</b>				Topographic Position:
VARIEGATED HORSETAIL ( <i>Equisetum variegatum</i> )	25.0	10.0-40.0	100	<b>Soil Variables</b>
BRACKETED LOUSEWORT ( <i>Pedicularis bracteosa</i> )	2.5	0.0-5.0	50	Soil Drainage: Imperfectly drained (1)
<b>Low Forb (&lt; 30 cm)</b>				Soil Subgroup: ELUVIATED DYSTRIC BRUNISOL (1), REGO GLEYSOL (1)
WOOLLY PUSSYTOES ( <i>Antennaria lanata</i> )	7.5	0.0-15.0	50	Surface Texture:
SHOWY EVERLASTING ( <i>Antennaria pulcherrima</i> )	6.0	0.0-12.0	50	Effective Texture:
SMALL-FLOWERED ANEMONE ( <i>Anemone parviflora</i> )	2.5	0.0-5.0	50	Depth to Mottles/Gley:
<b>Graminoid</b>				Organic Thickness: 0 - 5 cm (2)
RUSH-LIKE SEDGE ( <i>Carex scirpoidea</i> )	17.0	9.0-25.0	100	Parent Material: Fluvial (1), Fluviolacustrine (1)
WIRE RUSH ( <i>Juncus balticus</i> )	10.0	0.0-20.0	50	Soil Type:
SEDGE SPECIES ( <i>Carex</i> )	4.0	0.0-8.0	50	Humus Form
TUFTED HAIR GRASS ( <i>Deschampsia cespitosa</i> )	2.0	1.0-3.0	100	
<b>Moss</b>				
BROWN MOSS ( <i>Drepanocladus uncinatus</i> )	7.5	0.0-15.0	50	
UNDIFFERENTIATED BRYUM ( <i>Bryum</i> )	2.5	0.0-5.0	50	

LFH Thickness	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

## Mnb13 Willow/Horsetail (n=4)

(*Salix spp./Equisetum arvense*)

This community type is found at the lower elevational limits of the Montane subregion. Holland and Coen (1982) describe this community type on hygric, level to gently sloping fluvial landforms of various aspects. The soils are imperfectly to poorly drained and are subject to periodic flooding and sediment deposition and are predominantly Gleysols. Tree cover is absent and willow cover is high. Common horsetail is the dominant herb. Other species may also be found, such as dwarf shrubs and sedges, however, these are minor components.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** h horsetail (hygric/rich)

**Ecosite Phase:** h3 horsetail shrubland

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Overstory Tree</b>					Ecological Status Score: 40
BLACK SPRUCE ( <i>Picea mariana</i> )	2.0	0.0-8.0	25		Moisture Regime: Subhydric (moderately wet) (2), Subhygric (moderately moist) (1), Hygric (moist) (1)
<b>Understory Tree</b>					Nutrient Regime: Permesotrophic (rich) (3)
WHITE SPRUCE ( <i>Picea glauca</i> )	3.0	0.0-12.0	25		Elevation (range): 1044 (980-1109) M
<b>Tall Shrub (2 to 5m)</b>					Slope (%): 0.5 - 2.49 (2), 2.5 - 5.99 (1), 0 - 0.49 (1)
SALIX SPECIES ( <i>Salix</i> )	31.2	0.0-85.0	50		Aspect: Northerly (1), Southerly (1), Westerly (1)
RIVER ALDER ( <i>Alnus tenuifolia</i> )	3.7	0.0-15.0	25		Topographic Position: Lower Slope (1), Toe (1), Depression (1)
<b>Medium Shrub (0.5 to 2 m)</b>					<b>Soil Variables</b>
SALIX SPECIES ( <i>Salix</i> )	11.5	0.0-40.0	75		Soil Drainage: Imperfectly drained (1), Poorly drained (1), Very poorly drained (1)
MYRTLE-LEAVED WILLOW ( <i>Salix myrtillifolia</i> )	6.7	0.0-27.0	25		Soil Subgroup: TERRIC HUMISOL (1), REGO HUMIC GLEYSOL (1), GLEYPED CUMULIC REGOSOL (1)
BRACKETED HONEYSUCKLE ( <i>Lonicera involucrata</i> )	1.2	0.0-5.0	25		Surface Texture: Humic (1), Silty clay (1)
<b>Tall Forb (&gt;= 30 cm)</b>					Effective Texture: Clay (1), Silty clay (1)
COMMON HORSETAIL ( <i>Equisetum arvense</i> )	21.7	8.0-40.0	100		Depth to Mottles/Gley:
LARGE NORTHERN ASTER ( <i>Aster modestus</i> )	1.2	0.0-4.8	25		Organic Thickness: 6 - 15 cm (1), 60 - 79 cm (1), 0 - 5 cm (1)
TALL LUNGWORT ( <i>Mertensia paniculata</i> )	1.0	0.0-3.0	50		Parent Material: Fluviolacustrine (1), Glaciolacustrine (1), Fen (1)
<b>Graminoid</b>					Soil Type:
COMMON TALL MANNA GRASS ( <i>Glyceria grandis</i> )	3.9	0.0-15.0	50		Humus Form HUMIC PEATYMOR (1)
SEDGE SPECIES ( <i>Carex</i> )	2.5	0.0-10.0	25		
<b>Moss</b>					
GOLDEN MOSS ( <i>Tomenthypnum nitens</i> )	17.5	0.0-70.0	25		
BROWN MOSS ( <i>Drepanocladus</i> )	12.5	0.0-50.0	25		
					<b>LFH Thickness</b>
					<b>Mean</b>
					<b>Min</b>
					<b>Max</b>
					<b>Count</b>
					cm:
					0.00
					0.00
					0.00
					0

## ij fen (subhydic/rich) (n=27)

Natural Subregion: Montane

### General Description

The rich and poor fen are combined in this ecosite. The fen ecosite is generally characterized by flowing oxygenated water and alkaline, nutrient-rich conditions. This ecosite occupies level, depressional and lower slope positions where impeded drainage or high water tables enhance the accumulation of organic matter consisting of sedges, golden moss, tufted moss, and brown moss. Black spruce, white spruce, and/or tamarack dominate the sparse canopy on the treed phase. White spruce is more common than black spruce in these treed fens, especially in highly calcareous areas such as the Athabasca river valley near Hinton (Natural Regions Committee 2006). Dwarf birch or willow form the canopy of the shrubby phase and sedges dominate the graminoid phase of this ecosite.



### Successional Relationships

Black spruce or white spruce are the edaphic climax trees on this ecosite. On calcareous materials black spruce may be replaced by white spruce as the climax tree species. Species composition and direction of succession changes with changing hydrologic regime. As with other wetlands, fens have slow successional rates so recovery from disturbance may also be slow.

### Indicator Species

#### Tree

WHITE SPRUCE  
*Picea glauca*

BLACK SPRUCE  
*Picea mariana*

TAMARACK  
*Larix laricina*

#### Shrub

COMMON LABRADOR TEA  
*Ledum groenlandicum*

MYRTLE-LEAVED WILLOW  
*Salix myrtillifolia*

#### Moss and Liverwort

GOLDEN MOSS  
*Tomentypnum nitens*

#### Graminoid

WATER SEDGE  
*Carex aquatilis*

SMALL BOTTLE SEDGE  
*Carex utriculata*

Ecosection: Mn Montane North Ecosection

### Site Index at 50 Years

	Height (m)	Variation (m)	Count
WHITE SPRUCE <i>(Picea glauca)</i>	5.30	1.30	0
BLACK SPRUCE <i>(Picea mariana)</i>	4.00	0.30	0

### Environmental Variables

Moisture Regime: Subhydic (moderately wet) (11), Hygric (moist) (5), Hydic (wet) (3), Mesic (fresh) (2), Subhydic (moderately moist) (2)

Nutrient Regime: Permesotrophic (rich) (4), Eutrophic (very rich) (2), Mesotrophic (medium) (2)

Elevation (range): 1217 (990-1420) M

Slope (%): level (17), gentle slope (5), very gentle slope (3), nearly level (1)

Aspect: Level (6), Easterly (4), Westerly (3), Northerly (1), Southerly (1)

Topographic Position: Level (4), Depression (2), Lower Slope (1)

### Soil Variables

Soil Drainage: Poorly drained (7), Very poorly drained (7), Imperfectly drained (1)

Soil Subgroup: REGO GLEYSOL (7), ORTHIC HUMIC GLEYSOL (3), TYPIC FIBRISOL (2), REGO HUMIC GLEYSOL (2), TERRIC FIBRISOL (2), TERRIC MESISOL (1), BRUNISOLIC GRAY LUVISOL (1), CUMULIC MESISOL (1), GLEYED EUTRIC BRUNISOL (1), ORTHIC GLEYSOL (1), TYPIC MESISOL (1), ORTHIC HUMIC REGOSOL (1)

Surface Texture: Fibric (5), Mesic (2)

Effective Texture: Fibric (2), Mesic (2), Sandy clay (1), Silt (1), Silt loam (1)

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (19), >= 80 cm (2), 60 - 79 cm (2), 16 - 25 cm (1), 26 - 39 cm (1)

Parent Material: Undifferentiated Organic (8), Glaciolacustrine (7), Fen (5), Fluviolacustrine (5), Fluvial (4), Eolian (4), Morainal (2), Lacustrine (1), Glaciofluvial (1)

Soil Type:

Humus Form FIBRIMOR (2), MESIC PEATYMOR (1), FIBRIC PEATYMOR (1)

# ij1 treed fen (n=14)

**Natural Subregion:** Montane  
**Ecosection:** Mn Montane North Ecosection

**Ecosite:** ij fen (subhydric/rich)

## Characteristic Species

### Tree

- [ 10.2 ] BLACK SPRUCE\*  
*Picea mariana*
- [ 4.5 ] LODGEPOLE PINE  
*Pinus contorta*
- [ 3.2 ] WHITE SPRUCE\*  
*Picea glauca*

### Shrub

- [ 14.4 ] COMMON LABRADOR TEA\*  
*Ledum groenlandicum*
- [ 5.6 ] MYRTLE-LEAVED WILLOW\*  
*Salix myrtillifolia*
- [ 2.2 ] BOG BIRCH  
*Betula glandulosa*
- [ 2.0 ] TWINFLOWER  
*Linnaea borealis*
- [ 1.8 ] RED BEARBERRY  
*Arctostaphylos rubra*

### Forb

- [ 1.7 ] COMMON HORSETAIL  
*Equisetum arvense*

### Moss and Liverwort

- [ 20.5 ] GOLDEN MOSS\*  
*Tomenthypnum nitens*
- [ 19.1 ] STAIR-STEP MOSS  
*Hylocomium splendens*
- [ 18.7 ] BROWN MOSS  
*Drepanocladus revolvens*
- [ 6.5 ] TUFTED MOSS  
*Aulacomnium palustre*
- [ 3.0 ] SCHREBER'S MOSS  
*Pleurozium schreberi*

### Graminoid

- [ 8.1 ] WATER SEDGE\*  
*Carex aquatilis*
- [ 3.2 ] SHEATHED SEDGE  
*Carex vaginata*
- [ 2.8 ] HAIRY WILD RYE  
*Elymus innovatus*

## Environmental Variables

Moisture Regime: Subhydric (moderately wet) (6), Hygric (moist) (4), Mesic (fresh) (1), Subhygric (moderately moist) (1)

Nutrient Regime: Mesotrophic (medium) (2)

Elevation (range): 1217 (1100-1330) M

Slope (%): level (7), very gentle slope (3), gentle slope (3), nearly level (1)

Aspect: Easterly (3), Westerly (3), Level (2), Southerly (1)

Topographic Position: Lower Slope (1), Level (1)

## Soil Variables

Soil Drainage: Poorly drained (3), Imperfectly drained (1), Very poorly drained (1)

Soil Subgroup: REGO GLEYSOL (4), ORTHIC HUMIC GLEYSOL (2), GLEYED EUTRIC BRUNISOL (1), TERRIC FIBRISOL (1), ORTHIC GLEYSOL (1), REGO HUMIC GLEYSOL (1), TERRIC MESISOL (1), TYPIC MESISOL (1), BRUNISOLIC GRAY LUVISOL (1)

Surface Texture: Fibric (2)

Effective Texture: Mesic (2)

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (12), 60 - 79 cm (1), >= 80 cm (1)

Parent Material: Undifferentiated Organic (4), Eolian (4), Glaciolacustrine (4), Fluvial (3), Fluvialacustrine (2), Fen (2), Morainal (2), Glaciofluvial (1)

Soil Type:

Humus Form FIBRIMOR (1), FIBRIC PEATYMOR (1)

## Mne19 PI-Sb/Labrador tea/Feather moss (n=3)

(*Pinus contorta*-*Picea mariana*/*Ledum groenlandicum*/*Hylocomium splendens*)

This community type is not common in the Montane subregion and is likely an outlier of the Upper Foothills subregion where it would be described within the Labrador tea-subhygric (h ecological site). This community type has a nutrient-poor substrate with well to moderately well drained soils. Labrador tea and black spruce are indicative of the relatively acidic surface soil conditions. This community type is drier than the average moisture regime for this ecological site and represents a transition from the horsetail to the fen ecological site. Mature stands developing in this ecosite often have a component of black spruce. The black spruce is often the same age as the pine but forms a secondary canopy due to slower growth rates. Successionally mature stands are dominated by black spruce with small component of old residual pine.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** ij fen (subhygric/rich)

**Ecosite Phase:** ij1 treed fen

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstorey Tree</b>				Ecological Status Score: 25
LOGEPOLE PINE ( <i>Pinus contorta</i> )	18.3	5.0-25.0	100	Moisture Regime: Hygric (moist) (2), Mesic (fresh) (1)
<b>Understorey Tree</b>				Nutrient Regime:
BLACK SPRUCE ( <i>Picea mariana</i> )	7.0	1.0-10.0	100	Elevation (range): 1267 (1260-1280) M
<b>Tall Shrub (2 to 5m)</b>				Slope (%): 0 - 0.49 (1), 0.5 - 2.49 (1), 6 - 9.99 (1)
BLACK SPRUCE ( <i>Picea mariana</i> )	7.0	3.0-15.0	100	Aspect: Westerly (2)
<b>Medium Shrub (0.5 to 2 m)</b>				Topographic Position:
COMMON LABRADOR TEA ( <i>Ledum groenlandicum</i> )	35.6	2.0-75.0	100	<b>Soil Variables</b>
TWINFLOWER ( <i>Linnaea borealis</i> )	8.0	1.0-20.0	100	Soil Drainage:
BLACK SPRUCE ( <i>Picea mariana</i> )	4.3	0.0-8.0	67	Soil Subgroup: GLEYED EUTRIC BRUNISOL (1), BRUNISOLIC GRAY LUVISOL (1), TERRIC MESISOL (1)
PRICKLY ROSE ( <i>Rosa acicularis</i> )	2.3	1.0-5.0	100	Surface Texture:
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	1.6	0.0-5.0	33	Effective Texture:
MYRTLE-LEAVED WILLOW ( <i>Salix myrtillifolia</i> )	1.3	1.0-2.0	100	Depth to Mottles/Gley:
BOG CRANBERRY ( <i>Vaccinium vitis-idaea</i> )	1.0	0.0-2.0	67	Organic Thickness: 0 - 5 cm (3)
<b>Tall Forb (&gt;= 30 cm)</b>				Parent Material: Eolian (2), Glacioluvial (1), Glaciolacustrine (1), Fen (1), Undifferentiated Organic (1)
SHOWY ASTER ( <i>Aster conspicuus</i> )	1.6	0.0-5.0	33	Soil Type:
<b>Low Forb (&lt; 30 cm)</b>				Humus Form
BUNCHBERRY ( <i>Cornus canadensis</i> )	3.0	1.0-7.0	100	
HEART-LEAVED ARNICA ( <i>Arnica cordifolia</i> )	2.0	0.0-5.0	67	
<b>Graminoid</b>				
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	4.0	0.0-10.0	67	
<b>Moss</b>				
STAIR-STEP MOSS ( <i>Hylocomium splendens</i> )	51.6	45.0-65.0	100	
SCHREBER'S MOSS ( <i>Pleurozium schreberi</i> )	12.0	0.0-35.0	67	
PEAT MOSS ( <i>Sphagnum</i> )	1.6	0.0-5.0	33	
GOLDEN MOSS ( <i>Tomenthypnum nitens</i> )	1.6	0.0-5.0	33	

## Mne23 Sb/Labrador tea/Golden moss (n=4)

(*Picea mariana*/*Ledum groenlandicum*/*Tomenthypum nitens*)

This community type occurs in association with lowland wet areas. The water table under this type has begun to drop which has allowed succession toward a white spruce-dominated community. Generally, black spruce-larch dominated communities are considered successional mature because of poor drainage, acidic soils and low soil nutrients which prevent succession to white spruce. This community type is likely flooded in the spring.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecotope:** ij fen (subhydric/rich)

**Ecotope Phase:** ij1 treed fen

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Overstory Tree</b>					Ecological Status Score: 25
BLACK SPRUCE ( <i>Picea mariana</i> )	12.0	0.0-30.0	75		Moisture Regime: Subhydric (moderately wet) (2), Hygric (moist) (1)
<b>Understory Tree</b>					Nutrient Regime:
BLACK SPRUCE ( <i>Picea mariana</i> )	6.0	0.0-20.0	50		Elevation (range): 1282 (1230-1330) M
<b>Medium Shrub (0.5 to 2 m)</b>					Slope (%): 6 - 9.99 (2), 0 - 0.49 (1), 2.5 - 5.99 (1)
COMMON LABRADOR TEA ( <i>Ledum groenlandicum</i> )	17.0	5.0-35.0	100		Aspect: Level (1), Easterly (1), Southerly (1)
RED BEARBERRY ( <i>Arctostaphylos rubra</i> )	5.2	0.0-10.0	75		Topographic Position:
MYRTLE-LEAVED WILLOW ( <i>Salix myrtillifolia</i> )	3.7	0.0-10.0	50		<b>Soil Variables</b>
BOG BIRCH ( <i>Betula glandulosa</i> )	2.0	0.0-5.0	75		Soil Drainage: Poorly drained (2)
SMOOTH WILLOW ( <i>Salix glauca</i> )	2.0	0.0-7.0	50		Soil Subgroup: REGO GLEYSOL (3), ORTHIC HUMIC GLEYSOL (1)
<b>Tall Forb (&gt;= 30 cm)</b>					Surface Texture:
COMMON HORSETAIL ( <i>Equisetum arvense</i> )	3.5	0.0-6.0	75		Effective Texture:
<b>Low Forb (&lt; 30 cm)</b>					Depth to Mottles/Gley:
DWARF SCOURING-RUSH ( <i>Equisetum scirpoides</i> )	2.7	0.0-5.0	75		Organic Thickness: 0 - 5 cm (4)
<b>Graminoid</b>					Parent Material: Glaciolacustrine (2), Undifferentiated Organic (2), Eolian (1), Fluvial (1)
WATER SEDGE ( <i>Carex aquatilis</i> )	10.5	0.0-40.0	50		Soil Type:
SEDGE SPECIES ( <i>Carex</i> )	7.0	0.0-25.0	75		Humus Form
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	5.0	0.0-20.0	25		<b>LFH Thickness</b>
SHEATHED SEDGE ( <i>Carex vaginata</i> )	2.5	0.0-5.0	50		Mean
TUFTED HAIR GRASS ( <i>Deschampsia cespitosa</i> )	1.5	0.0-5.0	50		Min
<b>Moss</b>					Max
GOLDEN MOSS ( <i>Tomenthypnum nitens</i> )	51.2	30.0-70.0	100		Count
TUFTED MOSS ( <i>Aulacomnium palustre</i> )	13.2	0.0-45.0	75		cm:
STAIR-STEP MOSS ( <i>Hylocomium splendens</i> )	10.0	5.0-15.0	100		0.00
PEAT MOSS ( <i>Sphagnum warnstorffii</i> )	2.5	0.0-10.0	25		0.00
					0.00
					0



## Mne24 Sb-Lt/Willow-Bog birch/Golden moss (n=6)

(*Picea glauca*-*Larix laricina*/*Salix spp.*-*Betula glandulosa*/*Tomenthypnum nitens*)

This community type is transitional to the Upper Foothills subregion and is characterized by a dominant cover of black spruce and a sparse understory cover. The sites are moist in the spring and dry out later in the growing season. Corns and Annas (1986), found that these forests have a fire origin and can persist for more than 150 years.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** ij fen (subhydric/rich)

**Ecosite Phase:** ij1 treed fen

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 25
BLACK SPRUCE ( <i>Picea mariana</i> )	12.1	8.0-20.0	100	Moisture Regime: Subhydric (moderately wet) (3), Subhydric (moderately moist) (1), Hygric (moist) (1)
TAMARACK ( <i>Larix laricina</i> )	2.8	0.0-12.0	33	Nutrient Regime: Mesotrophic (medium) (1)
<b>Tall Shrub (2 to 5m)</b>				Elevation (range): 1222 (1100-1300) M
BLACK SPRUCE ( <i>Picea mariana</i> )	9.1	1.0-40.0	100	Slope (%): 0 - 0.49 (5), 2.5 - 5.99 (1)
WHITE SPRUCE ( <i>Picea glauca</i> )	3.1	0.0-10.0	50	Aspect: Level (1), Easterly (1), Westerly (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Topographic Position: Level (1)
MYRTLE-LEAVED WILLOW ( <i>Salix myrtillifolia</i> )	17.6	0.0-50.0	83	<b>Soil Variables</b>
COMMON LABRADOR TEA ( <i>Ledum groenlandicum</i> )	5.1	0.0-10.0	83	Soil Drainage: Imperfectly drained (1), Very poorly drained (1)
DWARF BIRCH ( <i>Betula pumila</i> )	2.3	0.0-10.0	33	Soil Subgroup: TERRIC FIBRISOL (1), ORTHIC GLEYSOL (1), REGO GLEYSOL (1), ORTHIC HUMIC GLEYSOL (1), REGO HUMIC GLEYSOL (1)
RED BEARBERRY ( <i>Arctostaphylos rubra</i> )	1.1	0.0-4.0	50	Surface Texture: Fibric (1)
<b>Tall Forb (&gt;= 30 cm)</b>				Effective Texture: Mesic (1)
COMMON HORSETAIL ( <i>Equisetum arvense</i> )	1.5	0.0-5.0	50	Depth to Mottles/Gley:
<b>Low Forb (&lt; 30 cm)</b>				Organic Thickness: 0 - 5 cm (5), 60 - 79 cm (1)
DWARF SCOURING-RUSH ( <i>Equisetum scirpoides</i> )	2.1	0.0-5.0	67	Parent Material: Fluvial (2), Fluvioacustrine (2), Morainal (2), Fen (1), Glaciolacustrine (1), Eolian (1)
<b>Graminoid</b>				Soil Type:
SHEATHED SEDGE ( <i>Carex vaginata</i> )	10.5	0.0-40.0	83	Humus Form FIBRIC PEATYMOR (1)
WIRE RUSH ( <i>Juncus balticus</i> )	5.1	0.0-30.0	33	
NORWAY SEDGE ( <i>Carex norvegica</i> )	5.0	0.0-30.0	17	
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	2.5	0.0-10.0	50	
WATER SEDGE ( <i>Carex aquatilis</i> )	2.1	0.0-8.0	33	
<b>Moss</b>				
GOLDEN MOSS ( <i>Tomenthypnum nitens</i> )	19.5	0.0-65.0	83	
STAIR-STEP MOSS ( <i>Hylocomium splendens</i> )	15.1	0.0-70.0	50	
TUFTED MOSS ( <i>Aulacomnium palustre</i> )	10.1	0.0-40.0	83	
BROWN MOSS ( <i>Drepanocladus revolvens</i> )	5.0	0.0-20.0	33	

## Mne25 Sb-Sw/Bog birch/Sedge (n=1)

(*Picea mariana*-*Picea glauca*/*Betula glandulosa*/*Carex spp.*)

This community type occurs in association with lowland wet areas. The water table under this type has begun to drop which has allowed succession toward a white spruce-dominated community. Generally, black spruce-larch dominated communities are considered successional mature because of poor drainage, acidic soils and low soil nutrients which prevent succession to white spruce. This community type is likely flooded in the spring.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** ij fen (subhydric/rich)

**Ecosite Phase:** ij1 treed fen

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 25
BLACK SPRUCE ( <i>Picea mariana</i> )	17.0	17.0-17.0	100	Moisture Regime: Subhydric (moderately wet) (1)
WHITE SPRUCE ( <i>Picea glauca</i> )	13.0	13.0-13.0	100	Nutrient Regime: Mesotrophic (medium) (1)
<b>Tall Shrub (2 to 5m)</b>				Elevation (range): 1100 (1100-1100) M
WHITE SPRUCE ( <i>Picea glauca</i> )	3.0	3.0-3.0	100	Slope (%): 2.5 - 5.99 (1)
BLACK SPRUCE ( <i>Picea mariana</i> )	3.0	3.0-3.0	100	Aspect: Easterly (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Topographic Position: Lower Slope (1)
BOG BIRCH ( <i>Betula glandulosa</i> )	7.0	7.0-7.0	100	<b>Soil Variables</b>
SHORT-CAPSULED WILLOW ( <i>Salix brachycarpa</i> )	1.0	1.0-1.0	100	Soil Drainage: Poorly drained (1)
RED BEARBERRY ( <i>Arctostaphylos rubra</i> )	1.0	1.0-1.0	100	Soil Subgroup: TYPIC MESISOL (1)
<b>Tall Forb (&gt;= 30 cm)</b>				Surface Texture: Fibric (1)
COMMON HORSETAIL ( <i>Equisetum arvense</i> )	2.0	2.0-2.0	100	Effective Texture: Mesic (1)
<b>Low Forb (&lt; 30 cm)</b>				Depth to Mottles/Gley:
THREE-LEAVED SOLOMON'S-SEAL ( <i>Smilacina trifolia</i> )	1.0	1.0-1.0	100	Organic Thickness: >= 80 cm (1)
<b>Graminoid</b>				Parent Material: Undifferentiated Organic (1)
WATER SEDGE ( <i>Carex aquatilis</i> )	20.0	20.0-20.0	100	Soil Type:
<b>Moss</b>				Humus Form FIBRIMOR (1)
BROWN MOSS ( <i>Drepanocladus revolvens</i> )	70.0	70.0-70.0	100	
GOLDEN MOSS ( <i>Tomenthypnum nitens</i> )	10.0	10.0-10.0	100	
TUFTED MOSS ( <i>Aulacomnium palustre</i> )	3.0	3.0-3.0	100	

## ij2 shrubby fen (n=10)

**Natural Subregion:** Montane  
**Ecosection:** Mn Montane North Ecosection

**Ecosite:** ij fen (subhydric/rich)

### Characteristic Species

#### Tree

- [ 2.5 ] WHITE SPRUCE  
*Picea glauca*
- [ 1.7 ] TAMARACK\*  
*Larix laricina*

#### Shrub

- [ 18.0 ] COMMON LABRADOR TEA\*  
*Ledum groenlandicum*
- [ 8.5 ] MYRTLE-LEAVED WILLOW\*  
*Salix myrtillifolia*
- [ 4.0 ] FLAT-LEAVED WILLOW  
*Salix planifolia*
- [ 2.5 ] SHRUBBY WILLOW  
*Salix arbusculoides*
- [ 2.0 ] RED BEARBERRY  
*Arctostaphylos rubra*
- [ 1.7 ] BOG BIRCH  
*Betula glandulosa*

#### Forb

- [ 5.7 ] SWAMP HORSETAIL  
*Equisetum fluviatile*

#### Moss and Liverwort

- [ 16.5 ] GOLDEN MOSS\*  
*Tomenthypnum nitens*
- [ 13.7 ] STAIR-STEP MOSS  
*Hylocomium splendens*
- [ 6.0 ] BROWN MOSS  
*Drepanocladus*

#### Graminoid

- [ 7.0 ] SHEATHED SEDGE  
*Carex vaginata*
- [ 6.2 ] HAIR-LIKE SEDGE  
*Carex capillaris*
- [ 6.0 ] WATER SEDGE\*  
*Carex aquatilis*
- [ 2.0 ] SMALL BOTTLE SEDGE  
*Carex utriculata*
- [ 1.8 ] BLUEJOINT  
*Calamagrostis canadensis*

### Environmental Variables

Moisture Regime: Subhydric (moderately wet) (5), Hydric (wet) (2), Hygric (moist) (1), Mesic (fresh) (1), Subhygric (moderately moist) (1)

Nutrient Regime: Permesotrophic (rich) (3), Eutrophic (very rich) (2)

Elevation (range): 1194 (990-1340) M

Slope (%): level (7), gentle slope (2)

Aspect: Level (3), Easterly (1), Northerly (1)

Topographic Position: Depression (2), Level (2)

### Soil Variables

Soil Drainage: Very poorly drained (5), Poorly drained (3)

Soil Subgroup: TYPIC FIBRISOL (2), REGO GLEYSOL (2), ORTHIC HUMIC GLEYSOL (1), REGO HUMIC GLEYSOL (1), ORTHIC HUMIC REGOSOL (1), CUMULIC MESISOL (1)

Surface Texture: Fibric (3), Mesic (1)

Effective Texture: Fibric (2), Sandy clay (1), Silt loam (1)

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (5), 16 - 25 cm (1), 26 - 39 cm (1), >= 80 cm (1)

Parent Material: Glaciolacustrine (3), Fluviolacustrine (3), Undifferentiated Organic (3), Fen (1)

Soil Type:

Humus Form MESIC PEATYMOR (1)

## Mnb14 Labrador tea-Willow/Golden moss (n=2)

(*Ledum groenlandicum*-*Salix spp./Tomenthypnum nitens*)

This community type occurs in association with lowland boggy areas. Generally, black spruce-larch dominated communities are considered successional mature because of poor drainage, acidic soils and low soil nutrients which prevent succession to white spruce. This community type is likely flooded in the spring.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** ij fen (subhydric/rich)

**Ecosite Phase:** ij2 shrubby fen

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 40
TAMARACK ( <i>Larix laricina</i> )	3.5	0.0-7.0	50	Moisture Regime: Subhygric (moderately moist) (1), Hygric (moist) (1)
BLACK SPRUCE ( <i>Picea mariana</i> )	3.5	0.0-7.0	50	Nutrient Regime:
<b>Understory Tree</b>				Elevation (range): 1315 (1290-1340) M
WHITE SPRUCE ( <i>Picea glauca</i> )	5.0	0.0-10.0	50	Slope (%): 6 - 9.99 (2)
TAMARACK ( <i>Larix laricina</i> )	1.0	0.0-2.0	50	Aspect: Northerly (1), Easterly (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Topographic Position:
COMMON LABRADOR TEA ( <i>Ledum groenlandicum</i> )	36.0	15.0-57.0	100	<b>Soil Variables</b>
MYRTLE-LEAVED WILLOW ( <i>Salix myrtillifolia</i> )	10.0	5.0-15.0	100	Soil Drainage: Poorly drained (1)
RED BEARBERRY ( <i>Arctostaphylos rubra</i> )	4.0	3.0-5.0	100	Soil Subgroup: REGO GLEYSOL (1)
BOG BIRCH ( <i>Betula glandulosa</i> )	3.5	0.0-7.0	50	Surface Texture:
PRICKLY ROSE ( <i>Rosa acicularis</i> )	2.5	1.0-4.0	100	Effective Texture:
CROWBERRY ( <i>Empetrum nigrum</i> )	1.5	0.0-3.0	50	Depth to Mottles/Gley:
<b>Tall Forb (&gt;= 30 cm)</b>				Organic Thickness: 0 - 5 cm (2)
COMMON HORSETAIL ( <i>Equisetum arvense</i> )	1.0	1.0-1.0	100	Parent Material: Glaciolacustrine (1), Undifferentiated Organic (1)
VARIEGATED HORSETAIL ( <i>Equisetum variegatum</i> )	1.0	1.0-1.0	100	Soil Type:
<b>Graminoid</b>				Humus Form
SHEATHED SEDGE ( <i>Carex vaginata</i> )	14.0	3.0-25.0	100	
HAIR-LIKE SEDGE ( <i>Carex capillaris</i> )	12.5	0.0-25.0	50	
WIRE RUSH ( <i>Juncus balticus</i> )	1.0	0.0-2.0	50	
<b>Moss</b>				
GOLDEN MOSS ( <i>Tomenthypnum nitens</i> )	30.0	30.0-30.0	100	
STAIR-STEP MOSS ( <i>Hylocomium splendens</i> )	27.5	25.0-30.0	100	
TUFTED MOSS ( <i>Aulacomnium palustre</i> )	3.0	1.0-5.0	100	
N/A ( <i>Campylium stellatum</i> )	3.0	1.0-5.0	100	
BROOM MOSS ( <i>Dicranum scoparium</i> )	1.0	0.0-2.0	50	
PEAT MOSS ( <i>Sphagnum warnstorffii</i> )	0.5	0.0-1.0	50	

## Mnb15 Willow-Bog birch/Water sedge (n=7)

(*Salix spp.-Betula glandulosa/Carex aquatilis*)

This community type is similar to the Willow-Bog birch/Sedge community type of Lane et al (2000). It represents a typical willow/sedge community type found on wet, poorly drained soils. There are numerous different species of willow as a result of the open canopy and the wet moisture regime. A high cover of beaked sedge indicates a nitrogen-rich environment where the water is moving. Tufted hair grass (*Deschampsia cespitosa*) will replace marsh reedgrass in this community type at higher elevations (Lane et al, 2000). This would be considered an edaphic climax community since the area is frequently flooded which prevents establishment of trees although it may be found in association with black spruce and black spruce-larch community types.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** ij fen (subhydric/rich)

**Ecosite Phase:** ij2 shrubby fen

### Plant Composition

### Canopy Cover (%)

### Environmental Variables

	Mean	Range	Const.	
<b>Tall Shrub (2 to 5m)</b>				Ecological Status Score: 40
FALSE MOUNTAIN WILLOW ( <i>Salix pseudomonticola</i> )	2.8	0.0-20.0	14	Moisture Regime: Subhydric (moderately wet) (5), Hydric (wet) (2)
SALIX SPECIES ( <i>Salix</i> )	2.4	0.0-10.0	29	Nutrient Regime: Permesotrophic (rich) (3), Eutrophic (very rich) (2)
<b>Medium Shrub (0.5 to 2 m)</b>				Elevation (range): 1107 (990-1340) M
FLAT-LEAVED WILLOW ( <i>Salix planifolia</i> )	8.0	0.0-56.0	14	Slope (%): 0 - 0.49 (6)
MYRTLE-LEAVED WILLOW ( <i>Salix myrtillifolia</i> )	7.1	0.0-50.0	14	Aspect: Level (3)
SHRUBBY WILLOW ( <i>Salix arbusculoides</i> )	5.0	0.0-35.0	14	Topographic Position: Level (2), Depression (2)
DWARF BIRCH ( <i>Betula pumila</i> )	3.0	0.0-10.0	43	<b>Soil Variables</b>
<b>Tall Forb (&gt;= 30 cm)</b>				Soil Drainage: Very poorly drained (5), Poorly drained (2)
SWAMP HORSETAIL ( <i>Equisetum fluviatile</i> )	11.4	0.0-60.0	29	Soil Subgroup: TYPIC FIBRISOL (2), REGO GLEYSOL (1), REGO HUMIC GLEYSOL (1), ORTHIC HUMIC REGOSOL (1), CUMULIC MESISOL (1)
<b>Graminoid</b>				Surface Texture: Fibric (3), Mesic (1)
WATER SEDGE ( <i>Carex aquatilis</i> )	12.1	0.0-25.0	57	Effective Texture: Fibric (2), Sandy clay (1), Silt loam (1)
SEDGE SPECIES ( <i>Carex</i> )	5.1	0.0-34.7	29	Depth to Mottles/Gley:
SMALL BOTTLE SEDGE ( <i>Carex utriculata</i> )	4.1	0.0-10.0	86	Organic Thickness: 0 - 5 cm (2), 16 - 25 cm (1), >= 80 cm (1), 26 - 39 cm (1)
BLUEJOINT ( <i>Calamagrostis canadensis</i> )	3.7	0.0-25.0	29	Parent Material: Fluviolacustrine (2), Glaciolacustrine (2), Undifferentiated Organic (2), Fen (1)
<b>Moss</b>				Soil Type:
BROWN MOSS ( <i>Drepanocladus</i> )	12.1	0.0-85.0	14	Humus Form MESIC PEATYMOR (1)
GOLDEN MOSS ( <i>Tomenthypnum nitens</i> )	3.1	0.0-18.0	43	

## Mnb16 Willow/Kentucky bluegrass (n=1)

(*Salix spp./Poa pratensis*)

This community type represents a grazing disclimax of the Willow-Bog birch/Water sedge dominated community type. Flat leaved willow is not particularly palatable to livestock, but heavy grazing of the understory will allow Kentucky bluegrass and timothy to invade. Once established these introduced species are very palatable to livestock and this community type would be extensively utilized by livestock because of the high moisture and nutrients on the site.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** ij fen (subhydric/rich)

**Ecosite Phase:** ij2 shrubby fen

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Medium Shrub (0.5 to 2 m)</b>				Ecological Status Score: 20-27
FLAT-LEAVED WILLOW ( <i>Salix planifolia</i> )	25.0	25.0-25.0	100	Moisture Regime: Mesic (fresh) (1)
ASPEN ( <i>Populus tremuloides</i> )	1.0	1.0-1.0	100	Nutrient Regime:
PRICKLY ROSE ( <i>Rosa acicularis</i> )	1.0	1.0-1.0	100	Elevation (range): 1160 (1160-1160) M
<b>Tall Forb (&gt;= 30 cm)</b>				Slope (%): 0 - 0.49 (1)
BROOK CINQUEFOIL ( <i>Potentilla rivalis</i> )	1.0	1.0-1.0	100	Aspect:
COMMON BLUE-EYED GRASS ( <i>Sisyrinchium montanum</i> )	1.0	1.0-1.0	100	Topographic Position:
<b>Low Forb (&lt; 30 cm)</b>				<b>Soil Variables</b>
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	1.0	1.0-1.0	100	Soil Drainage:
SILVERWEED ( <i>Potentilla anserina</i> )	1.0	1.0-1.0	100	Soil Subgroup: ORTHIC HUMIC GLEYSOL (1)
<b>Graminoid</b>				Surface Texture:
QUACK GRASS ( <i>Agropyron repens</i> )	35.0	35.0-35.0	100	Effective Texture:
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	35.0	35.0-35.0	100	Depth to Mottles/Gley:
TIMOTHY ( <i>Phleum pratense</i> )	1.0	1.0-1.0	100	Organic Thickness: 0 - 5 cm (1)
<b>Moss</b>				Parent Material: Fluviolacustrine (1)
HAIRY SCREW MOSS ( <i>Tortula ruralis</i> )	1.0	1.0-1.0	100	Soil Type:
<b>Lichen</b>				Humus Form
N/A ( <i>Peltigera rufescens</i> )	5.0	5.0-5.0	100	

## ij3 graminoid fen (n=3)

Natural Subregion: Montane

Ecosection: Mn Montane North Ecosection

Ecosite: ij fen (subhydric/rich)

### Characteristic Species

#### Shrub

- [ 1.6 ] FLAT-LEAVED WILLOW  
*Salix planifolia*
- [ 1.6 ] AUTUMN WILLOW  
*Salix serissima*
- [ 1.0 ] ATHABASCA WILLOW  
*Salix athabascensis*

#### Graminoid

- [ 32.0 ] SMALL BOTTLE SEDGE\*  
*Carex utriculata*
- [ 10.0 ] ROCKY-GROUND SEDGE  
*Carex saxatilis*
- [ 10.0 ] HAIR-LIKE SEDGE  
*Carex capillaris*
- [ 8.3 ] WATER SEDGE\*  
*Carex aquatilis*
- [ 1.6 ] TUFTED HAIR GRASS  
*Deschampsia cespitosa*
- [ 1.3 ] BLUEJOINT  
*Calamagrostis canadensis*

### Environmental Variables

Moisture Regime: Hydric (wet) (1)  
Nutrient Regime: Permesotrophic (rich) (1)  
Elevation (range): 1287 (1220-1420) M  
Slope (%): level (3)  
Aspect: Level (1)  
Topographic Position: Level (1)

### Soil Variables

Soil Drainage: Poorly drained (1), Very poorly drained (1)  
Soil Subgroup: TERRIC FIBRISOL (1), REGO GLEYSOL (1)  
Surface Texture: Mesic (1)  
Effective Texture: Silt (1)  
Depth to Mottles/Gley:  
Organic Thickness: 0 - 5 cm (2), 60 - 79 cm (1)  
Parent Material: Fen (2), Lacustrine (1), Fluvial (1), Undifferentiated Organic (1)  
Soil Type:  
Humus Form FIBRIMOR (1)

## Mna8 Water sedge meadows (n=3)

### (*Carex aquatilis*)

This community type is found in all subregions of Alberta. Wet conditions and periodic flooding result in the formation of sedge meadows. Bog birch and willow will invade into the drier edges of these meadows to form the Willow/Sedge and Bog birch /Sedge community types. These community types are quite productive producing nearly 2000 kg/ha of forage, but the high water table in the spring and summer when these meadows are most palatable limits livestock use. A study in the Yukon found that crude protein on these meadows declined from a high of 10% in May to less than 5% in September (Bailey et al. 1992).

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** ij fen (subhydric/rich)

**Ecosite Phase:** ij3 graminoid fen

#### Plant Composition

#### Canopy Cover (%)

#### Environmental Variables

	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Medium Shrub (0.5 to 2 m)</b>					Ecological Status Score: 40
FLAT-LEAVED WILLOW ( <i>Salix planifolia</i> )	1.6	0.0-5.0	33		Moisture Regime: Hydric (wet) (1)
AUTUMN WILLOW ( <i>Salix serissima</i> )	1.6	0.0-5.0	33		Nutrient Regime: Permesotrophic (rich) (1)
ATHABASCA WILLOW ( <i>Salix athabascensis</i> )	1.0	0.0-3.0	33		Elevation (range): 1287 (1220-1420) M
<b>Graminoid</b>					Slope (%): 0 - 0.49 (3)
SMALL BOTTLE SEDGE ( <i>Carex utriculata</i> )	32.0	11.0-60.0	100		Aspect: Level (1)
HAIR-LIKE SEDGE ( <i>Carex capillaris</i> )	10.0	0.0-30.0	33		Topographic Position: Level (1)
ROCKY-GROUND SEDGE ( <i>Carex saxatilis</i> )	10.0	0.0-30.0	33		<b>Soil Variables</b>
WATER SEDGE ( <i>Carex aquatilis</i> )	8.3	0.0-15.0	67		Soil Drainage: Poorly drained (1), Very poorly drained (1)
TUFTED HAIR GRASS ( <i>Deschampsia cespitosa</i> )	1.6	0.0-5.0	33		Soil Subgroup: TERRIC FIBRISOL (1), REGO GLEYSOL (1)
BLUEJOINT ( <i>Calamagrostis canadensis</i> )	1.3	0.0-3.0	67		Surface Texture: Mesic (1)
					Effective Texture: Silt (1)
					Depth to Mottles/Gley:
					Organic Thickness: 0 - 5 cm (2), 60 - 79 cm (1)
					Parent Material: Fen (2), Undifferentiated Organic (1), Fluvial (1), Lacustrine (1)
					Soil Type:
					Humus Form FIBRIMOR (1)



## k marsh (hydric/rich) (n=2)

**Natural Subregion:** Montane

### General Description

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The marsh ecosite is found in level and depressional areas along shorelines of water bodies and riparian zones. The water is above the rooting zone for at least part of the growing season. These ecosites are dominated by a wide variety of emergent sedges and rushes. This ecosite is not common in the Montane northern ecosection and was described at only two sites in West Central Alberta.



### Successional Relationships

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The marsh ecosite characterizes the beginning stages of hydrarch succession. It can be thought of as successional stable with changes in plant community composition being determined largely by disturbance regime.

### Indicator Species

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#### Shrub

BOG BIRCH  
*Betula glandulosa*

#### Graminoid

GREAT BULRUSH  
*Scirpus acutus*  
SHEATHED SEDGE  
*Carex vaginata*

**Ecosection:** Mn Montane North Ecosection

### Environmental Variables

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Moisture Regime: Hydric (wet) (2)  
Nutrient Regime: Eutrophic (very rich) (1), Permesotrophic (rich) (1)  
Elevation (range): 1109 (998-1220) M  
Slope (%): level (1), nearly level (1)  
Aspect: Level (1), Northerly (1)  
Topographic Position: Depression (1), Level (1)

### Soil Variables

---

Soil Drainage: Very poorly drained (2)  
Soil Subgroup: REGO HUMIC GLEYSOL (2)  
Surface Texture: Fibric (1), Silty clay (1)  
Effective Texture: Clay loam (1), Heavy clay (1)  
Depth to Mottles/Gley:  
Organic Thickness: 26 - 39 cm (1)  
Parent Material: Lacustrine (1)  
Soil Type:  
Humus Form ANMOOR (1)

# k1 marsh (n=2)

**Natural Subregion:** Montane  
**Ecosection:** Mn Montane North Ecosection

**Ecosite:** k marsh (hydric/rich)

## Characteristic Species

### Shrub

- [ 12.5 ] BOG BIRCH\*  
*Betula glandulosa*

### Forb

- [ 1.0 ] TALL EVERLASTING  
*Antennaria anaphaloides*
- [ 1.0 ] SMALL-FLOWERED ANEMONE  
*Anemone parviflora*

### Moss and Liverwort

- [ 30.0 ] BROWN MOSS  
*Drepanocladus vernicosus*
- [ 10.0 ] N/A  
*Scorpidium scorpioides*
- [ 5.0 ] N/A  
*Campylium stellatum*

### Graminoid

- [ 30.0 ] UNDIFFERENTIATED SCIRPUS  
*Scirpus*
- [ 5.0 ] SHEATHED SEDGE\*  
*Carex vaginata*
- [ 4.0 ] GREAT BULRUSH\*  
*Scirpus acutus*
- [ 1.0 ] INLAND SEDGE  
*Carex interior*

## Environmental Variables

Moisture Regime: Hydric (wet) (2)  
Nutrient Regime: Eutrophic (very rich) (1), Permesotrophic (rich) (1)  
Elevation (range): 1109 (998-1220) M  
Slope (%): level (1), nearly level (1)  
Aspect: Level (1), Northerly (1)  
Topographic Position: Level (1), Depression (1)

## Soil Variables

Soil Drainage: Very poorly drained (2)  
Soil Subgroup: REGO HUMIC GLEYSOL (2)  
Surface Texture: Silty clay (1), Fibric (1)  
Effective Texture: Heavy clay (1), Clay loam (1)  
Depth to Mottles/Gley:  
Organic Thickness: 26 - 39 cm (1)  
Parent Material: Lacustrine (1)  
Soil Type:  
Humus Form ANMOOR (1)

## Mna9 Great bulrush (n=2)

### (*Scirpus acutus*)

This community type occurs along the margins of ponds and lakes (Thompson and Hansen 2002). Great bulrush tends to be found growing in the water. Often the water is up to 2 m deep. This community type is much wetter than the previously described small fruited bulrush community. The wet conditions and unpalatability of great bulrush limits the use of this community type. This community should be rated as non-use.

**Natural Subregion:** Montane

**Ecosection:** Mn Montane North Ecosection

**Ecosite:** k marsh (hydric/rich)

**Ecosite Phase:** k1 marsh

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Medium Shrub (0.5 to 2 m)</b>				Ecological Status Score: 40
BOG BIRCH ( <i>Betula glandulosa</i> )	12.5	0.0-25.0	50	Moisture Regime: Hydric (wet) (2)
<b>Low Forb (&lt; 30 cm)</b>				Nutrient Regime: Permesotrophic (rich) (1), Eutrophic (very rich) (1)
TALL EVERLASTING ( <i>Antennaria anaphaloides</i> )	1.0	0.0-2.0	50	Elevation (range): 1109 (998-1220) M
SMALL-FLOWERED ANEMONE ( <i>Anemone parviflora</i> )	1.0	0.0-2.0	50	Slope (%): 0 - 0.49 (1), 0.5 - 2.49 (1)
<b>Graminoid</b>				Aspect: Level (1), Northerly (1)
UNDIFFERENTIATED SCIRPUS ( <i>Scirpus</i> )	30.0	0.0-60.0	50	Topographic Position: Level (1), Depression (1)
SHEATHED SEDGE ( <i>Carex vaginata</i> )	5.0	0.0-10.0	50	<b>Soil Variables</b>
GREAT BULRUSH ( <i>Scirpus acutus</i> )	4.0	0.0-8.0	50	Soil Drainage: Very poorly drained (2)
INLAND SEDGE ( <i>Carex interior</i> )	1.0	0.0-2.0	50	Soil Subgroup: REGO HUMIC GLEYSOL (2)
<b>Moss</b>				Surface Texture: Fibric (1), Silty clay (1)
BROWN MOSS ( <i>Drepanocladus vernicosus</i> )	30.0	0.0-60.0	50	Effective Texture: Clay loam (1), Heavy clay (1)
N/A ( <i>Scorpidium scorpioides</i> )	10.0	0.0-20.0	50	Depth to Mottles/Gley:
N/A ( <i>Campylium stellatum</i> )	5.0	0.0-10.0	50	Organic Thickness: 26 - 39 cm (1)
				Parent Material: Lacustrine (1)
				Soil Type:
				Humus Form ANMOOR (1)

# Ms Montane South Ecosection (n=3145)

Natural Subregion: Montane

## General Description

The Montane Natural subregion is composed of several geographically separate units. The south ecosection represents the largest contiguous unit that includes areas north of the Bow Valley and south along the foothills to the Montana-Alberta border. The Montane subregion in this ecosection intergrades with the Foothills Fescue and Foothills Parkland Natural subregions, which have similar climates, vegetation and soils along the boundary, and also generally borders the Subalpine as elevation increases to the west. This ecosection includes the Banff Mountains, Black Diamond Upland, Blairmore Foothills, Bragg Creek Foothills, Jasper Mountains and Morley Foothills ecodistricts.



Lodgepole pine, Douglas fir and aspen stands occur on easterly and northerly aspects and rough fescue dominated grasslands on southerly and westerly aspects at lower elevations are typical of the Montane South Ecosection.



## Environmental Variables

Elevation (range): 1510 (450-5453) M

## Ecological Sites

## Site Count

a	limber pine/juniper(subxeric/poor)	14
aa	bluebunch wheat grass(subxeric/medium)	111
b	bearberry(submesic/poor)	241
c	buffaloberry/hairy wild rye (submesic/medium)	512
cc	rough fescue grassland(submesic/rich)	1153
d	mahonia-meadowsweet(mesic/medium)	604
e	thimbleberry/pine grass(mesic/rich)	229
f	balsam poplar(subhygric/rich)	56
g	meadow(subhygric/very rich)	102
h	horsetail(hygric/rich)	35
ij	fen(subhydric/rich)	84
k	marsh(hydric/rich)	4

## a limber pine/juniper(subxeric/poor) (n=14)

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

### General Description

Dry site conditions and exposure to westerly winds characterize this ecosite. The tree canopy is generally open and a well-developed grass layer is present. This ecosite commonly occurs on exposed ridge tops or upper slope positions within the subregion. Soils are often shallow to bedrock (Archibald et al. 1996).



### Successional Relationships

Open Douglas-fir and/or limber pine stands with grassland vegetation form an edaphic climax on these sites. Exposure and drought limit the establishment and growth rates of tree species (Archibald et al. 1996). Grass understory is commonly low in productivity with fair amounts of bare soil.

### Indicator Species

#### Tree

LIMBER PINE  
*Pinus flexilis*  
DOUGLAS-FIR  
*Pseudotsuga menziesii*

#### Shrub

GROUND JUNIPER  
*Juniperus communis*  
COMMON BEARBERRY  
*Arctostaphylos uva-ursi*

#### Graminoid

FOOTHILLS ROUGH FESCUE  
*Festuca campestris*

Site Index at 50 Years	Height (m)	Variation (m)	Count
LOGEPOLE PINE <i>(Pinus contorta)</i>	5.80	0.00	0
DOUGLAS-FIR <i>(Pseudotsuga menziesii)</i>	6.00	0.20	0

### Environmental Variables

Moisture Regime: Subxeric (moderately dry) (11), Xeric (dry) (8)

Nutrient Regime: Submesotrophic (poor) (9), Mesotrophic (medium) (6)

Elevation (range): 1643 (1436-1845) M

Slope (%): strong slope (9), very strong slope (3), level (3), moderate slope (2), steep slope (2)

Aspect: Westerly (8), Southerly (7), Level (1)

Topographic Position: Crest (11), Upper Slope (4), Midslope (2)

### Soil Variables

Soil Drainage: Rapidly drained (12), Well drained (4), Very rapidly drained (2)

Soil Subgroup: ORTHIC EUTRIC BRUNISOL (2), ORTHIC GRAY LUVISOL (1), CUMULIC REGOSOL (1)

Surface Texture: Sandy loam (2), Sandy clay loam (1)

Effective Texture: Loam (1), Sandy loam (1)

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (4)

Parent Material: Saprolite (3), Colluvial (1), Fluvial (1), Rock (1)

Soil Type:

Humus Form FIBRIMOR (3)

LFH Thickness	Mean	Min	Max	Count
cm:	2.00	1.00	5.00	3

# a1 limber pine/juniper Fd-Pf (n=14)

**Natural Subregion:** Montane  
**Ecosection:** Ms Montane South Ecosection

**Ecosite:** a limber pine/juniper(subxeric/poor)

## General Description

This phase represents thinly forested very dry ridge tops and upper slopes in the Montane south ecosection. Generally the understory is covered in grass species, however productivity is low and naturally occurring exposed soil is common.

## Characteristic Species

### Tree

- [ 21.9 ] DOUGLAS-FIR  
*Pseudotsuga menziesii*
- [ 10.3 ] LIMBER PINE  
*Pinus flexilis*

### Shrub

- [ 23.3 ] COMMON BEARBERRY  
*Arctostaphylos uva-ursi*
- [ 11.7 ] GROUND JUNIPER  
*Juniperus communis*
- [ 3.0 ] CANADA BUFFALOBERRY  
*Shepherdia canadensis*
- [ 2.2 ] SHRUBBY CINQUEFOIL  
*Potentilla fruticosa*

### Forb

- [ 2.7 ] YELLOW HEDYSARUM  
*Hedysarum sulphurescens*
- [ 1.3 ] CUT-LEAVED ANEMONE  
*Anemone multifida*
- [ 1.1 ] BALSAMROOT  
*Balsamorhiza sagittata*

### Graminoid

- [ 2.4 ] FOOTHILLS ROUGH FESCUE  
*Festuca campestris*
- [ 2.2 ] HAIRY WILD RYE  
*Elymus innovatus*

## Environmental Variables

Moisture Regime: Subxeric (moderately dry) (11), Xeric (dry) (8)  
 Nutrient Regime: Submesotrophic (poor) (9), Mesotrophic (medium) (6)  
 Elevation (range): 1643 (1436-1845) M  
 Slope (%): strong slope (9), very strong slope (3), level (3), steep slope (2), moderate slope (2)  
 Aspect: Westerly (8), Southerly (7), Level (1)  
 Topographic Position: Crest (11), Upper Slope (4), Midslope (2)

## Soil Variables

Soil Drainage: Rapidly drained (12), Well drained (4), Very rapidly drained (2)  
 Soil Subgroup: ORTHIC EUTRIC BRUNISOL (2), ORTHIC GRAY LUVISOL (1), CUMULIC REGOSOL (1)  
 Surface Texture: Sandy loam (2), Sandy clay loam (1)  
 Effective Texture: Loam (1), Sandy loam (1)  
 Depth to Mottles/Gley:  
 Organic Thickness: 0 - 5 cm (4)  
 Parent Material: Saprolite (3), Rock (1), Colluvial (1), Fluvial (1)  
 Soil Type:  
 Humus Form FIBRIMOR (3)

## LFH Thickness

	Mean	Min	Max	Count
cm:	2.00	1.00	5.00	3

## Mse2 Pf-Fd/Juniper/Bearberry (n=14)

(*Pinus flexilis*-*Pseudotsuga menziesii*/*Juniperus communis*/*Arctostaphylos uva-ursi*)

This community type occurs on steep, exposed ridge tops and upper slope positions within the Montane subregion. It is characterized by dry site conditions and exposure to westerly winds. Soils are often shallow to bedrock (Archibald et al 1996). This community often forms an edaphic climax on these sites. Limber pine is normally associated with high elevations or timberline where it attains a Krummholz form (Kuchar 1973). However, the southwest Montane falls within limber pine's northern limit where it can generally be found at the lower elevations between prairie and coniferous forest. Limber pine, bearberry, juniper and the other associated species are all well adapted to the low moisture levels, high light intensity, heat and low soil nutrient levels which occur on these erosional, south-facing scarps (Kuchar 1973). Utilization of this site by livestock is often difficult because of the steep slope, and overuse commonly increases soil exposure and erosion potential. This plant community should be considered tertiary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** a limber pine/juniper(subxeric/poor)

**Ecosite Phase:** a1 limber pine/juniper Fd-Pf

### Plant Composition

### Canopy Cover (%)

### Environmental Variables

	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 20-25
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	18.6	0.0-55.0	93	Moisture Regime: Subxeric (moderately dry) (11), Xeric (dry) (8)
LIMBER PINE ( <i>Pinus flexilis</i> )	10.3	0.0-30.0	71	Nutrient Regime: Submesotrophic (poor) (9), Mesotrophic (medium) (6)
<b>Understory Tree</b>				Elevation (range): 1643 (1436-1845) M
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	2.2	0.0-14.0	25	Slope (%): 16 - 30.99 (9), 31 - 45.99 (3), 0 - 0.49 (3), 46 - 70.99 (2), 10 - 15.99 (2)
<b>Medium Shrub (0.5 to 2 m)</b>				Aspect: Westerly (8), Southerly (7), Level (1)
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	23.3	0.0-63.7	93	Topographic Position: Crest (11), Upper Slope (4), Midslope (2)
GROUND JUNIPER ( <i>Juniperus communis</i> )	11.7	3.0-24.0	100	<b>Soil Variables</b>
CANADA BUFFALOBERRY ( <i>Shepherdia canadensis</i> )	3.0	0.0-12.0	64	Soil Drainage: Rapidly drained (12), Well drained (4), Very rapidly drained (2)
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	2.2	0.0-10.0	71	Soil Subgroup: ORTHIC EUTRIC BRUNISOL (2), ORTHIC GRAY LUVISOL (1), CUMULIC REGOSOL (1)
<b>Tall Forb (&gt;= 30 cm)</b>				Surface Texture: Sandy loam (2), Sandy clay loam (1)
YELLOW HEDYSARUM ( <i>Hedysarum sulphurescens</i> )	2.7	0.0-8.9	79	Effective Texture: Loam (1), Sandy loam (1)
BALSAMROOT ( <i>Balsamorhiza sagittata</i> )	1.1	0.0-8.3	36	Depth to Mottles/Gley:
<b>Low Forb (&lt; 30 cm)</b>				Organic Thickness: 0 - 5 cm (4)
CUT-LEAVED ANEMONE ( <i>Anemone multifida</i> )	1.3	0.0-4.4	57	Parent Material: Saprolite (3), Colluvial (1), Fluvial (1), Rock (1)
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	1.0	0.0-3.0	93	Soil Type:
<b>Graminoid</b>				Humus Form FIBRIMOR (3)
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	2.4	0.0-7.8	29	<b>LFH Thickness</b>
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	2.2	0.0-16.0	64	<b>Mean</b>
				<b>Min</b>
				<b>Max</b>
				<b>Count</b>
				cm: 2.00 1.00 5.00 3

## aa bluebunch wheat grass(subxeric/medium) (n=111)

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

### General Description

This ecosite is located on steep, south and west facing slopes throughout the Montane South, particularly in the Gap and Castle Areas. The soils are poorly developed, nutrient poor and generally have xeric or subxeric moisture regimes. The grassland communities nearing the north end of this area are often dominated by northern wheat grass, june grass, fringed sage, sheep fescue and upland sedge species. In contrast the south end of this area is often dominated by bluebunch wheat grass. Big sagebrush dominated communities are also found in isolated areas in the South Castle in this ecosite.



### Environmental Variables

**Moisture Regime:** Xeric (dry) (15), Subxeric (moderately dry) (11), Submesic (moderately fresh) (7), Mesic (fresh) (3), Very Xeric (very dry) (1)

**Nutrient Regime:** Mesotrophic (medium) (22), Submesotrophic (poor) (12), Permesotrophic (rich) (3)

**Elevation (range):** 1539 (1367-1829) M

**Slope (%):** very strong slope (15), steep slope (8), strong slope (4), moderate slope (1)

**Aspect:** Southerly (20), Westerly (8)

**Topographic Position:** Midslope (15), Upper Slope (10), Lower Slope (5), Crest (1)

### Soil Variables

**Soil Drainage:** Very rapidly drained (19), Well drained (13), Rapidly drained (7)

**Soil Subgroup:** ORTHIC EUTRIC BRUNISOL (2), ORTHIC REGOSOL (2)

**Surface Texture:** Clay loam (2), Silt loam (1)

**Effective Texture:** Clay (3), Clay loam (1), Silty clay (1)

**Depth to Mottles/Gley:** None (1)

**Organic Thickness:** 0 - 5 cm (1)

**Parent Material:** Morainal (2), Colluvial (1), Glaciofluvial (1)

**Soil Type:** Dry/Fine (1), Very Dry/Fine (1), Shallow (0)

**Humus Form:** MULL (1)

### Successional Relationships

Due to the dry nature of the site, grasslands often remain the climax vegetation on these sites. In the absence of fire or other disturbance shrubs such as saskatoon, snowberry and chokecherry, often become established. Although no phases are described, further succession may lead to thin Douglas-fir or limber pine similar to those in the submesic ecosite. Heavy grazing pressure on the grasslands can often lead to a degraded soil site that is dominated by fringed sage, sedge and little club-moss. However, on sites closer to submesic, timothy and Kentucky bluegrass can often invade into this ecological site, especially on high precipitation years.

### LFH Thickness

	Mean	Min	Max	Count
cm:	1.00	1.00	1.00	2

### Indicator Species

#### Shrub

BIG SAGEBRUSH

*Artemisia tridentata*

COMMON BEARBERRY

*Arctostaphylos uva-ursi*

#### Forb

WILD BERGAMOT

*Monarda fistulosa*

#### Graminoid

FOOTHILLS ROUGH FESCUE

*Festuca campestris*

IDAHO FESCUE

*Festuca idahoensis*

BLUEBUNCH WHEAT GRASS

*Agropyron spicatum*

BLUNT SEDGE

*Carex obtusata*



# aa1 bluebunch wheat grass grassland (n=45)

**Natural Subregion:** Montane  
**Ecosection:** Ms Montane South Ecosection

**Ecosite:** aa bluebunch wheat grass(subxeric/medium)

## General Description

Bluebunch wheat grass dominated grasslands occur in select portions of the Montane South Ecosection including towards the Gap and Castle areas. These are considered only slightly drier than the submesic/poor [b] ecosite, and occur on the tops of steep south and west facing slopes.

## Characteristic Species

### Shrub

- [ 9.6 ] COMMON BEARBERRY  
*Arctostaphylos uva-ursi*
- [ 5.3 ] PRICKLY ROSE  
*Rosa acicularis*
- [ 2.9 ] SASKATOON  
*Amelanchier alnifolia*
- [ 2.0 ] WHITE MEADOWSWEET  
*Spiraea betulifolia*

### Forb

- [ 2.3 ] PASTURE SAGEWORT  
*Artemisia frigida*
- [ 2.2 ] SMALL-LEAVED PUSSYTOES  
*Antennaria parvifolia*
- [ 1.3 ] COMMON YARROW  
*Achillea millefolium*
- [ 1.2 ] SILKY PERENNIAL LUPINE  
*Lupinus sericeus*

### Graminoid

- [ 16.2 ] BLUEBUNCH WHEAT GRASS  
*Agropyron spicatum*
- [ 5.7 ] JUNE GRASS  
*Koeleria macrantha*
- [ 3.3 ] FOOTHILLS ROUGH FESCUE  
*Festuca campestris*
- [ 2.0 ] BLUNT SEDGE  
*Carex obtusata*
- [ 1.5 ] IDAHO FESCUE  
*Festuca idahoensis*

## Environmental Variables

Moisture Regime: Xeric (dry) (5), Submesic (moderately fresh) (4), Subxeric (moderately dry) (4)

Nutrient Regime: Mesotrophic (medium) (10), Submesotrophic (poor) (3), Permesotrophic (rich) (1)

Elevation (range): 1556 (1367-1798) M

Slope (%): steep slope (6), very strong slope (4), strong slope (3), moderate slope (1)

Aspect: Southerly (10), Westerly (4)

Topographic Position: Midslope (5), Upper Slope (5), Lower Slope (1), Crest (1)

## Soil Variables

Soil Drainage: Well drained (8), Very rapidly drained (6)

Soil Subgroup: ORTHIC EUTRIC BRUNISOL (1), ORTHIC REGOSOL (1)

Surface Texture: Silt loam (1), Clay loam (1)

Effective Texture: Clay loam (1), Clay (1)

Depth to Mottles/Gley:

Organic Thickness:

Parent Material: Morainal (1), Colluvial (1)

Soil Type: Very Dry/Fine (1), Dry/Fine (1)

Humus Form

## LFH Thickness

	Mean	Min	Max	Count
cm:	1.00	1.00	1.00	1

## Msb3 Bluebunch wheat grass-Sedge (n=37)

### (*Agropyron spicatum-Carex obtusata*)

Bluebunch wheat grass dominated sites are found on well-drained, south facing-slopes in the Montane subregion throughout southern Alberta (Strong 1992). This community type resembles the Snowberry-Rose/Bluebunch wheatgrass-Rough fescue (Msd23) community but the cover and density of snowberry, rose and saskatoon are reduced in this community type (<15% shrub cover). It appears that increased grazing pressure on this community reduces the litter levels making moisture conditions more favorable for the growth of grass and forbs over shrubs (Rangeland Reference Area data North Todd and Station Creek 2020 Appendix 3). Bluebunch wheatgrass dominated communities are abundant in the interior of southern British Columbia, where it is co-dominant with big sagebrush (*Artemisia tridentata*) at lower elevations and rough fescue at higher elevations (Tisdale 1947). Increased grazing pressure on the drier sites leads to a decline in bluebunch wheat grass and allows low growing forbs and sedge species to increase to form the Sedge-Junegrass-Bluebunch wheatgrass/Fringed sage (Msc13) dominated community type. On sites with big sagebrush in British Columbia, bluebunch wheat grass decreases and big sagebrush will increase with increased grazing pressure (Tisdale 1947).

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** aa bluebunch wheat grass(subxeric/medium)

**Ecosite Phase:** aa1 bluebunch wheat grass grassland

Plant Composition	Canopy Cover (%)			Environmental Variables										
	Mean	Range	Const.											
<b>Medium Shrub (0.5 to 2 m)</b>				Ecological Status Score: 27-40 Moisture Regime: Xeric (dry) (5), Subxeric (moderately dry) (3), Submesic (moderately fresh) (3) Nutrient Regime: Mesotrophic (medium) (8), Submesotrophic (poor) (3), Permesotrophic (rich) (1) Elevation (range): 1604 (1495-1798) M Slope (%): 46 - 70.99 (4), 31 - 45.99 (4), 16 - 30.99 (3) Aspect: Southerly (7), Westerly (4) Topographic Position: Upper Slope (5), Midslope (4), Crest (1)										
SASKATOON ( <i>Amelanchier alnifolia</i> )	1.6	0.0-22.2	27											
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	1.0	0.0-10.3	35											
<b>Low Shrub (&lt; 0.5m)</b>														
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	4.5	0.0-12.9	84											
PRICKLY ROSE ( <i>Rosa acicularis</i> )	3.6	0.0-17.7	49											
SASKATOON ( <i>Amelanchier alnifolia</i> )	3.1	0.0-13.6	60											
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	2.6	0.0-44.7	14											
PRAIRIE ROSE ( <i>Rosa arkansana</i> )	2.3	0.0-14.9	41											
<b>Tall Forb (&gt;= 30 cm)</b>														
MOUNTAIN WILD PARSNIP ( <i>Lomatium dissectum</i> )	1.9	0.0-16.6	27											
YELLOW BEARDTONGUE ( <i>Penstemon confertus</i> )	1.8	0.0-24.5	49											
SILKY PERENNIAL LUPINE ( <i>Lupinus sericeus</i> )	1.6	0.0-9.7	51											
SMOOTH ASTER ( <i>Aster laevis</i> )	1.0	0.0-8.5	35											
WILD BERGAMOT ( <i>Monarda fistulosa</i> )	0.9	0.0-10.4	30											
<b>Low Forb (&lt; 30 cm)</b>														
PASTURE SAGEWORT ( <i>Artemisia frigida</i> )	2.5	0.0-12.4	54											
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	2.2	0.0-17.6	38											
COMMON YARROW ( <i>Achillea millefolium</i> )	1.6	0.0-10.1	89											
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	1.3	0.0-5.7	97											
<b>Graminoid</b>														
BLUEBUNCH WHEAT GRASS ( <i>Agropyron spicatum</i> )	11.1	6.0-26.6	100											
BLUNT SEDGE ( <i>Carex obtusata</i> )	4.5	0.0-21.6	87											
JUNE GRASS ( <i>Koeleria macrantha</i> )	3.2	0.0-14.8	89											
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	2.9	0.0-13.9	74											
				<b>Soil Variables</b>										
				Soil Drainage: Very rapidly drained (6), Well drained (6)										
				Soil Subgroup: ORTHIC REGOSOL (1), ORTHIC EUTRIC BRUNISOL (1)										
				Surface Texture: Silt loam (1), Clay loam (1)										
				Effective Texture: Clay loam (1), Clay (1)										
				Depth to Mottles/Gley:										
				Organic Thickness:										
				Parent Material: Colluvial (1), Morainal (1)										
				Soil Type: Very Dry/Fine (1), Dry/Fine (1)										
				Humus Form										
				<table border="1"> <thead> <tr> <th>LFH Thickness</th> <th>Mean</th> <th>Min</th> <th>Max</th> <th>Count</th> </tr> </thead> <tbody> <tr> <td>cm:</td> <td>1.00</td> <td>1.00</td> <td>1.00</td> <td>1</td> </tr> </tbody> </table>	LFH Thickness	Mean	Min	Max	Count	cm:	1.00	1.00	1.00	1
LFH Thickness	Mean	Min	Max	Count										
cm:	1.00	1.00	1.00	1										

## Msc13 Sedge-June grass-Bluebunch wheat grass/Fringed sage (n=8)

(*Carex obtusata*-*Koeleria macrantha*-*Agropyron spicatum*/*Artemisia frigida*)

This community type represents a grazing disclimax of the bluebunch wheat grass dominated community found on steep south facing slopes in the Montane. As grazing pressure increases bluebunch wheat grass cover will decline and sedge, june grass and fringed sage will dominate the site. If grazing pressure continues to increase it is believed these sites will eventually become dominated by fringed sage and little club-moss (Bailey et al. 1992), but this community type has not been described in Alberta.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** aa bluebunch wheat grass(subxeric/medium)

**Ecosite Phase:** aa1 bluebunch wheat grass grassland

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Medium Shrub (0.5 to 2 m)</b>				Ecological Status Score: 15-27
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	2.0	0.8-3.6	100	Moisture Regime: Submesic (moderately fresh) (1), Subxeric (moderately dry) (1)
<b>Low Shrub (&lt; 0.5m)</b>				Nutrient Regime: Mesotrophic (medium) (2)
PRAIRIE ROSE ( <i>Rosa arkansana</i> )	1.1	0.0-2.4	88	Elevation (range): 1509 (1367-1580) M
<b>Tall Forb (&gt;= 30 cm)</b>				Slope (%): 46 - 70.99 (2), 10 - 15.99 (1)
GRACEFUL CINQUEFOIL ( <i>Potentilla gracilis</i> )	0.7	0.0-1.9	63	Aspect: Southerly (3)
LOW GOLDENROD ( <i>Solidago missouriensis</i> )	0.6	0.0-3.3	25	Topographic Position: Lower Slope (1), Midslope (1)
<b>Low Forb (&lt; 30 cm)</b>				<b>Soil Variables</b>
PASTURE SAGEWORT ( <i>Artemisia frigida</i> )	3.8	1.1-9.3	100	Soil Drainage: Well drained (2)
SMALL-LEAVED PUSSYTOES ( <i>Antennaria parvifolia</i> )	2.2	0.0-8.2	50	Soil Subgroup:
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	0.8	0.0-2.7	50	Surface Texture:
COMMON YARROW ( <i>Achillea millefolium</i> )	0.6	0.0-2.0	50	Effective Texture:
CUT-LEAVED ANEMONE ( <i>Anemone multifida</i> )	0.6	0.0-1.6	50	Depth to Mottles/Gley:
FEW-FLOWERED MILK VETCH ( <i>Astragalus vexilliflexus</i> )	0.6	0.0-2.2	38	Organic Thickness:
THREE-FLOWERED AVENS ( <i>Geum triflorum</i> )	0.5	0.0-2.0	50	Parent Material:
<b>Graminoid</b>				Soil Type:
BLUNT SEDGE ( <i>Carex obtusata</i> )	7.9	3.8-12.0	100	Humus Form
JUNE GRASS ( <i>Koeleria macrantha</i> )	6.6	2.2-10.4	100	
BLUEBUNCH WHEAT GRASS ( <i>Agropyron spicatum</i> )	4.5	0.9-7.7	100	
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	1.7	0.0-5.3	75	
RICHARDSON NEEDLE GRASS ( <i>Stipa richardsonii</i> )	1.2	0.0-2.7	75	
COLUMBIA NEEDLE GRASS ( <i>Stipa columbiana</i> )	1.0	0.0-5.3	25	
WOOD BLUEGRASS ( <i>Poa nemoralis</i> )	0.7	0.0-1.6	63	
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	0.5	0.0-4.7	13	
				<b>LFH Thickness</b>
				Mean
				Min
				Max
				Count
				cm:
				0.00
				0.00
				0.00
				0

## aa2 bluebunch wheat grass shrubland (n=66)

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** aa bluebunch wheat grass(subxeric/medium)

### General Description

Bluebunch wheat grass dominated shrublands occur in select portions of the Montane South Ecosection including towards the Gap and Castle areas. These shrublands are considered only slightly drier than the submesic/poor [b] ecosite, and occur on the tops of steep south and west facing slopes. Similar to the submesic/poor [b] ecosite, rose, snowberry and saskatoon will slowly establish in the absence of fire.

### Characteristic Species

#### Shrub

- [ 27.4 ] COMMON BEARBERRY  
*Arctostaphylos uva-ursi*
- [ 6.4 ] SASKATOON  
*Amelanchier alnifolia*
- [ 4.4 ] BIG SAGEBRUSH  
*Artemisia tridentata*
- [ 2.4 ] SHRUBBY CINQUEFOIL  
*Potentilla fruticosa*

#### Forb

- [ 2.6 ] SMOOTH ASTER  
*Aster laevis*
- [ 2.2 ] WILD BERGAMOT  
*Monarda fistulosa*
- [ 1.0 ] YELLOW BEARDTONGUE  
*Penstemon confertus*

#### Graminoid

- [ 4.0 ] BLUNT SEDGE  
*Carex obtusata*
- [ 3.5 ] IDAHO FESCUE  
*Festuca idahoensis*
- [ 2.9 ] FOOTHILLS ROUGH FESCUE  
*Festuca campestris*
- [ 2.5 ] BLUEBUNCH WHEAT GRASS  
*Agropyron spicatum*

### Environmental Variables

Moisture Regime: Xeric (dry) (10), Subxeric (moderately dry) (7), Mesic (fresh) (3), Submesic (moderately fresh) (3), Very Xeric (very dry) (1)

Nutrient Regime: Mesotrophic (medium) (12), Submesotrophic (poor) (9), Permesotrophic (rich) (2)

Elevation (range): 1528 (1430-1829) M

Slope (%): very strong slope (11), steep slope (2), strong slope (1)

Aspect: Southerly (10), Westerly (4)

Topographic Position: Midslope (10), Upper Slope (5), Lower Slope (4)

### Soil Variables

Soil Drainage: Very rapidly drained (13), Rapidly drained (7), Well drained (5)

Soil Subgroup: ORTHIC EUTRIC BRUNISOL (1), ORTHIC REGOSOL (1)

Surface Texture: Clay loam (1), Silt loam (0)

Effective Texture: Clay (2), Silty clay (1)

Depth to Mottles/Gley: None (1)

Organic Thickness: 0 - 5 cm (1)

Parent Material: Morainal (1), Glaciofluvial (1)

Soil Type: Shallow (0)

Humus Form MULL (1)

### LFH Thickness

	Mean	Min	Max	Count
cm:	1.00	1.00	1.00	1

# Msb5 Big sagebrush/Bluebunch wheat grass-Rough fescue/Bearberry (n=10)

(*Artemisia tridentata*/*Agropyron spicatum*-*Festuca campestris*/*Arctostaphylos uva-ursi*)

This community type is rare in Alberta and is isolated on gravelly south facing slopes in the Montane subregion south of Blairmore. This community type is similar to the Pacific Northwest Bunchgrass type described by Tisdale (1982) in Washington and British Columbia. The big sagebrush, bluebunch wheat grass community types found in these areas are located on Dark Brown and Dark Gray Chernozemic soils, with glacial till parent material (Green and van Ryswyk 1982). Tisdale (1982), found that there is little known about the environmental factors which determine the presence of sagebrush-grass type versus a true grassland. Therefore, it is not clear why these south facing slopes are dominated by sagebrush and not a bluebunch wheat grass community type. Increased grazing pressure on a Big sagebrush/Bluebunch wheat grass communities in British Columbia will allow big sagebrush to increase in cover, but reference area data suggests heavy grazing pressure is less a factor in the formation of this community type in Alberta. The inside ungrazed transect at the South Castle Slope RRA represents this plant community.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** aa bluebunch wheat grass(subxeric/medium)

**Ecosite Phase:** aa2 bluebunch wheat grass shrubland

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 27-40
ASPEN ( <i>Populus tremuloides</i> )	1.2	0.0-5.0	60	Moisture Regime: Xeric (dry) (2), Subxeric (moderately dry) (1)
<b>Tall Shrub (2 to 5m)</b>				Nutrient Regime: Submesotrophic (poor) (3)
SASKATOON ( <i>Amelanchier alnifolia</i> )	7.5	0.0-12.0	80	Elevation (range): 1514 (1470-1580) M
CREEPING MAHONIA ( <i>Berberis repens</i> )	1.7	0.0-4.7	70	Slope (%): 31 - 45.99 (3)
<b>Medium Shrub (0.5 to 2 m)</b>				Aspect: Southerly (3)
BIG SAGEBRUSH ( <i>Artemisia tridentata</i> )	11.0	2.1-21.3	100	Topographic Position: Midslope (1), Lower Slope (1)
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	1.8	0.0-5.0	90	
SASKATOON ( <i>Amelanchier alnifolia</i> )	1.4	0.0-10.3	20	
<b>Low Shrub (&lt; 0.5m)</b>				<b>Soil Variables</b>
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	16.5	0.0-58.5	90	Soil Drainage: Very rapidly drained (2), Rapidly drained (1)
<b>Tall Forb (&gt;= 30 cm)</b>				Soil Subgroup: ORTHIC REGOSOL (1)
SILKY PERENNIAL LUPINE ( <i>Lupinus sericeus</i> )	3.0	0.3-6.2	100	Surface Texture: Clay loam (0), Silt loam (0)
SMOOTH ASTER ( <i>Aster laevis</i> )	2.9	0.0-5.5	90	Effective Texture: Clay (1), Silty clay (1)
<b>Low Forb (&lt; 30 cm)</b>				Depth to Mottles/Gley: None (1)
SMALL-LEAVED PUSSYTOES ( <i>Antennaria parvifolia</i> )	7.0	0.0-17.3	80	Organic Thickness: 0 - 5 cm (1)
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	2.1	0.4-4.0	100	Parent Material: Glaciofluvial (1)
COMMON YARROW ( <i>Achillea millefolium</i> )	1.8	0.8-5.4	100	Soil Type: Shallow (0)
PRAIRIE SELAGINELLA ( <i>Selaginella densa</i> )	1.6	0.0-6.0	40	Humus Form MULL (1)
CUT-LEAVED ANEMONE ( <i>Anemone multifida</i> )	1.5	0.0-7.3	80	
<b>Graminoid</b>				<b>LFH Thickness</b>
IDAHO FESCUE ( <i>Festuca idahoensis</i> )	7.5	0.0-13.1	90	<b>Mean</b>
BLUEBUNCH WHEAT GRASS ( <i>Agropyron spicatum</i> )	4.4	0.9-13.3	100	<b>Min</b>
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	3.2	1.0-7.5	100	<b>Max</b>
INTERMEDIATE OAT GRASS ( <i>Danthonia intermedia</i> )	3.1	0.0-7.9	70	<b>Count</b>
JUNE GRASS ( <i>Koeleria macrantha</i> )	1.2	0.0-4.9	80	cm:
BLUNT SEDGE ( <i>Carex obtusata</i> )	1.1	0.0-3.4	80	0.00
				0.00
				0.00
				0

## Msc21 Big sagebrush/Idaho fescue-Bluebunch wheatgrass/Bearberry (n=10)

(*Artemisia tridentata*/*Festuca idahoensis*-*Agropyron spicatum*?*Arctostaphylos uva-ursi*)

This community type is formed when a Big sagebrush/Bluebunch wheatgrass-Rough fescue/Bearberry (Msb5) is moderately grazed. Increased grazing pressure favours the growth of sedge, Idaho fescue and bearberry over rough fescue and bluebunch wheatgrass. Increased grazing pressure on a Big sagebrush/Bluebunch wheat grass communities in British Columbia will allow big sagebrush to increase in cover, but reference area data suggests heavy grazing pressure is less a factor in the formation of this community type in Alberta. The outside grazed transect at the South Castle Slope RRA represents this plant community.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** aa bluebunch wheat grass(subxeric/medium)

**Ecosite Phase:** aa2 bluebunch wheat grass shrubland

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Tall Shrub (2 to 5m)</b>				Ecological Status Score: 15-20
SASKATOON ( <i>Amelanchier alnifolia</i> )	4.2	0.0-7.9	80	Moisture Regime: Subxeric (moderately dry) (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Nutrient Regime: Submesotrophic (poor) (1)
BIG SAGEBRUSH ( <i>Artemisia tridentata</i> )	5.9	0.0-10.2	90	Elevation (range): 1470 (1470-1470) M
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	5.6	0.0-10.2	90	Slope (%): 31 - 45.99 (2)
SASKATOON ( <i>Amelanchier alnifolia</i> )	2.5	0.0-15.7	20	Aspect: Southerly (2)
<b>Low Shrub (&lt; 0.5m)</b>				Topographic Position: Lower Slope (1)
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	20.3	16.3-35.7	100	<b>Soil Variables</b>
<b>Tall Forb (&gt;= 30 cm)</b>				Soil Drainage: Very rapidly drained (1)
YELLOW BEARDTONGUE ( <i>Penstemon confertus</i> )	3.7	1.8-5.3	100	Soil Subgroup:
SMOOTH ASTER ( <i>Aster laevis</i> )	2.3	0.0-4.7	90	Surface Texture:
GAILLARDIA ( <i>Gaillardia aristata</i> )	1.7	0.5-3.0	100	Effective Texture:
WILD BERGAMOT ( <i>Monarda fistulosa</i> )	1.5	0.0-8.7	90	Depth to Mottles/Gley:
YELLOW HEDYSARUM ( <i>Hedysarum sulphurescens</i> )	1.0	0.0-2.8	80	Organic Thickness:
<b>Low Forb (&lt; 30 cm)</b>				Parent Material:
SMALL-LEAVED PUSSYTOES ( <i>Antennaria parvifolia</i> )	1.8	0.3-3.3	100	Soil Type:
FIELD MOUSE-EAR CHICKWEED ( <i>Cerastium arvense</i> )	1.6	0.0-5.1	80	Humus Form
PRAIRIE SELAGINELLA ( <i>Selaginella densa</i> )	1.4	0.0-3.9	80	<b>LFH Thickness</b>
PASTURE SAGEWORT ( <i>Artemisia frigida</i> )	1.3	0.0-13.2	10	Mean
CUT-LEAVED ANEMONE ( <i>Anemone multifida</i> )	1.2	0.0-2.7	80	Min
COMMON YARROW ( <i>Achillea millefolium</i> )	1.1	0.3-3.3	100	Max
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	1.0	0.0-2.4	90	Count
<b>Graminoid</b>				cm:
IDAHO FESCUE ( <i>Festuca idahoensis</i> )	5.6	1.7-10.6	100	0.00
BLUEBUNCH WHEAT GRASS ( <i>Agropyron spicatum</i> )	4.5	2.1-9.6	100	0.00
INTERMEDIATE OAT GRASS ( <i>Danthonia intermedia</i> )	3.1	0.0-11.5	80	0.00
JUNE GRASS ( <i>Koeleria macrantha</i> )	1.5	0.0-5.6	80	0
TIMOTHY ( <i>Phleum pratense</i> )	1.3	0.0-3.5	90	

## Msd23 Snowberry-Rose/Bluebunch wheat grass-Rough fescue (n=46)

### (*Symphoricarpos occidentalis-Rosa/Agropyron spicatum-Festuca campestris*)

This site represents steep upper slope grasslands in the Oldman and Castle areas that have been encroached by rose, snowberry, saskatoon or chokecherry (>15% total shrub cover). This community type appears to occur under light to no grazing pressure and no fire disturbance. The lack of disturbance allows shrub cover and rough fescue cover to increase because of the increase in moisture due to snow catchment and higher litter levels. Under light to moderate grazing pressure this community type will resemble the Bluebunch wheatgrass-Sedge (Msb3) dominated community type. Under heavy grazing pressure on these sites bluebunch wheatgrass cover will decline and the site will often be dominated by sedge, junegrass and fringed sage to form the Sedge-Junegrass-Bluebunch wheatgrass/Fringed sage (Msc13) community type. The soils of this community are typically thin and poor in nutrients, and exposed soil is common. This community type will look similar to a grassland and will often be identified as grassland by AVI photo interpreters. Plots for this community type are from the Station Creek and North Todd Range Reference Areas (Appendix 3).

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** aa bluebunch wheat grass(subxeric/medium)

**Ecosite Phase:** aa2 bluebunch wheat grass shrubland

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Medium Shrub (0.5 to 2 m)</b>				Ecological Status Score: 27-40
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	10.0	0.0-41.0	83	Moisture Regime: Xeric (dry) (8), Subxeric (moderately dry) (5), Mesic (fresh) (3), Submesic (moderately fresh) (3), Very Xeric (very dry) (1)
SASKATOON ( <i>Amelanchier alnifolia</i> )	8.1	0.0-31.2	96	Nutrient Regime: Mesotrophic (medium) (12), Submesotrophic (poor) (5), Permesotrophic (rich) (2)
PRICKLY ROSE ( <i>Rosa acicularis</i> )	5.5	0.0-26.0	70	Elevation (range): 1601 (1430-1829) M
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	2.3	0.0-31.0	17	Slope (%): 31 - 45.99 (6), 46 - 70.99 (2), 16 - 30.99 (1)
CHOKE CHERRY ( <i>Prunus virginiana</i> )	1.6	0.0-32.3	30	Aspect: Southerly (5), Westerly (4)
<b>Tall Forb (&gt;= 30 cm)</b>				Topographic Position: Midslope (9), Upper Slope (5), Lower Slope (2)
YELLOW BEARDTONGUE ( <i>Penstemon confertus</i> )	3.1	0.0-18.9	63	<b>Soil Variables</b>
WILD VETCH ( <i>Vicia americana</i> )	3.0	0.0-12.9	65	Soil Drainage: Very rapidly drained (10), Rapidly drained (6), Well drained (5)
MOUNTAIN WILD PARSNIP ( <i>Lomatium dissectum</i> )	2.5	0.0-14.7	39	Soil Subgroup: ORTHIC EUTRIC BRUNISOL (1)
SILKY PERENNIAL LUPINE ( <i>Lupinus sericeus</i> )	1.7	0.0-13.7	50	Surface Texture: Clay loam (1)
<b>Low Forb (&lt; 30 cm)</b>				Effective Texture: Clay (1)
COMMON YARROW ( <i>Achillea millefolium</i> )	2.4	0.0-10.9	96	Depth to Mottles/Gley:
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	2.1	0.0-6.4	89	Organic Thickness:
FIELD MOUSE-EAR CHICKWEED ( <i>Cerastium arvense</i> )	1.9	0.0-13.5	74	Parent Material: Morainal (1)
PASTURE SAGEWORT ( <i>Artemisia frigida</i> )	1.8	0.0-12.9	41	Soil Type:
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	1.7	0.0-10.4	48	Humus Form
SMALL-LEAVED PUSSYTOES ( <i>Antennaria parvifolia</i> )	1.5	0.0-8.5	65	
<b>Graminoid</b>				
BLUEBUNCH WHEAT GRASS ( <i>Agropyron spicatum</i> )	11.2	1.1-35.3	100	
BLUNT SEDGE ( <i>Carex obtusata</i> )	5.9	0.0-29.0	91	
JUNE GRASS ( <i>Koeleria macrantha</i> )	5.5	0.0-22.0	94	
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	4.8	0.0-29.0	56	
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	2.9	0.0-17.7	46	
IDAHO FESCUE ( <i>Festuca idahoensis</i> )	1.9	0.0-16.7	37	
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	1.1	0.0-17.3	63	
				<b>LFH Thickness</b>
				<b>Mean</b>
				<b>Min</b>
				<b>Max</b>
				<b>Count</b>
				cm:
				1.00
				1.00
				1.00
				1

## b bearberry(submesic/poor) (n=241)

Natural Subregion: Montane

Ecosection: Ms Montane South Ecosection

### General Description

Dry site conditions resulting from dry exposures or coarse-textured soils are characteristic of this ecosite. Organic layers are generally thin and soils are relatively poorly developed. The presence of species such as bearberry and juniper are indicative of the dry site conditions (Archibald et al. 1996).



### Site Index at 50 Years

Site Index at 50 Years	Height (m)	Variation (m)	Count
WHITE SPRUCE ( <i>Picea glauca</i> )	12.00	0.80	0
LOGEPOLE PINE ( <i>Pinus contorta</i> )	11.40	0.70	0
ASPEN ( <i>Populus tremuloides</i> )	5.20	0.20	0

### Environmental Variables

Moisture Regime: Subxeric (moderately dry) (36), Submesic (moderately fresh) (33), Xeric (dry) (28), Mesic (fresh) (24), Hygric (moist) (1), Very Xeric (very dry) (1)

Nutrient Regime: Mesotrophic (medium) (84), Submesotrophic (poor) (23), Permesotrophic (rich) (3), Oligotrophic (very poor) (1)

Elevation (range): 1540 (1163-2134) M

Slope (%): strong slope (31), very strong slope (27), steep slope (18), nearly level (17), moderate slope (14), very gentle slope (13), level (7), gentle slope (4), very steep slope (1)

Aspect: Southerly (63), Westerly (41), Easterly (11), Level (5), Northerly (4)

Topographic Position: Midslope (40), Upper Slope (15), Crest (11), Level (7), Lower Slope (4), Toe (2)

### Successional Relationships

Lodgepole pine, Douglas-fir, aspen and white spruce form pure and mixed stands on this ecosite. Succession is generally toward white spruce; however, succession rates are slow. Some of the drier examples may form edaphic climax as in the limber pine/juniper ecosite. Shrub and forb layers are generally poorly developed due to the dry site conditions (Archibald et al. 1996). Generally, steep south and west facing slopes can be maintained as grasslands under natural disturbance, however, lack of disturbance can lead to most of this ecosite being dominated by aspen and coniferous trees.

### Soil Variables

Soil Drainage: Rapidly drained (61), Well drained (54), Very rapidly drained (11), Moderately well drained (8), Very poorly drained (1)

Soil Subgroup: ORTHIC EUTRIC BRUNISOL (10), ELUVIATED EUTRIC BRUNISOL (8), BRUNISOLIC GRAY LUVISOL (4), CUMULIC REGOSOL (4), ORTHIC REGOSOL (3), REGO BLACK CHERNOZEM (1), REGO DARK BROWN CHERNOZEM (1), TERRIC FIBRIC MESISOL (1), CUMULIC HUMIC REGOSOL (1), ORTHIC DARK GRAY CHERNOZEM (1)

Surface Texture: Sandy loam (6), Sandy clay loam (4), Loam (3), Clay loam (1), Silt loam (1)

Effective Texture: Sandy clay loam (5), Sandy loam (3), Loam (2), Loamy sand (1), Silt loam (1), Silty clay loam (1), Undifferentiated Mineral (1)

Depth to Mottles/Gley: 0 - 25 (1)

Organic Thickness: 0 - 5 cm (36)

Parent Material: Glaciofluvial (13), Morainal (12), Fluvial (7), Fluvio-lacustrine (4), Rock (2), Glaciolacustrine (1), Colluvial (1), Fen (1)

Soil Type: Dry/Silty-Loamy (2), Shallow (1), Very Dry/Silty-Loamy (1), Dry/Coarse (1), Dry/Fine (1)

Humus Form FIBRIMOR (3), HUMIFIBRIMOR (1), RHIZOMULL (1)

### Indicator Species

#### Tree

WHITE SPRUCE  
*Picea glauca*  
LOGEPOLE PINE  
*Pinus contorta*  
ASPEN  
*Populus tremuloides*

#### Shrub

PRICKLY ROSE  
*Rosa acicularis*  
GROUND JUNIPER  
*Juniperus communis*  
CREEPING JUNIPER  
*Juniperus horizontalis*  
COMMON BEARBERRY  
*Arctostaphylos uva-ursi*

#### Graminoid

JUNE GRASS  
*Koeleria macrantha*  
HAIRY WILD RYE  
*Elymus innovatus*

### LFH Thickness

LFH Thickness	Mean	Min	Max	Count
cm:	3.50	1.00	10.00	15



# b1 bearberry PI (n=21)

**Natural Subregion:** Montane  
**Ecosection:** Ms Montane South Ecosection

**Ecosite:** b bearberry(submesic/poor)

## General Description

This phase within the submesic/poor [b] ecosite represents either north and east facing established forests or south and west facing areas that are now in a forested phase. Generally, these sites are steep, water-shedding slopes, or less steep areas with coarse texture soils; in both cases, soil drainage is rapid and sites are dry. This is indicated by a strong presence of bearberry and juniper in the understory.

## Characteristic Species

### Tree

- [ 25.8 ] LODGEPOLE PINE  
*Pinus contorta*
- [ 10.5 ] LODGEPOLE PINE  
*Pinus contorta*
- [ 2.7 ] DOUGLAS-FIR  
*Pseudotsuga menziesii*

### Shrub

- [ 24.1 ] COMMON BEARBERRY  
*Arctostaphylos uva-ursi*
- [ 9.9 ] CANADA BUFFALOBERRY  
*Shepherdia canadensis*
- [ 9.2 ] GROUND JUNIPER  
*Juniperus communis*
- [ 5.4 ] TWINFLOWER  
*Linnaea borealis*
- [ 3.0 ] CREEPING JUNIPER  
*Juniperus horizontalis*

### Forb

- [ 2.3 ] CREAM-COLORED VETCHLING  
*Lathyrus ochroleucus*
- [ 1.6 ] YELLOW HEDYSARUM  
*Hedysarum sulphurescens*

### Graminoid

- [ 7.0 ] PINE REED GRASS  
*Calamagrostis rubescens*

## Environmental Variables

Moisture Regime: Mesic (fresh) (5), Submesic (moderately fresh) (5), Subxeric (moderately dry) (3), Xeric (dry) (2), Hygric (moist) (1)

Nutrient Regime: Mesotrophic (medium) (7), Submesotrophic (poor) (4)

Elevation (range): 1466 (1330-1688) M

Slope (%): very gentle slope (9), nearly level (4), steep slope (2), moderate slope (2), very strong slope (2), gentle slope (1), level (1)

Aspect: Westerly (9), Southerly (6), Easterly (1)

Topographic Position: Midslope (4), Level (2), Upper Slope (1)

## Soil Variables

Soil Drainage: Well drained (8), Rapidly drained (7), Moderately well drained (3)

Soil Subgroup: ELUVIATED EUTRIC BRUNISOL (7), ORTHIC EUTRIC BRUNISOL (6), BRUNISOLIC GRAY LUVISOL (2)

Surface Texture: Sandy loam (5), Sandy clay loam (1)

Effective Texture: Sandy loam (3), Sandy clay loam (2), Loamy sand (1)

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (15)

Parent Material: Glaciofluvial (6), Morainal (5), Fluvial (5), Fluvio-lacustrine (1)

Soil Type: Dry/Coarse (1)

Humus Form FIBRIMOR (2), HUMIFIBRIMOR (1)

## LFH Thickness

	Mean	Min	Max	Count
cm:	4.00	2.00	10.00	8

## Mse3 PI/Bearberry-Juniper (n=21)

### (*Pinus contorta*/Arctostaphylos uva-ursa-Juniperus spp.)

This community type is similar to the Limber pine-Douglas-fir/Juniper/Bearberry community type previously described, but occurs on slightly richer and better developed soils. Dry site conditions from south exposures or coarse-textured soils are characteristic of this community type (Archibald et al. 1996). The dry site conditions limit the amount of forage this site can produce and the steep slope limits access to livestock. As a result, this community type would be considered tertiary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** b bearberry(submesic/poor)

**Ecosite Phase:** b1 bearberry PI

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 20-25
LOGEPOLE PINE ( <i>Pinus contorta</i> )	25.8	0.0-55.0	91	Moisture Regime: Submesic (moderately fresh) (5), Mesic (fresh) (5), Subxeric (moderately dry) (3), Xeric (dry) (2), Hygric (moist) (1)
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	1.7	0.0-10.0	29	Nutrient Regime: Mesotrophic (medium) (7), Submesotrophic (poor) (4)
WHITE SPRUCE ( <i>Picea glauca</i> )	1.1	0.0-10.0	29	Elevation (range): 1466 (1330-1688) M
<b>Understory Tree</b>				Slope (%): 2.5 - 5.99 (9), 0.5 - 2.49 (4), 10 - 15.99 (2), 31 - 45.99 (2), 46 - 70.99 (2), 0 - 0.49 (1), 6 - 9.99 (1)
LOGEPOLE PINE ( <i>Pinus contorta</i> )	8.9	0.0-30.0	91	Aspect: Westerly (9), Southerly (6), Easterly (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Topographic Position: Midslope (4), Level (2), Upper Slope (1)
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	24.1	0.0-70.0	95	<b>Soil Variables</b>
CANADA BUFFALOBERRY ( <i>Shepherdia canadensis</i> )	9.9	0.0-30.0	91	Soil Drainage: Well drained (8), Rapidly drained (7), Moderately well drained (3)
GROUND JUNIPER ( <i>Juniperus communis</i> )	9.2	1.0-31.3	100	Soil Subgroup: ELUVIATED EUTRIC BRUNISOL (7), ORTHIC EUTRIC BRUNISOL (6), BRUNISOLIC GRAY LUVISOL (2)
TWINFLOWER ( <i>Linnaea borealis</i> )	5.4	0.0-20.0	57	Surface Texture: Sandy loam (5), Sandy clay loam (1)
PRICKLY ROSE ( <i>Rosa acicularis</i> )	2.9	0.0-17.3	86	Effective Texture: Sandy loam (3), Sandy clay loam (2), Loamy sand (1)
CREEPING JUNIPER ( <i>Juniperus horizontalis</i> )	2.7	0.0-40.0	33	Depth to Mottles/Gley:
<b>Tall Forb (&gt;= 30 cm)</b>				Organic Thickness: 0 - 5 cm (15)
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	2.3	0.0-20.0	52	Parent Material: Glaciofluvial (6), Morainal (5), Fluvial (5), Fluviolacustrine (1)
SHOWY ASTER ( <i>Aster conspicuus</i> )	1.7	0.0-8.0	67	Soil Type: Dry/Coarse (1)
YELLOW HEDYSARUM ( <i>Hedysarum sulphurescens</i> )	1.6	0.0-9.3	52	Humus Form FIBRIMOR (2), HUMIFIBRIMOR (1)
<b>Low Forb (&lt; 30 cm)</b>				<b>LFH Thickness</b>
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	2.6	0.0-10.0	91	Mean
<b>Graminoid</b>				Min
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	7.0	0.0-40.0	57	Max
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	6.6	0.0-40.0	67	Count
				cm:
				4.00
				2.00
				10.00
				8

## b2 bearberry Aw (n=10)

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** b bearberry(submesic/poor)

### General Description

This phase within the submesic/poor [b] ecosite represents either north and east facing re-establishing forests or south and west facing areas that are being encroached by aspen. Generally, these sites are steep, water-shedding slopes or less steep areas with course texture soils; in both cases, soil drainage is rapid and sites are dry. A strong presence of bearberry and juniper in the understory indicates this. Hairy wild rye and pine grass are common in the understory, but rough fescue and Idaho fescue can also occur.

### Characteristic Species

#### Tree

- [ 45.4 ] ASPEN  
*Populus tremuloides*
- [ 17.0 ] ASPEN  
*Populus tremuloides*

#### Shrub

- [ 24.5 ] COMMON BEARBERRY  
*Arctostaphylos uva-ursi*
- [ 6.0 ] PRICKLY ROSE  
*Rosa acicularis*
- [ 4.1 ] CANADA BUFFALOBERRY  
*Shepherdia canadensis*

#### Forb

- [ 5.3 ] CREAM-COLORED VETCHLING  
*Lathyrus ochroleucus*
- [ 4.4 ] ALPINE HEDYSARUM  
*Hedysarum alpinum*
- [ 3.6 ] SHOWY ASTER  
*Aster conspicuus*

#### Graminoid

- [ 8.7 ] HAIRY WILD RYE  
*Elymus innovatus*
- [ 3.7 ] PINE REED GRASS  
*Calamagrostis rubescens*
- [ 3.4 ] FOOTHILLS ROUGH FESCUE  
*Festuca campestris*
- [ 2.8 ] IDAHO FESCUE  
*Festuca idahoensis*

### Environmental Variables

Moisture Regime: Submesic (moderately fresh) (4), Mesic (fresh) (3), Subxeric (moderately dry) (3)

Nutrient Regime: Mesotrophic (medium) (7), Submesotrophic (poor) (1)

Elevation (range): 1442 (1333-1585) M

Slope (%): moderate slope (3), nearly level (2), gentle slope (1), very gentle slope (1), strong slope (1)

Aspect: Southerly (4), Westerly (2)

Topographic Position: Midslope (7), Crest (1), Upper Slope (1)

### Soil Variables

Soil Drainage: Well drained (11)

Soil Subgroup: REGO BLACK CHERNOZEM (1), ELUVIATED EUTRIC BRUNISOL (1), BRUNISOLIC GRAY LUVISOL (1), CUMULIC HUMIC REGOSOL (1)

Surface Texture: Sandy loam (1), Sandy clay loam (1), Loam (1)

Effective Texture: Sandy clay loam (1), Loam (1)

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (4)

Parent Material: Glaciofluvial (3), Rock (1), Morainal (1), Fluvial (1)

Soil Type: Very Dry/Silty-Loamy (1)

Humus Form FIBRIMOR (1)

### LFH Thickness

	Mean	Min	Max	Count
cm:	3.00	3.00	3.00	2

# Msg1 Aw/Bearberry/Foothills rough fescue (n=10)

(*Populus tremuloides*/*Arctostaphylos uva-ursi*/*Festuca campestris*)

This community type occupies dry upper slope and hilltop positions and represents the establishment of aspen within a Rough fescue-Sedge/Bearberry-dominated community type. The soils on this community type are fairly well developed and the moisture conditions are high enough to favour the growth of aspen. In years of drought, aspen will likely die back in this community. Frequent fire also tends to control the spread of aspen onto these rough fescue dominated grasslands. The lack of fire in the last 50 years has allowed many grasslands on this ecosite to establish aspen. Invasion of aspen causes a decline in forage productivity and a change in soil productivity.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** b bearberry(submesic/poor)

**Ecosite Phase:** b2 bearberry Aw

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 20-25
ASPEN ( <i>Populus tremuloides</i> )	28.6	0.0-40.0	90	Moisture Regime: Submesic (moderately fresh) (4), Mesic (fresh) (3), Subxeric (moderately dry) (3)
LODGEPOLE PINE ( <i>Pinus contorta</i> )	1.5	0.0-7.0	40	Nutrient Regime: Mesotrophic (medium) (7), Submesotrophic (poor) (1)
<b>Understory Tree</b>				Elevation (range): 1442 (1333-1585) M
ASPEN ( <i>Populus tremuloides</i> )	16.8	0.0-80.0	40	Slope (%): 10 - 15.99 (3), 0.5 - 2.49 (2), 16 - 30.99 (1), 2.5 - 5.99 (1), 6 - 9.99 (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Aspect: Southerly (4), Westerly (2)
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	24.5	12.7-47.1	100	Topographic Position: Midslope (7), Crest (1), Upper Slope (1)
PRICKLY ROSE ( <i>Rosa acicularis</i> )	6.0	0.0-18.0	90	<b>Soil Variables</b>
CANADA BUFFALOBERRY ( <i>Shepherdia canadensis</i> )	4.1	0.0-15.0	70	Soil Drainage: Well drained (11)
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	1.2	0.0-4.0	60	Soil Subgroup: REGO BLACK CHERNOZEM (1), ELUVIATED EUTRIC BRUNISOL (1), BRUNISOLIC GRAY LUVISOL (1), CUMULIC HUMIC REGOSOL (1)
<b>Tall Forb (&gt;= 30 cm)</b>				Surface Texture: Sandy loam (1), Sandy clay loam (1), Loam (1)
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	5.3	0.0-27.0	90	Effective Texture: Loam (1), Sandy clay loam (1)
ALPINE HEDYSARUM ( <i>Hedysarum alpinum</i> )	4.4	0.0-37.0	40	Depth to Mottles/Gley:
SHOWY ASTER ( <i>Aster conspicuus</i> )	3.6	0.0-25.0	60	Organic Thickness: 0 - 5 cm (4)
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	3.5	0.0-14.1	70	Parent Material: Glaciofluvial (3), Fluvial (1), Morainal (1), Rock (1)
<b>Low Forb (&lt; 30 cm)</b>				Soil Type: Very Dry/Silty-Loamy (1)
COMMON YARROW ( <i>Achillea millefolium</i> )	1.6	0.0-4.3	90	Humus Form FIBRIMOR (1)
<b>Graminoid</b>				<b>LFH Thickness</b>
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	8.7	0.0-45.0	80	Mean
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	3.7	0.0-15.0	50	Min
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	3.4	0.0-15.0	30	Max
IDAHO FESCUE ( <i>Festuca idahoensis</i> )	2.8	0.0-15.0	30	Count
				cm:
				3.00
				3.00
				3.00
				2

### b3 bearberry Aw-Sw-PI (n=7)

**Natural Subregion:** Montane  
**Ecosection:** Ms Montane South Ecosection

**Ecosite:** b bearberry(submesic/poor)

#### General Description

This phase represents communities in successional transition from aspen to coniferous forests in drier submesic conditions. In the absence of natural fire disturbance, coniferous trees will begin to grow in the understory of aspen and eventually take over. As this occurs the understory changes as well, becoming less productive than the original aspen stand. Often mixed wood phases are difficult to delineate exactly as they are a mosaic of aspen dominated to conifer dominated. Consider this phase when there isn't a clear distinction whether the site is aspen or conifer dominated and the understory seems in transition.

#### Characteristic Species

##### Tree

- [ 17.6 ] ASPEN  
*Populus tremuloides*
- [ 10.3 ] LODGEPOLE PINE  
*Pinus contorta*
- [ 5.2 ] WHITE SPRUCE  
*Picea glauca*
- [ 5.0 ] DOUGLAS-FIR  
*Pseudotsuga menziesii*
- [ 4.9 ] WHITE SPRUCE  
*Picea glauca*

##### Shrub

- [ 26.5 ] COMMON BEARBERRY  
*Arctostaphylos uva-ursi*
- [ 8.6 ] GROUND JUNIPER  
*Juniperus communis*
- [ 3.8 ] CANADA BUFFALOBERRY  
*Shepherdia canadensis*
- [ 3.8 ] SHRUBBY CINQUEFOIL  
*Potentilla fruticosa*

##### Moss and Liverwort

- [ 2.6 ] UNDIFFERENTIATED MOSS - ALL GENERA  
*Moss*

##### Graminoid

- [ 15.7 ] HAIRY WILD RYE  
*Elymus innovatus*
- [ 4.6 ] PINE REED GRASS  
*Calamagrostis rubescens*
- [ 2.4 ] FOOTHILLS ROUGH FESCUE  
*Festuca campestris*

#### Environmental Variables

Moisture Regime: Submesic (moderately fresh) (4)  
Nutrient Regime: Mesotrophic (medium) (2), Submesotrophic (poor) (1)  
Elevation (range): 1490 (1366-1661) M  
Slope (%): level (3), nearly level (2), moderate slope (2)  
Aspect: Southerly (3), Level (2)  
Topographic Position: Level (2), Midslope (1)

#### Soil Variables

Soil Drainage: Well drained (4), Rapidly drained (2)  
Soil Subgroup: CUMULIC REGOSOL (2), BRUNISOLIC GRAY LUVISOL (1)  
Surface Texture: Silt loam (1)  
Effective Texture: Silt loam (1)  
Depth to Mottles/Gley: 0 - 25 (1)  
Organic Thickness: 0 - 5 cm (3)  
Parent Material: Fluviolacustrine (2), Glaciolacustrine (1), Glaciofluvial (1)  
Soil Type:  
Humus Form

#### LFH Thickness

	Mean	Min	Max	Count
cm:	5.00	5.00	5.00	1

## Msf1 Aw-Fd-Pl-Sw/Bearberry (n=7)

(*Populus tremuloides*-*Pseudotsuga menziesii*-*Pinus contorta*-*Picea glauca*/*Arctostaphylos uva-ursi*)

This community represents an aspen dominated community type that is undergoing succession to Douglas-fir, lodgepole pine or white spruce. It is part of the bearberry ecosite described by Archibald et al. (1996). This ecosite commonly occupies southern exposures on coarse textured soils. Forage production on this site is lower than similar aspen communities due to successional changes on dry site conditions, therefore the community should be considered secondary to tertiary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** b bearberry(submesic/poor)

**Ecosite Phase:** b3 bearberry Aw-Sw-Pl

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Overstory Tree</b>					Ecological Status Score: 20-25
ASPEN ( <i>Populus tremuloides</i> )	13.1	0.0-30.0	71		Moisture Regime: Submesic (moderately fresh) (4)
LOGEPOLE PINE ( <i>Pinus contorta</i> )	8.5	0.0-30.0	57		Nutrient Regime: Mesotrophic (medium) (2), Submesotrophic (poor) (1)
WHITE SPRUCE ( <i>Picea glauca</i> )	5.2	0.0-17.0	71		Elevation (range): 1490 (1366-1661) M
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	5.0	0.0-20.0	29		Slope (%): 0 - 0.49 (3), 0.5 - 2.49 (2), 10 - 15.99 (2)
<b>Understory Tree</b>					Aspect: Southerly (3), Level (2)
WHITE SPRUCE ( <i>Picea glauca</i> )	4.9	0.0-15.0	43		Topographic Position: Level (2), Midslope (1)
ASPEN ( <i>Populus tremuloides</i> )	4.5	0.0-20.0	43		<b>Soil Variables</b>
LOGEPOLE PINE ( <i>Pinus contorta</i> )	2.8	0.0-10.0	29		Soil Drainage: Well drained (4), Rapidly drained (2)
<b>Medium Shrub (0.5 to 2 m)</b>					Soil Subgroup: CUMULIC REGOSOL (2), BRUNISOLIC GRAY LUVISOL (1)
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	26.5	5.0-52.3	100		Surface Texture: Silt loam (1)
GROUND JUNIPER ( <i>Juniperus communis</i> )	8.6	0.0-40.0	86		Effective Texture: Silt loam (1)
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	3.8	0.0-10.4	86		Depth to Mottles/Gley: 0 - 25 (1)
CANADA BUFFALOBERRY ( <i>Shepherdia canadensis</i> )	3.8	1.0-10.6	100		Organic Thickness: 0 - 5 cm (3)
<b>Tall Forb (&gt;= 30 cm)</b>					Parent Material: Fluviolacustrine (2), Glaciofluvial (1), Glaciolacustrine (1)
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	2.6	0.0-12.0	86		Soil Type:
SHOWY ASTER ( <i>Aster conspicuus</i> )	1.9	0.0-10.0	57		Humus Form
<b>Low Forb (&lt; 30 cm)</b>					<b>LFH Thickness</b>
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	3.9	0.0-9.2	86		Mean
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	1.6	0.0-3.1	86		Min
<b>Graminoid</b>					Max
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	15.7	0.0-55.0	57		Count
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	4.6	0.0-15.0	57		cm:
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	2.4	0.0-16.7	29		5.00
BLUNT SEDGE ( <i>Carex obtusata</i> )	1.3	0.0-9.6	14		5.00
<b>Moss</b>					5.00
UNDIFFERENTIATED MOSS - ALL GENERA ( <i>Moss</i> )	2.6	0.0-15.0	14		1

## b4 yellow mountain avens (n=3)

**Natural Subregion:** Montane  
**Ecosection:** Ms Montane South Ecosection

**Ecosite:** b bearberry(submesic/poor)

### General Description

This is a unique stand-alone phase in the submesic/poor [b] ecosite. It represents dry gravelly flats next to rivers that are on rapidly drained soils supporting bearberry. However this phase is dominated by mountain avens. White spruce will establish on these sites to varying degrees.

### Characteristic Species

#### Tree

- [ 1.0 ] ASPEN  
*Populus tremuloides*
- [ 1.0 ] WHITE SPRUCE  
*Picea glauca*

#### Shrub

- [ 35.0 ] YELLOW MOUNTAIN AVENS  
*Dryas drummondii*
- [ 5.0 ] SILVERBERRY  
*Elaeagnus commutata*
- [ 2.2 ] SHRUBBY CINQUEFOIL  
*Potentilla fruticosa*
- [ 2.2 ] ROCKY MOUNTAIN JUNIPER  
*Juniperus scopulorum*
- [ 2.0 ] COMMON BEARBERRY  
*Arctostaphylos uva-ursi*

#### Forb

- [ 5.0 ] EARLY YELLOW LOCOWEED  
*Oxytropis sericea*
- [ 4.0 ] COMMON YARROW  
*Achillea millefolium*
- [ 2.5 ] REFLEXED LOCOWEED  
*Oxytropis deflexa*
- [ 2.3 ] YELLOW FALSE DANDELION  
*Agoseris glauca*

#### Lichen

- [ 9.7 ] UNDIFFERENTIATED LICHENOTHELIA  
*Lichenothelia*

#### Graminoid

- [ 20.5 ] JUNE GRASS  
*Koeleria macrantha*
- [ 4.1 ] FRINGED BROME  
*Bromus ciliatus*
- [ 2.3 ] SEDGE SPECIES  
*Carex*

### Environmental Variables

Moisture Regime: Subxeric (moderately dry) (1), Submesic (moderately fresh) (1)  
Nutrient Regime: Mesotrophic (medium) (2)  
Elevation (range): 1553 (1360-1705) M  
Slope (%): nearly level (2), very gentle slope (1)  
Aspect: Level (1), Easterly (1), Southerly (1)  
Topographic Position:

### Soil Variables

Soil Drainage: Rapidly drained (2), Very rapidly drained (1)  
Soil Subgroup: ORTHIC REGOSOL (1)  
Surface Texture:  
Effective Texture:  
Depth to Mottles/Gley:  
Organic Thickness: 0 - 5 cm (1)  
Parent Material: Fluviolacustrine (1)  
Soil Type:  
Humus Form

### LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

## Msd2 Yellow mountain avens/June grass (n=2)

### (*Dryas drummondii*/*Koeleria macrantha*)

This community type is typical of dry, gravelly river flats with nutrient poor soils. Mountain avens, silverberry, bearberry, juniper and june grass are all characteristic of dry, rapidly-drained soils. Willoughby (2007) also described a similar community type on dry, gravelly, well-drained river flats in the Upper Foothills Subregion. The poor soil conditions limits the forage productivity and amount of regrowth after grazing. This community should be considered tertiary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** b bearberry(submesic/poor)

**Ecosite Phase:** b4 yellow mountain avens

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 40
WHITE SPRUCE ( <i>Picea glauca</i> )	1.5	0.0-2.0	100	Moisture Regime: Subxeric (moderately dry) (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Nutrient Regime: Mesotrophic (medium) (1)
YELLOW MOUNTAIN AVENS ( <i>Dryas drummondii</i> )	35.0	23.0-47.0	100	Elevation (range): 1532 (1360-1705) M
SILVERBERRY ( <i>Elaeagnus commutata</i> )	5.0	0.0-10.0	50	Slope (%): 0.5 - 2.49 (1), 2.5 - 5.99 (1)
ROCKY MOUNTAIN JUNIPER ( <i>Juniperus scopulorum</i> )	2.2	0.0-4.5	50	Aspect: Easterly (1), Southerly (1)
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	2.2	1.0-3.5	100	Topographic Position:
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	2.0	0.0-4.0	50	<b>Soil Variables</b>
<b>Tall Forb (&gt;= 30 cm)</b>				Soil Drainage: Very rapidly drained (1), Rapidly drained (1)
SILKY PERENNIAL LUPINE ( <i>Lupinus sericeus</i> )	1.2	0.0-2.5	50	Soil Subgroup: ORTHIC REGOSOL (1)
<b>Low Forb (&lt; 30 cm)</b>				Surface Texture:
EARLY YELLOW LOCOWEED ( <i>Oxytropis sericea</i> )	5.0	0.0-10.0	50	Effective Texture:
COMMON YARROW ( <i>Achillea millefolium</i> )	4.0	0.0-8.0	50	Depth to Mottles/Gley:
REFLEXED LOCOWEED ( <i>Oxytropis deflexa</i> )	2.5	0.0-5.0	50	Organic Thickness: 0 - 5 cm (1)
YELLOW FALSE DANDELION ( <i>Agoseris glauca</i> )	2.3	0.0-4.6	50	Parent Material: Fluviolacustrine (1)
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	1.5	0.0-3.0	50	Soil Type:
ALPINE FORGET-ME-NOT ( <i>Myosotis alpestris</i> )	1.3	0.0-2.6	50	Humus Form
CUT-LEAVED ANEMONE ( <i>Anemone multifida</i> )	1.0	1.0-1.0	100	<b>LFH Thickness</b>
REDDISH STITCHWORT ( <i>Minuartia rubella</i> )	1.0	0.0-2.0	50	Mean
<b>Graminoid</b>				Min
JUNE GRASS ( <i>Koeleria macrantha</i> )	20.5	1.1-40.0	100	Max
FRINGED BROME ( <i>Bromus ciliatus</i> )	4.1	0.0-8.2	50	Count
SEDGE SPECIES ( <i>Carex</i> )	2.3	0.0-4.7	50	cm:
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	1.5	0.0-3.0	50	0.00
				0.00
				0.00
				0



## Msf2 Sw-PI-Pb/Yellow mountain avens (fluvial) (n=1)

(*Picea glauca*-*Pinus contorta*-*Populus balsamifera*/*Dryas drummondii*)

This community is typical of dry, gravelly river flats with nutrient poor soils. It is similar to the Yellow mountain avens/June grass community type previously described, but this community type is successional more advanced. The poor soil conditions limits the forage productivity and amount of regrowth after grazing. This community type should be rated as non-use. .

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** b bearberry(submesic/poor)

**Ecosite Phase:** b4 yellow mountain avens

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables				
	Mean	Range							
<b>Overstory Tree</b>					Ecological Status Score: 25				
WHITE SPRUCE ( <i>Picea glauca</i> )	35.0	35.0-35.0		100	Moisture Regime: Submesic (moderately fresh) (1)				
LOGEPOLE PINE ( <i>Pinus contorta</i> )	20.0	20.0-20.0		100	Nutrient Regime: Mesotrophic (medium) (1)				
BALSAM POPLAR ( <i>Populus balsamifera</i> )	15.0	15.0-15.0		100	Elevation (range): 1574 (1574-1574) M				
<b>Understory Tree</b>					Slope (%): 0.5 - 2.49 (1)				
WHITE SPRUCE ( <i>Picea glauca</i> )	3.7	3.7-3.7		100	Aspect: Level (1)				
BALSAM POPLAR ( <i>Populus balsamifera</i> )	2.1	2.1-2.1		100	Topographic Position:				
<b>Medium Shrub (0.5 to 2 m)</b>					<b>Soil Variables</b>				
YELLOW MOUNTAIN AVENS ( <i>Dryas drummondii</i> )	12.0	12.0-12.0		100	Soil Drainage: Rapidly drained (1)				
CANADA BUFFALOBERRY ( <i>Shepherdia canadensis</i> )	3.5	3.5-3.5		100	Soil Subgroup:				
<b>Tall Forb (&gt;= 30 cm)</b>					Surface Texture:				
SHOWY ASTER ( <i>Aster conspicuus</i> )	7.2	7.2-7.2		100	Effective Texture:				
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	2.9	2.9-2.9		100	Depth to Mottles/Gley:				
WHITE ANGELICA ( <i>Angelica arguta</i> )	1.7	1.7-1.7		100	Organic Thickness:				
UNDIFFERENTIATED HEDYSARUM ( <i>Hedysarum</i> )	1.7	1.7-1.7		100	Parent Material:				
CANADA THISTLE ( <i>Cirsium arvense</i> )	1.0	1.0-1.0		100	Soil Type:				
<b>Low Forb (&lt; 30 cm)</b>					Humus Form				
SHOWY LOCOWEED ( <i>Oxytropis splendens</i> )	2.0	2.0-2.0		100	<b>LFH Thickness</b>				
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	1.7	1.7-1.7		100					
<b>Graminoid</b>									
CANADA BLUEGRASS ( <i>Poa compressa</i> )	1.3	1.3-1.3		100					
<b>Moss</b>									
UNDIFFERENTIATED MOSS - ALL GENERA ( <i>Moss</i> )	2.3	2.3-2.3		100					
					<b>LFH Thickness</b>				
					<b>Mean</b>				
					<b>Min</b>				
					<b>Max</b>				
					<b>Count</b>				
					cm:				
					0.00				
					0.00				
					0.00				
					0				

## b5 bearberry grassland (n=166)

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** b bearberry(submesic/poor)

### General Description

This phase within the submesic/poor [b] ecosite commonly occurs on strong south and west facing slopes exposed to sunlight. These slopes generally rapidly shed water, and have high evapotranspiration causing dry grassland conditions. This is indicated by a strong presence of bearberry and/or juniper along with grasses. Rough fescue is the most common grass on these communities, along with Parry oat grass and Idaho fescue.

### Characteristic Species

#### Shrub

- [ 20.1 ] COMMON BEARBERRY  
*Arctostaphylos uva-ursi*
- [ 4.2 ] CREEPING JUNIPER  
*Juniperus horizontalis*
- [ 4.1 ] SHRUBBY CINQUEFOIL  
*Potentilla fruticosa*
- [ 3.0 ] GROUND JUNIPER  
*Juniperus communis*

#### Graminoid

- [ 7.8 ] FOOTHILLS ROUGH FESCUE  
*Festuca campestris*
- [ 3.4 ] PARRY OAT GRASS  
*Danthonia parryi*
- [ 1.6 ] IDAHO FESCUE  
*Festuca idahoensis*

### Environmental Variables

Moisture Regime: Subxeric (moderately dry) (27), Xeric (dry) (23), Mesic (fresh) (15), Submesic (moderately fresh) (15)

Nutrient Regime: Mesotrophic (medium) (59), Submesotrophic (poor) (15), Permesotrophic (rich) (3)

Elevation (range): 1614 (1163-2134) M

Slope (%): strong slope (29), very strong slope (23), steep slope (13), moderate slope (7), nearly level (5), gentle slope (2), very steep slope (1), level (1), very gentle slope (1)

Aspect: Southerly (45), Westerly (28), Easterly (6), Northerly (3), Level (1)

Topographic Position: Midslope (23), Upper Slope (13), Crest (9), Lower Slope (4), Level (2), Toe (1)

### Soil Variables

Soil Drainage: Rapidly drained (46), Well drained (28), Very rapidly drained (7), Moderately well drained (3), Very poorly drained (1)

Soil Subgroup: ORTHIC EUTRIC BRUNISOL (4), CUMULIC REGOSOL (2), ORTHIC REGOSOL (1), REGO DARK BROWN CHERNOZEM (1), ORTHIC DARK GRAY CHERNOZEM (1), TERRIC FIBRIC MESISOL (1)

Surface Texture: Sandy clay loam (2), Loam (1), Clay loam (1)

Effective Texture: Sandy clay loam (2), Silty clay loam (1), Undifferentiated Mineral (1)

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (12)

Parent Material: Morainal (6), Glaciofluvial (3), Rock (1), Colluvial (1), Fen (1)

Soil Type: Shallow (1), Dry/Fine (1), Dry/Silty-Loamy (1)

Humus Form RHIZOMULL (1)

### LFH Thickness

	Mean	Min	Max	Count
cm:	2.50	1.00	3.00	3

# Msa7 Bearberry-Juniper (n=11)

(*Arctostaphylos uva-ursi*-*Juniperus spp.*)

This community type represents the forest-grassland ecotone on dry, rocky south facing slopes. Indeed many of the stands described in this community type were placed into Douglas-fir and spruce forest types described by Corns and Achuff (1982). Lane et al. (2000), described a similar community type Low northern sedge/Bearberry, on rocky hilltops in the Lower Foothills subregion near Hinton. This community should be considered tertiary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** b bearberry(submesic/poor)

**Ecosite Phase:** b5 bearberry grassland

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Tall Shrub (2 to 5m)</b>					Ecological Status Score: 27-40
SUBALPINE FIR ( <i>Abies lasiocarpa</i> )	2.0	0.0-12.0	18		Moisture Regime: Xeric (dry) (5), Subxeric (moderately dry) (2)
WHITEBARK PINE ( <i>Pinus albicaulis</i> )	1.9	0.0-20.0	18		Nutrient Regime: Mesotrophic (medium) (4)
<b>Medium Shrub (0.5 to 2 m)</b>					Elevation (range): 1567 (1350-2042) M
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	13.1	0.0-40.0	55		Slope (%): 46 - 70.99 (5), 0.5 - 2.49 (3), 31 - 45.99 (3)
GROUND JUNIPER ( <i>Juniperus communis</i> )	6.1	0.0-16.7	73		Aspect: Southerly (7), Westerly (4)
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	3.1	0.0-8.0	64		Topographic Position: Upper Slope (2), Level (1), Crest (1), Midslope (1)
CREEPING JUNIPER ( <i>Juniperus horizontalis</i> )	2.6	0.0-16.0	36		<b>Soil Variables</b>
SUBALPINE FIR ( <i>Abies lasiocarpa</i> )	1.0	0.0-8.0	18		Soil Drainage: Rapidly drained (7), Moderately well drained (1), Very poorly drained (1), Very rapidly drained (1)
<b>Low Shrub (&lt; 0.5m)</b>					Soil Subgroup: CUMULIC REGOSOL (2), ORTHIC EUTRIC BRUNISOL (1), TERRIC FIBRIC MESISOL (1)
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	3.9	0.0-43.7	9		Surface Texture:
<b>Low Forb (&lt; 30 cm)</b>					Effective Texture:
PRAIRIE SELAGINELLA ( <i>Selaginella densa</i> )	1.4	0.0-8.0	18		Depth to Mottles/Gley:
TUFTED FLEABANE ( <i>Erigeron caespitosus</i> )	1.3	0.0-15.0	9		Organic Thickness: 0 - 5 cm (7)
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	1.1	0.0-3.0	64		Parent Material: Glaciofluvial (3), Morainal (2), Fen (1)
SMALL-LEAVED PUSSYTOES ( <i>Antennaria parvifolia</i> )	1.0	0.0-10.0	27		Soil Type:
<b>Graminoid</b>					Humus Form
TUFTED BULRUSH ( <i>Scirpus cespitosus</i> )	4.5	0.0-50.0	9		<b>LFH Thickness</b>
GRACEFUL SEDGE ( <i>Carex praegracilis</i> )	2.7	0.0-30.0	9		<b>Mean</b>
PARRY OAT GRASS ( <i>Danthonia parryi</i> )	1.8	0.0-20.0	9		<b>Min</b>
					<b>Max</b>
					<b>Count</b>
				cm:	0.00
					0.00
					0.00
					0

## Msb4 Foothills rough fescue-Sedge/Bearberry-Juniper (n=121)

(*Festuca campestris*-*Carex spp./Arctostaphylos uva-ursi-Juniperus spp.*)

This community appears to be characteristic of dry grass meadows on hilltops throughout the Montane subregion. It is similar to the rough fescue-sedge community described by Willoughby (1992) on hilltops in the Porcupine Hills. The shallow poorly developed soils appear to favour rough fescue, slender wheat grass and sedge over Parry oat grass. This community is drier than the rough fescue grasslands characteristic of lower slope positions such as the Parry oat grass-Foothills rough fescue-Idaho fescue [Msb2] community, but is slightly less dry than bluebunch wheat grass grasslands [i.e., Msb3]. Grazing pressure leads to a decline in fescue cover and an increase in lower growing species. Shrub invasion can occur on this grassland slopes also, mainly rose, saskatoon, juniper and snowberry. This community type resembles the Saskatoon-Bearberry/Rough fescue (Msd24) community but the cover and density of snowberry, rose and saskatoon are reduced in this community type (<15% shrub cover). It appears that increased grazing pressure on this community reduces the litter levels making moisture conditions more favorable for the growth of grass and forbs over shrubs (Rangeland Reference Area data SouthTodd, Middle Chimney, South Rock Creek, Highwood Slope 2020 Appendix 3).

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** b bearberry(submesic/poor)

**Ecosite Phase:** b5 bearberry grassland

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Medium Shrub (0.5 to 2 m)</b>				Ecological Status Score: 27-40
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	20.4	0.0-77.7	86	Moisture Regime: Subxeric (moderately dry) (22), Xeric (dry) (16), Mesic (fresh) (15), Submesic (moderately fresh) (10)
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	4.7	0.0-25.4	82	Nutrient Regime: Mesotrophic (medium) (46), Submesotrophic (poor) (14), Permesotrophic (rich) (3)
SASKATOON ( <i>Amelanchier alnifolia</i> )	2.6	0.0-16.5	60	Elevation (range): 1660 (1163-2134) M
PRICKLY ROSE ( <i>Rosa acicularis</i> )	1.4	0.0-14.3	58	Slope (%): 16 - 30.99 (22), 31 - 45.99 (18), 10 - 15.99 (7), 46 - 70.99 (6), 0.5 - 2.49 (2), 6 - 9.99 (2), 71 - 100.99 (1), 2.5 - 5.99 (1), 0 - 0.49 (1)
<b>Low Shrub (&lt; 0.5m)</b>				Aspect: Southerly (28), Westerly (23), Easterly (6), Northerly (3), Level (1)
CREeping JUNIPER ( <i>Juniperus horizontalis</i> )	6.4	0.0-48.5	42	Topographic Position: Midslope (18), Upper Slope (10), Crest (5), Lower Slope (2), Toe (1), Level (1)
<b>Tall Forb (&gt;= 30 cm)</b>				<b>Soil Variables</b>
SILKY PERENNIAL LUPINE ( <i>Lupinus sericeus</i> )	2.6	0.0-23.7	65	Soil Drainage: Rapidly drained (37), Well drained (22), Very rapidly drained (4), Moderately well drained (2)
YELLOW HEDYSARUM ( <i>Hedysarum sulphurescens</i> )	1.5	0.0-13.0	60	Soil Subgroup: ORTHIC EUTRIC BRUNISOL (3), ORTHIC DARK GRAY CHERNOZEM (1), REGO DARK BROWN CHERNOZEM (1)
<b>Low Forb (&lt; 30 cm)</b>				Surface Texture: Sandy clay loam (2), Loam (1)
CUT-LEAVED ANEMONE ( <i>Anemone multifida</i> )	3.8	0.0-23.7	90	Effective Texture: Sandy clay loam (2), Undifferentiated Mineral (1)
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	2.2	0.0-19.2	58	Depth to Mottles/Gley:
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	2.1	0.0-12.7	95	Organic Thickness: 0 - 5 cm (5)
COMMON YARROW ( <i>Achillea millefolium</i> )	1.4	0.0-8.5	84	Parent Material: Morainal (4), Rock (1)
PRAIRIE SELAGINELLA ( <i>Selaginella densa</i> )	1.4	0.0-33.3	23	Soil Type: Dry/Fine (1), Shallow (1)
<b>Graminoid</b>				Humus Form
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	14.3	13.0-54.7	100	<b>LFH Thickness</b>
PARRY OAT GRASS ( <i>Danthonia parryi</i> )	5.3	0.0-37.3	75	<b>Mean</b>
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	3.2	0.0-48.5	43	<b>Min</b>
IDAHO FESCUE ( <i>Festuca idahoensis</i> )	3.2	0.0-20.0	77	<b>Max</b>
BLUNT SEDGE ( <i>Carex obtusata</i> )	2.2	0.0-15.7	53	<b>Count</b>
RICHARDSON NEEDLE GRASS ( <i>Stipa richardsonii</i> )	1.1	0.0-26.9	29	cm: 2.00 1.00 2.00 2
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	1.0	0.0-7.7	48	
JUNE GRASS ( <i>Koeleria macrantha</i> )	1.0	0.0-9.9	71	

## Msc15 Bearberry/Little clubmoss/Parry oatgrass-Sedge (n=30)

(*Arctostaphylos uva-ursi*/*Selaginella densa*/*Danthonia parryi*-*Carex obtusata*)

This community type represents a grazing disclimax of the Rough fescue-Sedge/Bearberry-Juniper (Msb4) dominated community type. The Rough fescue-Sedge/Bearberry-Juniper dominated community is characteristic of dry grass upper hillsides and hilltops throughout the Montane subregion and is similar to the Rough fescue-Sedge community described by Willoughby (1992) on hilltops in the Porcupine Hills. Heavy grazing pressure reduces the cover of rough fescue and allows little clubmoss, moss phlox, parry oat grass and sedge to increase to form this community type. Continued heavy grazing pressure and drought conditions leads to a decline in all grass species to form a plant community dominated by little clubmoss, fringed sage, moss phlox and bearberry (Msc20). In the absence of grazing disturbance rough fescue, bearberry and juniper species will increase in cover to form the Rough fescue/Bearberry-Juniper (Msb4) dominated community type (Rangeland Reference Areas South Todd and Highwood slope 2020 Appendix 3).

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** b bearberry(submesic/poor)

**Ecosite Phase:** b5 bearberry grassland

### Plant Composition

### Canopy Cover (%)

### Environmental Variables

	Canopy Cover (%)			Const.
	Mean	Range		
<b>Medium Shrub (0.5 to 2 m)</b>				
SASKATOON ( <i>Amelanchier alnifolia</i> )	2.0	0.0-25.6	23	
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	1.5	0.0-7.3	63	
<b>Low Shrub (&lt; 0.5m)</b>				
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	3.9	0.0-17.8	56	
<b>Tall Forb (&gt;= 30 cm)</b>				
SILKY PERENNIAL LUPINE ( <i>Lupinus sericeus</i> )	4.6	0.0-21.0	80	
LOW GOLDENROD ( <i>Solidago missouriensis</i> )	1.0	0.0-5.3	53	
YELLOW HEDYSARUM ( <i>Hedysarum sulphurescens</i> )	0.9	0.0-9.4	47	
<b>Low Forb (&lt; 30 cm)</b>				
PRAIRIE SELAGINELLA ( <i>Selaginella densa</i> )	9.4	0.0-38.7	67	
MOSS PHLOX ( <i>Phlox hoodii</i> )	3.9	0.0-24.3	50	
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	2.9	0.4-9.1	100	
CUT-LEAVED ANEMONE ( <i>Anemone multifida</i> )	2.0	0.0-8.7	80	
YELLOW FALSE DANDELION ( <i>Agoseris glauca</i> )	1.7	0.0-6.3	73	
COMMON DANDELION ( <i>Taraxacum officinale</i> )	1.4	0.0-6.6	70	
<b>Graminoid</b>				
PARRY OAT GRASS ( <i>Danthonia parryi</i> )	7.4	0.0-30.0	93	
BLUNT SEDGE ( <i>Carex obtusata</i> )	6.9	0.0-18.5	83	
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	4.9	0.0-15.0	93	
JUNE GRASS ( <i>Koeleria macrantha</i> )	4.4	0.0-13.7	97	
IDAHO FESCUE ( <i>Festuca idahoensis</i> )	3.2	0.0-9.3	80	
RICHARDSON NEEDLE GRASS ( <i>Stipa richardsonii</i> )	3.1	0.0-13.7	67	
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	1.6	0.0-9.7	63	
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	1.5	0.0-6.9	70	
NORTHERN WHEAT GRASS ( <i>Agropyron dasystachyum</i> )	1.2	0.0-11.1	47	
EARLY BLUEGRASS ( <i>Poa cusickii</i> )	0.9	0.0-5.0	37	

Ecological Status Score: 15-27

Moisture Regime: Subxeric (moderately dry) (3), Submesic (moderately fresh) (3), Xeric (dry) (2)

Nutrient Regime: Mesotrophic (medium) (7), Submesotrophic (poor) (1)

Elevation (range): 1559 (1449-1670) M

Slope (%): 16 - 30.99 (5), 31 - 45.99 (2), 46 - 70.99 (2)

Aspect: Southerly (8), Westerly (1)

Topographic Position: Midslope (3), Lower Slope (2), Crest (2), Upper Slope (1)

### Soil Variables

Soil Drainage: Well drained (4), Rapidly drained (2), Very rapidly drained (2)

Soil Subgroup: ORTHIC REGOSOL (1)

Surface Texture: Clay loam (1)

Effective Texture: Silty clay loam (1)

Depth to Mottles/Gley:

Organic Thickness:

Parent Material: Colluvial (1)

Soil Type: Dry/Silty-Loamy (1)

Humus Form RHIZOMULL (1)

### LFH Thickness

	Mean	Min	Max	Count
cm:	3.00	3.00	3.00	1

## Msc20 Sedge-Junegrass/Moss phlox-Fringed sage (n=4)

(*Carex obtusata*-*Koeleria macrantha*/*Phlox hoodii*-*Artemisia frigida*)

This community type was described on the grazed outside transect of the South Todd reference area during the drought years of the 1980's and the heavily grazed outside transects from Highwood slope rangeland reference area from the 1950s to the 1980's. Eight of the ten years in the 1980's had below average precipitation in southern Alberta (Willoughby and Alexander 2005). The droughty conditions and heavy grazing pressure limited plant growth to grazing resistant and drought tolerate species of sedge, junegrass, fringed sage and moss phlox plant species. In the 1990's when moisture conditions were more favorable range health improved on the grazed outside transects to form the Bearberry/Little clubmoss/Parry oatgrass-Sedge (Msc15) dominated community type at both reference areas (Rangeland Reference Areas South Todd and Highwood Slope 2020).

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** b bearberry(submesic/poor)

**Ecosite Phase:** b5 bearberry grassland

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Tall Shrub (2 to 5m)</b>				Ecological Status Score: 10-15
SASKATOON ( <i>Amelanchier alnifolia</i> )	1.0	0.1-2.4	100	Moisture Regime: Submesic (moderately fresh) (2)
<b>Medium Shrub (0.5 to 2 m)</b>				Nutrient Regime: Mesotrophic (medium) (2)
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	1.5	0.0-3.7	75	Elevation (range): 1670 (1670-1670) M
COMMON WILD ROSE ( <i>Rosa woodsii</i> )	1.3	0.0-2.2	75	Slope (%): 16 - 30.99 (2)
<b>Tall Forb (&gt;= 30 cm)</b>				Aspect: Southerly (2)
UNDIFFERENTIATED MILK VETCH ( <i>Astragalus</i> )	3.5	0.0-7.7	75	Topographic Position: Crest (1), Midslope (1)
ALPINE HEDYSARUM ( <i>Hedysarum alpinum</i> )	2.2	0.0-5.8	75	
DRUMMOND'S MILK VETCH ( <i>Astragalus drummondii</i> )	1.9	0.0-7.9	25	
BALSAMROOT ( <i>Balsamorhiza sagittata</i> )	1.4	0.0-5.7	25	
GOLDEN ASTER ( <i>Heterotheca villosa</i> )	1.4	0.1-3.8	100	
YELLOW HEDYSARUM ( <i>Hedysarum sulphurescens</i> )	1.2	0.0-5.0	25	
<b>Low Forb (&lt; 30 cm)</b>				
MOSS PHLOX ( <i>Phlox hoodii</i> )	23.1	8.8-50.1	100	
CUT-LEAVED ANEMONE ( <i>Anemone multifida</i> )	3.2	0.9-8.7	100	
PASTURE SAGEWORT ( <i>Artemisia frigida</i> )	1.1	0.2-3.5	100	
COMMON YARROW ( <i>Achillea millefolium</i> )	1.0	0.4-2.5	100	
<b>Graminoid</b>				
JUNE GRASS ( <i>Koeleria macrantha</i> )	4.5	1.1-14.8	100	
SEDGE SPECIES ( <i>Carex</i> )	4.4	0.0-15.2	75	
PARRY OAT GRASS ( <i>Danthonia parryi</i> )	3.2	0.8-5.7	100	
IDAHO FESCUE ( <i>Festuca idahoensis</i> )	2.9	1.4-5.2	100	
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	2.2	0.1-7.0	100	
				<b>Soil Variables</b>
				Soil Drainage: Well drained (2)
				Soil Subgroup:
				Surface Texture:
				Effective Texture:
				Depth to Mottles/Gley:
				Organic Thickness:
				Parent Material:
				Soil Type:
				Humus Form
				<b>LFH Thickness</b>
				Mean
				Min
				Max
				Count
				cm:
				0.00
				0.00
				0.00
				0

## b6 bearberry Sw (n=5)

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** b bearberry(submesic/poor)

### General Description

This phase within the submesic/poor [b] ecosite represents either north and east facing established forests or south and west facing areas that are now in a forested phase. Generally, these sites are steep, water-shedding slopes, or less steep areas with coarse texture soils; in both cases, soil drainage is rapid and sites are dry. This is indicated by a strong presence of bearberry and juniper in the understory.

### Characteristic Species

#### Tree

- [ 19.7 ] WHITE SPRUCE  
*Picea glauca*

#### Shrub

- [ 16.9 ] COMMON BEARBERRY  
*Arctostaphylos uva-ursi*
- [ 5.9 ] GROUND JUNIPER  
*Juniperus communis*
- [ 3.4 ] SHRUBBY CINQUEFOIL  
*Potentilla fruticosa*
- [ 3.0 ] SILVERBERRY  
*Elaeagnus commutata*

#### Forb

- [ 1.5 ] SHOWY ASTER  
*Aster conspicuus*
- [ 1.5 ] LINDLEY'S ASTER  
*Aster ciliolatus*
- [ 1.2 ] CREAM-COLORED VETCHLING  
*Lathyrus ochroleucus*
- [ 1.0 ] ALPINE HEDYSARUM  
*Hedysarum alpinum*

#### Moss and Liverwort

- [ 6.0 ] UNDIFFERENTIATED MOSS - ALL GENERA  
*Moss*

#### Graminoid

- [ 3.6 ] HAIRY WILD RYE  
*Elymus innovatus*
- [ 2.0 ] BLUNT SEDGE  
*Carex obtusata*

### Environmental Variables

Moisture Regime: Very Xeric (very dry) (1), Subxeric (moderately dry) (1), Submesic (moderately fresh) (1)

Nutrient Regime: Mesotrophic (medium) (2)

Elevation (range): 1428 (1350-1564) M

Slope (%): level (2)

Aspect: Level (1), Southerly (1)

Topographic Position: Midslope (1), Level (1), Crest (1), Toe (1)

### Soil Variables

Soil Drainage: Moderately well drained (2), Well drained (1), Very rapidly drained (1)

Soil Subgroup: ORTHIC REGOSOL (1)

Surface Texture:

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (1)

Parent Material: Fluvial (1)

Soil Type:

Humus Form

### LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

## Mse24 Sw/Juniper-Bearberry (n=5)

### (*Picea glauca*/*Juniperus communis*-*Arctostaphylos uva-ursi*)

This community type is similar to the Sw/bearberry community type described in the Upper Foothills subregion. This type represents dry ridges or gravelly river flood plains with poor nutrient regimes; as indicated by the high abundance of bearberry. These sites are often windswept and desiccated. If this community type is located near a physical feature that attracts livestock to the area it may be considered secondary range. Most other instances however, this community type would be considered tertiary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** b bearberry(submesic/poor)

**Ecosite Phase:** b6 bearberry Sw

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Overstory Tree</b>					Ecological Status Score: 20-25
WHITE SPRUCE ( <i>Picea glauca</i> )	14.6	0.0-30.0	80		Moisture Regime: Very Xeric (very dry) (1), Subxeric (moderately dry) (1), Submesic (moderately fresh) (1)
LOGEPOLE PINE ( <i>Pinus contorta</i> )	1.4	0.0-7.0	20		Nutrient Regime: Mesotrophic (medium) (2)
<b>Understory Tree</b>					Elevation (range): 1428 (1350-1564) M
WHITE SPRUCE ( <i>Picea glauca</i> )	5.1	0.0-15.0	60		Slope (%): 0 - 0.49 (2)
<b>Medium Shrub (0.5 to 2 m)</b>					Aspect: Level (1), Southerly (1)
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	16.9	0.0-31.8	80		Topographic Position: Level (1), Crest (1), Midslope (1), Toe (1)
GROUND JUNIPER ( <i>Juniperus communis</i> )	5.9	1.3-10.0	100		<b>Soil Variables</b>
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	3.4	0.0-8.6	60		Soil Drainage: Moderately well drained (2), Very rapidly drained (1), Well drained (1)
SILVERBERRY ( <i>Elaeagnus commutata</i> )	3.0	0.0-15.0	20		Soil Subgroup: ORTHIC REGOSOL (1)
CREEPING JUNIPER ( <i>Juniperus horizontalis</i> )	1.4	0.0-2.1	80		Surface Texture:
PRICKLY ROSE ( <i>Rosa acicularis</i> )	1.4	0.2-3.0	100		Effective Texture:
<b>Tall Forb (&gt;= 30 cm)</b>					Depth to Mottles/Gley:
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	1.5	0.0-4.9	80		Organic Thickness: 0 - 5 cm (1)
SHOWY ASTER ( <i>Aster conspicuus</i> )	1.5	0.0-6.5	40		Parent Material: Fluvial (1)
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	1.2	0.0-6.2	20		Soil Type:
ALPINE HEDYSARUM ( <i>Hedysarum alpinum</i> )	1.0	0.0-2.9	40		Humus Form
<b>Graminoid</b>					<b>LFH Thickness</b>
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	3.6	0.0-7.4	60		Mean
BRISTLE-LEAVED SEDGE ( <i>Carex eburnea</i> )	1.0	0.0-5.0	40		Min
					Max
					Count
				cm:	0.00
					0.00
					0.00
					0



## b7 bearberry shrubland (n=29)

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** b bearberry(submesic/poor)

### General Description

This ecosite phase represents a phase where shrubs such as saskatoon, rose, snowberry and chokecherry have advanced in the absence of fire disturbance. They typically catch and hold more snow in the winter and provide some shelter from wind, and may show increasing productivity. These sites will also typically have less bare soil and more litter compared to the grassland phase. However, accessibility under the shrubs may be limited, negating any overall stocking increases.

### Characteristic Species

#### Shrub

- [ 17.3 ] COMMON BEARBERRY  
*Arctostaphylos uva-ursi*
- [ 12.3 ] SASKATOON  
*Amelanchier alnifolia*
- [ 2.1 ] UNDIFFERENTIATED ROSE  
*Rosa*
- [ 2.1 ] UNDIFFERENTIATED JUNIPERUS  
*Juniperus*
- [ 1.6 ] UNDIFFERENTIATED SYMPHORICARPOS  
*Symphoricarpos*

#### Graminoid

- [ 10.6 ] FOOTHILLS ROUGH FESCUE  
*Festuca campestris*

### Environmental Variables

Moisture Regime: Submesic (moderately fresh) (3), Xeric (dry) (3), Mesic (fresh) (1), Subxeric (moderately dry) (1)

Nutrient Regime: Mesotrophic (medium) (5), Submesotrophic (poor) (2), Oligotrophic (very poor) (1)

Elevation (range): 1561 (1378-1783) M

Slope (%): steep slope (3), nearly level (2), very strong slope (2), very gentle slope (1), strong slope (1)

Aspect: Easterly (3), Southerly (3), Westerly (2), Northerly (1)

Topographic Position: Midslope (4)

### Soil Variables

Soil Drainage: Rapidly drained (4), Well drained (2), Very rapidly drained (2)

Soil Subgroup:

Surface Texture: Loam (1)

Effective Texture: Loam (1)

Depth to Mottles/Gley:

Organic Thickness:

Parent Material:

Soil Type: Dry/Silty-Loamy (1)

Humus Form

### LFH Thickness

	Mean	Min	Max	Count
cm:	4.00	4.00	4.00	1

## Msd24 Saskatoon-Bearberry/Foothills rough fescue (n=29)

(*Amelanchier alnifolia*-*Arctostaphylos uva-ursi*/*Festuca campestris*)

This site represents steep upper slope grasslands that have been encroached by aspen, rose, snowberry, saskatoon or chokecherry. These communities occur on the top and crest of slopes and commonly have rough fescue, juniper and bearberry. The soils of this community are typically thin and poor in nutrients, and exposed soil is common. Without disturbances such as fire and grazing, shrubs and trees will slowly establish themselves and litter levels will increase creating slightly more moisture retention due to snow catchment in the winter. Sites occur for this community throughout the Montane South Ecoregion, and are also represented by the South Rock Creek and Highwood slope reference areas (Rangeland Reference Areas 2020 Appendix 3). This community type resembles the Rough fescue-Sedge/Bearberry-Juniper (Msb4) community but the cover and density of shrubs and trees is lower (<15%) in the Msb4 dominated community type.

**Natural Subregion:** Montane

**Ecoregion:** Ms Montane South Ecoregion

**Ecosite:** b bearberry(submesic/poor)

**Ecosite Phase:** b7 bearberry shrubland

### Plant Composition

### Canopy Cover (%)

### Environmental Variables

	Canopy Cover (%)			Const.	Ecological Status Score: 27-40 Moisture Regime: Xeric (dry) (3), Submesic (moderately fresh) (3), Mesic (fresh) (1), Subxeric (moderately dry) (1) Nutrient Regime: Mesotrophic (medium) (5), Submesotrophic (poor) (2), Oligotrophic (very poor) (1) Elevation (range): 1561 (1378-1783) M Slope (%): 46 - 70.99 (3), 31 - 45.99 (2), 0.5 - 2.49 (2), 16 - 30.99 (1), 2.5 - 5.99 (1) Aspect: Southerly (3), Easterly (3), Westerly (2), Northerly (1) Topographic Position: Midslope (4)
	Mean	Range			
<b>Medium Shrub (0.5 to 2 m)</b>					
SASKATOON ( <i>Amelanchier alnifolia</i> )	7.3	0.0-24.7	76	Soil Drainage: Rapidly drained (4), Very rapidly drained (2), Well drained (2) Soil Subgroup: Surface Texture: Loam (1) Effective Texture: Loam (1) Depth to Mottles/Gley: Organic Thickness: Parent Material: Soil Type: Dry/Silty-Loamy (1) Humus Form	
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	7.0	0.0-18.6	93		
PRICKLY ROSE ( <i>Rosa acicularis</i> )	1.6	0.0-8.7	62		
CANADA BUFFALOBERRY ( <i>Shepherdia canadensis</i> )	1.4	0.0-13.3	38		
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	1.1	0.0-9.3	38		
GROUND JUNIPER ( <i>Juniperus communis</i> )	1.0	0.0-5.3	41		
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	0.9	0.0-9.3	48		
<b>Low Shrub (&lt; 0.5m)</b>					
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	23.9	0.0-78.8	73		
CREeping JUNIPER ( <i>Juniperus horizontalis</i> )	0.9	0.0-7.0	28		
<b>Tall Forb (&gt;= 30 cm)</b>					
YELLOW HEDYSARUM ( <i>Hedysarum sulphurescens</i> )	1.8	0.0-9.2	59		
SILKY PERENNIAL LUPINE ( <i>Lupinus sericeus</i> )	1.7	0.0-13.5	41		
YELLOW BEARDTONGUE ( <i>Penstemon confertus</i> )	1.2	0.0-3.7	72		
<b>Low Forb (&lt; 30 cm)</b>					
CUT-LEAVED ANEMONE ( <i>Anemone multifida</i> )	3.3	0.0-11.2	93	LFH Thickness cm: 4.00 4.00 4.00 1	
SMALL-LEAVED PUSSYTOES ( <i>Antennaria parvifolia</i> )	3.1	0.0-29.3	45		
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	2.2	0.4-7.9	100		
THREE-FLOWERED AVENS ( <i>Geum triflorum</i> )	1.9	0.0-7.2	79		
<b>Graminoid</b>					
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	11.2	8.0-22.1	100		
PARRY OAT GRASS ( <i>Danthonia parryi</i> )	5.4	0.0-22.8	72		
BLUNT SEDGE ( <i>Carex obtusata</i> )	5.2	0.0-25.3	79		
RICHARDSON NEEDLE GRASS ( <i>Stipa richardsonii</i> )	2.2	0.0-15.5	52		
IDAHO FESCUE ( <i>Festuca idahoensis</i> )	2.0	0.0-10.8	76		
JUNE GRASS ( <i>Koeleria macrantha</i> )	1.6	0.0-11.3	72		

## c buffaloberry/hairy wild rye (submesic/medium) (n=512)

Natural Subregion: Montane

Ecosection: Ms Montane South Ecosection

### General Description

This ecosite represents relatively dry conditions for the subregion but not as dry as the two ecosites previously described. Stands usually have closed canopies. Understory vegetation is generally sparse; however, Canada buffaloberry and hairy wild rye are commonly occurring species. Edaphic grasslands in this ecosite usually occupy steep south and west facing slopes and due to their exposure can occur on lower slope positions compared to the forested communities on the north and east aspects of this ecosite. They are commonly dominated by rough fescue, Parry oat grass, Idaho fescue and sedge species.



### Successional Relationships

Lodgepole pine, Douglas-fir and aspen form pure and mixed stands on this ecosite. Succession is toward white spruce and/or Douglas-fir; however, succession rates are slow due to the dry nature of the ecosite. Shrub and forb layers may be very sparse depending on canopy closure, particularly in Douglas-fir stands. Grasslands do occur on south and west facing slopes, however without fire disturbance encroachment of aspen or conifers can occur, usually advancing from the edges of the community transitions. Coniferous trees tend to encroach on sloped areas, where aspen will encroach from lower slope positions or from moist pockets. Heavy grazing on the grasslands in this ecosite will lead to a community dominated by sedge, little clubmoss and fringed sage.

### Indicator Species

#### Tree

WHITE SPRUCE  
*Picea glauca*  
LODGEPOLE PINE  
*Pinus contorta*  
DOUGLAS-FIR  
*Pseudotsuga menziesii*

#### Shrub

CANADA BUFFALOBERRY  
*Shepherdia canadensis*

#### Graminoid

FOOTHILLS ROUGH FESCUE  
*Festuca campestris*  
HAIRY WILD RYE  
*Elymus innovatus*  
PARRY OAT GRASS  
*Danthonia parryi*  
PINE REED GRASS  
*Calamagrostis rubescens*  
BLUNT SEDGE  
*Carex obtusata*

Site Index at 50 Years	Height (m)	Variation (m)	Count
WHITE SPRUCE <i>(Picea glauca)</i>	11.00	0.60	0
LODGEPOLE PINE <i>(Pinus contorta)</i>	12.20	0.40	0
DOUGLAS-FIR <i>(Pseudotsuga menziesii)</i>	9.70	0.40	0
ASPEN <i>(Populus tremuloides)</i>	13.60	3.70	0

### Environmental Variables

Moisture Regime: Submesic (moderately fresh) (101), Mesic (fresh) (95), Subseric (moderately dry) (63), Xeric (dry) (19), Subhygric (moderately moist) (3)

Nutrient Regime: Mesotrophic (medium) (173), Submesotrophic (poor) (46), Permesotrophic (rich) (21), Oligotrophic (very poor) (1)

Elevation (range): 1537 (1318-5453) M

Slope (%): strong slope (144), moderate slope (63), very strong slope (53), very gentle slope (37), gentle slope (23), steep slope (20), level (18), nearly level (16)

Aspect: Southerly (163), Westerly (135), Easterly (61), Northerly (25), Level (20)

Topographic Position: Midslope (101), Upper Slope (62), Lower Slope (34), Level (20), Crest (11), Toe (4)

### Soil Variables

Soil Drainage: Well drained (225), Rapidly drained (113), Moderately well drained (37), Very rapidly drained (15), Mixed drainage (3), Imperfectly drained (2)

Soil Subgroup: ORTHIC EUTRIC BRUNISOL (44), ORTHIC BLACK CHERNOZEM (41), ORTHIC GRAY LUVISOL (34), ORTHIC DARK GRAY CHERNOZEM (23), ORTHIC REGOSOL (21), ORTHIC BROWN CHERNOZEM (12), ELUVIATED EUTRIC BRUNISOL (10), DARK GRAY LUVISOL (7), BRUNISOLIC GRAY LUVISOL (7), ORTHIC MELANIC BRUNISOL (5), ELUVIATED DYSTRIC BRUNISOL (4), BRUNISOLIC GRAY BROWN LUVISOL (3), CUMULIC REGOSOL (3), GLEYED GRAY LUVISOL (2), ORTHIC DYSTRIC BRUNISOL (2),

Surface Texture: Loam (13), Clay loam (10), Sandy loam (10), Silt loam (6), Silty clay (3), Sandy clay loam (2), Clay (1), Silty clay loam (1), Very fine sandy loam (1), Fine sandy loam (1), Sand (1)

Effective Texture: Clay loam (12), Loam (6), Silty clay loam (6), Sandy clay loam (5), Sandy loam (5), Clay (5), Silty clay (3), Silt loam (2), Fine sandy loam (2), Loamy sand (1), Very fine sand (1), Very fine sandy loam (1)

Depth to Mottles/Gley: 0 - 25 (3), 26 - 50 (2), 51 - 100 (1)

Organic Thickness: 0 - 5 cm (214)

Parent Material: Morainal (129), Colluvial (46), Fluvial (20), Rock (16), Residual (14), Glaciofluvial (12), Glaciolacustrine (2), Eolian (1), Saprolite (1), Tephra (1), Undifferentiated Mineral (1)

Soil Type: Dry/Silty-Loamy (5), Moist/Coarse (2), Moist/Fine (2), Dry/Fine (2), Very Dry/Silty-Loamy (2), Dry/Coarse (1), Moist/Sandy (1), Very Dry/Sandy (1)

Humus Form FIBRIMOR (13), HUMIFIBRIMOR (7), FIBRIHUMIMOR (7), RAW MODER (3), RHIZOMULL (3)

LFH Thickness	Mean	Min	Max	Count
cm:	4.57	1.00	12.00	49

# c1 Canada buffaloberry/hairy wild rye Fd (n=65)

**Natural Subregion:** Montane  
**Ecosection:** Ms Montane South Ecosection

**Ecosite:** c buffaloberry/hairy wild rye (submesic/medium)

## General Description

Douglas-fir forests with relatively sparse hairy wild rye understories are common in the Porcupine Hills and Foothills region of the Montane South Ecosection. This phase represents the climax successional community in these areas.

## Characteristic Species

### Tree

- [ 44.7 ] DOUGLAS-FIR  
*Pseudotsuga menziesii*
- [ 5.1 ] WHITE SPRUCE  
*Picea glauca*
- [ 2.1 ] LODGEPOLE PINE  
*Pinus contorta*

### Shrub

- [ 1.1 ] PRICKLY ROSE  
*Rosa acicularis*

### Forb

- [ 2.7 ] SHOWY ASTER  
*Aster conspicuus*

### Moss and Liverwort

- [ 18.6 ] UNDIFFERENTIATED MOSS - ALL GENERA  
*Moss*

### Graminoid

- [ 4.8 ] HAIRY WILD RYE  
*Elymus innovatus*
- [ 2.0 ] PINE REED GRASS  
*Calamagrostis rubescens*

## Environmental Variables

Moisture Regime: Submesic (moderately fresh) (29), Mesic (fresh) (22), Subxeric (moderately dry) (13)

Nutrient Regime: Mesotrophic (medium) (35), Submesotrophic (poor) (7)

Elevation (range): 1532 (1365-1810) M

Slope (%): strong slope (33), moderate slope (9), very gentle slope (5), very strong slope (3), gentle slope (2)

Aspect: Westerly (26), Easterly (17), Southerly (7), Northerly (4), Level (1)

Topographic Position: Midslope (24), Upper Slope (22), Lower Slope (11), Crest (5), Toe (1)

## Soil Variables

Soil Drainage: Well drained (46), Moderately well drained (11), Rapidly drained (7), Imperfectly drained (2)

Soil Subgroup: ORTHIC EUTRIC BRUNISOL (15), ORTHIC GRAY LUVISOL (7), ELUVIATED EUTRIC BRUNISOL (6), DARK GRAY LUVISOL (3), ORTHIC MELANIC BRUNISOL (3), ORTHIC BLACK CHERNOZEM (1), REGO BLACK CHERNOZEM (1), REGO DARK BROWN CHERNOZEM (1), ELUVIATED DYSTRIC BRUNISOL (1), ORTHIC DYSTRIC BRUNISOL (1), CUMULIC REGOSOL (1), ORTHIC REGOSOL (1), ORTHIC HUMIC REGOSOL (1), GLEYED GRAY LUVISOL (1), GLEYED DARK GRAY LUVISOL (1), BRUNISOLIC GRAY BROWN LUVISOL (1)

Surface Texture: Loam (10), Clay loam (7), Sandy loam (7), Silty clay (3), Silt loam (3), Very fine sandy loam (1), Silty clay loam (1), Sandy clay loam (1), Fine sandy loam (1)

Effective Texture: Clay loam (9), Sandy loam (4), Sandy clay loam (3), Clay (3), Silty clay (3), Silty clay loam (3), Silt loam (2), Fine sandy loam (2), Loam (2), Loamy sand (1), Very fine sand (1), Very fine sandy loam (1)

Depth to Mottles/Gley: 0 - 25 (2), 26 - 50 (2), 51 - 100 (1)

Organic Thickness: 0 - 5 cm (40)

Parent Material: Morainal (13), Residual (13), Colluvial (11), Rock (10), Glaciofluvial (4), Fluvial (2), Tephra (1), Eolian (1)

Soil Type: Dry/Fine (2), Dry/Silty-Loamy (2), Moist/Coarse (2), Moist/Sandy (1), Very Dry/Sandy (1), Very Dry/Silty-Loamy (1), Dry/Coarse (1), Moist/Fine (1)

Humus Form FIBRIMOR (8), FIBRIHUMIMOR (6), HUMIFIBRIMOR (6), RAW MODER (2)

## LFH Thickness

	Mean	Min	Max	Count
cm:	4.50	1.00	10.00	34

## Mse6 Fd/Hairy wild rye (n=36)

(*Pseudotsuga menziesii*/*Elymus innovatus*)

This community type occurs on steep, dry sites throughout the subregion. Douglas-fir is usually restricted to steep, south facing slopes, shallow rocky soils and coarse-textured outwash in valley bottoms (Strong 1992). The soils of this type are richer than the bearberry and limber pine dominated ecosites. This community has a high cover of Douglas-fir and a very sparse understory. Consequently, there is little forage available for domestic livestock. As a result, this community type should be considered tertiary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** c buffaloberry/hairy wild rye (submesic/medium)

**Ecosite Phase:** c1 Canada buffaloberry/hairy wild rye Fd

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Overstory Tree</b>					Ecological Status Score: 20-25 Moisture Regime: Mesic (fresh) (16), Submesic (moderately fresh) (14), Subxeric (moderately dry) (7) Nutrient Regime: Mesotrophic (medium) (23) Elevation (range): 1546 (1390-1750) M Slope (%): 16 - 30.99 (14), 10 - 15.99 (7), 2.5 - 5.99 (4) Aspect: Westerly (14), Easterly (10), Southerly (4) Topographic Position: Upper Slope (13), Midslope (11), Lower Slope (8), Crest (4)
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	45.7	1.0-88.0	100		
LOGDEPOLE PINE ( <i>Pinus contorta</i> )	1.3	0.0-15.0	17		
<b>Understory Tree</b>					
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	8.8	0.0-42.0	58		
<b>Medium Shrub (0.5 to 2 m)</b>					
PRICKLY ROSE ( <i>Rosa acicularis</i> )	2.5	0.0-24.3	89		
GROUND JUNIPER ( <i>Juniperus communis</i> )	2.2	0.0-55.0	22		
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	1.0	0.0-8.0	20		
<b>Tall Forb (&gt;= 30 cm)</b>					
SHOWY ASTER ( <i>Aster conspicuus</i> )	5.6	0.0-20.9	92		
WESTERN MEADOW RUE ( <i>Thalictrum occidentale</i> )	1.1	0.0-9.0	28		
<b>Low Forb (&lt; 30 cm)</b>					
HEART-LEAVED ARNICA ( <i>Arnica cordifolia</i> )	1.8	0.0-23.0	44		
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	1.7	0.0-8.7	75		
<b>Graminoid</b>					
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	12.4	0.0-50.0	94		
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	4.8	0.0-30.0	61		
<b>Moss</b>					
UNDIFFERENTIATED MOSS - ALL GENERA (Moss)	2.8	0.0-33.2	19		
<b>Soil Variables</b>					
Soil Drainage: Well drained (27), Moderately well drained (7), Rapidly drained (5)					
Soil Subgroup: ORTHIC EUTRIC BRUNISOL (8), ORTHIC MELANIC BRUNISOL (3), ELUVIATED EUTRIC BRUNISOL (3), ORTHIC REGOSOL (1), REGO BLACK CHERNOZEM (1), ORTHIC GRAY LUVISOL (1), ORTHIC HUMIC REGOSOL (1), ORTHIC DYSTRIC BRUNISOL (1)					
Surface Texture: Loam (5), Clay loam (4), Sandy loam (3), Silt loam (1), Very fine sandy loam (1), Fine sandy loam (1)					
Effective Texture: Clay loam (3), Sandy loam (3), Loam (2), Fine sandy loam (2), Clay (2), Sandy clay loam (1), Loamy sand (1), Silt loam (1)					
Depth to Mottles/Gley:					
Organic Thickness: 0 - 5 cm (19)					
Parent Material: Colluvial (6), Morainal (6), Glaciofluvial (3), Fluvial (2), Rock (2), Residual (1), Eolian (1)					
Soil Type: Moist/Coarse (2), Dry/Silty-Loamy (2), Very Dry/Silty-Loamy (1), Moist/Fine (1), Dry/Fine (1), Very Dry/Sandy (1), Dry/Coarse (1)					
Humus Form FIBRIMOR (4), HUMIFIBRIMOR (2)					
<b>LFH Thickness</b>					
cm:	5.00	1.00	9.00	15	

## Mse6a Fd/Needle litter (n=22)

### (*Pseudotsuga menziesii*)

This community type represents a mature Douglas-fir forest. The closed canopy of Douglas-fir limits the light reaching the forest floor restricting the growth of the understory vegetation. Consequently there is little forage available for domestic livestock and this community type should be considered tertiary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** c buffaloberry/hairy wild rye (submesic/medium)

**Ecosite Phase:** c1 Canada buffaloberry/hairy wild rye Fd

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Overstory Tree</b>					Ecological Status Score: 25 Moisture Regime: Submesic (moderately fresh) (13), Mesic (fresh) (6), Subxeric (moderately dry) (3) Nutrient Regime: Submesotrophic (poor) (7), Mesotrophic (medium) (7) Elevation (range): 1590 (1365-1810) M Slope (%): 16 - 30.99 (16), 6 - 9.99 (2), 10 - 15.99 (2), 31 - 45.99 (2) Aspect: Westerly (11), Northerly (4), Easterly (4), Southerly (2), Level (1) Topographic Position: Midslope (12), Upper Slope (7), Lower Slope (2), Crest (1)  <b>Soil Variables</b> Soil Drainage: Well drained (14), Moderately well drained (4), Imperfectly drained (2), Rapidly drained (2) Soil Subgroup: ORTHIC EUTRIC BRUNISOL (7), ORTHIC GRAY LUVISOL (5), ELUVIATED EUTRIC BRUNISOL (3), DARK GRAY LUVISOL (2), ORTHIC BLACK CHERNOZEM (1), REGO DARK BROWN CHERNOZEM (1), GLEYED GRAY LUVISOL (1), GLEYED DARK GRAY LUVISOL (1) Surface Texture: Loam (5), Sandy loam (4), Silty clay (3), Clay loam (3), Silt loam (2), Silty clay loam (1), Sandy clay loam (1) Effective Texture: Clay loam (6), Silty clay (3), Silty clay loam (3), Sandy clay loam (2), Clay (1), Very fine sand (1), Very fine sandy loam (1), Sandy loam (1), Silt loam (1) Depth to Mottles/Gley: 0 - 25 (2), 26 - 50 (2), 51 - 100 (1) Organic Thickness: 0 - 5 cm (21) Parent Material: Residual (12), Rock (8), Morainal (7), Colluvial (5), Glaciofluvial (1), Tephra (1) Soil Type: Moist/Sandy (1), Dry/Fine (1) Humus Form FIBRIHUMIMOR (6), HUMIFIBRIMOR (4), FIBRIMOR (4), RAW MODER (2)
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	44.0	17.0-70.0	100		
LOGEPOLE PINE ( <i>Pinus contorta</i> )	3.0	0.0-20.0	46		
<b>Understory Tree</b>					
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	12.5	0.0-30.0	100		
<b>Medium Shrub (0.5 to 2 m)</b>					
TWINFLOWER ( <i>Linnaea borealis</i> )	1.0	0.0-10.0	41		
PRICKLY ROSE ( <i>Rosa acicularis</i> )	1.0	0.0-3.0	82		
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	1.0	0.0-10.0	50		
<b>Tall Forb (&gt;= 30 cm)</b>					
SHOWY ASTER ( <i>Aster conspicuus</i> )	1.3	0.0-5.0	82		
<b>Low Forb (&lt; 30 cm)</b>					
HEART-LEAVED ARNICA ( <i>Arnica cordifolia</i> )	1.1	0.0-7.0	59		
<b>Graminoid</b>					
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	1.2	0.0-5.0	59		
<b>LFH Thickness</b>	<b>Mean</b>	<b>Min</b>	<b>Max</b>	<b>Count</b>	
cm:	4.00	1.00	10.00	19	

## Mse6b Fd/Timothy (n=2)

### (*Pseudotsuga menziesii*/*Phleum pratense*)

This community type was described on a hill crest and toe slope, and represents an open Douglas-fir forested community type that has been extensively utilized by livestock. Livestock often congregate in these open Douglas-fir stands on the hilltops. These sites can be windy and cool offering livestock a respite from biting insects and clear sight lines for potential predators. The heavy use on these sites favours the establishment of introduced species such as timothy and Kentucky bluegrass into the native grass species.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** c buffaloberry/hairy wild rye (submesic/medium)

**Ecosite Phase:** c1 Canada buffaloberry/hairy wild rye Fd

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Overstory Tree</b>					Ecological Status Score: 5-10
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	50.0	40.0-60.0	100		Moisture Regime: Subxeric (moderately dry) (2)
<b>Medium Shrub (0.5 to 2 m)</b>					Nutrient Regime: Mesotrophic (medium) (2)
SNOWBERRY ( <i>Symphoricarpos albus</i> )	4.8	3.2-6.4	100		Elevation (range): 1462 (1439-1486) M
PRICKLY ROSE ( <i>Rosa acicularis</i> )	4.4	2.3-6.5	100		Slope (%): 16 - 30.99 (1), 31 - 45.99 (1)
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	1.3	0.0-2.7	50		Aspect: Easterly (2)
<b>Tall Forb (&gt;= 30 cm)</b>					Topographic Position: Upper Slope (1), Toe (1)
VEINY MEADOW RUE ( <i>Thalictrum venulosum</i> )	4.6	2.5-6.7	100		<b>Soil Variables</b>
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	2.7	1.9-3.5	100		Soil Drainage: Well drained (2)
SHOWY ASTER ( <i>Aster conspicuus</i> )	2.6	1.0-4.2	100		Soil Subgroup:
FAIRYBELLS ( <i>Disporum trachycarpum</i> )	1.2	1.0-1.4	100		Surface Texture:
<b>Low Forb (&lt; 30 cm)</b>					Effective Texture:
COMMON DANDELION ( <i>Taraxacum officinale</i> )	2.7	2.1-3.3	100		Depth to Mottles/Gley:
<b>Graminoid</b>					Organic Thickness:
AWNLESS BROME ( <i>Bromus inermis</i> )	2.7	0.0-5.4	50		Parent Material:
TIMOTHY ( <i>Phleum pratense</i> )	2.4	1.1-3.7	100		Soil Type:
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	2.1	1.1-3.2	100		Humus Form
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	1.3	1.0-1.6	100		
					<b>LFH Thickness</b>
					<b>Mean</b>
					<b>Min</b>
					<b>Max</b>
					<b>Count</b>
					cm:
					0.00
					0.00
					0.00
					0

## Msh28 PI-Fd/Foothills rough fescue (cutblock) (n=5)

(*Pinus contorta*-*Pseudotsuga menziesii*/*Festuca campestris*)

This community type represents harvested lodgepole pine or Douglas-fir forests on south and west facing slopes that occur in the Porcupine Hills and Foothills areas of the Montane. These sites tend to be drier than the pinegrass or even hairy wild rye dominated cutblocks which occur on more mesic north and east facing ecosites. Studies in the Porcupine Hills suggest Douglas-fir clear cuts may not regenerate directly back to Douglas-fir. Lodgepole pine may first establish, then Douglas-fir slowly infills the canopy. Cutblocks in this ecosite that exhibit significant cover of rough fescue often indicate sites that are encroached grasslands. In these cases, forest regeneration may be very slow as the site may have moved to the grassland phase of this ecosite. These sites will advance to forest cover in the long-term if not disturbed once again (e.g., fire), but this may take decades.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** c buffaloberry/hairy wild rye (submesic/medium)

**Ecosite Phase:** c1 Canada buffaloberry/hairy wild rye Fd

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Overstory Tree</b>					Ecological Status Score: 5-25
LOGEPOLE PINE ( <i>Pinus contorta</i> )	9.0	0.0-40.0	40		Moisture Regime: Submesic (moderately fresh) (2), Subxeric (moderately dry) (1)
ASPEN ( <i>Populus tremuloides</i> )	6.0	1.0-15.0	100		Nutrient Regime: Mesotrophic (medium) (3)
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	2.2	0.0-10.0	40		Elevation (range): 1532 (1517-1555) M
<b>Medium Shrub (0.5 to 2 m)</b>					Slope (%): 16 - 30.99 (2), 2.5 - 5.99 (1)
SASKATOON ( <i>Amelanchier alnifolia</i> )	4.6	0.0-14.9	80		Aspect: Easterly (1), Southerly (1), Westerly (1)
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	3.5	0.0-13.1	60		Topographic Position: Lower Slope (1), Midslope (1), Upper Slope (1)
CHOKO CHERRY ( <i>Prunus virginiana</i> )	3.3	0.0-10.2	40		<b>Soil Variables</b>
PRICKLY ROSE ( <i>Rosa acicularis</i> )	3.3	0.0-5.7	80		Soil Drainage: Well drained (3)
SNOWBERRY ( <i>Symphoricarpos albus</i> )	2.4	0.0-5.3	80		Soil Subgroup: ELUVIATED DYSTRIC BRUNISOL (1), BRUNISOLIC GRAY BROWN LUVISOL (1), DARK GRAY LUVISOL (1), ORTHIC GRAY LUVISOL (1), CUMULIC REGOSOL (1)
<b>Low Shrub (&lt; 0.5m)</b>					Surface Texture:
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	26.0	0.0-63.5	60		Effective Texture:
<b>Tall Forb (&gt;= 30 cm)</b>					Depth to Mottles/Gley:
STAR-FLOWERED SOLOMON'S-SEAL ( <i>Smilacina stellata</i> )	2.5	0.0-7.3	60		Organic Thickness:
SILVERY PERENNIAL LUPINE ( <i>Lupinus argenteus</i> )	2.3	0.0-8.8	40		Parent Material:
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	1.9	0.0-7.1	80		Soil Type:
YELLOW BEARDTONGUE ( <i>Penstemon confertus</i> )	1.9	0.0-3.9	60		Humus Form
YELLOW HEDYSARUM ( <i>Hedysarum sulphurescens</i> )	1.3	0.0-6.0	40		<b>LFH Thickness</b>
WILD VETCH ( <i>Vicia americana</i> )	1.1	0.5-1.9	100		Mean
<b>Low Forb (&lt; 30 cm)</b>					Min
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	1.3	0.0-2.1	80		Max
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	1.1	0.0-2.7	80		Count
<b>Graminoid</b>					cm:
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	10.3	4.0-16.8	100		0.00
CREeping RED FESCUE ( <i>Festuca rubra</i> )	4.0	0.0-16.7	40		0.00
TIMOTHY ( <i>Phleum pratense</i> )	1.5	0.0-3.0	80		0.00
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	1.0	0.0-3.2	60		0



## c2 Canada buffaloberry/hairy wild rye PI (n=48)

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** c buffaloberry/hairy wild rye (submesic/medium)

### General Description

Lodgepole pine is often the first coniferous tree to establish on this ecosite after any disturbance. Over time, Douglas-fir or white spruce saplings will establish and ultimately move to a climax community. The understories in this ecosite are typically sparse with hairy wild rye more common than pine grass.

### Characteristic Species

#### Tree

[ 42.0 ] LODGEPOLE PINE  
*Pinus contorta*

[ 3.8 ] WHITE SPRUCE  
*Picea glauca*

#### Shrub

[ 13.0 ] CANADA BUFFALOBERRY  
*Shepherdia canadensis*

[ 8.2 ] TWINFLOWER  
*Linnaea borealis*

[ 6.8 ] DWARF BILBERRY  
*Vaccinium caespitosum*

[ 5.6 ] COMMON BEARBERRY  
*Arctostaphylos uva-ursi*

#### Forb

[ 3.1 ] HEART-LEAVED ARNICA  
*Arnica cordifolia*

[ 2.3 ] SHOWY ASTER  
*Aster conspicuus*

#### Moss and Liverwort

[ 6.2 ] STAIR-STEP MOSS  
*Hylocomium splendens*

[ 6.0 ] SCHREBER'S MOSS  
*Pleurozium schreberi*

#### Graminoid

[ 11.0 ] HAIRY WILD RYE  
*Elymus innovatus*

[ 4.7 ] PINE REED GRASS  
*Calamagrostis rubescens*

### Environmental Variables

Moisture Regime: Submesic (moderately fresh) (22), Mesic (fresh) (21), Subxeric (moderately dry) (5), Xeric (dry) (1)

Nutrient Regime: Mesotrophic (medium) (34), Submesotrophic (poor) (3), Permesotrophic (rich) (2)

Elevation (range): 1576 (1333-5453) M

Slope (%): moderate slope (13), strong slope (12), very gentle slope (10), gentle slope (8), level (8), very strong slope (6), nearly level (1)

Aspect: Southerly (16), Westerly (14), Northerly (12), Level (10), Easterly (6)

Topographic Position: Midslope (12), Level (10), Lower Slope (10), Upper Slope (9), Toe (1)

### Soil Variables

Soil Drainage: Well drained (37), Moderately well drained (8), Rapidly drained (4), Very rapidly drained (1)

Soil Subgroup: ORTHIC EUTRIC BRUNISOL (13), ELUVIATED EUTRIC BRUNISOL (4), ELUVIATED DYSTRIC BRUNISOL (2), BRUNISOLIC GRAY BROWN LUVISOL (2), BRUNISOLIC GRAY LUVISOL (2), DARK GRAY LUVISOL (2), ORTHIC GRAY LUVISOL (2), CUMULIC REGOSOL (2), ORTHIC DYSTRIC BRUNISOL (1)

Surface Texture: Silt loam (1)

Effective Texture: Clay loam (1)

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (21)

Parent Material: Morainal (10), Fluvial (5), Colluvial (4), Rock (4), Glaciofluvial (3), Undifferentiated Mineral (1)

Soil Type:

Humus Form

### LFH Thickness

	Mean	Min	Max	Count
cm:	3.00	3.00	3.00	1

## Mse5 PI/Canada buffaloberry/Hairy wild rye (n=27)

(*Pinus contorta*/*Shepherdia canadensis*/*Elymus innovatus*)

This community type occurs on mostly well drained, south and west-facing slopes. It is situated in slightly lower slope positions than the limber pine and bearberry-dominated community types, therefore has better developed soils. Archibald et al. (1996) described communities in this ecosite to be relatively dry for the subregion, but not as dry as the limber pine and bearberry ecosites. This community type has relatively sparse understory vegetation and therefore has only limited forage for domestic livestock. This community should be considered tertiary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** c buffaloberry/hairy wild rye (submesic/medium)

**Ecosite Phase:** c2 Canada buffaloberry/hairy wild rye PI

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 20-25
LOGEPOLE PINE ( <i>Pinus contorta</i> )	29.0	10.0-60.0	100	Moisture Regime: Mesic (fresh) (10), Submesic (moderately fresh) (9), Subxeric (moderately dry) (4), Xeric (dry) (1)
<b>Understory Tree</b>				Nutrient Regime: Mesotrophic (medium) (13), Submesotrophic (poor) (3)
LOGEPOLE PINE ( <i>Pinus contorta</i> )	9.5	0.0-40.0	70	Elevation (range): 1628 (1430-5453) M
<b>Medium Shrub (0.5 to 2 m)</b>				Slope (%): 10 - 15.99 (9), 0 - 0.49 (8), 16 - 30.99 (6), 6 - 9.99 (5), 31 - 45.99 (4), 2.5 - 5.99 (2)
CANADA BUFFALOBERRY ( <i>Shepherdia canadensis</i> )	22.2	0.0-65.0	96	Aspect: Southerly (11), Westerly (8), Level (8), Northerly (5), Easterly (2)
TWINFLOWER ( <i>Linnaea borealis</i> )	9.8	0.0-50.0	85	Topographic Position: Level (7), Midslope (4), Lower Slope (3), Upper Slope (2), Toe (1)
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	4.1	0.0-30.3	74	<b>Soil Variables</b>
GROUND JUNIPER ( <i>Juniperus communis</i> )	2.8	0.0-15.0	70	Soil Drainage: Well drained (18), Moderately well drained (5), Rapidly drained (2)
PRICKLY ROSE ( <i>Rosa acicularis</i> )	2.0	0.0-10.0	89	Soil Subgroup: ORTHIC EUTRIC BRUNISOL (13), ELUVIATED EUTRIC BRUNISOL (4), BRUNISOLIC GRAY LUVISOL (2)
<b>Low Shrub (&lt; 0.5m)</b>				Surface Texture: Silt loam (1)
UNDIFFERENTIATED VACCINIUM ( <i>Vaccinium</i> )	4.1	0.0-20.0	52	Effective Texture: Clay loam (1)
<b>Tall Forb (&gt;= 30 cm)</b>				Depth to Mottles/Gley:
SHOWY ASTER ( <i>Aster conspicuus</i> )	4.6	0.0-22.0	70	Organic Thickness: 0 - 5 cm (20)
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	2.0	0.0-15.7	67	Parent Material: Morainal (10), Rock (4), Colluvial (4), Fluvial (4), Glaciofluvial (3), Undifferentiated Mineral (1)
<b>Low Forb (&lt; 30 cm)</b>				Soil Type:
HEART-LEAVED ARNICA ( <i>Arnica cordifolia</i> )	4.9	0.0-25.0	70	Humus Form
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	2.3	0.0-8.0	82	<b>LFH Thickness</b>
BUNCHBERRY ( <i>Cornus canadensis</i> )	1.6	0.0-20.0	41	Mean
<b>Graminoid</b>				Min
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	13.8	0.0-40.0	96	Max
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	5.6	0.0-30.0	52	Count
<b>Moss</b>				cm:
UNDIFFERENTIATED MOSS - ALL GENERA ( <i>Moss</i> )	28.6	1.0-60.0	100	3.00
				3.00
				3.00
				1

## Mse7 PI/Low bilberry/Hairy wild rye (n=5)

(*Pinus contorta/Vaccinium caespitosum/Elymus innovatus*)

This community is typical of the pine dominated community types adjacent to the grasslands within the mountain ecodistricts. It is similar to the PI/Buffaloberry/Hairy wild rye [Mse5] community type but reduced buffaloberry and increased cover of low bilberry in the understory. These tend to be dry to moderately moist sites, with poor to medium nutrient regimes. Forage production on these sites tends to be low because of the closed canopy and lower cover of grasses. Succession in the absence of disturbance will be to white spruce. This community should be considered tertiary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** c buffaloberry/hairy wild rye (submesic/medium)

**Ecosite Phase:** c2 Canada buffaloberry/hairy wild rye PI

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 25
LOGEPOLE PINE ( <i>Pinus contorta</i> )	46.4	25.0-70.0	100	Moisture Regime: Mesic (fresh) (4)
<b>Understory Tree</b>				Nutrient Regime: Mesotrophic (medium) (2)
WHITE SPRUCE ( <i>Picea glauca</i> )	7.6	0.0-35.0	40	Elevation (range): 1488 (1426-1636) M
<b>Medium Shrub (0.5 to 2 m)</b>				Slope (%): 2.5 - 5.99 (4), 0.5 - 2.49 (1)
DWARF BILBERRY ( <i>Vaccinium caespitosum</i> )	13.6	0.0-30.0	80	Aspect: Level (2), Northerly (1), Easterly (1), Southerly (1)
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	7.1	0.0-25.0	80	Topographic Position: Lower Slope (2), Midslope (1), Upper Slope (1)
TWINFLOWER ( <i>Linnaea borealis</i> )	6.6	0.0-21.0	80	
CANADA BUFFALOBERRY ( <i>Shepherdia canadensis</i> )	3.8	0.0-8.0	80	
<b>Tall Forb (&gt;= 30 cm)</b>				<b>Soil Variables</b>
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	1.1	0.0-4.0	60	Soil Drainage: Well drained (2), Moderately well drained (1), Rapidly drained (1)
<b>Low Forb (&lt; 30 cm)</b>				Soil Subgroup: ORTHIC DYSTRIC BRUNISOL (1)
BUNCHBERRY ( <i>Cornus canadensis</i> )	4.0	0.0-14.3	60	Surface Texture:
HEART-LEAVED ARNICA ( <i>Arnica cordifolia</i> )	1.3	0.0-3.6	80	Effective Texture:
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	1.3	0.8-3.0	100	Depth to Mottles/Gley:
PALMATE-LEAVED COLTSFOOT ( <i>Petasites palmatus</i> )	1.0	0.0-2.0	60	Organic Thickness: 0 - 5 cm (1)
<b>Graminoid</b>				Parent Material: Fluvial (1)
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	8.3	1.5-20.0	100	Soil Type:
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	3.8	0.0-15.0	60	Humus Form
				<b>LFH Thickness</b>
				<b>Mean</b>
				<b>Min</b>
				<b>Max</b>
				<b>Count</b>
				cm:
				0.00
				0.00
				0.00
				0

# Msh11 Lodgepole pine/Hairy wild rye (cutblock) (n=11)

## (*Pinus contorta*/*Elymus innovatus*)

This community represents harvested Douglas-fir, lodgepole pine or white spruce stands on predominantly north and east facing upper slopes that are being reforested to lodgepole pine. Typically after fire or harvest, lodgepole pine is the early seral establishing species on dry to mesic sites. Succession after lodgepole pine stand establishment can advance to Douglas-fir or white spruce, depending on seed source and ecosite characteristics (Archibald et al. 1996). The understory for this community is dominated by hairy wild rye, forbs and shrubs. Analysis of cutblock production data suggests, although minimal forage is available the first 2 years after harvest, cutblocks have as much as three times the productivity of forested sites until 8 years, where productivity reduces each following year as established trees close the canopy. For this reason, under normal circumstances, if stocking rates are increased due to available cutblock forage, the increase should be reduced so forested rates are used by 15-20 years after harvest. Hairy wild rye sites tend to be drier than pine grass sites with lower productivity especially after logging.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** c buffaloberry/hairy wild rye (submesic/medium)

**Ecosite Phase:** c2 Canada buffaloberry/hairy wild rye PI

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 5-25
LODGEPOLE PINE ( <i>Pinus contorta</i> )	11.0	1.0-20.0	100	Moisture Regime: Submesic (moderately fresh) (12), Mesic (fresh) (5), Subxeric (moderately dry) (1)
ASPEN ( <i>Populus tremuloides</i> )	4.3	0.0-30.0	27	Nutrient Regime: Mesotrophic (medium) (17), Permesotrophic (rich) (1)
WHITE SPRUCE ( <i>Picea glauca</i> )	1.1	0.0-5.0	27	Elevation (range): 1596 (1453-1770) M
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	1.0	0.0-5.0	27	Slope (%): 16 - 30.99 (5), 2.5 - 5.99 (4), 6 - 9.99 (3), 10 - 15.99 (3), 31 - 45.99 (2)
<b>Medium Shrub (0.5 to 2 m)</b>				Aspect: Northerly (6), Westerly (5), Easterly (3), Southerly (3)
PRICKLY ROSE ( <i>Rosa acicularis</i> )	2.6	0.2-7.5	100	Topographic Position: Midslope (7), Lower Slope (5), Upper Slope (4), Level (2)
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	2.2	0.0-11.7	73	<b>Soil Variables</b>
TWINFLOWER ( <i>Linnaea borealis</i> )	1.0	0.0-5.3	46	Soil Drainage: Well drained (14), Moderately well drained (2), Very rapidly drained (1), Rapidly drained (1)
<b>Low Shrub (&lt; 0.5m)</b>				Soil Subgroup: ELUVIATED DYSTRIC BRUNISOL (1), BRUNISOLIC GRAY BROWN LUVISOL (1), DARK GRAY LUVISOL (1), ORTHIC GRAY LUVISOL (1), CUMULIC REGOSOL (1)
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	2.7	0.0-11.5	46	Surface Texture:
<b>Tall Forb (&gt;= 30 cm)</b>				Effective Texture:
SHOWY ASTER ( <i>Aster conspicuus</i> )	4.9	0.0-15.3	73	Depth to Mottles/Gley:
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	3.7	0.0-9.8	64	Organic Thickness:
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	2.4	0.0-12.9	64	Parent Material:
WESTERN MEADOW RUE ( <i>Thalictrum occidentale</i> )	1.4	0.0-11.4	27	Soil Type:
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	1.1	0.0-5.7	64	Humus Form
<b>Low Forb (&lt; 30 cm)</b>				<b>LFH Thickness</b>
BUNCHBERRY ( <i>Cornus canadensis</i> )	2.3	0.0-11.7	46	Mean
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	1.5	0.0-3.7	91	Min
COMMON YARROW ( <i>Achillea millefolium</i> )	1.2	0.0-3.8	73	Max
HEART-LEAVED ARNICA ( <i>Arnica cordifolia</i> )	1.2	0.0-7.5	36	Count
<b>Graminoid</b>				cm:
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	15.2	9.8-22.5	100	0.00
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	6.5	0.0-22.0	73	0.00
SEDGE SPECIES ( <i>Carex</i> )	2.9	0.0-23.3	73	0.00
BLUEJOINT ( <i>Calamagrostis canadensis</i> )	1.1	0.0-11.8	18	0

## Msh13 Hairy wild rye (cutblock) (n=5)

### (*Elymus innovatus*)

This community type represents recently harvested lodgepole pine or Douglas-fir forests on drier slopes in the Montane. Although trees have not significantly grown, hairy wild rye, forbs and shrubs contribute to ground cover significantly. This can occur as early as one growing season after harvest. These sites tend to be drier than the pinegrass and thimbleberry dominated cutblocks which occur in mid to lower slope positions. Sites that are a number of years old and still not regenerating trees may indicate they are not meeting their silviculture regeneration requirement, and other problems are present. Analysis of cutblock production data suggests, although minimal forage is available the first two years after harvest, cutblocks have as much as three times the productivity of forested sties until eight years, where productivity reduces each following year as established trees close the canopy (Figure 4). For this reason, under normal circumstances, if stocking rates are increased due to available cutblock forage, the increase should be reduced so forested rates are used by 15-20 years after harvest. Hairy wild rye harvested sites tend to be drier than pinegrass sites with lower productivity.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** c buffaloberry/hairy wild rye (submesic/medium)

**Ecosite Phase:** c2 Canada buffaloberry/hairy wild rye PI

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Tall Shrub (2 to 5m)</b>				Ecological Status Score: 10-15
SASKATOON ( <i>Amelanchier alnifolia</i> )	1.6	0.0-5.0	40	Moisture Regime: Mesic (fresh) (2), Submesic (moderately fresh) (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Nutrient Regime: Mesotrophic (medium) (2), Permesotrophic (rich) (1)
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	7.9	0.0-16.5	80	Elevation (range): 1593 (1333-1771) M
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	7.3	0.0-23.8	60	Slope (%): 10 - 15.99 (1), 16 - 30.99 (1)
PRICKLY ROSE ( <i>Rosa acicularis</i> )	1.9	1.0-2.9	100	Aspect: Southerly (1), Westerly (1)
<b>Low Shrub (&lt; 0.5m)</b>				Topographic Position: Upper Slope (2), Level (1)
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	11.5	0.0-18.5	80	<b>Soil Variables</b>
<b>Tall Forb (&gt;= 30 cm)</b>				Soil Drainage: Well drained (3)
SHOWY ASTER ( <i>Aster conspicuus</i> )	7.2	0.0-13.2	80	Soil Subgroup: ELUVIATED DYSTRIC BRUNISOL (1), BRUNISOLIC GRAY BROWN LUVISOL (1), DARK GRAY LUVISOL (1), ORTHIC GRAY LUVISOL (1), CUMULIC REGOSOL (1)
YELLOW BEARDTONGUE ( <i>Penstemon confertus</i> )	6.1	4.1-7.3	100	Surface Texture:
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	5.6	0.0-13.4	80	Effective Texture:
CANADA THISTLE ( <i>Cirsium arvense</i> )	1.4	0.0-4.5	60	Depth to Mottles/Gley:
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	1.3	0.0-6.7	40	Organic Thickness:
<b>Low Forb (&lt; 30 cm)</b>				Parent Material:
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	5.7	1.3-16.7	100	Soil Type:
<b>Graminoid</b>				Humus Form
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	10.8	6.5-22.1	100	<b>LFH Thickness</b>
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	3.9	0.0-10.3	80	Mean
TIMOTHY ( <i>Phleum pratense</i> )	3.4	0.0-11.1	60	Min
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	1.8	0.0-3.8	80	Max
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	1.0	0.0-2.3	80	Count
				cm:
				0.00
				0.00
				0.00
				0

### c3 Canada buffaloberry/hairy wild rye Aw (n=22)

**Natural Subregion:** Montane  
**Ecosection:** Ms Montane South Ecosection

**Ecosite:** c buffaloberry/hairy wild rye (submesic/medium)

#### General Description

This aspen dominated ecosite phase commonly occurs on well drained south or west facing slopes and commonly represents a transitory stage of succession of this ecosite from grasslands to forest. These stands often establish on transitory locations such as near aspect changes close to forests, and then expand from there. Hairy wild rye is the common understory grass, among a diversity of forbs. Shrubs are typically more sparse than on wetter ecosites.

#### Characteristic Species

##### Tree

- [ 55.5 ] ASPEN  
*Populus tremuloides*

##### Shrub

- [ 7.0 ] PRICKLY ROSE  
*Rosa acicularis*
- [ 4.2 ] CANADA BUFFALOBERRY  
*Shepherdia canadensis*
- [ 2.6 ] COMMON BEARBERRY  
*Arctostaphylos uva-ursi*

##### Forb

- [ 5.1 ] WILD STRAWBERRY  
*Fragaria virginiana*
- [ 4.8 ] CREAM-COLORED VETCHLING  
*Lathyrus ochroleucus*
- [ 2.7 ] LINDLEY'S ASTER  
*Aster ciliolatus*
- [ 2.6 ] STAR-FLOWERED SOLOMON'S-SEAL  
*Smilacina stellata*

##### Graminoid

- [ 19.2 ] HAIRY WILD RYE  
*Elymus innovatus*
- [ 2.3 ] PINE REED GRASS  
*Calamagrostis rubescens*
- [ 1.7 ] FOOTHILLS ROUGH FESCUE  
*Festuca campestris*

#### Environmental Variables

Moisture Regime: Mesic (fresh) (19), Submesic (moderately fresh) (9), Subhygric (moderately moist) (3)  
 Nutrient Regime: Mesotrophic (medium) (15), Permesotrophic (rich) (13)  
 Elevation (range): 1507 (1318-1791) M  
 Slope (%): strong slope (9), level (6), very strong slope (6), moderate slope (4), very gentle slope (4), gentle slope (2)  
 Aspect: Southerly (12), Westerly (8), Level (4), Easterly (3), Northerly (2)  
 Topographic Position: Midslope (9), Level (6), Upper Slope (5), Lower Slope (3), Toe (2)

#### Soil Variables

Soil Drainage: Well drained (18), Moderately well drained (8), Rapidly drained (5), Very rapidly drained (2)  
 Soil Subgroup: BRUNISOLIC GRAY LUVISOL (3), ORTHIC EUTRIC BRUNISOL (1), ORTHIC GRAY LUVISOL (1), CUMULIC HUMIC REGOSOL (1), ORTHIC HUMIC REGOSOL (1), ORTHIC REGOSOL (1)  
 Surface Texture: Sandy loam (2), Silt loam (1), Sand (1), Clay loam (1)  
 Effective Texture: Silty clay loam (2), Sandy clay loam (1), Loam (1), Clay (1)  
 Depth to Mottles/Gley:  
 Organic Thickness: 0 - 5 cm (8)  
 Parent Material: Fluvial (8), Glaciolacustrine (2), Morainal (1)  
 Soil Type:  
 Humus Form RAW MODER (1), HUMIFIBRIMOR (1), FIBRIHUMIMOR (1), FIBRIMOR (1)

#### LFH Thickness

	Mean	Min	Max	Count
cm:	8.00	5.00	12.00	5

## Msg2 Aw/Rose/Hairy wild rye (n=22)

(*Populus tremuloides*/*Rosa acicularis*/*Elymus innovatus*)

This community type occurs on submesic to mesic, well drained, south and west-facing slopes. It is situated on slightly lower slope positions and therefore has somewhat deeper and moister soils than the limber pine and bearberry-dominated community types previously described. Archibald et al. (1996) described this community type as being part of the Canada buffaloberry-hairy wild rye ecosite. They felt this ecosite to be relatively dry for the subregion, but not as dry as the limber pine and bearberry ecosites. Succession on this site will be to the PI/Buffaloberry/Hairy wild rye [Mse5] or Fd/Hairy wild rye [Mse6] community types, or less likely become white spruce leading if moist enough. This community type has a moderate amount of forage for domestic livestock. It should be considered secondary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** c buffaloberry/hairy wild rye (submesic/medium)

**Ecosite Phase:** c3 Canada buffaloberry/hairy wild rye Aw

### Plant Composition

### Canopy Cover (%)

	Mean	Range	Const.
<b>Overstory Tree</b>			
ASPEN ( <i>Populus tremuloides</i> )	45.2	0.0-75.0	86
BALSAM POPLAR ( <i>Populus balsamifera</i> )	1.5	0.0-30.0	9
<b>Understory Tree</b>			
ASPEN ( <i>Populus tremuloides</i> )	9.5	0.0-60.0	68
<b>Medium Shrub (0.5 to 2 m)</b>			
PRICKLY ROSE ( <i>Rosa acicularis</i> )	5.5	0.0-40.0	82
CANADA BUFFALOBERRY ( <i>Shepherdia canadensis</i> )	4.2	0.0-35.0	46
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	2.6	0.0-28.9	50
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	1.5	0.0-13.5	27
<b>Tall Forb (&gt;= 30 cm)</b>			
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	4.8	0.0-17.9	86
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	2.7	0.0-11.7	77
STAR-FLOWERED SOLOMON'S-SEAL ( <i>Smilacina stellata</i> )	2.6	0.0-27.8	50
<b>Low Forb (&lt; 30 cm)</b>			
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	5.1	0.0-29.9	86
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	1.9	0.0-9.7	91
COMMON DANDELION ( <i>Taraxacum officinale</i> )	1.6	0.0-10.0	68
<b>Graminoid</b>			
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	19.2	0.0-60.0	86
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	2.3	0.0-17.2	41
ROUGH FESCUE ( <i>Festuca scabrella</i> )	1.7	0.0-25.0	32
SILVERY-FLOWERED SEDGE ( <i>Carex aenea</i> )	1.3	0.0-30.0	5
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	1.0	0.0-7.3	32

### Environmental Variables

Ecological Status Score: 25

Moisture Regime: Mesic (fresh) (19), Submesic (moderately fresh) (9), Subhygric (moderately moist) (3)

Nutrient Regime: Mesotrophic (medium) (15), Permesotrophic (rich) (13)

Elevation (range): 1507 (1318-1791) M

Slope (%): 16 - 30.99 (9), 31 - 45.99 (6), 0 - 0.49 (6), 10 - 15.99 (4), 2.5 - 5.99 (4), 6 - 9.99 (2)

Aspect: Southerly (12), Westerly (8), Level (4), Easterly (3), Northerly (2)

Topographic Position: Midslope (9), Level (6), Upper Slope (5), Lower Slope (3), Toe (2)

### Soil Variables

Soil Drainage: Well drained (18), Moderately well drained (8), Rapidly drained (5), Very rapidly drained (2)

Soil Subgroup: BRUNISOLIC GRAY LUVISOL (3), ORTHIC EUTRIC BRUNISOL (1), ORTHIC GRAY LUVISOL (1), CUMULIC HUMIC REGOSOL (1), ORTHIC HUMIC REGOSOL (1), ORTHIC REGOSOL (1)

Surface Texture: Sandy loam (2), Silt loam (1), Sand (1), Clay loam (1)

Effective Texture: Silty clay loam (2), Clay (1), Loam (1), Sandy clay loam (1)

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (8)

Parent Material: Fluvial (8), Glaciolacustrine (2), Morainal (1)

Soil Type:

Humus Form HUMIFIBRIMOR (1), RAW MODER (1), FIBRIHUMIMOR (1), FIBRIMOR (1)

### LFH Thickness

	Mean	Min	Max	Count
cm:	8.00	5.00	12.00	5

## c4 Canada buffaloberry/hairy wild rye Aw-Sw-PI-Fd (n=18)

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** c buffaloberry/hairy wild rye (submesic/medium)

### General Description

Generally mixed woods represent stands that have at least 30 percent of their composition in coniferous and deciduous species. In this ecosite, the coniferous species can be white spruce, lodgepole pine or Douglas-fir, depending on the slope aspect and age of the stand. These forests have avoided fire or other disturbances long enough that they are succeeding from aspen to coniferous forests. Understories are generally less productive than deciduous yet more than coniferous, with hairy wild rye and smaller shrubs common in the understory.

### Characteristic Species

#### Tree

- [ 28.1 ] ASPEN  
*Populus tremuloides*
- [ 20.3 ] WHITE SPRUCE  
*Picea glauca*
- [ 7.2 ] LODGEPOLE PINE  
*Pinus contorta*
- [ 7.1 ] DOUGLAS-FIR  
*Pseudotsuga menziesii*

#### Shrub

- [ 3.7 ] PRICKLY ROSE  
*Rosa acicularis*
- [ 2.3 ] GROUSEBERRY  
*Vaccinium scoparium*
- [ 2.0 ] CANADA BUFFALOBERRY  
*Shepherdia canadensis*
- [ 2.0 ] GREEN ALDER  
*Alnus crispa*

#### Forb

- [ 4.8 ] WILD STRAWBERRY  
*Fragaria virginiana*
- [ 3.4 ] CREAM-COLORED VETCHLING  
*Lathyrus ochroleucus*

#### Graminoid

- [ 8.9 ] HAIRY WILD RYE  
*Elymus innovatus*
- [ 6.8 ] PINE REED GRASS  
*Calamagrostis rubescens*

### Environmental Variables

Moisture Regime: Mesic (fresh) (8), Submesic (moderately fresh) (7)

Nutrient Regime: Mesotrophic (medium) (15)

Elevation (range): 1502 (1370-1615) M

Slope (%): moderate slope (3), strong slope (3), nearly level (2), gentle slope (2), very gentle slope (2), very strong slope (1), level (1)

Aspect: Westerly (5), Southerly (5), Northerly (3), Level (2), Easterly (1)

Topographic Position: Midslope (8), Lower Slope (3), Crest (2), Level (1), Upper Slope (1)

### Soil Variables

Soil Drainage: Well drained (13), Moderately well drained (3), Rapidly drained (2)

Soil Subgroup: BRUNISOLIC GRAY LUVISOL (2), GLEYED GRAY LUVISOL (1), ORTHIC GRAY LUVISOL (1), ELUVIATED DYSTRIC BRUNISOL (1)

Surface Texture: Sandy loam (1), Sandy clay loam (1), Clay (1), Clay loam (1)

Effective Texture: Clay loam (2), Sandy clay loam (1), Sandy loam (1)

Depth to Mottles/Gley: 0 - 25 (1)

Organic Thickness: 0 - 5 cm (5)

Parent Material: Morainal (5), Rock (1), Fluvial (1)

Soil Type:

Humus Form FIBRIMOR (4)

### LFH Thickness

	Mean	Min	Max	Count
cm:	5.00	3.00	8.00	4



## Msf3 Aw-PI-Sw/Canada buffaloberry/Hairy wild rye (n=11)

(*Populus tremuloides*-*Pinus contorta*-*Picea glauca*/*Shepherdia canadensis*/*Elymus innovatus*)

This community commonly occurs on submesic, well drained, south and west-facing slopes. It is similar to the PI/Buffaloberry/Hairy wild rye [Mse5] community type previously described, but is an earlier successional stage indicated by mixes of different aged deciduous and coniferous trees. The forage productivity in this community is low to moderate and should be rated as secondary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** c buffaloberry/hairy wild rye (submesic/medium)

**Ecosite Phase:** c4 Canada buffaloberry/hairy wild rye Aw-Sw-PI-Fd

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Overstory Tree</b>					Ecological Status Score: 25
LODGEPOLE PINE ( <i>Pinus contorta</i> )	18.8	0.0-40.0	82		Moisture Regime: Mesic (fresh) (5), Submesic (moderately fresh) (2)
ASPEN ( <i>Populus tremuloides</i> )	9.2	0.0-40.0	64		Nutrient Regime: Mesotrophic (medium) (8)
WHITE SPRUCE ( <i>Picea glauca</i> )	3.1	0.0-10.0	64		Elevation (range): 1476 (1370-1608) M
<b>Understory Tree</b>					Slope (%): 10 - 15.99 (2), 0 - 0.49 (1), 0.5 - 2.49 (1), 2.5 - 5.99 (1), 6 - 9.99 (1)
ASPEN ( <i>Populus tremuloides</i> )	7.6	0.0-40.0	73		Aspect: Southerly (5), Westerly (2)
LODGEPOLE PINE ( <i>Pinus contorta</i> )	2.2	0.0-11.0	64		Topographic Position: Midslope (4), Crest (2), Upper Slope (1), Lower Slope (1), Level (1)
WHITE SPRUCE ( <i>Picea glauca</i> )	2.1	0.0-6.0	73		
<b>Tall Shrub (2 to 5m)</b>					<b>Soil Variables</b>
GREEN ALDER ( <i>Alnus crispa</i> )	6.7	0.0-40.0	18		Soil Drainage: Well drained (7), Moderately well drained (2)
ASPEN ( <i>Populus tremuloides</i> )	1.0	0.0-10.0	18		Soil Subgroup: BRUNISOLIC GRAY LUVISOL (2), GLEYED GRAY LUVISOL (1), ORTHIC GRAY LUVISOL (1), ELUVIATED DYSTRIC BRUNISOL (1)
<b>Medium Shrub (0.5 to 2 m)</b>					Surface Texture: Sandy loam (1), Sandy clay loam (1), Clay loam (1), Clay (1)
CANADA BUFFALOBERRY ( <i>Shepherdia canadensis</i> )	5.1	0.0-15.3	91		Effective Texture: Clay loam (2), Sandy clay loam (1), Sandy loam (1)
PRICKLY ROSE ( <i>Rosa acicularis</i> )	4.8	0.3-30.0	100		Depth to Mottles/Gley: 0 - 25 (1)
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	2.1	0.0-9.1	64		Organic Thickness: 0 - 5 cm (5)
TWINFLOWER ( <i>Linnaea borealis</i> )	2.1	0.0-7.0	73		Parent Material: Morainal (5), Fluvial (1), Rock (1)
<b>Tall Forb (&gt;= 30 cm)</b>					Soil Type:
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	5.6	1.0-22.0	100		Humus Form FIBRIMOR (4)
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	1.8	0.0-5.6	91		
SHOWY ASTER ( <i>Aster conspicuus</i> )	1.4	0.0-4.0	91		
<b>Low Forb (&lt; 30 cm)</b>					<b>LFH Thickness</b>
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	2.1	0.0-8.7	91		Mean
<b>Graminoid</b>					Min
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	17.1	3.0-47.0	100		Max
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	14.4	0.0-77.0	73		Count
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	4.3	0.0-37.0	27		cm:

## Msf5 Aw-Sw/Grouseberry (n=3)

### (*Populus tremuloides*-*Picea glauca*/*Vaccinium scoparium*)

This community represents the mid successional stage of a Sw/Moss like community at slightly higher elevations that are transitional to the Subalpine subregion. Spruce stands typically occupy lower slope positions with northerly aspects in the Montane. These sites have escaped recent fires and are succeeding to white spruce as the climax species. This community has been placed in this ecosite due to the presence of *Vaccinium* species although may be wetter. There is very little growth of forbs and grass in this community type and should be considered tertiary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** c buffaloberry/hairy wild rye (submesic/medium)

**Ecosite Phase:** c4 Canada buffaloberry/hairy wild rye Aw-Sw-PI-Fd

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 25
ASPEN ( <i>Populus tremuloides</i> )	36.6	30.0-45.0	100	Moisture Regime: Submesic (moderately fresh) (1), Mesic (fresh) (1)
WHITE SPRUCE ( <i>Picea glauca</i> )	31.6	20.0-40.0	100	Nutrient Regime: Mesotrophic (medium) (2)
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	6.6	0.0-10.0	67	Elevation (range): 1517 (1495-1532) M
BALSAM POPLAR ( <i>Populus balsamifera</i> )	3.3	0.0-10.0	33	Slope (%): 0.5 - 2.49 (1), 2.5 - 5.99 (1)
<b>Understory Tree</b>				Aspect: Level (2), Northerly (1)
WHITE SPRUCE ( <i>Picea glauca</i> )	4.2	0.0-12.6	33	Topographic Position: Lower Slope (1)
<b>Medium Shrub (0.5 to 2 m)</b>				<b>Soil Variables</b>
GROUSEBERRY ( <i>Vaccinium scoparium</i> )	4.6	0.0-14.0	33	Soil Drainage: Well drained (2), Rapidly drained (1)
TALL BILBERRY ( <i>Vaccinium membranaceum</i> )	3.7	0.0-11.3	33	Soil Subgroup:
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	3.3	0.0-8.8	67	Surface Texture:
PRICKLY ROSE ( <i>Rosa acicularis</i> )	2.9	0.9-4.3	100	Effective Texture:
<b>Tall Forb (&gt;= 30 cm)</b>				Depth to Mottles/Gley:
WESTERN MEADOW RUE ( <i>Thalictrum occidentale</i> )	2.8	0.8-6.6	100	Organic Thickness:
SMOOTH ASTER ( <i>Aster laevis</i> )	2.5	0.0-7.5	33	Parent Material:
WILD WHITE GERANIUM ( <i>Geranium richardsonii</i> )	2.4	0.0-7.3	33	Soil Type:
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	2.4	2.3-2.6	100	Humus Form
<b>Low Forb (&lt; 30 cm)</b>				<b>LFH Thickness</b>
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	7.1	4.9-10.1	100	Mean
<b>Graminoid</b>				Min
MELIC GRASS ( <i>Melica smithii</i> )	8.1	0.0-24.5	33	Max
VIRGINIA WILD RYE ( <i>Elymus virginicus</i> )	3.1	0.0-9.3	33	Count
TIMOTHY ( <i>Phleum pratense</i> )	2.3	0.0-7.0	33	cm:
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	2.2	0.0-5.4	67	0.00
				0.00
				0.00
				0

## Msh12 White spruce/Hairy wild rye (cutblock) (n=4)

(*Picea glauca/Elymus innovatus*)

This community type represents the harvested white spruce dominated forests that are regenerating back to spruce. Hairy wild rye and spruce associations tend to occur at higher elevations close to the Subalpine subregion. These sites are drier than pinegrass dominated cutblocks which occur at lower elevations and more mesic ecosites. Productivity for these sites is less known, however there is a window for increased production in the first ten years after harvesting. There is risk however to increasing stocking rates as spruce regeneration tends to be slower than lodgepole pine and these trees are vulnerable to damage for a longer period.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** c buffaloberry/hairy wild rye (submesic/medium)

**Ecosite Phase:** c4 Canada buffaloberry/hairy wild rye Aw-Sw-PI-Fd

Plant Composition	Canopy Cover (%)		
	Mean	Range	Const.
<b>Overstory Tree</b>			
WHITE SPRUCE ( <i>Picea glauca</i> )	27.5	10.0-40.0	100
ASPEN ( <i>Populus tremuloides</i> )	10.0	0.0-40.0	25
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	7.5	0.0-15.0	75
LOGEPOLE PINE ( <i>Pinus contorta</i> )	1.5	0.0-5.0	50
<b>Medium Shrub (0.5 to 2 m)</b>			
DWARF BILBERRY ( <i>Vaccinium caespitosum</i> )	3.0	0.0-4.0	50
PRICKLY ROSE ( <i>Rosa acicularis</i> )	2.4	1.0-3.3	100
TWINFLOWER ( <i>Linnaea borealis</i> )	1.4	0.0-3.3	75
NORTHERN GOOSEBERRY ( <i>Ribes oxycanthoides</i> )	1.2	0.0-2.5	75
<b>Tall Forb (&gt;= 30 cm)</b>			
SHOWY ASTER ( <i>Aster conspicuus</i> )	10.0	3.6-17.5	100
SILVERY PERENNIAL LUPINE ( <i>Lupinus argenteus</i> )	5.4	0.0-21.8	25
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	3.8	1.7-5.2	100
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	2.5	0.0-6.9	75
<b>Low Forb (&lt; 30 cm)</b>			
HEART-LEAVED ARNICA ( <i>Arnica cordifolia</i> )	4.3	0.0-15.4	75
<b>Graminoid</b>			
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	14.9	7.6-26.1	100
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	5.8	2.1-9.4	100
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	1.7	0.0-4.4	50

### Environmental Variables

Ecological Status Score: 5-25

Moisture Regime: Submesic (moderately fresh) (4), Mesic (fresh) (2)

Nutrient Regime: Mesotrophic (medium) (5)

Elevation (range): 1514 (1432-1615) M

Slope (%): 16 - 30.99 (3), 6 - 9.99 (1), 10 - 15.99 (1), 31 - 45.99 (1)

Aspect: Westerly (3), Northerly (2), Easterly (1)

Topographic Position: Midslope (4), Lower Slope (1)

### Soil Variables

Soil Drainage: Well drained (4), Rapidly drained (1), Moderately well drained (1)

Soil Subgroup:

Surface Texture:

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness:

Parent Material:

Soil Type:

Humus Form

LFH Thickness	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

## c5 grassland (n=320)

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** c buffaloberry/hairy wild rye (submesic/medium)

### General Description

Grasslands in this ecosite characteristically occur on south and west facing well drained slopes. Rough fescue is present, however, cover is reduced compared to lower slope sites. Idaho fescue and/or Parry oat grasses typically dominate.

### Environmental Variables

Moisture Regime: Subxeric (moderately dry) (40), Submesic (moderately fresh) (30), Mesic (fresh) (20), Xeric (dry) (15)

Nutrient Regime: Mesotrophic (medium) (64), Submesotrophic (poor) (30), Permesotrophic (rich) (6)

Elevation (range): 1540 (1330-1787) M

Slope (%): strong slope (80), very strong slope (33), moderate slope (32), steep slope (14), very gentle slope (14), nearly level (11), gentle slope (8), level (3)

Aspect: Southerly (112), Westerly (77), Easterly (24), Level (2)

Topographic Position: Midslope (43), Upper Slope (22), Lower Slope (6), Crest (4), Level (3)

### Characteristic Species

#### Forb

- [ 3.3 ] SILKY PERENNIAL LUPINE  
*Lupinus sericeus*
- [ 1.4 ] THREE-FLOWERED AVENS  
*Geum triflorum*
- [ 1.3 ] CUT-LEAVED ANEMONE  
*Anemone multifida*
- [ 1.2 ] BALSAMROOT  
*Balsamorhiza sagittata*

#### Graminoid

- [ 24.0 ] IDAHO FESCUE  
*Festuca idahoensis*
- [ 11.7 ] PARRY OAT GRASS  
*Danthonia parryi*
- [ 8.9 ] FOOTHILLS ROUGH FESCUE  
*Festuca campestris*
- [ 1.2 ] SEDGE SPECIES  
*Carex*
- [ 0.9 ] RICHARDSON NEEDLE GRASS  
*Stipa richardsonii*

### Soil Variables

Soil Drainage: Well drained (102), Rapidly drained (82), Very rapidly drained (10), Moderately well drained (6), Mixed drainage (3)

Soil Subgroup: ORTHIC BLACK CHERNOZEM (39), ORTHIC GRAY LUVISOL (20), ORTHIC DARK GRAY CHERNOZEM (19), ORTHIC REGOSOL (17), ORTHIC EUTRIC BRUNISOL (15), ORTHIC BROWN CHERNOZEM (12), ORTHIC MELANIC BRUNISOL (2), DARK GRAY LUVISOL (1), REGO BLACK CHERNOZEM (1)

Surface Texture: Loam (3), Silt loam (1), Clay loam (1)

Effective Texture: Loam (3), Clay (1), Silty clay loam (1)

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (129)

Parent Material: Morainal (91), Colluvial (28), Glaciofluvial (5), Fluvial (4), Residual (1), Rock (1), Saprolite (1)

Soil Type: Dry/Silty-Loamy (3), Very Dry/Silty-Loamy (1), Moist/Fine (1)

Humus Form RHIZOMULL (3)

### LFH Thickness

	Mean	Min	Max	Count
cm:	3.50	2.00	5.00	5

## Msb2 Parry oat grass-Foothills rough fescue-Idaho fescue (n=217)

### (*Danthonia parryi*-*Festuca campestris*-*Festuca idahoensis*)

This community type is found upslope above the Rough fescue-Parry oat grass-Idaho fescue [Msb1] community type. Rough fescue begins to lessen and Parry oat grass or Idaho fescue increases as the soil becomes thinner and less developed. In this case, Parry oat grass is dominating and represents a slope with fair production. This community occurs generally on mid to upper slopes, and on drier sites in steep upper slope positions the cover of juniper and bearberry will increase. Therefore, some of these species can be expected in the transition. Under grazing pressure Parry oat grass, Idaho fescue and rough fescue decline and upland sedges increase (Willoughby 1992). Increased grazing pressure on the drier sites will lead to an increase in low growing forbs (little clubmoss, moss phlox) as well as sedges. Use this community when Parry oat grass occurs in a higher percentage than Idaho fescue. Parry oat grass prefers a slightly more mesic site and will have slightly higher production than the community dominated by Idaho fescue.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** c buffaloberry/hairy wild rye (submesic/medium)

**Ecosite Phase:** c5 grassland

Plant Composition	Canopy Cover (%)			Environmental Variables	
	Mean	Range	Const.		
<b>Medium Shrub (0.5 to 2 m)</b>				Ecological Status Score: 27-40	
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	1.5	0.0-14.4	71	Moisture Regime: Subxeric (moderately dry) (32), Submesic (moderately fresh) (12), Mesic (fresh) (8), Xeric (dry) (7)	
PRICKLY ROSE ( <i>Rosa acicularis</i> )	1.0	0.0-15.5	45	Nutrient Regime: Mesotrophic (medium) (35), Submesotrophic (poor) (17), Permesotrophic (rich) (5)	
<b>Tall Forb (&gt;= 30 cm)</b>				Elevation (range): 1521 (1337-1775) M	
SILKY PERENNIAL LUPINE ( <i>Lupinus sericeus</i> )	1.7	0.0-14.7	54	Slope (%): 16 - 30.99 (50), 31 - 45.99 (26), 10 - 15.99 (25), 46 - 70.99 (10), 0.5 - 2.49 (9), 2.5 - 5.99 (7), 6 - 9.99 (5), 0 - 0.49 (1)	
<b>Low Forb (&lt; 30 cm)</b>				Aspect: Southerly (73), Westerly (49), Easterly (18), Level (1)	
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	2.5	0.0-14.4	85	Topographic Position: Midslope (24), Upper Slope (17), Lower Slope (6), Crest (4), Level (2)	
CUT-LEAVED ANEMONE ( <i>Anemone multifida</i> )	1.4	0.0-11.0	57		
THREE-FLOWERED AVENS ( <i>Geum triflorum</i> )	1.4	0.0-26.3	47	<b>Soil Variables</b>	
GOLDEN BEAN ( <i>Thermopsis rhombifolia</i> )	1.2	0.0-18.0	31	Soil Drainage: Well drained (71), Rapidly drained (49), Very rapidly drained (8), Moderately well drained (2)	
PASTURE SAGEWORT ( <i>Artemisia frigida</i> )	1.1	0.0-13.0	53	Soil Subgroup: ORTHIC BLACK CHERNOZEM (23), ORTHIC DARK GRAY CHERNOZEM (19), ORTHIC GRAY LUVISOL (13), ORTHIC EUTRIC BRUNISOL (13), ORTHIC REGOSOL (11), ORTHIC BROWN CHERNOZEM (9), ORTHIC MELANIC BRUNISOL (2), DARK GRAY LUVISOL (1), REGO BLACK CHERNOZEM (1)	
COMMON YARROW ( <i>Achillea millefolium</i> )	1.0	0.0-8.0	73	Surface Texture: Silt loam (1), Loam (1), Clay loam (1)	
<b>Graminoid</b>				Effective Texture: Clay (1), Loam (1), Silty clay loam (1)	
PARRY OAT GRASS ( <i>Danthonia parryi</i> )	26.0	1.0-64.2	100	Depth to Mottles/Gley:	
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	10.2	7.0-42.0	100	Organic Thickness: 0 - 5 cm (95)	
IDAHO FESCUE ( <i>Festuca idahoensis</i> )	4.8	0.0-17.5	90	Parent Material: Morainal (71), Colluvial (19), Glaciofluvial (3), Fluvial (2), Saprolite (1)	
BLUNT SEDGE ( <i>Carex obtusata</i> )	3.6	0.0-22.0	77	Soil Type: Dry/Silty-Loamy (2), Moist/Fine (1)	
NORTHERN WHEAT GRASS ( <i>Agropyron dasystachyum</i> )	1.6	0.0-23.4	38	Humus Form RHIZOMULL (3)	
JUNE GRASS ( <i>Koeleria macrantha</i> )	1.6	0.0-9.0	79		
	<b>LFH Thickness</b>	<b>Mean</b>	<b>Min</b>	<b>Max</b>	<b>Count</b>
	cm:	3.00	2.00	4.00	3

## Msb2a Idaho fescue-Parry oat grass-Foothills rough fescue (n=30)

(*Festuca idahoensis*-*Danthonia parryi*-*Festuca campestris*)

This community type is found up slope from the Rough fescue-Parry oat grass-Idaho fescue [Msb1] community type where rough fescue begins to lessen and Parry oat grass or Idaho fescue increases. In this case, Idaho fescue is dominating. This community generally occurs on mid to upper slopes, as slopes become drier and soils poorer in nutrients than the grasslands on lower slopes below. Up slope to this community, the cover of juniper and bearberry increases and changes to rough fescue - bearberry communities. Therefore, juniper and bearberry can be expected in the transition. Under grazing pressure Parry oat grass, Idaho fescue and rough fescue decline and upland sedges increase (Willoughby 1992). Increased grazing pressure on the drier sites will lead to an increase in low growing forbs (little clubmoss, moss phlox) as well as sedges. Use this community when Idaho fescue occurs in a higher percentage than Parry oat grass.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** c buffaloberry/hairy wild rye (submesic/medium)

**Ecosite Phase:** c5 grassland

### Plant Composition

### Canopy Cover (%)

	Mean	Range	Const.
<b>Medium Shrub (0.5 to 2 m)</b>			
PRICKLY ROSE ( <i>Rosa acicularis</i> )	1.5	0.0-13.5	50
SASKATOON ( <i>Amelanchier alnifolia</i> )	1.0	0.0-8.5	43
<b>Tall Forb (&gt;= 30 cm)</b>			
SILKY PERENNIAL LUPINE ( <i>Lupinus sericeus</i> )	3.2	0.0-12.9	67
BALSAMROOT ( <i>Balsamorhiza sagittata</i> )	1.6	0.0-25.6	17
<b>Low Forb (&lt; 30 cm)</b>			
THREE-FLOWERED AVENS ( <i>Geum triflorum</i> )	2.9	0.0-18.3	43
COMMON YARROW ( <i>Achillea millefolium</i> )	2.6	0.4-11.9	100
CUT-LEAVED ANEMONE ( <i>Anemone multifida</i> )	2.5	0.0-18.1	70
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	2.3	0.0-6.0	93
<b>Graminoid</b>			
IDAHO FESCUE ( <i>Festuca idahoensis</i> )	22.0	6.0-63.8	100
PARRY OAT GRASS ( <i>Danthonia parryi</i> )	8.6	0.0-27.7	70
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	5.4	0.0-22.1	70
JUNE GRASS ( <i>Koeleria macrantha</i> )	4.5	0.0-18.2	93
RICHARDSON NEEDLE GRASS ( <i>Stipa richardsonii</i> )	2.9	0.0-27.7	43

### Environmental Variables

Ecological Status Score: 27-40

Moisture Regime: Mesic (fresh) (8), Submesic (moderately fresh) (7), Xeric (dry) (5), Subxeric (moderately dry) (4)

Nutrient Regime: Mesotrophic (medium) (16), Submesotrophic (poor) (6)

Elevation (range): 1522 (1330-1740) M

Slope (%): 16 - 30.99 (12), 10 - 15.99 (4), 31 - 45.99 (3), 6 - 9.99 (3)

Aspect: Southerly (15), Westerly (7)

Topographic Position: Midslope (8), Upper Slope (3)

### Soil Variables

Soil Drainage: Rapidly drained (18), Well drained (9), Very rapidly drained (2)

Soil Subgroup: ORTHIC BLACK CHERNOZEM (2)

Surface Texture:

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (2)

Parent Material: Glaciofluvial (1), Morainal (1)

Soil Type:

Humus Form

### LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

## Msb9 Fd/Idaho fescue-Rough fescue (n=2)

(*Pseudotsuga menziesii*/*Festuca idahoensis*-*Festuca campestris*)

This community type represents the transition from a fescue grassland to a Douglas-fir forest, but this type is drier and has shallower soils than the Douglas-fir/Foothills rough fescue-Idaho fescue [Msb8] community type. Little clubmoss, fringed sage, Sandberg bluegrass and june grass are all well adapted to dry, rapidly drained sites (Johnston 1981), and may be expected to grow on these sites as well. Without fire disturbance, Douglas-fir will establish and ultimately convert to forest, although this succession would be slow. Height of Douglas-fir can be variable, from saplings to an open stand of mature trees, depending on the stage of the encroachment.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** c buffaloberry/hairy wild rye (submesic/medium)

**Ecosite Phase:** c5 grassland

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 27-40
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	14.5	7.0-22.0	100	Moisture Regime: Subxeric (moderately dry) (1), Submesic (moderately fresh) (1)
LODGEPOLE PINE ( <i>Pinus contorta</i> )	1.0	0.0-2.0	50	Nutrient Regime: Mesotrophic (medium) (2)
<b>Medium Shrub (0.5 to 2 m)</b>				Elevation (range): 1524 (1493-1554) M
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	8.5	2.0-15.0	100	Slope (%): 16 - 30.99 (1), 31 - 45.99 (1)
GROUND JUNIPER ( <i>Juniperus communis</i> )	3.0	1.0-5.0	100	Aspect: Easterly (1), Westerly (1)
SASKATOON ( <i>Amelanchier alnifolia</i> )	1.5	1.0-2.0	100	Topographic Position: Midslope (2)
COMMON WILD ROSE ( <i>Rosa woodsii</i> )	1.5	1.0-2.0	100	
<b>Tall Forb (&gt;= 30 cm)</b>				<b>Soil Variables</b>
SILKY PERENNIAL LUPINE ( <i>Lupinus sericeus</i> )	5.0	0.0-10.0	50	Soil Drainage: Well drained (2)
BALSAMROOT ( <i>Balsamorhiza sagittata</i> )	2.0	2.0-2.0	100	Soil Subgroup: ORTHIC EUTRIC BRUNISOL (2)
<b>Low Forb (&lt; 30 cm)</b>				Surface Texture: Loam (2)
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	2.5	0.0-5.0	50	Effective Texture: Loam (2)
PRAIRIE SELAGINELLA ( <i>Selaginella densa</i> )	2.5	0.0-5.0	50	Depth to Mottles/Gley:
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	2.0	2.0-2.0	100	Organic Thickness: 0 - 5 cm (2)
UMBER PUSSYTOES ( <i>Antennaria umbrinella</i> )	1.5	1.0-2.0	100	Parent Material: Morainal (1), Rock (1), Residual (1)
<b>Graminoid</b>				Soil Type: Dry/Silty-Loamy (1), Very Dry/Silty-Loamy (1)
IDAHO FESCUE ( <i>Festuca idahoensis</i> )	45.0	30.0-60.0	100	Humus Form
SANDBERG BLUEGRASS ( <i>Poa sandbergii</i> )	15.0	0.0-30.0	50	
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	10.0	0.0-20.0	50	
JUNE GRASS ( <i>Koeleria macrantha</i> )	5.0	0.0-10.0	50	
BLUEBUNCH WHEAT GRASS ( <i>Agropyron spicatum</i> )	2.5	0.0-5.0	50	
				<b>LFH Thickness</b>
				Mean
				Min
				Max
				Count
				cm:
				4.00
				2.00
				5.00
				2

## Msc19 Timothy-Parry oat grass (n=30)

### (*Phleum pratense*-*Danthonia parryi*)

This community occurs on dry water shedding benches or steeper slopes. Although Parry oat grass is still significant, introduced species such as timothy and Kentucky bluegrass have invaded. These species will persist especially in wetter years. Typically, these introduced species establish from the introduction of a seed source combined with moderate to heavy grazing creating site conditions conducive for invading species. Continued heavier grazing also increases bare soil and reduces litter levels. These communities usually occur close to the Foothills fescue and Parkland transitions to the Montane. Agronomic grasses may provide more grazing opportunities early in the spring as agronomic grasses typically green up and cure earlier than native species.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** c buffaloberry/hairy wild rye (submesic/medium)

**Ecosite Phase:** c5 grassland

#### Plant Composition

#### Canopy Cover (%)

	Mean	Range	Const.
<b>Medium Shrub (0.5 to 2 m)</b>			
COMMON WILD ROSE ( <i>Rosa woodsii</i> )	1.6	0.0-7.5	50
PRAIRIE ROSE ( <i>Rosa arkansana</i> )	0.9	0.0-11.5	33
<b>Tall Forb (&gt;= 30 cm)</b>			
GRACEFUL CINQUEFOIL ( <i>Potentilla gracilis</i> )	1.2	0.0-6.5	60
<b>Low Forb (&lt; 30 cm)</b>			
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	1.0	0.0-3.0	80
<b>Graminoid</b>			
TIMOTHY ( <i>Phleum pratense</i> )	19.5	2.5-34.6	100
PARRY OAT GRASS ( <i>Danthonia parryi</i> )	17.3	0.5-33.5	100
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	10.2	0.0-26.0	97
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	6.5	0.0-20.0	87
IDAHO FESCUE ( <i>Festuca idahoensis</i> )	4.4	0.0-18.0	90

#### Environmental Variables

Ecological Status Score: 15-20  
 Moisture Regime:  
 Nutrient Regime:  
 Elevation (range): 0 (0-0) M  
 Slope (%): 16 - 30.99 (4), 46 - 70.99 (4), 31 - 45.99 (3), 2.5 - 5.99 (3), 10 - 15.99 (2)  
 Aspect: Westerly (14), Southerly (11), Easterly (4)  
 Topographic Position:

#### Soil Variables

Soil Drainage: Well drained (8), Rapidly drained (6), Moderately well drained (3), Mixed drainage (3)  
 Soil Subgroup: ORTHIC BLACK CHERNOZEM (14), ORTHIC GRAY LUVISOL (7), ORTHIC REGOSOL (6), ORTHIC BROWN CHERNOZEM (3)  
 Surface Texture:  
 Effective Texture:  
 Depth to Mottles/Gley:  
 Organic Thickness: 0 - 5 cm (30)  
 Parent Material: Morainal (18), Colluvial (9), Fluvial (2), Glaciofluvial (1)  
 Soil Type:  
 Humus Form

LFH Thickness	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0



# Msc1a Sedge-Parry oat grass-Foothills rough fescue (n=16)

(*Carex spp.-Danthonia parryi-Festuca campestris*)

This community type represents an Idaho fescue or Parry oat grass-Rough fescue [Msb2, Msb2a] plant community that has been moderately to heavily grazed. Increased grazing pressure causes reduced Idaho fescue and Parry oat grass cover and increases in low growing sedges such as blunt sedge. Continued heavy grazing pressure will eventually lead to a further decline in Parry oat grass and sedges leaving little clubmoss and moss phlox and increases in exposed soil. If grazing pressure is reduced, the community will likely succeed back to an Idaho fescue, Parry oat grass dominated grassland. Recovery of this grassland back to a Parry oat grass or Idaho fescue dominated community type will likely take 20-30 years (Willoughby 1996).

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** c buffaloberry/hairy wild rye (submesic/medium)

**Ecosite Phase:** c5 grassland

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Low Shrub (&lt; 0.5m)</b>				Ecological Status Score: 20 Moisture Regime: Submesic (moderately fresh) (5), Xeric (dry) (3), Subxeric (moderately dry) (3) Nutrient Regime: Submesotrophic (poor) (7), Mesotrophic (medium) (4) Elevation (range): 1465 (1400-1610) M Slope (%): 16 - 30.99 (8), 0 - 0.49 (2), 10 - 15.99 (1), 2.5 - 5.99 (1) Aspect: Southerly (7), Westerly (2), Easterly (1), Level (1) Topographic Position: Midslope (6), Upper Slope (2), Level (1)
PRAIRIE ROSE ( <i>Rosa arkansana</i> )	1.0	0.0-7.9	44	
<b>Tall Forb (&gt;= 30 cm)</b>				Soil Drainage: Well drained (5), Rapidly drained (5), Moderately well drained (1) Soil Subgroup: Surface Texture: Effective Texture: Depth to Mottles/Gley: Organic Thickness: Parent Material: Soil Type: Humus Form
STICKY PURPLE GERANIUM ( <i>Geranium viscosissimum</i> )	1.0	0.0-5.7	69	
<b>Low Forb (&lt; 30 cm)</b>				<b>Soil Variables</b>
PRAIRIE SELAGINELLA ( <i>Selaginella densa</i> )	5.1	0.0-34.1	44	
THREE-FLOWERED AVENS ( <i>Geum triflorum</i> )	2.1	0.0-21.7	31	<b>LFH Thickness</b>
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	1.8	0.1-3.5	100	
CUT-LEAVED ANEMONE ( <i>Anemone multifida</i> )	1.1	0.0-5.1	75	Mean
SMALL-LEAVED PUSSYTOES ( <i>Antennaria parvifolia</i> )	1.1	0.0-4.9	38	Min
PASTURE SAGEWORT ( <i>Artemisia frigida</i> )	1.0	0.0-3.2	69	Max
<b>Graminoid</b>				Count
PARRY OAT GRASS ( <i>Danthonia parryi</i> )	15.0	0.7-25.3	100	cm:
BLUNT SEDGE ( <i>Carex obtusata</i> )	8.6	0.0-29.8	50	0.00
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	4.6	2.5-9.2	100	0.00
JUNE GRASS ( <i>Koeleria macrantha</i> )	3.1	0.0-9.8	75	0.00
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	2.1	0.0-7.8	81	0
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	1.7	0.0-7.7	63	
SEDGE SPECIES ( <i>Carex</i> )	1.4	0.0-7.7	38	
RICHARDSON NEEDLE GRASS ( <i>Stipa richardsonii</i> )	1.3	0.0-6.7	56	
IDAHO FESCUE ( <i>Festuca idahoensis</i> )	1.0	0.0-8.1	69	

## Msc6 Sedge-Idaho fescue/Little club-moss (n=20)

(*Carex obtusata*-*Festuca Idahoensis*/*Selaginella densa*)

This community is a result of Parry oat grass-Foothills rough fescue-Idaho fescue [Msb2] and Idaho fescue-Parry oat grass-Foothills rough fescue [Msb2a] community types that have been heavily grazed. Parry oat grass and rough fescue will decline with heavy grazing and allows low growing sedge, Idaho fescue and forb species to increase. There is very little grass or forb cover found within this community type. If protected from grazing this community will eventually recover to form a Parry oat grass or Idaho fescue dominated community type.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** c buffaloberry/hairy wild rye (submesic/medium)

**Ecosite Phase:** c5 grassland

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Tall Forb (&gt;= 30 cm)</b>				Ecological Status Score: 15
GOLDEN ASTER ( <i>Heterotheca villosa</i> )	1.4	0.0-10.2	35	Moisture Regime: Submesic (moderately fresh) (3), Mesic (fresh) (2)
SHINING ARNICA ( <i>Arnica fulgens</i> )	1.1	0.0-15.3	15	Nutrient Regime: Mesotrophic (medium) (4)
<b>Low Forb (&lt; 30 cm)</b>				Elevation (range): 1582 (1370-1787) M
PRAIRIE SELAGINELLA ( <i>Selaginella densa</i> )	25.5	2.8-57.4	100	Slope (%): 16 - 30.99 (3), 2.5 - 5.99 (2), 0.5 - 2.49 (1)
MOSS PHLOX ( <i>Phlox hoodii</i> )	2.2	0.0-15.3	30	Aspect: Southerly (4), Westerly (2)
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	1.8	0.0-4.4	95	Topographic Position: Midslope (2)
SMALL-LEAVED PUSSYTOES ( <i>Antennaria parvifolia</i> )	1.5	0.0-12.0	65	<b>Soil Variables</b>
PASTURE SAGEWORT ( <i>Artemisia frigida</i> )	1.4	0.0-5.6	40	Soil Drainage: Well drained (4), Rapidly drained (2)
COMMON YARROW ( <i>Achillea millefolium</i> )	1.0	0.0-5.3	70	Soil Subgroup:
CUT-LEAVED ANEMONE ( <i>Anemone multifida</i> )	1.0	0.0-6.2	60	Surface Texture:
<b>Graminoid</b>				Effective Texture:
BLUNT SEDGE ( <i>Carex obtusata</i> )	8.6	0.0-32.3	95	Depth to Mottles/Gley:
IDAHO FESCUE ( <i>Festuca idahoensis</i> )	6.7	0.0-25.0	90	Organic Thickness:
UNDIFFERENTIATED OAT GRASS ( <i>Danthonia</i> )	5.4	0.0-17.3	95	Parent Material:
WHEAT GRASS SPECIES ( <i>Agropyron</i> )	3.8	0.0-18.4	80	Soil Type:
JUNE GRASS ( <i>Koeleria macrantha</i> )	3.6	0.0-10.6	90	Humus Form
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	3.0	0.0-4.1	85	<b>LFH Thickness</b>
EARLY BLUEGRASS ( <i>Poa cusickii</i> )	1.4	0.0-11.5	50	Mean
RICHARDSON NEEDLE GRASS ( <i>Stipa richardsonii</i> )	1.2	0.0-5.2	50	Min
				Max
				Count
				cm:
				0.00
				0.00
				0.00
				0

## c6 shrubland (n=39)

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** c buffaloberry/hairy wild rye (submesic/medium)

### General Description

Shrublands in this ecosite occur on mid to upper slopes where transitions in aspect cause forest conditions to occur, either in proximity to swales, or due to a lack of fire disturbance allowing shrubs to establish. Once established shrubs catch snow, increase moisture and slowly increase in cover, creating microsite conditions conducive to tree growth.

### Environmental Variables

Moisture Regime: Mesic (fresh) (5), Subxeric (moderately dry) (5), Submesic (moderately fresh) (4), Xeric (dry) (3)

Nutrient Regime: Mesotrophic (medium) (10), Submesotrophic (poor) (6), Oligotrophic (very poor) (1)

Elevation (range): 1528 (1378-1783) M

Slope (%): strong slope (7), steep slope (6), very strong slope (4), moderate slope (2), nearly level (2), very gentle slope (2), gentle slope (1)

Aspect: Southerly (11), Easterly (10), Westerly (5), Northerly (4), Level (1)

Topographic Position: Midslope (5), Upper Slope (3), Lower Slope (1)

### Characteristic Species

#### Shrub

- [ 7.0 ] UNDIFFERENTIATED ROSE  
*Rosa*
- [ 4.1 ] COMMON BEARBERRY  
*Arctostaphylos uva-ursi*
- [ 3.0 ] SNOWBERRY (BUCKBRUSH)  
*Symphoricarpos occidentalis*
- [ 2.9 ] SHRUBBY CINQUEFOIL  
*Potentilla fruticosa*
- [ 1.4 ] SASKATOON  
*Amelanchier alnifolia*

#### Forb

- [ 1.5 ] BALSAMROOT  
*Balsamorhiza sagittata*

#### Graminoid

- [ 20.5 ] PARRY OAT GRASS  
*Danthonia parryi*
- [ 8.8 ] FOOTHILLS ROUGH FESCUE  
*Festuca campestris*
- [ 7.5 ] BLUNT SEDGE  
*Carex obtusata*
- [ 6.1 ] IDAHO FESCUE  
*Festuca idahoensis*
- [ 3.0 ] JUNE GRASS  
*Koeleria macrantha*

### Soil Variables

Soil Drainage: Rapidly drained (13), Well drained (9), Very rapidly drained (2), Moderately well drained (1)

Soil Subgroup: ORTHIC DARK GRAY CHERNOZEM (4), ORTHIC GRAY LUVISOL (3), ORTHIC REGOSOL (2), ORTHIC BLACK CHERNOZEM (1), DARK GRAY LUVISOL (1)

Surface Texture:

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (11)

Parent Material: Morainal (9), Colluvial (3)

Soil Type:

Humus Form

### LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

## Msd25 Rose/Parry oat grass-Rough fescue (n=23)

(*Rosa spp./Danthonia parryii-Festuca campestris*)

South and west facing, moderate to steep grassland slopes in the Montane are typically dominated by Parry oat grass or Idaho fescue. Without ongoing natural disturbances such as fire, shrubs such as rose, saskatoon, chokecherry and/or snowberry will slowly encroach. Once established - usually beginning near swales - the shrubs will capture snow and change their microsite conditions to more moist conditions and increase the opportunity for these shrubs to establish and allow further expansion. Once shrubs are established this may set the stage for lodgepole pine and Douglas-fir to establish, or start to resemble a more moist and thicker Snowberry-Rose-Saskatoon [Msb6a] dominated community. With more moisture also comes increased risk from invasion of introduced species, especially with moderate to heavy grazing. This transition will not affect the more tolerant shrubs, but increase species such as Kentucky bluegrass and timothy. This community type will look similar to a Parry oatgrass dominated grassland (Msb2) and will often be identified as grassland by AVI photo interpreters.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** c buffaloberry/hairy wild rye (submesic/medium)

**Ecosite Phase:** c6 shrubland

Plant Composition	Canopy Cover (%)			Environmental Variables										
	Mean	Range	Const.											
<b>Medium Shrub (0.5 to 2 m)</b>				Ecological Status Score: 15-20 Moisture Regime: Submesic (moderately fresh) (3), Mesic (fresh) (2), Subxeric (moderately dry) (2) Nutrient Regime: Mesotrophic (medium) (4), Submesotrophic (poor) (3) Elevation (range): 1514 (1380-1661) M Slope (%): 16 - 30.99 (4), 46 - 70.99 (3), 31 - 45.99 (3), 2.5 - 5.99 (1), 6 - 9.99 (1) Aspect: Southerly (6), Easterly (4), Westerly (3), Level (1), Northerly (1) Topographic Position: Midslope (3), Upper Slope (2)										
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	4.4	0.0-11.5	83											
PRAIRIE ROSE ( <i>Rosa arkansana</i> )	2.5	0.0-20.5	30											
PRICKLY ROSE ( <i>Rosa acicularis</i> )	2.4	0.0-15.3	57											
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	2.3	0.0-21.3	17											
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	1.7	0.0-20.5	35											
<b>Low Shrub (&lt; 0.5m)</b>														
CREeping JUNIPER ( <i>Juniperus horizontalis</i> )	4.6	0.0-26.3	39											
<b>Tall Forb (&gt;= 30 cm)</b>														
LOW GOLDENROD ( <i>Solidago missouriensis</i> )	1.7	0.0-6.9	61											
GAILLARDIA ( <i>Gaillardia aristata</i> )	1.3	0.0-3.7	78											
SILKY PERENNIAL LUPINE ( <i>Lupinus sericeus</i> )	1.3	0.0-5.5	74											
STICKY PURPLE GERANIUM ( <i>Geranium viscosissimum</i> )	1.2	0.0-4.7	61											
SMOOTH ASTER ( <i>Aster laevis</i> )	1.0	0.0-7.0	44											
<b>Low Forb (&lt; 30 cm)</b>														
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	3.2	0.0-8.3	91											
THREE-FLOWERED AVENS ( <i>Geum triflorum</i> )	1.8	0.0-17.1	61											
COMMON YARROW ( <i>Achillea millefolium</i> )	1.7	0.0-8.5	87											
GOLDEN BEAN ( <i>Thermopsis rhombifolia</i> )	1.7	0.0-5.0	65											
<b>Graminoid</b>														
PARRY OAT GRASS ( <i>Danthonia parryi</i> )	21.2	0.7-46.0	100											
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	11.6	0.0-27.0	91											
IDAHO FESCUE ( <i>Festuca idahoensis</i> )	6.0	0.0-19.8	96											
BLUNT SEDGE ( <i>Carex obtusata</i> )	4.2	0.0-39.6	91											
JUNE GRASS ( <i>Koeleria macrantha</i> )	2.0	0.0-9.8	74											
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	1.0	0.0-6.5	39											
				<b>Soil Variables</b> <hr/> Soil Drainage: Well drained (8), Rapidly drained (5) Soil Subgroup: ORTHIC DARK GRAY CHERNOZEM (3), ORTHIC REGOSOL (2), ORTHIC GRAY LUVISOL (1), DARK GRAY LUVISOL (1), ORTHIC BLACK CHERNOZEM (1) Surface Texture: Effective Texture: Depth to Mottles/Gley: Organic Thickness: 0 - 5 cm (8) Parent Material: Morainal (6), Colluvial (3) Soil Type: Humus Form										
				<table border="1"> <thead> <tr> <th>LFH Thickness</th> <th>Mean</th> <th>Min</th> <th>Max</th> <th>Count</th> </tr> </thead> <tbody> <tr> <td>cm:</td> <td>0.00</td> <td>0.00</td> <td>0.00</td> <td>0</td> </tr> </tbody> </table>	LFH Thickness	Mean	Min	Max	Count	cm:	0.00	0.00	0.00	0
LFH Thickness	Mean	Min	Max	Count										
cm:	0.00	0.00	0.00	0										

# cc rough fescue grassland(submesic/rich) (n=1153)

Natural Subregion: Montane

Ecosection: Ms Montane South Ecosection

## General Description

This ecosite is typical of south and west facing slopes and lower slope positions throughout the Montane subregion from an elevation of 1300 m to 1900 m. It is usually dominated by grass species because of the dry site conditions and westerly winds. The soils of this ecosite are dominated by deep black chernozems. Rough fescue dominated sites have not had species composition change in over 30 years indicating the climax nature of this species on these ecosites in the Montane subregion.



## Environmental Variables

Moisture Regime: Mesic (fresh) (256), Submesic (moderately fresh) (184), Subxeric (moderately dry) (86), Subhygric (moderately moist) (27), Xeric (dry) (19), Hygric (moist) (2)

Nutrient Regime: Mesotrophic (medium) (327), Permesotrophic (rich) (222), Submesotrophic (poor) (22), Eutrophic (very rich) (4)

Elevation (range): 1508 (1110-2073) M

Slope (%): strong slope (140), moderate slope (110), very gentle slope (92), level (70), nearly level (53), gentle slope (45), very strong slope (20), steep slope (7)

Aspect: Southerly (213), Easterly (110), Westerly (107), Level (45), Northerly (22)

Topographic Position: Midslope (133), Level (125), Lower Slope (63), Upper Slope (49), Toe (34), Crest (20), Depression (2)

## Soil Variables

Soil Drainage: Well drained (368), Rapidly drained (142), Moderately well drained (81), Very rapidly drained (17), Poorly drained (1), Imperfectly drained (1)

Soil Subgroup: ORTHIC BLACK CHERNOZEM (37), ORTHIC EUTRIC BRUNISOL (7), ORTHIC DARK GRAY CHERNOZEM (5), ORTHIC REGOSOL (4), ORTHIC GRAY LUVISOL (3), ORTHIC HUMIC REGOSOL (3), ORTHIC MELANIC BRUNISOL (1), ORTHIC DARK BROWN CHERNOZEM (1), BRUNISOLIC GRAY LUVISOL (1), CUMULIC REGOSOL (1), GLEYED MELANIC BRUNISOL (1), REGO DARK GRAY CHERNOZEM (1)

Surface Texture: Loam (12), Silt loam (7), Clay loam (4), Very fine sandy loam (1), Sandy clay loam (1)

Effective Texture: Loam (5), Silt loam (5), Sandy clay loam (4), Clay loam (4), Sandy loam (2), Clay (2), Very fine sandy loam (1), Fine sandy loam (1), Loamy sand (1)

Depth to Mottles/Gley: 26 - 50 (1), None (1)

Organic Thickness: 0 - 5 cm (46)

Parent Material: Morainal (46), Fluvial (8), Glaciofluvial (7), Colluvial (3), Residual (2), Rock (1), Glaciolacustrine (1)

Soil Type: Moist/Silty-Loamy (9), Dry/Fine (3), Moist/Coarse (3), Moist/Fine (2), Dry/Silty-Loamy (2), Very Dry/Silty-Loamy (2), Dry/Coarse (1)

Humus Form RHIZOMULL (10), MULL (6), MULL-LIKE MODER (1), FIBRIMOR (1)

## Successional Relationships

Grasslands often remain the climax vegetation in this ecosite where normal disturbance regimes of grazing and fire occur. In the absence of disturbance, shrubs and trees such as rose, saskatoon, snowberry, chokecherry and aspen often invade initially from more moist locations and expand from there. Over the long-term, these move to aspen forests, and ultimately to lodgepole pine or spruce forest. On drier upslope locations within this ecosite, Douglas-fir or lodgepole pine commonly encroaches, creating an open savannah forest. On the grassland phases, disturbance in the more moist areas often lead to a degraded site that is dominated by Kentucky bluegrass, timothy and brome grasses. Drier sites that have been heavily grazed tend to reduce in rough fescue and begin to resemble upslope grasslands dominated by Parry oat grass and Idaho fescue.

## Indicator Species

### Forb

STICKY PURPLE GERANIUM  
*Geranium viscosissimum*  
THREE-FLOWERED AVENS  
*Geum triflorum*  
SILKY PERENNIAL LUPINE  
*Lupinus sericeus*

### Graminoid

FOOTHILLS ROUGH FESCUE  
*Festuca campestris*  
IDAHO FESCUE  
*Festuca idahoensis*  
PARRY OAT GRASS  
*Danthonia parryi*

## LFH Thickness

	Mean	Min	Max	Count
cm:	3.00	1.00	20.00	22

# cc1 rough fescue (n=1025)

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** cc rough fescue grassland(submesic/rich)

## General Description

This phase commonly occurs on lower slopes within valleys and represents areas with Black Chernozemic soils. Foothills rough fescue is the climax grass species, with Parry oat grass and Idaho fescue subdominant secondary species. There is also an abundance of diverse forb species. Shrubs commonly occurring are shrubby cinquefoil and rose. This phase can easily be invaded by introduced forages such as Kentucky bluegrass, brome and timothy, unless the site is nearing the drier and less rich range of the edatope boundaries.

## Characteristic Species

### Shrub

- [ 3.4 ] SHRUBBY CINQUEFOIL  
*Potentilla fruticosa*
- [ 2.6 ] COMMON BEARBERRY  
*Arctostaphylos uva-ursi*

### Forb

- [ 3.6 ] THREE-FLOWERED AVENS  
*Geum triflorum*
- [ 2.2 ] STICKY PURPLE GERANIUM  
*Geranium viscosissimum*

### Graminoid

- [ 34.0 ] FOOTHILLS ROUGH FESCUE  
*Festuca campestris*
- [ 7.3 ] PARRY OAT GRASS  
*Danthonia parryi*
- [ 3.8 ] IDAHO FESCUE  
*Festuca idahoensis*

## Environmental Variables

Moisture Regime: Mesic (fresh) (244), Submesic (moderately fresh) (169), Subxeric (moderately dry) (79), Subhygric (moderately moist) (26), Xeric (dry) (17)

Nutrient Regime: Mesotrophic (medium) (303), Permesotrophic (rich) (212), Submesotrophic (poor) (21), Eutrophic (very rich) (3)

Elevation (range): 1496 (1110-2073) M

Slope (%): strong slope (121), moderate slope (102), very gentle slope (85), level (68), nearly level (53), gentle slope (39), very strong slope (15), steep slope (5)

Aspect: Southerly (193), Westerly (94), Easterly (91), Level (44), Northerly (17)

Topographic Position: Midslope (123), Level (120), Lower Slope (60), Upper Slope (42), Toe (34), Crest (16), Depression (2)

## Soil Variables

Soil Drainage: Well drained (338), Rapidly drained (123), Moderately well drained (78), Very rapidly drained (15), Imperfectly drained (1), Poorly drained (1)

Soil Subgroup: ORTHIC BLACK CHERNOZEM (26), ORTHIC EUTRIC BRUNISOL (6), ORTHIC HUMIC REGOSOL (3), ORTHIC DARK GRAY CHERNOZEM (3), ORTHIC REGOSOL (2), ORTHIC DARK BROWN CHERNOZEM (1), GLEYED MELANIC BRUNISOL (1), CUMULIC REGOSOL (1), BRUNISOLIC GRAY LUVISOL (1)

Surface Texture: Loam (11), Silt loam (6), Clay loam (3), Very fine sandy loam (1), Sandy clay loam (1)

Effective Texture: Loam (5), Silt loam (4), Sandy clay loam (4), Clay loam (3), Clay (2), Sandy loam (1), Loamy sand (1), Fine sandy loam (1), Very fine sandy loam (1)

Depth to Mottles/Gley: 26 - 50 (1)

Organic Thickness: 0 - 5 cm (26)

Parent Material: Morainal (29), Fluvial (7), Glaciofluvial (6), Residual (1), Rock (1), Glaciolacustrine (1), Colluvial (1)

Soil Type: Moist/Silty-Loamy (9), Dry/Fine (3), Moist/Coarse (3), Dry/Silty-Loamy (2), Very Dry/Silty-Loamy (2), Moist/Fine (2), Dry/Coarse (1)

Humus Form RHIZOMULL (10), MULL (5), MULL-LIKE MODER (1), FIBRIMOR (1)

LFH Thickness	Mean	Min	Max	Count
cm:	3.00	1.00	20.00	22

# Msb1 Foothills rough fescue-Idaho fescue-Parry oat grass (n=270)

## (*Festuca campestris*-*Festuca idahoensis*-*Danthonia parryii*)

This community appears to be the modal grassland community type on lower slope Black Chernozemic soils in the foothills of southern Alberta from an elevation of 1300m up to 2000m. Willoughby (1992) described one rough fescue dominated site where the species composition had not changed in over 30 years, indicating this may be the climax community type on river terraces and south facing slopes in the Montane. Indeed Moss and Campbell (1947) found that rough fescue grows almost to the exclusion of other plants in the absence of disturbance. Willoughby (1992) suggests that Parry oat grass and Idaho fescue interchange as the primary subdominant species depending on substrate and geography. For example, Idaho fescue sub-dominated community types with little Parry oat grass occurred in the Castle area south of Blairmore. However it is often difficult and impractical to distinguish these as community types. Consequently, rough fescue, rough fescue-Idaho fescue and rough fescue-Parry oat grass/shrubby cinquefoil-rose associations listed in Willoughby (1992) are grouped into this one community type. Upslope, especially on shallower soils, rough fescue is reduced and Parry oat grass and/or Idaho fescue increase in cover to form the Msb2 community type. Moss and Campbell (1947) also found Parry oat grass and Idaho fescue increased and rough fescue declined with increased grazing pressure to form the Msc1 community type.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** cc rough fescue grassland(submesic/rich)

**Ecosite Phase:** cc1 rough fescue

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Medium Shrub (0.5 to 2 m)</b>					Ecological Status Score: 27-40 Moisture Regime: Mesic (fresh) (42), Submesic (moderately fresh) (37), Subxeric (moderately dry) (17), Subhygric (moderately moist) (5), Xeric (dry) (5) Nutrient Regime: Mesotrophic (medium) (57), Permesotrophic (rich) (43), Submesotrophic (poor) (6) Elevation (range): 1559 (1290-2073) M Slope (%): 16 - 30.99 (34), 10 - 15.99 (19), 2.5 - 5.99 (15), 0 - 0.49 (6), 0.5 - 2.49 (6), 31 - 45.99 (4), 6 - 9.99 (4), 46 - 70.99 (1) Aspect: Southerly (33), Westerly (28), Easterly (16), Level (3), Northerly (2) Topographic Position: Midslope (29), Level (21), Upper Slope (10), Lower Slope (8), Crest (3), Toe (2)
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	2.1	0.0-22.7	62		
PRICKLY ROSE ( <i>Rosa acicularis</i> )	1.1	0.0-20.0	31		
<b>Tall Forb (&gt;= 30 cm)</b>					
YELLOW BEARDTONGUE ( <i>Penstemon confertus</i> )	3.7	0.0-33.4	56		
GRACEFUL CINQUEFOIL ( <i>Potentilla gracilis</i> )	1.1	0.0-14.7	52		
<b>Low Forb (&lt; 30 cm)</b>					
THREE-FLOWERED AVENS ( <i>Geum triflorum</i> )	5.4	0.0-42.8	82		
COMMON YARROW ( <i>Achillea millefolium</i> )	2.2	0.0-15.3	93		
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	1.9	0.0-11.7	85		
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	1.6	0.0-39.7	45		
CUT-LEAVED ANEMONE ( <i>Anemone multifida</i> )	1.1	0.0-13.2	47		
<b>Graminoid</b>					
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	21.1	10.5-61.7	100		
PARRY OAT GRASS ( <i>Danthonia parryi</i> )	8.4	0.0-50.3	85		
IDAHO FESCUE ( <i>Festuca idahoensis</i> )	4.6	0.0-48.3	81		
BLUNT SEDGE ( <i>Carex obtusata</i> )	4.3	0.0-35.3	63		
RICHARDSON NEEDLE GRASS ( <i>Stipa richardsonii</i> )	2.6	0.0-28.3	48		
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	1.8	0.0-14.6	72		
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	1.4	0.0-27.0	43		
INTERMEDIATE OAT GRASS ( <i>Danthonia intermedia</i> )	1.2	0.0-28.0	39		
JUNE GRASS ( <i>Koeleria macrantha</i> )	1.2	0.0-15.7	61		
				<b>Soil Variables</b>	
				Soil Drainage: Well drained (69), Rapidly drained (27), Moderately well drained (6), Very rapidly drained (5) Soil Subgroup: ORTHIC BLACK CHERNOZEM (6), ORTHIC DARK GRAY CHERNOZEM (2), ORTHIC EUTRIC BRUNISOL (1), ORTHIC HUMIC REGOSOL (1) Surface Texture: Silt loam (3), Loam (3), Clay loam (2), Very fine sandy loam (1) Effective Texture: Clay (2), Clay loam (1), Fine sandy loam (1), Loam (1), Sandy clay loam (1), Very fine sandy loam (1), Sandy loam (1), Silt loam (1) Depth to Mottles/Gley: Organic Thickness: 0 - 5 cm (1) Parent Material: Morainal (6), Glaciofluvial (2), Colluvial (1), Fluvial (1), Glaciolacustrine (1) Soil Type: Moist/Silty-Loamy (4), Dry/Fine (2), Moist/Coarse (1), Dry/Silty-Loamy (1), Dry/Coarse (1) Humus Form RHIZOMULL (7), MULL-LIKE MODER (1), MULL (1)	
				<b>LFH Thickness</b>	
				Mean    Min    Max    Count	
				cm:            2.00    1.00    3.00    9	

## Msb15 Foothills rough fescue-Hairy wild rye (n=4)

### (*Festuca campestris*-*Elymus innovatus*)

This community type was first described on the east slopes of the Livingstone range and appears to represent a transitional community from the lower Montane subregion to the higher Subalpine and Upper Foothills subregions. Indeed Willoughby and Alexander (2007) and Willoughby (2007) described rough fescue-hairy wild rye community types in the southern subalpine and upper foothills west of Calgary. They felt that as one moved upslope there would be a shift in codominance of sedge to hairy wild rye and an increase in cover of bearberry and juniper. Corns and Achuff (1982) described hairy wild rye dominated community types on south facing slopes in the more northern areas of the subalpine. They felt these grasslands occurred on areas with frequent snow avalanching. It is possible that this community type is associated with deeper snow accumulation than the other rough fescue dominated types.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** cc rough fescue grassland(submesic/rich)

**Ecosite Phase:** cc1 rough fescue

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Medium Shrub (0.5 to 2 m)</b>				Ecological Status Score: 40
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	5.3	0.0-19.1	75	Moisture Regime: Mesic (fresh) (4)
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	4.4	0.0-13.0	75	Nutrient Regime: Mesotrophic (medium) (4), Permesotrophic (rich) (1)
<b>Tall Forb (&gt;= 30 cm)</b>				Elevation (range): 1672 (1615-1717) M
GRACEFUL CINQUEFOIL ( <i>Potentilla gracilis</i> )	3.3	0.0-13.3	25	Slope (%): 16 - 30.99 (2), 31 - 45.99 (1), 10 - 15.99 (1)
STICKY PURPLE GERANIUM ( <i>Geranium viscosissimum</i> )	2.8	0.0-11.2	25	Aspect: Southerly (2), Westerly (1), Easterly (1)
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	2.3	0.0-9.2	25	Topographic Position: Midslope (2), Upper Slope (1)
YELLOW HEDYSARUM ( <i>Hedysarum sulphurescens</i> )	2.0	0.0-8.2	25	<b>Soil Variables</b>
YELLOW BEARDTONGUE ( <i>Penstemon confertus</i> )	1.4	0.0-5.2	50	Soil Drainage: Well drained (4), Rapidly drained (1)
<b>Low Forb (&lt; 30 cm)</b>				Soil Subgroup:
THREE-FLOWERED AVENS ( <i>Geum triflorum</i> )	2.9	0.0-11.7	25	Surface Texture:
<b>Graminoid</b>				Effective Texture:
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	19.5	15.0-24.8	100	Depth to Mottles/Gley:
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	14.0	6.2-20.0	100	Organic Thickness:
PARRY OAT GRASS ( <i>Danthonia parryi</i> )	4.8	0.0-11.3	50	Parent Material:
SEDGE SPECIES ( <i>Carex</i> )	2.9	0.0-11.8	25	Soil Type:
				Humus Form
				<b>LFH Thickness</b>
				Mean
				Min
				Max
				Count
				cm:
				0.00
				0.00
				0.00
				0



# Msc1 Idaho fescue-Parry oat grass-Sedge (n=156)

(*Festuca idahoensis*-*Danthonia parryi*-*Carex obtusata*)

This community type represents a Rough fescue-Idaho fescue-Parry oat grass plant community that has been moderately to heavily grazed for a number of years. The species composition of this community is very similar to the upslope Parry oat grass-Foothills rough fescue-Idaho fescue [Msb2] and Idaho fescue-Parry oat grass-Rough fescue [Msb2a] community types, but this community type occupies lower slope positions. Increased grazing pressure causes rough fescue to decline and allows Idaho fescue, Parry oat grass and sedge species to increase (Moss and Campbell 1947). Continued heavy grazing pressure will eventually lead to a decline in all native species and introduced species will invade. If grazing pressure on this community type is reduced or is eliminated the community will likely succeed back to a rough fescue dominated grassland. Recovery of this grassland back to a rough fescue dominated community type will likely take 10 years (Willoughby 1996). Sites that are slightly more moist and rich may also be invaded by agronomic species, leading to a different successional pathway with Kentucky bluegrass a commonly occurring species.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** cc rough fescue grassland(submesic/rich)

**Ecosite Phase:** cc1 rough fescue

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Medium Shrub (0.5 to 2 m)</b>				Ecological Status Score: 20 Moisture Regime: Mesic (fresh) (29), Submesic (moderately fresh) (17), Subxeric (moderately dry) (8), Xeric (dry) (3), Subhygric (moderately moist) (3)
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	1.7	0.0-15.0	57	
<b>Tall Forb (&gt;= 30 cm)</b>				Nutrient Regime: Mesotrophic (medium) (38), Permesotrophic (rich) (18), Submesotrophic (poor) (2) Elevation (range): 1485 (1340-1920) M Slope (%): 16 - 30.99 (27), 2.5 - 5.99 (11), 0.5 - 2.49 (8), 10 - 15.99 (8), 0 - 0.49 (4), 6 - 9.99 (4), 31 - 45.99 (1) Aspect: Southerly (26), Westerly (14), Easterly (14), Northerly (2), Level (2) Topographic Position: Midslope (22), Level (10), Lower Slope (7), Crest (3), Upper Slope (1), Toe (1)
SILKY PERENNIAL LUPINE ( <i>Lupinus sericeus</i> )	1.7	0.0-25.1	35	
WILD VETCH ( <i>Vicia americana</i> )	0.7	0.0-9.7	46	Soil Drainage: Well drained (42), Rapidly drained (20), Moderately well drained (2), Very rapidly drained (2) Soil Subgroup: ORTHIC BLACK CHERNOZEM (7), ORTHIC EUTRIC BRUNISOL (2), ORTHIC DARK GRAY CHERNOZEM (1), BRUNISOLIC GRAY LUVISOL (1), ORTHIC REGOSOL (1) Surface Texture: Sandy clay loam (1), Loam (1) Effective Texture: Sandy clay loam (1), Silt loam (1) Depth to Mottles/Gley: Organic Thickness: 0 - 5 cm (12) Parent Material: Morainal (12), Glaciofluvial (1) Soil Type: Very Dry/Silty-Loamy (1), Dry/Fine (1) Humus Form FIBRIMOR (1)
YELLOW BEARDTONGUE ( <i>Penstemon confertus</i> )	0.6	0.0-16.0	23	
<b>Low Forb (&lt; 30 cm)</b>				<b>Soil Variables</b>
THREE-FLOWERED AVENS ( <i>Geum triflorum</i> )	5.3	0.0-34.9	83	
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	2.3	0.0-10.5	85	<b>LFH Thickness</b>
COMMON YARROW ( <i>Achillea millefolium</i> )	1.6	0.0-13.6	75	
PRAIRIE SELAGINELLA ( <i>Selaginella densa</i> )	1.3	0.0-19.9	22	Mean
CUT-LEAVED ANEMONE ( <i>Anemone multifida</i> )	0.9	0.0-12.6	51	Min
YELLOW FALSE DANDELION ( <i>Agoseris glauca</i> )	0.8	0.0-12.7	47	Max
COMMON DANDELION ( <i>Taraxacum officinale</i> )	0.8	0.0-13.4	51	Count
FIELD MOUSE-EAR CHICKWEED ( <i>Cerastium arvense</i> )	0.6	0.0-6.6	43	cm:
<b>Graminoid</b>				
PARRY OAT GRASS ( <i>Danthonia parryi</i> )	14.2	0.0-63.3	85	
IDAHO FESCUE ( <i>Festuca idahoensis</i> )	8.0	0.0-77.0	93	
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	5.9	0.0-21.5	95	
BLUNT SEDGE ( <i>Carex obtusata</i> )	5.2	0.0-49.5	58	
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	4.7	0.0-27.7	64	
JUNE GRASS ( <i>Koeleria macrantha</i> )	2.6	0.0-29.0	78	
RICHARDSON NEEDLE GRASS ( <i>Stipa richardsonii</i> )	1.8	0.0-19.0	42	
INTERMEDIATE OAT GRASS ( <i>Danthonia intermedia</i> )	1.5	0.0-50.0	33	
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	1.4	0.0-15.7	66	
SEDGE SPECIES ( <i>Carex</i> )	1.3	0.0-20.3	23	

## Msc18 Weeds/Bare ground (n=1)

### (*Cirsium arvense-Descurainia richardsonii*)

This community represents a Rough fescue-Idaho fescue -Parry oat grass [Msb1] community type on Black Chernozmic soils that has seen major disturbance. Disturbances such as industrial soil disturbance prior to restoration, continuous long-term heavy grazing, recreational disturbance or a combination of these has shifted the community to one dominated by weeds (thistle, mustards, stinkweed), Kentucky bluegrass, timothy, dandelion and bare ground. Once this community type is established it is difficult for the site to recover back to native species. When protected these sites often become dominated by Kentucky bluegrass, timothy or brome, resembling a Kentucky bluegrass-Timothy/Dandelion [Msc4] or Smooth brome-Kentucky bluegrass [Msc5] but are very susceptible to drought conditions with high amounts of bare ground. These are usually rated as an ecological status rating of 0, and no ESSR is assigned to this community as rest is required for any potential for recovery. With moisture and rest, ecological status may improve to an 8 or 15 modified community.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** cc rough fescue grassland(submesic/rich)

**Ecosite Phase:** cc1 rough fescue

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Tall Forb (&gt;= 30 cm)</b>				Ecological Status Score: 0
GREY TANSY MUSTARD ( <i>Descurainia richardsonii</i> )	4.0	4.0-4.0	100	Moisture Regime: Mesic (fresh) (1)
STINKWEED ( <i>Thlaspi arvense</i> )	2.8	2.8-2.8	100	Nutrient Regime: Mesotrophic (medium) (1)
CANADA THISTLE ( <i>Cirsium arvense</i> )	2.5	2.5-2.5	100	Elevation (range): 1350 (1350-1350) M
<b>Low Forb (&lt; 30 cm)</b>				Slope (%): 2.5 - 5.99 (1)
COMMON DANDELION ( <i>Taraxacum officinale</i> )	1.0	1.0-1.0	100	Aspect: Southerly (1)
<b>Graminoid</b>				Topographic Position: Midslope (1)
TIMOTHY ( <i>Phleum pratense</i> )	36.5	36.5-36.5	100	<b>Soil Variables</b>
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	18.5	18.5-18.5	100	Soil Drainage: Well drained (1)
				Soil Subgroup:
				Surface Texture:
				Effective Texture:
				Depth to Mottles/Gley:
				Organic Thickness:
				Parent Material:
				Soil Type:
				Humus Form
				<b>LFH Thickness</b>
				<b>Mean</b>
				<b>Min</b>
				<b>Max</b>
				<b>Count</b>
cm:	0.00	0.00	0.00	0

## Msc2 Canada bluegrass-Foothills rough fescue-Slender wheat grass (n=6)

### (*Poa compressa-Festuca campestris-Agropyron trachycaulum*)

This community type was described on mesic, lower slope positions with shallow, nutrient poor soils and is similar to the Kentucky bluegrass-Rough fescue dominated [Msc3] type but is dominated by Canada bluegrass rather than Kentucky bluegrass. Canada bluegrass is a pioneer species on moderately acidic soils and on soils with poor fertility (St. John et al. 2012). This community type appears to have been moderately grazed. Increased grazing pressure causes rough fescue to decline and allows bluegrasses and dandelion to increase.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** cc rough fescue grassland(submesic/rich)

**Ecosite Phase:** cc1 rough fescue

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Medium Shrub (0.5 to 2 m)</b>				Ecological Status Score: 15
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	1.2	0.0-2.1	83	Moisture Regime: Submesic (moderately fresh) (4), Mesic (fresh) (2), Subhygric (moderately moist) (2)
PRICKLY ROSE ( <i>Rosa acicularis</i> )	1.0	0.0-5.2	50	Nutrient Regime: Mesotrophic (medium) (6), Permesotrophic (rich) (1)
<b>Tall Forb (&gt;= 30 cm)</b>				Elevation (range): 1429 (1225-1554) M
GRACEFUL CINQUEFOIL ( <i>Potentilla gracilis</i> )	5.3	0.3-13.3	100	Slope (%): 0 - 0.49 (4), 0.5 - 2.49 (2)
STICKY PURPLE GERANIUM ( <i>Geranium viscosissimum</i> )	3.9	0.0-7.7	83	Aspect: Southerly (1), Westerly (1)
<b>Low Forb (&lt; 30 cm)</b>				Topographic Position: Level (5), Depression (1)
COMMON YARROW ( <i>Achillea millefolium</i> )	9.3	4.5-13.7	100	<b>Soil Variables</b>
COMMON DANDELION ( <i>Taraxacum officinale</i> )	6.5	0.0-14.1	83	Soil Drainage: Well drained (3), Rapidly drained (2), Moderately well drained (1), Imperfectly drained (1), Poorly drained (1)
THREE-FLOWERED AVENS ( <i>Geum triflorum</i> )	4.9	1.0-7.7	100	Soil Subgroup:
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	3.7	0.5-7.7	100	Surface Texture:
<b>Graminoid</b>				Effective Texture:
CANADA BLUEGRASS ( <i>Poa compressa</i> )	29.0	13.3-51.9	100	Depth to Mottles/Gley:
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	12.5	3.3-26.7	100	Organic Thickness:
BLUNT SEDGE ( <i>Carex obtusata</i> )	7.4	0.0-19.7	67	Parent Material:
IDAHO FESCUE ( <i>Festuca idahoensis</i> )	6.5	1.6-12.7	100	Soil Type:
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	5.3	0.0-9.8	83	Humus Form
WIRE RUSH ( <i>Juncus balticus</i> )	3.2	0.0-10.7	50	
				<b>LFH Thickness</b>
				<b>Mean</b>
				<b>Min</b>
				<b>Max</b>
				<b>Count</b>
				cm:
				0.00
				0.00
				0.00
				0

## Msc3 Kentucky bluegrass-Foothills rough fescue (n=166)

### (*Poa pratensis*-*Festuca campestris*)

Heavy disturbance such as long-term heavy grazing pressure leads to decline in rough fescue and an increase in more grazing tolerant species. On the moister and richer end of this ecosite, disturbances that reduce the competitive advantage of rough fescue and other native grass species will allow introduced agronomic species to invade. Continued heavy grazing pressure eventually leads to a decline of all native species, changing to the Timothy-Kentucky bluegrass/ Dandelion [Msc4] type. The forage productivity of this community type is equivalent to or better than the Rough fescue-Idaho fescue-Parry oat grass [Msb1] community. However, rough fescue is a preferred later season forage as it cures on the stalk after the growing season (Tirmenstein 2000). In contrast, Kentucky bluegrass is a good forage early, but loses its palatability and productivity soon after flowering into the drier portions of the season (Uchytel 1993). There is still a significant component of native species within this community type, which will facilitate some recovery if the grazing pressure is reduced to low or moderate levels.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** cc rough fescue grassland(submesic/rich)

**Ecosite Phase:** cc1 rough fescue

#### Plant Composition

#### Canopy Cover (%)

#### Environmental Variables

	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Medium Shrub (0.5 to 2 m)</b>					Ecological Status Score: 15-20
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	2.2	0.0-32.7	56		Moisture Regime: Mesic (fresh) (59), Submesic (moderately fresh) (42), Subxeric (moderately dry) (20), Subhygric (moderately moist) (5), Xeric (dry) (5)
PRICKLY ROSE ( <i>Rosa acicularis</i> )	1.5	0.0-29.8	38		Nutrient Regime: Mesotrophic (medium) (62), Permesotrophic (rich) (60), Submesotrophic (poor) (9), Eutrophic (very rich) (2)
<b>Tall Forb (&gt;= 30 cm)</b>					Elevation (range): 1493 (1300-1768) M
STICKY PURPLE GERANIUM ( <i>Geranium viscosissimum</i> )	2.2	0.0-22.9	51		Slope (%): 16 - 30.99 (26), 10 - 15.99 (24), 2.5 - 5.99 (20), 0 - 0.49 (17), 0.5 - 2.49 (13), 6 - 9.99 (9), 31 - 45.99 (6), 46 - 70.99 (3)
GRACEFUL CINQUEFOIL ( <i>Potentilla gracilis</i> )	2.0	0.0-13.9	60		Aspect: Southerly (44), Easterly (26), Westerly (19), Level (14), Northerly (2)
WILD VETCH ( <i>Vicia americana</i> )	1.8	0.0-25.5	66		Topographic Position: Level (37), Midslope (22), Lower Slope (20), Upper Slope (17), Crest (6), Toe (4)
SILKY PERENNIAL LUPINE ( <i>Lupinus sericeus</i> )	1.6	0.0-33.5	37		
YELLOW BEARDTONGUE ( <i>Penstemon confertus</i> )	1.3	0.0-20.9	43		
<b>Low Forb (&lt; 30 cm)</b>					<b>Soil Variables</b>
THREE-FLOWERED AVENS ( <i>Geum triflorum</i> )	4.3	0.0-41.0	65		Soil Drainage: Well drained (81), Rapidly drained (29), Moderately well drained (24), Very rapidly drained (3)
COMMON YARROW ( <i>Achillea millefolium</i> )	4.2	0.0-41.7	94		Soil Subgroup: ORTHIC BLACK CHERNOZEM (7), ORTHIC EUTRIC BRUNISOL (2), ORTHIC REGOSOL (1)
COMMON DANDELION ( <i>Taraxacum officinale</i> )	3.6	0.0-42.6	81		Surface Texture: Loam (3), Silt loam (1)
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	3.0	0.0-20.0	93		Effective Texture: Silt loam (2), Loam (1), Loamy sand (1)
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	1.8	0.0-34.9	51		Depth to Mottles/Gley:
<b>Graminoid</b>					Organic Thickness: 0 - 5 cm (8)
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	23.1	0.0-80.3	91		Parent Material: Morainal (6), Glaciofluvial (2), Fluvial (1), Residual (1), Rock (1)
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	6.3	0.0-43.7	80		Soil Type: Moist/Silty-Loamy (2), Moist/Coarse (1), Very Dry/Silty-Loamy (1)
TIMOTHY ( <i>Phleum pratense</i> )	4.9	0.0-36.7	66		Humus Form RHIZOMULL (2)
IDAHO FESCUE ( <i>Festuca idahoensis</i> )	4.3	0.0-39.0	71		
PARRY OAT GRASS ( <i>Danthonia parryi</i> )	2.9	0.0-21.0	60		
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	2.0	0.0-30.4	70		
RICHARDSON NEEDLE GRASS ( <i>Stipa richardsonii</i> )	1.9	0.0-43.0	34		
BLUNT SEDGE ( <i>Carex obtusata</i> )	1.7	0.0-18.7	44		
CALIFORNIA OAT GRASS ( <i>Danthonia californica</i> )	1.7	0.0-59.2	15		
JUNE GRASS ( <i>Koeleria macrantha</i> )	1.2	0.0-14.5	58		

LFH Thickness	Mean	Min	Max	Count
cm:	3.00	2.00	5.00	4

## Msc4 Kentucky bluegrass-Timothy/Dandelion (n=262)

(*Poa pratensis*-*Phleum pratense*/*Taraxacum officinale*)

This community type appears to once have represented a Rough fescue-Idaho fescue -Parry oat grass [Msb1] community type on Black Chernozemic soils. Heavy disturbance has shifted the community to one dominated by Kentucky bluegrass, timothy and dandelion. Once timothy and Kentucky bluegrass are dominant it appears to limit the re-establishment of rough fescue (Willoughby 1992). Reference area data suggests that these communities have moved to a new state following the "State transition model" proposed by Westoby et al. (1989). Areas that were dominated by these introduced species prior to protection have remained dominated by these species, even after 50 years of protection. This indicates a new state stabilizing to timothy and Kentucky bluegrass. For this reason, these communities have a higher stocking rate than their respective reference community and should be utilized when introduced species are most palatable.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** cc rough fescue grassland(submesic/rich)

**Ecosite Phase:** cc1 rough fescue

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Medium Shrub (0.5 to 2 m)</b>				Ecological Status Score: 8-15
PRICKLY ROSE ( <i>Rosa acicularis</i> )	1.0	0.0-41.0	21	Moisture Regime: Mesic (fresh) (78), Submesic (moderately fresh) (41), Subxeric (moderately dry) (25), Subhygric (moderately moist) (11), Xeric (dry) (4)
<b>Tall Forb (&gt;= 30 cm)</b>				Nutrient Regime: Mesotrophic (medium) (106), Permesotrophic (rich) (50), Submesotrophic (poor) (3)
GRACEFUL CINQUEFOIL ( <i>Potentilla gracilis</i> )	2.9	0.0-45.7	62	Elevation (range): 1473 (1110-1676) M
VEINY MEADOW RUE ( <i>Thalictrum venulosum</i> )	1.7	0.0-40.0	34	Slope (%): 0 - 0.49 (30), 2.5 - 5.99 (30), 10 - 15.99 (29), 16 - 30.99 (19), 0.5 - 2.49 (19), 6 - 9.99 (16), 31 - 45.99 (2), 46 - 70.99 (1)
CANADA THISTLE ( <i>Cirsium arvense</i> )	1.4	0.0-24.8	34	Aspect: Southerly (58), Level (22), Westerly (21), Easterly (21), Northerly (10)
STICKY PURPLE GERANIUM ( <i>Geranium viscosissimum</i> )	1.3	0.0-15.7	36	Topographic Position: Level (30), Midslope (25), Toe (21), Lower Slope (18), Upper Slope (10), Crest (4), Depression (1)
<b>Low Forb (&lt; 30 cm)</b>				
COMMON DANDELION ( <i>Taraxacum officinale</i> )	10.2	0.0-52.3	95	
COMMON YARROW ( <i>Achillea millefolium</i> )	5.0	0.0-45.8	94	<b>Soil Variables</b>
WHITE CLOVER ( <i>Trifolium repens</i> )	4.5	0.0-85.6	37	Soil Drainage: Well drained (93), Moderately well drained (31), Rapidly drained (31), Very rapidly drained (5)
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	2.8	0.0-32.5	65	Soil Subgroup: ORTHIC BLACK CHERNOZEM (2), ORTHIC EUTRIC BRUNISOL (1), CUMULIC REGOSOL (1), GLEYED MELANIC BRUNISOL (1), ORTHIC DARK BROWN CHERNOZEM (1), ORTHIC HUMIC REGOSOL (1)
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	1.6	0.0-12.1	73	Surface Texture: Loam (3), Silt loam (1)
FIELD MOUSE-EAR CHICKWEED ( <i>Cerastium arvense</i> )	1.0	0.0-22.0	53	Effective Texture: Sandy clay loam (2), Loam (2)
<b>Graminoid</b>				Depth to Mottles/Gley: 26 - 50 (1)
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	34.8	0.0-92.3	99	Organic Thickness: 0 - 5 cm (3)
TIMOTHY ( <i>Phleum pratense</i> )	17.0	0.0-90.5	92	Parent Material: Morainal (3), Fluvial (3), Glaciofluvial (1)
AWNLESS BROME ( <i>Bromus inermis</i> )	1.2	0.0-21.3	38	Soil Type: Moist/Fine (2), Moist/Coarse (1), Moist/Silty-Loamy (1)
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	1.0	0.0-17.1	54	Humus Form MULL (4)
				<b>LFH Thickness</b>
				<b>Mean</b>
				<b>Min</b>
				<b>Max</b>
				<b>Count</b>
cm:	8.00	2.00	20.00	4

## Msc5 Smooth brome-Kentucky bluegrass (n=65)

### (*Bromus inermis*-*Poa pratensis*)

These sites probably were once rough fescue dominated. Cultivation, industrial disturbance, recreation and historic grazing pressure have led to a decline in all native species and have stabilized with smooth brome dominating. Reference area data suggests that these communities have moved to a new state following the "State transition model" proposed by Westoby et al. (1989) (Willoughby 1992). Therefore management should incorporate these communities as a good source of earlier seasonal forage. If utilized properly these sites can provide neighboring native communities with effective growing season rest.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** cc rough fescue grassland(submesic/rich)

**Ecosite Phase:** cc1 rough fescue

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Tall Forb (&gt;= 30 cm)</b>					Ecological Status Score: 8-15
CANADA THISTLE ( <i>Cirsium arvense</i> )	4.0	0.0-25.7	57		Moisture Regime: Mesic (fresh) (12), Submesic (moderately fresh) (4)
VEINY MEADOW RUE ( <i>Thalictrum venulosum</i> )	1.4	0.0-12.9	25		Nutrient Regime: Permesotrophic (rich) (9), Mesotrophic (medium) (5), Submesotrophic (poor) (1), Eutrophic (very rich) (1)
<b>Low Forb (&lt; 30 cm)</b>					Elevation (range): 1490 (1370-1673) M
COMMON YARROW ( <i>Achillea millefolium</i> )	1.2	0.0-9.7	59		Slope (%): 2.5 - 5.99 (5), 10 - 15.99 (4), 0 - 0.49 (3), 6 - 9.99 (2), 0.5 - 2.49 (2), 16 - 30.99 (1)
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	0.9	0.0-8.3	39		Aspect: Southerly (7), Westerly (3), Level (3), Northerly (1), Easterly (1)
COMMON DANDELION ( <i>Taraxacum officinale</i> )	0.9	0.0-11.9	46		Topographic Position: Level (5), Toe (3), Lower Slope (2), Midslope (1)
<b>Graminoid</b>					<b>Soil Variables</b>
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	35.9	1.0-91.5	100		Soil Drainage: Rapidly drained (7), Moderately well drained (6), Well drained (5)
AWNLESS BROME ( <i>Bromus inermis</i> )	31.5	7.3-80.3	100		Soil Subgroup: ORTHIC BLACK CHERNOZEM (3), ORTHIC HUMIC REGOSOL (1)
WHEAT GRASS SPECIES ( <i>Agropyron</i> )	2.3	0.0-17.7	91		Surface Texture: Clay loam (1), Loam (1)
SEDGE SPECIES ( <i>Carex</i> )	2.2	0.0-5.3	56		Effective Texture: Clay loam (1), Loam (1)
TIMOTHY ( <i>Phleum pratense</i> )	0.9	0.0-8.3	35		Depth to Mottles/Gley:
					Organic Thickness: 0 - 5 cm (2)
					Parent Material: Fluvial (2), Morainal (2)
					Soil Type: Moist/Silty-Loamy (2)
					Humus Form RHIZOMULL (1)
					<b>LFH Thickness</b>
					<b>Mean</b>
					<b>Min</b>
					<b>Max</b>
					<b>Count</b>
					cm:
					2.00
					2.00
					2.00
					2

## Msc9 Foothills rough fescue-Kentucky bluegrass (n=92)

### (*Festuca campestris*-*Poa pratensis*)

This community type represents grasslands that have had non-native forage species established, whether it be from grazing, recreation, industrial disturbance or a combination of these. On drier sites, long-term heavy grazing pressure leads to a decline in rough fescue and an increase in Parry oat grass and sedge species. However in more mesic and richer sites, if the competitive advantage of rough fescue and other native grass species is reduced, agronomic species readily invade. Kentucky bluegrass is a common invasive species on these soils, although species like timothy and brome occur as well. Protection or a reduction in stocking level at this point allows rough fescue to recover, but it seems Kentucky bluegrass also permanently remains in the community. In fact, Willoughby (1996) noted that although areas within this ecosite recovered back to mainly native species once protected from disturbance if introduced species weren't initially present, if species such as Kentucky bluegrass were present at the time of protection, recovery moved to this described community. This community differs from the Kentucky bluegrass-Rough fescue [Msc3], in that although introduced species are present, rough fescue is still either dominant or subdominant with cover and densities similar to the reference community.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** cc rough fescue grassland(submesic/rich)

**Ecosite Phase:** cc1 rough fescue

#### Plant Composition

#### Canopy Cover (%)

	Mean	Range	Const.
<b>Medium Shrub (0.5 to 2 m)</b>			
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	2.1	0.0-33.2	46
<b>Tall Forb (&gt;= 30 cm)</b>			
YELLOW BEARDTONGUE ( <i>Penstemon confertus</i> )	2.2	0.0-30.0	57
SILKY PERENNIAL LUPINE ( <i>Lupinus sericeus</i> )	2.0	0.0-17.0	66
<b>Low Forb (&lt; 30 cm)</b>			
THREE-FLOWERED AVENS ( <i>Geum triflorum</i> )	5.8	0.0-30.2	87
COMMON YARROW ( <i>Achillea millefolium</i> )	3.8	0.0-20.5	94
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	3.6	0.0-53.0	96
MOUNTAIN SHOOTING STAR ( <i>Dodecatheon conjugens</i> )	1.6	0.0-18.0	46
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	1.1	0.0-15.2	32
<b>Graminoid</b>			
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	15.8	0.0-55.0	75
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	10.8	0.0-41.3	91
IDAHO FESCUE ( <i>Festuca idahoensis</i> )	4.3	0.0-28.0	85
PARRY OAT GRASS ( <i>Danthonia parryi</i> )	3.7	0.0-30.7	62
BLUNT SEDGE ( <i>Carex obtusata</i> )	3.6	0.0-28.6	63
RICHARDSON NEEDLE GRASS ( <i>Stipa richardsonii</i> )	2.2	0.0-24.7	47

#### Environmental Variables

Ecological Status Score: 20-40

Moisture Regime: Submesic (moderately fresh) (21), Mesic (fresh) (16), Subxeric (moderately dry) (8)

Nutrient Regime: Permesotrophic (rich) (26), Mesotrophic (medium) (23)

Elevation (range): 1511 (1330-1681) M

Slope (%): 10 - 15.99 (16), 16 - 30.99 (11), 0 - 0.49 (4), 0.5 - 2.49 (3), 2.5 - 5.99 (3), 6 - 9.99 (3)

Aspect: Southerly (18), Easterly (12), Westerly (7)

Topographic Position: Midslope (20), Level (11), Lower Slope (5), Toe (3)

#### Soil Variables

Soil Drainage: Well drained (36), Moderately well drained (8), Rapidly drained (5)

Soil Subgroup: ORTHIC BLACK CHERNOZEM (1)

Surface Texture: Silt loam (1)

Effective Texture: Clay loam (1)

Depth to Mottles/Gley:

Organic Thickness:

Parent Material:

Soil Type: Dry/Silty-Loamy (1)

Humus Form

#### LFH Thickness

	Mean	Min	Max	Count
cm:	1.00	1.00	1.00	1

## cc2 rough fescue shrub (n=104)

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** cc rough fescue grassland(submesic/rich)

### General Description

This ecosite represents lower valley slope positions that have >10% shrubs. In the absence of fire rose, saskatoon and snowberry will increase particularly where grasslands meet forests. Their establishment changes ecosite conditions slightly by capturing moisture which in turn, changes vegetation composition and productivity. In another situation, shrubby cinquefoil occurs at shrubland levels, however this is usually due to edaphic conditions.

### Characteristic Species

#### Shrub

- [ 9.3 ] SHRUBBY CINQUEFOIL  
*Potentilla fruticosa*
- [ 4.2 ] UNDIFFERENTIATED ROSE  
*Rosa*
- [ 2.2 ] SASKATOON  
*Amelanchier alnifolia*
- [ 0.9 ] SNOWBERRY (BUCKBRUSH)  
*Symphoricarpos occidentalis*

#### Graminoid

- [ 21.8 ] FOOTHILLS ROUGH FESCUE  
*Festuca campestris*
- [ 5.7 ] IDAHO FESCUE  
*Festuca idahoensis*
- [ 5.3 ] PARRY OAT GRASS  
*Danthonia parryi*
- [ 3.1 ] SEDGE SPECIES  
*Carex*
- [ 2.0 ] WHEAT GRASS SPECIES  
*Agropyron*

### Environmental Variables

Moisture Regime: Mesic (fresh) (9), Submesic (moderately fresh) (8), Subxeric (moderately dry) (3), Hygric (moist) (1)

Nutrient Regime: Mesotrophic (medium) (13), Permesotrophic (rich) (5), Submesotrophic (poor) (1)

Elevation (range): 1506 (1280-1890) M

Slope (%): strong slope (11), moderate slope (6), very gentle slope (6), gentle slope (5), steep slope (2), very strong slope (1), level (1)

Aspect: Easterly (15), Southerly (14), Westerly (8), Northerly (5)

Topographic Position: Crest (4), Level (3), Midslope (3), Lower Slope (2), Upper Slope (1)

### Soil Variables

Soil Drainage: Well drained (19), Rapidly drained (14), Moderately well drained (2), Very rapidly drained (1)

Soil Subgroup: ORTHIC BLACK CHERNOZEM (10), ORTHIC GRAY LUVISOL (3), ORTHIC REGOSOL (1), ORTHIC DARK GRAY CHERNOZEM (1), REGO DARK GRAY CHERNOZEM (1), ORTHIC EUTRIC BRUNISOL (1)

Surface Texture:

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (18)

Parent Material: Morainal (16), Colluvial (2)

Soil Type:

Humus Form

### LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0



## Msd21 Bog birch/Rough fescue/Bearberry (n=1)

(*Betula glandulosa*/*Festuca campestris*/*Arctostaphylos uva-ursi*)

This community type was described in the Aura Cache allotment located west of Calgary and is very similar to the bog birch-rough fescue-bearberry (UFA7) type described in the Upper Foothills subregion. The soils on this community type are gravelly, drier and have a poorer nutrient regime than the other rough fescue and tufted hairgrass dominated community types. The lack of fire on this community type has allowed the shrub cover to expand, reducing forage productivity for wildlife and domestic livestock. In one study, burning a bog birch/ rough fescue/ bearberry community type twice in 3 year intervals controlled birch growth and increased total forage production by over 40% compared to the unburned control (Bork, 1990).

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** cc rough fescue grassland(submesic/rich)

**Ecosite Phase:** cc2 rough fescue shrub

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Understory Tree</b>				Ecological Status Score: 40
WHITE SPRUCE ( <i>Picea glauca</i> )	10.0	10.0-10.0	100	Moisture Regime: Mesic (fresh) (1)
LODGEPOLE PINE ( <i>Pinus contorta</i> )	10.0	10.0-10.0	100	Nutrient Regime: Mesotrophic (medium) (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Elevation (range): 1410 (1410-1410) M
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	17.9	17.9-17.9	100	Slope (%): 0 - 0.49 (1)
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	8.3	8.3-8.3	100	Aspect:
BOG BIRCH ( <i>Betula glandulosa</i> )	6.7	6.7-6.7	100	Topographic Position: Level (1)
CREeping JUNIPER ( <i>Juniperus horizontalis</i> )	4.4	4.4-4.4	100	
<b>Tall Forb (&gt;= 30 cm)</b>				<b>Soil Variables</b>
WILD VETCH ( <i>Vicia americana</i> )	2.7	2.7-2.7	100	Soil Drainage: Well drained (1)
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	1.0	1.0-1.0	100	Soil Subgroup:
<b>Low Forb (&lt; 30 cm)</b>				Surface Texture:
THREE-FLOWERED AVENS ( <i>Geum triflorum</i> )	1.8	1.8-1.8	100	Effective Texture:
HAREBELL ( <i>Campanula rotundifolia</i> )	1.0	1.0-1.0	100	Depth to Mottles/Gley:
MOUNTAIN SHOOTING STAR ( <i>Dodecatheon conjugens</i> )	1.0	1.0-1.0	100	Organic Thickness:
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	1.0	1.0-1.0	100	Parent Material:
LATE YELLOW LOCOWEED ( <i>Oxytropis monticola</i> )	1.0	1.0-1.0	100	Soil Type:
<b>Graminoid</b>				Humus Form
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	17.6	17.6-17.6	100	
RICHARDSON NEEDLE GRASS ( <i>Stipa richardsonii</i> )	9.0	9.0-9.0	100	
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	3.7	3.7-3.7	100	
PARRY OAT GRASS ( <i>Danthonia parryi</i> )	3.3	3.3-3.3	100	
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	1.0	1.0-1.0	100	
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	1.0	1.0-1.0	100	
				<b>LFH Thickness</b>
				Mean
				Min
				Max
				Count
cm:	0.00	0.00	0.00	0

## Msd26 Shrubby cinquefoil/Foothills rough fescue (n=11)

### (*Potentilla fruticosa*/*Festuca campestris*)

This community is similar to the Foothills rough fescue-Idaho fescue-Parry oat grass [Msb1] community however has a significant shrub component (>10%). In this case it is shrubby cinquefoil, a common shrub found associated with these communities especially on gravelly soils. Although not often browsed, higher amounts of shrubby cinquefoil is not considered an effect from grazing but rather is more associated with environment variables. With a significant portion of shrubs, snow and moisture catchment increases, which protects understory vegetation and increases the productivity, but also increases the opportunity for introduced species to invade. In the community described here, Kentucky bluegrass and brome are both represented, indicating this issue. If these species are present in the assessed area in higher amounts, the ecological status score for range health should be reduced accordingly.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** cc rough fescue grassland(submesic/rich)

**Ecosite Phase:** cc2 rough fescue shrub

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Tall Shrub (2 to 5m)</b>				Ecological Status Score: 27-40
SASKATOON ( <i>Amelanchier alnifolia</i> )	1.5	0.0-9.0	18	Moisture Regime: Submesic (moderately fresh) (1), Mesic (fresh) (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Nutrient Regime: Mesotrophic (medium) (1)
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	16.9	7.0-25.7	100	Elevation (range): 1502 (1340-1676) M
CREEPING JUNIPER ( <i>Juniperus horizontalis</i> )	1.3	0.0-14.7	9	Slope (%): 2.5 - 5.99 (2), 16 - 30.99 (1)
<b>Tall Forb (&gt;= 30 cm)</b>				Aspect: Easterly (2), Southerly (1)
GRACEFUL CINQUEFOIL ( <i>Potentilla gracilis</i> )	1.9	0.0-4.3	73	Topographic Position: Level (1), Crest (1), Lower Slope (1)
SMOOTH ASTER ( <i>Aster laevis</i> )	1.7	0.0-13.2	55	<b>Soil Variables</b>
<b>Low Forb (&lt; 30 cm)</b>				Soil Drainage: Well drained (2), Moderately well drained (1)
COMMON YARROW ( <i>Achillea millefolium</i> )	2.8	1.5-4.4	100	Soil Subgroup:
THREE-FLOWERED AVENS ( <i>Geum triflorum</i> )	2.0	0.0-5.8	91	Surface Texture:
SLENDER BLUE BEARDTONGUE ( <i>Penstemon procerus</i> )	1.1	0.0-12.2	18	Effective Texture:
<b>Graminoid</b>				Depth to Mottles/Gley:
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	21.8	0.0-44.2	73	Organic Thickness:
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	5.8	0.0-11.0	91	Parent Material:
IDAHO FESCUE ( <i>Festuca idahoensis</i> )	5.2	0.5-9.5	100	Soil Type:
BLUNT SEDGE ( <i>Carex obtusata</i> )	4.5	0.5-9.6	100	Humus Form
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	2.7	0.0-6.2	91	<b>LFH Thickness</b>
PARRY OAT GRASS ( <i>Danthonia parryi</i> )	1.8	0.0-6.3	73	Mean
AWNLESS BROME ( <i>Bromus inermis</i> )	1.4	0.0-9.2	55	Min
				Max
				Count
				cm: 0.00 0.00 0.00 0

## Msd27 Rose-Saskatoon-Snowberry/Foothills rough fescue (n=21)

(*Rosa spp.-Amelanchier alnifolia-Symphoricarpos occidentalis/Festuca campestris*)

This community is similar to the Foothills rough fescue-Idaho fescue-Parry oat grass [Msb1], but has higher shrub cover (>10%). It generally occurs on low and toe of slopes and in this case shrub cover is the accumulation of rose, saskatoon and/or snowberry. In the absence of fire, these shrubs will establish, grow, and can increase moisture retention. Increases in snow catchment and protection to the understory will provide increases in productivity, but also increase the opportunity for invasive species to establish. If disturbed, these sites commonly move to the late seral Shrubby cinquefoil-Rose/Kentucky bluegrass-Foothills rough fescue [Msd28] community. As shrubs become well established, these communities will tend to succeed towards an aspen community.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** cc rough fescue grassland(submesic/rich)

**Ecosite Phase:** cc2 rough fescue shrub

### Plant Composition

### Canopy Cover (%)

	Mean	Range	Const.
<b>Medium Shrub (0.5 to 2 m)</b>			
UNDIFFERENTIATED ROSE ( <i>Rosa</i> )	8.4	0.0-18.0	95
SASKATOON ( <i>Amelanchier alnifolia</i> )	3.1	0.0-8.9	70
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	1.8	0.0-10.5	71
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	1.8	0.0-10.4	38
<b>Tall Forb (&gt;= 30 cm)</b>			
STICKY PURPLE GERANIUM ( <i>Geranium viscosissimum</i> )	3.1	0.0-15.7	52
SILKY PERENNIAL LUPINE ( <i>Lupinus sericeus</i> )	2.1	0.0-6.8	67
YELLOW BEARDTONGUE ( <i>Penstemon confertus</i> )	1.2	0.0-8.7	38
WILD VETCH ( <i>Vicia americana</i> )	1.2	0.0-13.4	43
<b>Low Forb (&lt; 30 cm)</b>			
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	3.5	0.0-20.2	52
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	3.1	0.0-9.5	76
CUT-LEAVED ANEMONE ( <i>Anemone multifida</i> )	2.2	0.0-11.1	62
COMMON YARROW ( <i>Achillea millefolium</i> )	1.6	0.0-5.5	81
YELLOW FALSE DANDELION ( <i>Agoseris glauca</i> )	1.1	0.0-8.7	43
<b>Graminoid</b>			
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	21.8	13.3-66.0	100
PARRY OAT GRASS ( <i>Danthonia parryi</i> )	8.8	0.0-30.3	71
IDAHO FESCUE ( <i>Festuca idahoensis</i> )	6.3	0.0-25.1	95
SEDGE SPECIES ( <i>Carex</i> )	6.2	0.0-24.7	95
WHEAT GRASS SPECIES ( <i>Agropyron</i> )	4.1	0.0-15.0	90
JUNE GRASS ( <i>Koeleria macrantha</i> )	2.3	0.0-16.7	62

### Environmental Variables

Ecological Status Score: 27-40

Moisture Regime: Submesic (moderately fresh) (5), Mesic (fresh) (4), Subxeric (moderately dry) (3), Hygric (moist) (1)

Nutrient Regime: Mesotrophic (medium) (10), Submesotrophic (poor) (1), Permesotrophic (rich) (1)

Elevation (range): 1682 (1448-1890) M

Slope (%): 16 - 30.99 (7), 46 - 70.99 (2), 6 - 9.99 (2), 10 - 15.99 (1), 31 - 45.99 (1)

Aspect: Southerly (9), Easterly (5), Westerly (3), Northerly (2)

Topographic Position: Midslope (2), Upper Slope (1), Crest (1)

### Soil Variables

Soil Drainage: Rapidly drained (10), Well drained (7), Very rapidly drained (1)

Soil Subgroup: ORTHIC GRAY LUVISOL (2), ORTHIC BLACK CHERNOZEM (1), ORTHIC DARK GRAY CHERNOZEM (1), ORTHIC EUTRIC BRUNISOL (1)

Surface Texture:

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (6)

Parent Material: Morainal (5), Colluvial (1)

Soil Type:

Humus Form

### LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

# Msd28 Shrubby cinquefoil-Rose/Kentucky bluegrass-Foothills rough fescue (n=71)

(*Potentilla fruticosa*-*Rosa spp./Festuca campestris*-*Poa pratensis*)

This community is similar to the Foothills rough fescue-Idaho fescue-Parry oat grass [Msb1], but has increased in both shrub cover and disturbance species. In the absence of natural disturbances shrubs will increase on this ecosite and increase the moisture availability by better understory protection and increased snow catchment. This increased productivity also increases the likelihood of invasive species. In this case Kentucky bluegrass and/or timothy has increased in the understory. Further disturbance will likely decrease the diversity of other grasses, forbs and shrubs, yet the less palatable, more disturbance resistant shrubs will likely stay. In the absence of fire, this community will likely succeed to an aspen dominated community. With a fire, this community will likely become a disturbed grassland.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** cc rough fescue grassland(submesic/rich)

**Ecosite Phase:** cc2 rough fescue shrub

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Medium Shrub (0.5 to 2 m)</b>				Ecological Status Score: 15-20
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	7.5	0.0-30.8	92	Moisture Regime: Mesic (fresh) (3), Submesic (moderately fresh) (2)
UNDIFFERENTIATED ROSE ( <i>Rosa</i> )	6.3	0.0-32.3	72	Nutrient Regime: Permesotrophic (rich) (4), Mesotrophic (medium) (1)
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	3.9	0.0-26.3	44	Elevation (range): 1431 (1280-1660) M
<b>Tall Forb (&gt;= 30 cm)</b>				Slope (%): 10 - 15.99 (5), 2.5 - 5.99 (4), 6 - 9.99 (3), 16 - 30.99 (3)
GRACEFUL CINQUEFOIL ( <i>Potentilla gracilis</i> )	2.6	0.0-14.6	82	Aspect: Easterly (8), Westerly (5), Southerly (4), Northerly (3)
YELLOW BEARDTONGUE ( <i>Penstemon confertus</i> )	1.9	0.0-21.7	62	Topographic Position: Crest (2), Lower Slope (1), Midslope (1), Level (1)
STICKY PURPLE GERANIUM ( <i>Geranium viscosissimum</i> )	1.4	0.0-12.7	48	<b>Soil Variables</b>
WILD BERGAMOT ( <i>Monarda fistulosa</i> )	1.1	0.0-12.4	44	Soil Drainage: Well drained (9), Rapidly drained (4), Moderately well drained (1)
<b>Low Forb (&lt; 30 cm)</b>				Soil Subgroup: ORTHIC BLACK CHERNOZEM (9), REGO DARK GRAY CHERNOZEM (1), ORTHIC GRAY LUVISOL (1), ORTHIC REGOSOL (1)
COMMON YARROW ( <i>Achillea millefolium</i> )	4.8	0.0-32.4	97	Surface Texture:
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	3.2	0.0-15.2	96	Effective Texture:
COMMON DANDELION ( <i>Taraxacum officinale</i> )	3.0	0.0-27.9	63	Depth to Mottles/Gley:
THREE-FLOWERED AVENS ( <i>Geum triflorum</i> )	2.1	0.0-14.7	52	Organic Thickness: 0 - 5 cm (12)
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	1.3	0.0-9.0	56	Parent Material: Morainal (11), Colluvial (1)
<b>Graminoid</b>				Soil Type:
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	23.6	0.0-57.7	97	Humus Form
SEDGE SPECIES ( <i>Carex</i> )	6.0	1.0-36.0	100	<b>LFH Thickness</b>
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	6.0	0.0-23.0	97	Mean
TIMOTHY ( <i>Phleum pratense</i> )	5.4	0.0-51.0	75	Min
PARRY OAT GRASS ( <i>Danthonia parryi</i> )	3.3	0.0-24.0	79	Max
IDAHO FESCUE ( <i>Festuca idahoensis</i> )	2.9	0.0-11.1	87	Count
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	1.3	0.0-9.3	76	cm:
AWNLESS BROME ( <i>Bromus inermis</i> )	1.3	0.0-17.4	31	0.00
				0.00
				0.00
				0

# cc3 rough fescue Fd (n=8)

**Natural Subregion:** Montane  
**Ecosection:** Ms Montane South Ecosection

**Ecosite:** cc rough fescue grassland(submesic/rich)

## General Description

This phase represents a grassland slope that has Douglas-fir encroaching, or an open Douglas-fir stand with limited canopy cover so that rough fescue can grow in the understory. As a canopy closes in, grassland species such as rough fescue, Idaho fescue and Parry oat grass are replaced by species that grow in forested understories such as pine grass and hairy wild rye. Productivity is directly related to overstory canopy, where the more open stands are usually more productive.

## Environmental Variables

Moisture Regime: Subxeric (moderately dry) (4), Submesic (moderately fresh) (3), Xeric (dry) (2)  
Nutrient Regime: Mesotrophic (medium) (6), Permesotrophic (rich) (2)  
Elevation (range): 1596 (1532-1710) M  
Slope (%): strong slope (5), very strong slope (3), moderate slope (1)  
Aspect: Westerly (5), Southerly (3)  
Topographic Position: Upper Slope (6), Midslope (3)

## Characteristic Species

### Tree

- [ 20.6 ] DOUGLAS-FIR  
*Pseudotsuga menziesii*

### Shrub

- [ 3.4 ] PRICKLY ROSE  
*Rosa acicularis*

### Forb

- [ 2.6 ] SHOWY ASTER  
*Aster conspicuus*
- [ 2.1 ] NORTHERN BEDSTRAW  
*Galium boreale*

### Graminoid

- [ 12.5 ] FOOTHILLS ROUGH FESCUE  
*Festuca campestris*
- [ 8.3 ] PARRY OAT GRASS  
*Danthonia parryi*
- [ 4.7 ] IDAHO FESCUE  
*Festuca idahoensis*

## Soil Variables

Soil Drainage: Rapidly drained (5), Well drained (3), Very rapidly drained (1)  
Soil Subgroup: ORTHIC REGOSOL (1)  
Surface Texture:  
Effective Texture:  
Depth to Mottles/Gley:  
Organic Thickness: 0 - 5 cm (1)  
Parent Material: Residual (1)  
Soil Type:  
Humus Form

## LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

## Msb8 Fd/Foothills rough fescue-Idaho fescue (n=8)

### (*Pseudotsuga menziesii*/*Festuca campestris*-*Festuca idahoensis*)

This community type represents the transition from grassland to a Douglas-fir dominated forest. The factors responsible for the differences between forest and grassland may be climatic, with cooler and moister conditions favouring forest, or may be edaphic with grasslands found on drier soils, or may be lack of disturbance from fire which favours the growth of trees. Extensive overlap of the forests and grassland will occur in the Montane because of the variable soils and topography that promote conditions favourable to both grasslands and forests.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** cc rough fescue grassland(submesic/rich)

**Ecosite Phase:** cc3 rough fescue Fd

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Overstory Tree</b>					Ecological Status Score: 40
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	20.0	0.0-40.0	88		Moisture Regime: Subxeric (moderately dry) (4), Submesic (moderately fresh) (3), Xeric (dry) (2)
<b>Understory Tree</b>					Nutrient Regime: Mesotrophic (medium) (6), Permesotrophic (rich) (2)
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	3.1	0.0-15.0	25		Elevation (range): 1596 (1532-1710) M
<b>Medium Shrub (0.5 to 2 m)</b>					Slope (%): 16 - 30.99 (5), 31 - 45.99 (3), 10 - 15.99 (1)
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	12.1	0.0-32.9	50		Aspect: Westerly (5), Southerly (3)
SASKATOON ( <i>Amelanchier alnifolia</i> )	5.4	0.0-29.0	75		Topographic Position: Upper Slope (6), Midslope (3)
GROUND JUNIPER ( <i>Juniperus communis</i> )	3.5	0.0-19.0	38		<b>Soil Variables</b>
PRICKLY ROSE ( <i>Rosa acicularis</i> )	3.1	0.0-5.3	88		Soil Drainage: Rapidly drained (5), Well drained (3), Very rapidly drained (1)
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	1.0	0.0-5.0	50		Soil Subgroup: ORTHIC REGOSOL (1)
<b>Tall Forb (&gt;= 30 cm)</b>					Surface Texture:
SHOWY ASTER ( <i>Aster conspicuus</i> )	2.3	0.0-16.3	38		Effective Texture:
BALSAMROOT ( <i>Balsamorhiza sagittata</i> )	1.8	0.0-10.7	25		Depth to Mottles/Gley:
SILKY PERENNIAL LUPINE ( <i>Lupinus sericeus</i> )	1.6	0.0-10.3	50		Organic Thickness: 0 - 5 cm (1)
<b>Low Forb (&lt; 30 cm)</b>					Parent Material: Residual (1)
CUT-LEAVED ANEMONE ( <i>Anemone multifida</i> )	1.4	0.0-3.7	63		Soil Type:
<b>Graminoid</b>					Humus Form
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	9.5	0.0-20.0	50		<b>LFH Thickness</b>
PARRY OAT GRASS ( <i>Danthonia parryi</i> )	6.4	0.0-25.0	75		Mean
IDAHO FESCUE ( <i>Festuca idahoensis</i> )	4.1	0.0-10.7	75		Min
BLUEBUNCH WHEAT GRASS ( <i>Agropyron spicatum</i> )	3.9	0.0-15.3	63		Max
					Count
					cm:
					0.00
					0.00
					0.00
					0

# cc4 rough fescue Aw (n=16)

**Natural Subregion:** Montane  
**Ecosection:** Ms Montane South Ecosection

**Ecosite:** cc rough fescue grassland(submesic/rich)

## General Description

This phase represents a lower grassland slope that has aspen encroaching. As the canopy closes in, grassland species such as rough fescue, Idaho fescue and Parry oat grass are replaced by species that grow in forested understories such as pine grass and hairy wild rye. In these cases productivity is related to aspen cover, where the more open stands are usually more productive.

## Environmental Variables

Moisture Regime: Submesic (moderately fresh) (4), Mesic (fresh) (3), Hygric (moist) (1), Subhygric (moderately moist) (1)

Nutrient Regime: Mesotrophic (medium) (5), Permesotrophic (rich) (3), Eutrophic (very rich) (1)

Elevation (range): 1531 (1355-1680) M

Slope (%): strong slope (3), very strong slope (1), very gentle slope (1), moderate slope (1), gentle slope (1), level (1)

Aspect: Easterly (4), Southerly (3), Level (1)

Topographic Position: Midslope (4), Level (2), Lower Slope (1)

## Characteristic Species

### Tree

- [ 17.0 ] ASPEN  
*Populus tremuloides*
- [ 5.0 ] WHITE SPRUCE  
*Picea glauca*

### Forb

- [ 6.8 ] WILD STRAWBERRY  
*Fragaria virginiana*
- [ 3.6 ] GRACEFUL CINQUEFOIL  
*Potentilla gracilis*
- [ 3.4 ] STICKY PURPLE GERANIUM  
*Geranium viscosissimum*

### Graminoid

- [ 15.5 ] FOOTHILLS ROUGH FESCUE  
*Festuca campestris*
- [ 3.8 ] SLENDER WHEAT GRASS  
*Agropyron trachycaulum*

## Soil Variables

Soil Drainage: Well drained (8), Moderately well drained (1)

Soil Subgroup: ORTHIC BLACK CHERNOZEM (1), ORTHIC DARK GRAY CHERNOZEM (1), ORTHIC MELANIC BRUNISOL (1)

Surface Texture: Silt loam (1), Loam (1), Clay loam (1)

Effective Texture: Sandy loam (1), Clay loam (1), Silt loam (1)

Depth to Mottles/Gley: None (1)

Organic Thickness: 0 - 5 cm (1)

Parent Material: Morainal (1), Glaciofluvial (1), Fluvial (1)

Soil Type:

Humus Form MULL (1)

## LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

# Msb10 Aw/Foothills rough fescue/Strawberry (n=5)

(*Populus tremuloides*/*Festuca campestris*/*Fragaria virginiana*)

This community commonly occurs at lower slope forest to grassland transition areas or on grassland swales. Aspen has encroached with species composition slowly succeeding to species more characteristic of aspen stands. This community type is moister than the up slope Douglas-fir transition forests described. Aspen favours the moist draws and north-facing slopes throughout the foothills of southern Alberta. Livestock often utilize this transition area between grasslands and aspen in the Montane and heavy use may occur. This is indicated by higher cover of introduced species such as Kentucky bluegrass and timothy.

**Natural Subregion:** Montane  
**Ecosection:** Ms Montane South Ecosection

**Ecosite:** cc rough fescue grassland(submesic/rich)  
**Ecosite Phase:** cc4 rough fescue Aw

## Plant Composition Canopy Cover (%)

	Mean	Range	Const.
<b>Overstory Tree</b>			
ASPEN ( <i>Populus tremuloides</i> )	18.3	5.1-50.0	100
WHITE SPRUCE ( <i>Picea glauca</i> )	5.0	0.0-15.0	40
<b>Medium Shrub (0.5 to 2 m)</b>			
PRICKLY ROSE ( <i>Rosa acicularis</i> )	2.4	1.0-3.7	100
SASKATOON ( <i>Amelanchier alnifolia</i> )	1.0	0.0-3.2	40
<b>Tall Forb (&gt;= 30 cm)</b>			
UNDIFFERENTIATED CINQUEFOIL ( <i>Potentilla</i> )	6.6	1.0-15.3	100
ASTER SPECIES ( <i>Aster</i> )	3.4	0.0-10.0	60
STICKY PURPLE GERANIUM ( <i>Geranium viscosissimum</i> )	3.4	0.0-6.2	80
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	2.8	0.0-13.0	40
WILD BERGAMOT ( <i>Monarda fistulosa</i> )	1.9	0.0-8.3	40
YELLOW BEARDTONGUE ( <i>Penstemon confertus</i> )	1.8	0.0-5.3	80
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	1.4	0.0-6.7	40
WILD VETCH ( <i>Vicia americana</i> )	1.2	0.0-2.5	80
<b>Low Forb (&lt; 30 cm)</b>			
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	6.8	0.0-16.5	80
COMMON YARROW ( <i>Achillea millefolium</i> )	3.4	1.0-6.4	100
<b>Graminoid</b>			
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	15.5	9.5-29.7	100
RICHARDSON NEEDLE GRASS ( <i>Stipa richardsonii</i> )	4.2	0.0-12.3	60
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	3.8	0.0-8.3	80
GREEN NEEDLE GRASS ( <i>Stipa viridula</i> )	3.2	0.0-12.3	40
PARRY OAT GRASS ( <i>Danthonia parryi</i> )	2.7	0.0-8.0	40
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	2.4	0.0-6.9	60
TIMOTHY ( <i>Phleum pratense</i> )	1.6	0.0-6.3	60
AWNLESS BROME ( <i>Bromus inermis</i> )	1.3	0.0-5.7	40
SEDGE SPECIES ( <i>Carex</i> )	1.2	0.0-4.0	60

## Environmental Variables

Ecological Status Score: 40  
 Moisture Regime: Submesic (moderately fresh) (3), Mesic (fresh) (1), Subhygric (moderately moist) (1), Hygric (moist) (1)  
 Nutrient Regime: Mesotrophic (medium) (3), Permesotrophic (rich) (2), Eutrophic (very rich) (1)  
 Elevation (range): 1532 (1355-1644) M  
 Slope (%): 16 - 30.99 (2), 0 - 0.49 (1), 6 - 9.99 (1), 10 - 15.99 (1)  
 Aspect: Easterly (2), Southerly (2), Level (1)  
 Topographic Position: Midslope (4), Level (1), Lower Slope (1)

## Soil Variables

Soil Drainage: Well drained (5), Moderately well drained (1)  
 Soil Subgroup: ORTHIC BLACK CHERNOZEM (1), ORTHIC DARK GRAY CHERNOZEM (1), ORTHIC MELANIC BRUNISOL (1)  
 Surface Texture: Silt loam (1), Clay loam (1), Loam (1)  
 Effective Texture: Clay loam (1), Sandy loam (1), Silt loam (1)  
 Depth to Mottles/Gley: None (1)  
 Organic Thickness: 0 - 5 cm (1)  
 Parent Material: Fluvial (1), Glaciofluvial (1), Morainal (1)  
 Soil Type:  
 Humus Form MULL (1)

LFH Thickness	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0



## Msb14 Fireweed (Aw) (n=11)

### (*Epilobium angustifolium* (*Populus tremuloides*))

This community type represents small isolated forest openings that are dominated by forbs that will eventually become dominated by aspen. These meadows can be dominated by fireweed, Lindley's aster, wild bergamot, snowberry, or star flowered solomon's seal. The grass layer is generally poorly developed which makes this community type hard to group with any of the grassland community types. The forage production of this community type is generally quite high because of the higher moisture and nutrient content of the soil, but the areas are so small and isolated they contribute little to the overall carrying capacity of a disposition. In the absence of disturbance these sites will likely become dominated by aspen. Indeed one reference area (Highwood Bench study area 72MFR) was dominated by rough fescue when first protected from livestock grazing but after 43 years of no disturbance has become dominated by fireweed and aspen is slowly encroaching onto the site.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** cc rough fescue grassland(submesic/rich)

**Ecosite Phase:** cc4 rough fescue Aw

#### Plant Composition

#### Canopy Cover (%)

	Mean	Range	Const.
<b>Overstory Tree</b>			
ASPEN ( <i>Populus tremuloides</i> )	0.2	0.0-2.0	36
<b>Medium Shrub (0.5 to 2 m)</b>			
BRISTLY BLACK CURRANT ( <i>Ribes lacustre</i> )	2.5	0.0-17.3	36
SNOWBERRY ( <i>Symphoricarpos albus</i> )	2.3	0.0-25.3	9
<b>Tall Forb (&gt;= 30 cm)</b>			
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	17.2	1.3-30.3	100
STICKY PURPLE GERANIUM ( <i>Geranium viscosissimum</i> )	10.6	1.1-25.7	100
CANADA THISTLE ( <i>Cirsium arvense</i> )	6.8	0.0-15.3	73
STAR-FLOWERED SOLOMON'S-SEAL ( <i>Smilacina stellata</i> )	4.5	0.0-13.3	91
WILD BERGAMOT ( <i>Monarda fistulosa</i> )	3.2	0.0-30.2	55
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	2.6	0.0-29.1	9
WILD VETCH ( <i>Vicia americana</i> )	1.2	0.0-4.3	73
<b>Low Forb (&lt; 30 cm)</b>			
COMMON YARROW ( <i>Achillea millefolium</i> )	4.1	1.2-15.2	100
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	1.3	0.2-3.5	100
<b>Graminoid</b>			
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	32.9	1.7-65.3	100
AWNLESS BROME ( <i>Bromus inermis</i> )	2.2	0.0-9.0	73
ROUGH FESCUE ( <i>Festuca scabrella</i> )	2.0	0.0-10.0	46
IDAHO FESCUE ( <i>Festuca idahoensis</i> )	1.3	0.0-6.7	55
PARRY OAT GRASS ( <i>Danthonia parryi</i> )	1.1	0.0-9.5	36
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	1.0	0.0-5.5	55

#### Environmental Variables

Ecological Status Score: 40  
 Moisture Regime: Mesic (fresh) (2), Submesic (moderately fresh) (1)  
 Nutrient Regime: Mesotrophic (medium) (2), Permesotrophic (rich) (1)  
 Elevation (range): 1530 (1450-1680) M  
 Slope (%): 16 - 30.99 (1), 31 - 45.99 (1), 2.5 - 5.99 (1)  
 Aspect: Easterly (2), Southerly (1)  
 Topographic Position: Level (1)

#### Soil Variables

Soil Drainage: Well drained (3)  
 Soil Subgroup:  
 Surface Texture:  
 Effective Texture:  
 Depth to Mottles/Gley:  
 Organic Thickness:  
 Parent Material:  
 Soil Type:  
 Humus Form

#### LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

## d mahonia-meadowsweet(mesic/medium) (n=604)

Natural Subregion: Montane

Ecosection: Ms Montane South Ecosection

### General Description

The mesic ecosite supports a variety of plant communities throughout the extent of the subregion. Mid to lower, north and east slopes typically predominate, however other slopes and aspects do occur, especially in areas without recent fires. Aspen, lodgepole pine, Douglas-fir and white spruce form pure and mixed stands on this ecosite. Some understory species are only locally common such as creeping mahonia in the vicinity of Crowsnest Pass and mountain lover and bear grass in the extreme southern portion of the subregion.



### Successional Relationships

Succession is toward white spruce and/or Douglas-fir; however, the extensive fire and disturbance history in the area has resulted in a predominance of lodgepole pine and Douglas-fir stands. Grassland communities are dominated by pinegrass and hairy wild rye in this ecological site. It is believed that these grassland communities will eventually succeed to forest.

### Indicator Species

#### Shrub

WHITE MEADOWSWEET  
*Spiraea betulifolia*  
PRICKLY ROSE  
*Rosa acicularis*  
GREEN ALDER  
*Alnus crispa*

#### Graminoid

PINE REED GRASS  
*Calamagrostis rubescens*

### Site Index at 50 Years

Site Index at 50 Years	Height (m)	Variation (m)	Count
WHITE SPRUCE ( <i>Picea glauca</i> )	13.40	0.70	0
SUBALPINE FIR ( <i>Abies lasiocarpa</i> )	11.80	2.60	0
LODGEPOLE PINE ( <i>Pinus contorta</i> )	14.10	0.30	0
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	0.40	69.00	0
ASPEN ( <i>Populus tremuloides</i> )	10.20	0.80	0

### Environmental Variables

Moisture Regime: Mesic (fresh) (300), Submesic (moderately fresh) (157), Subhygric (moderately moist) (57), Subxeric (moderately dry) (32), Hygric (moist) (4), Hydric (wet) (2)

Nutrient Regime: Mesotrophic (medium) (369), Permesotrophic (rich) (159), Submesotrophic (poor) (18), Eutrophic (very rich) (4)

Elevation (range): 1512 (450-5453) M

Slope (%): strong slope (197), moderate slope (156), very gentle slope (66), gentle slope (48), very strong slope (29), nearly level (16), level (15), steep slope (5), very steep slope (1)

Aspect: Southerly (185), Easterly (128), Westerly (127), Northerly (87), Level (44), Variable (0)

Topographic Position: Midslope (248), Lower Slope (110), Upper Slope (84), Level (30), Toe (19), Crest (14), Depression (4)

### Soil Variables

Soil Drainage: Well drained (380), Rapidly drained (99), Moderately well drained (86), Imperfectly drained (6), Very rapidly drained (1), Very poorly drained (1)

Soil Subgroup: ELUVIATED EUTRIC BRUNISOL (36), ORTHIC EUTRIC BRUNISOL (32), ORTHIC GRAY LUVISOL (18), ORTHIC DARK GRAY CHERNOZEM (6), GLEYED GRAY LUVISOL (6), BRUNISOLIC GRAY LUVISOL (6), DARK GRAY LUVISOL (6), ORTHIC BLACK CHERNOZEM (5), ORTHIC MELANIC BRUNISOL (4), ORTHIC REGOSOL (4),

Surface Texture: Loam (35), Clay loam (13), Sandy loam (13), Silt loam (8), Fine sandy loam (5), Sandy clay loam (5), Very fine sandy loam (3), Silty clay (3), Clay (2), Loamy fine sand (2), Fine Sandy Clay Loam (1), Silty clay loam (1), Silty Sand (1), Very fine sand (1)

Effective Texture: Clay loam (27), Sandy clay loam (17), Sandy loam (9), Silt loam (7), Loam (7), Silty clay loam (6), Clay (5), Silty clay (5), Silt (1)

Depth to Mottles/Gley: 0 - 25 (8), 26 - 50 (6), 51 - 100 (4)

Organic Thickness: 0 - 5 cm (155), 6 - 15 cm (1)

Parent Material: Morainal (71), Fluvial (31), Colluvial (30), Rock (20), Residual (18), Glaciofluvial (14), Fluvio-lacustrine (2), Swamp (2),

Soil Type: Moist/Fine (8), Dry/Silty-Loamy (7), Dry/Fine (5), Moist/Silty-Loamy (4), Moist/Coarse (2), Very Dry/Silty-Loamy (2), Dry/Sandy (1), Shallow (1), Moist/Sandy (1)

Humus Form FIBRIMOR (28), HUMIFIBRIMOR (19), FIBRIHUMIMOR (8), RAW MODER (4), TYPICAL MODER (3), FIBRIC PEATYMOR (1), MODER (1), MOR (1)

### LFH Thickness

LFH Thickness	Mean	Min	Max	Count
cm:	6.00	1.00	32.00	85

# d1 creeping mahonia-white meadowsweet Fd (n=58)

**Natural Subregion:** Montane  
**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

## General Description

Douglas-fir forested communities commonly occur in the Porcupine Hills and southwest Foothills areas of the Montane. These communities would be considered the climax community for these areas. These forests usually have sparse vegetation in the understory, either dominated by pine grass or mosses. A diversity of forbs may also occur, and minimal shrubs.

## Characteristic Species

### Tree

- [ 49.6 ] DOUGLAS-FIR  
*Pseudotsuga menziesii*
- [ 7.3 ] WHITE SPRUCE  
*Picea glauca*
- [ 1.4 ] ASPEN  
*Populus tremuloides*

### Shrub

- [ 3.9 ] SNOWBERRY (BUCKBRUSH)  
*Symphoricarpos occidentalis*
- [ 3.0 ] SNOWBERRY  
*Symphoricarpos albus*
- [ 2.8 ] PRICKLY ROSE  
*Rosa acicularis*
- [ 2.1 ] WHITE MEADOWSWEET  
*Spiraea betulifolia*

### Forb

- [ 3.0 ] SHOWY ASTER  
*Aster conspicuus*

### Moss and Liverwort

- [ 3.1 ] UNDIFFERENTIATED MOSS - ALL GENERA  
*Moss*

### Graminoid

- [ 5.0 ] PINE REED GRASS  
*Calamagrostis rubescens*

## Environmental Variables

Moisture Regime: Submesic (moderately fresh) (24), Mesic (fresh) (22), Subxeric (moderately dry) (5), Subhygric (moderately moist) (2)

Nutrient Regime: Mesotrophic (medium) (34), Permesotrophic (rich) (13), Submesotrophic (poor) (7)

Elevation (range): 1585 (1290-5453) M

Slope (%): strong slope (22), moderate slope (19), very strong slope (11), steep slope (3), very gentle slope (2), very steep slope (1), gentle slope (1)

Aspect: Westerly (19), Northerly (17), Easterly (14), Southerly (14), Level (1)

Topographic Position: Midslope (28), Upper Slope (18), Lower Slope (8), Crest (3), Toe (1)

## Soil Variables

Soil Drainage: Well drained (36), Rapidly drained (15), Moderately well drained (6), Imperfectly drained (1)

Soil Subgroup: ORTHIC EUTRIC BRUNISOL (8), ELUVIATED EUTRIC BRUNISOL (6), ORTHIC MELANIC BRUNISOL (3), ORTHIC REGOSOL (3), ORTHIC GRAY LUVISOL (2), ORTHIC HUMIC REGOSOL (2), ORTHIC BLACK CHERNOZEM (2), CALCAREOUS BLACK CHERNOZEM (1), ELUVIATED BLACK CHERNOZEM (1), BRUNISOLIC GRAY LUVISOL (1), DARK GRAY LUVISOL (1), GLEYED GRAY LUVISOL (1), GLEYED DARK GRAY LUVISOL (1)

Surface Texture: Loam (5), Sandy loam (4), Clay loam (3), Clay (2), Sandy clay loam (2), Silt loam (1), Very fine sand (1)

Effective Texture: Clay loam (7), Sandy clay loam (3), Sandy loam (3), Clay (2), Silt loam (1), Loam (1)

Depth to Mottles/Gley: 0 - 25 (2)

Organic Thickness: 0 - 5 cm (31), 6 - 15 cm (1)

Parent Material: Colluvial (13), Morainal (12), Fluvial (9), Rock (8), Residual (4), Glaciofluvial (3)

Soil Type: Dry/Silty-Loamy (2), Shallow (1), Dry/Fine (1)

Humus Form HUMIFIBRIMOR (6), FIBRIMOR (5), FIBRIHUMIMOR (3), TYPICAL MODER (2), RAW MODER (2), MOR (1), FIBRIC PEATYMOR (1)

LFH Thickness	Mean	Min	Max	Count
cm:	6.00	2.00	11.00	16

# Mse10 Fd/White meadowsweet (n=20)

## (*Pseudotsuga menziesii*/*Spiraea betulifolia*)

This community type is successional more advanced than the PI/White meadowsweet [Mse8] and PI/Pinegrass [Mse9] community types described within this ecological site. Archibald et al. (1996) described a successional change from pine to white spruce and Douglas-fir on these mesic/medium sites. As succession occurs there is less light reaching the forest floor and understory vegetation becomes very sparse. As a result, there is little forage for domestic livestock underneath these stands. This community type should be considered tertiary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

**Ecosite Phase:** d1 creeping mahonia-white meadowsweet Fd

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Overstory Tree</b>					Ecological Status Score: 25 Moisture Regime: Submesic (moderately fresh) (11), Mesic (fresh) (9), Subxeric (moderately dry) (4), Subhygric (moderately moist) (2) Nutrient Regime: Mesotrophic (medium) (11), Permesotrophic (rich) (8), Submesotrophic (poor) (4) Elevation (range): 1487 (1290-1700) M Slope (%): 16 - 30.99 (13), 10 - 15.99 (6), 31 - 45.99 (5), 2.5 - 5.99 (1) Aspect: Northerly (8), Southerly (7), Easterly (5), Westerly (5) Topographic Position: Midslope (12), Upper Slope (6), Crest (2), Lower Slope (2), Toe (1)
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	38.7	0.0-65.0	95		
WHITE SPRUCE ( <i>Picea glauca</i> )	8.7	0.0-40.0	55		
LODGEPOLE PINE ( <i>Pinus contorta</i> )	2.2	0.0-18.0	25		
<b>Understory Tree</b>					
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	10.3	0.0-45.0	65		
WHITE SPRUCE ( <i>Picea glauca</i> )	4.8	0.0-40.0	30		
ASPEN ( <i>Populus tremuloides</i> )	2.8	0.0-20.0	30		
<b>Medium Shrub (0.5 to 2 m)</b>					
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	5.9	0.0-25.0	70		
PRICKLY ROSE ( <i>Rosa acicularis</i> )	2.8	0.0-18.0	90		
SNOWBERRY ( <i>Symphoricarpos albus</i> )	2.4	0.0-15.0	75		
CANADA BUFFALOBERRY ( <i>Shepherdia canadensis</i> )	1.6	0.0-15.0	40		
<b>Tall Forb (&gt;= 30 cm)</b>					
SHOWY ASTER ( <i>Aster conspicuus</i> )	3.9	0.0-25.0	90		
WESTERN MEADOW RUE ( <i>Thalictrum occidentale</i> )	1.5	0.0-12.5	25		
VEINY MEADOW RUE ( <i>Thalictrum venulosum</i> )	1.1	0.0-9.2	40		
<b>Low Forb (&lt; 30 cm)</b>					
WESTERN CANADA VIOLET ( <i>Viola canadensis</i> )	2.4	0.0-22.0	40		
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	1.0	0.0-3.0	80		
<b>Graminoid</b>					
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	7.5	0.0-60.0	70		
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	3.8	0.0-24.0	60		
<b>Soil Variables</b>					
Soil Drainage: Well drained (12), Rapidly drained (8), Moderately well drained (3)					
Soil Subgroup: ORTHIC EUTRIC BRUNISOL (3), ELUVIATED EUTRIC BRUNISOL (3), ORTHIC BLACK CHERNOZEM (2), ORTHIC REGOSOL (2), CALCAREOUS BLACK CHERNOZEM (1), ELUVIATED BLACK CHERNOZEM (1), GLEYED DARK GRAY LUVISOL (1), ORTHIC GRAY LUVISOL (1), ORTHIC MELANIC BRUNISOL (1)					
Surface Texture: Sandy loam (3), Clay loam (3), Very fine sand (1), Sandy clay loam (1), Clay (1), Loam (1)					
Effective Texture: Clay loam (3), Sandy clay loam (3), Clay (1), Sandy loam (1), Silt loam (1)					
Depth to Mottles/Gley: 0 - 25 (1)					
Organic Thickness: 0 - 5 cm (15)					
Parent Material: Colluvial (7), Morainal (5), Residual (3), Glaciofluvial (2), Rock (2), Fluvial (1)					
Soil Type: Shallow (1), Dry/Fine (1), Dry/Silty-Loamy (1)					
Humus Form FIBRIMOR (3), HUMIFIBRIMOR (3), FIBRIHUMIMOR (2), RAW MODER (1), TYPICAL MODER (1), MOR (1)					
<b>LFH Thickness</b>					
	<b>Mean</b>	<b>Min</b>	<b>Max</b>	<b>Count</b>	
cm:	5.00	2.00	7.00	9	

## Mse10a Fd/Snowberry (n=14)

### (*Pseudotsuga menziesii*/*Symphoricarpos occidentalis*)

This community type was first described on moderate south and westerly facing slopes on the east side of the Porcupine Hills. Snowberry is generally indicative of nutrient rich seepage areas in the Montane subregion and generally forms thickets at lower slope positions. The snowberry in this community type consists of small individual plants that are uniformly scattered throughout the community. Archibald et al. (1996) did not recognize this community type and included the plots that comprise it within the hairy wild rye (submesic/medium) ecosite. However, the high constancy of snowberry in this community type appears to indicate slightly higher moisture and nutrients. Consequently, this community type was placed within the mesic/medium ecosite. Livestock may use these community types because of the open nature of the tree canopy, but the forage production is only moderate and the areas where this community type were described are generally inaccessible to livestock. As a result this community type should be considered tertiary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

**Ecosite Phase:** d1 creeping mahonia-white meadowsweet Fd

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 20-25
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	46.4	10.0-80.0	100	Moisture Regime: Submesic (moderately fresh) (5), Mesic (fresh) (5)
LOGEPOLE PINE ( <i>Pinus contorta</i> )	1.0	0.0-10.0	14	Nutrient Regime: Mesotrophic (medium) (13), Permesotrophic (rich) (1)
<b>Understory Tree</b>				Elevation (range): 1486 (1372-1649) M
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	4.0	0.0-30.0	21	Slope (%): 10 - 15.99 (7), 16 - 30.99 (4)
<b>Medium Shrub (0.5 to 2 m)</b>				Aspect: Westerly (6), Southerly (5), Easterly (4), Northerly (1)
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	7.9	0.0-38.7	57	Topographic Position: Midslope (8), Upper Slope (6), Lower Slope (2)
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	4.3	0.0-28.3	29	<b>Soil Variables</b>
SNOWBERRY ( <i>Symphoricarpos albus</i> )	3.7	0.0-20.0	43	Soil Drainage: Well drained (11), Rapidly drained (5)
PRICKLY ROSE ( <i>Rosa acicularis</i> )	2.8	0.0-9.3	93	Soil Subgroup: ORTHIC MELANIC BRUNISOL (1)
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	1.5	0.0-10.7	29	Surface Texture: Loam (1)
<b>Tall Forb (&gt;= 30 cm)</b>				Effective Texture: Loam (1)
SHOWY ASTER ( <i>Aster conspicuus</i> )	2.1	0.0-16.7	29	Depth to Mottles/Gley:
VEINY MEADOW RUE ( <i>Thalictrum venulosum</i> )	1.3	0.0-9.0	36	Organic Thickness: 0 - 5 cm (1)
<b>Low Forb (&lt; 30 cm)</b>				Parent Material: Morainal (1), Rock (1)
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	1.6	0.0-4.4	86	Soil Type: Dry/Silty-Loamy (1)
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	1.1	0.0-5.0	86	Humus Form
<b>Graminoid</b>				<b>LFH Thickness</b>
PARRY OAT GRASS ( <i>Danthonia parryi</i> )	2.8	0.0-18.7	29	Mean
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	2.6	0.0-15.0	43	Min
SEDGE SPECIES ( <i>Carex</i> )	1.5	0.0-5.9	50	Max
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	1.5	0.0-12.3	43	Count
				cm:
				5.00
				5.00
				5.00
				1

## Mse10b Fd/Feather moss (n=12)

### (*Pseudotsuga menziesii*/*Hylocomium splendens*)

This community type occurs where Douglas-fir canopy grows dense enough to limit understory species growth. This typically occurs in climax Douglas-fir forests where lack of fire has allowed ingress trees to develop in the understory (Page 2001). As both understory and overstory trees increase in density, less light reaches the forest floor causing sparse understory vegetation. In this case, mosses dominate the understory, leaving very little for production. This community should be rated as tertiary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

**Ecosite Phase:** d1 creeping mahonia-white meadowsweet Fd

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Overstory Tree</b>					Ecological Status Score: 25
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	37.3	10.0-65.0	100		Moisture Regime: Submesic (moderately fresh) (5), Mesic (fresh) (5), Subxeric (moderately dry) (1)
WHITE SPRUCE ( <i>Picea glauca</i> )	7.9	0.0-30.0	58		Nutrient Regime: Submesotrophic (poor) (3), Mesotrophic (medium) (3), Permesotrophic (rich) (3)
LODGEPOLE PINE ( <i>Pinus contorta</i> )	2.1	0.0-12.0	33		Elevation (range): 1421 (1315-1640) M
<b>Understory Tree</b>					Slope (%): 10 - 15.99 (3), 46 - 70.99 (3), 31 - 45.99 (2), 2.5 - 5.99 (1), 6 - 9.99 (1), 71 - 100.99 (1), 16 - 30.99 (1)
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	16.0	2.0-45.0	100		Aspect: Northerly (5), Easterly (4), Westerly (3)
WHITE SPRUCE ( <i>Picea glauca</i> )	7.6	0.0-20.0	67		Topographic Position: Lower Slope (3), Midslope (3), Upper Slope (3)
<b>Medium Shrub (0.5 to 2 m)</b>					<b>Soil Variables</b>
TWINFLOWER ( <i>Linnaea borealis</i> )	1.5	0.0-8.0	75		Soil Drainage: Well drained (4), Moderately well drained (3), Rapidly drained (2), Imperfectly drained (1)
<b>Tall Forb (&gt;= 30 cm)</b>					Soil Subgroup: ORTHIC EUTRIC BRUNISOL (4), ORTHIC HUMIC REGOSOL (2), ORTHIC REGOSOL (1), ELUVIATED EUTRIC BRUNISOL (1), BRUNISOLIC GRAY LUVISOL (1), DARK GRAY LUVISOL (1), GLEYED GRAY LUVISOL (1), ORTHIC GRAY LUVISOL (1)
SHOWY ASTER ( <i>Aster conspicuus</i> )	1.4	0.0-3.0	92		Surface Texture: Loam (3), Sandy loam (1), Silt loam (1), Sandy clay loam (1), Clay (1)
<b>Graminoid</b>					Effective Texture: Clay loam (4), Sandy loam (2), Clay (1)
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	2.0	0.0-10.0	75		Depth to Mottles/Gley: 0 - 25 (1)
<b>Moss</b>					Organic Thickness: 0 - 5 cm (11), 6 - 15 cm (1)
UNDIFFERENTIATED MOSS - ALL GENERA (Moss)	53.0	1.0-90.0	100		Parent Material: Fluvial (8), Colluvial (5), Morainal (3), Rock (2), Residual (1), Glaciofluvial (1)
					Soil Type:
					Humus Form HUMIFIBRIMOR (3), FIBRIMOR (2), FIBRIHUMIMOR (1), RAW MODER (1), TYPICAL MODER (1), FIBRIC PEATYMOR (1)
					<b>LFH Thickness</b>
					<b>Mean</b> <b>Min</b> <b>Max</b> <b>Count</b>
					cm:                    8.00    5.00    11.00    6

## Mse26 Fd-PI/Pine grass (n=6)

(*Pseudotsuga menziesii*-*Pinus contorta*/*Calamagrostis rubescens*)

This community is dominated by a lodgepole pine and Douglas-fir overstory and an understory of pine grass. The extensive fire history in the Montane suggests this community is late seral and will eventually lead to a Douglas-fir climax community (Archibald et al. 1996). This community is similar to the Fd/White meadowsweet [Mse10] or PI/White meadowsweet [Mse8] community types, but the high cover of pine grass and low cover of white meadowsweet may indicate slightly moister, better developed soils. Pine grass is an important forage for livestock and wildlife, however cures quickly and becomes unpalatable by mid-summer. Pinegrass is also susceptible to overgrazing, where its productivity diminishes the year following heavy grazing (Stout & Quinton 1986). The forage productivity of this community type is low. As a result, this community should be considered secondary or tertiary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

**Ecosite Phase:** d1 creeping mahonia-white meadowsweet Fd

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 25
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	18.0	0.0-40.0	83	Moisture Regime: Mesic (fresh) (1)
LOGEPOLE PINE ( <i>Pinus contorta</i> )	11.0	0.0-40.0	83	Nutrient Regime: Mesotrophic (medium) (3)
<b>Understory Tree</b>				Elevation (range): 2014 (1290-5453) M
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	5.9	0.0-15.0	83	Slope (%): 31 - 45.99 (4), 10 - 15.99 (1), 16 - 30.99 (1)
LOGEPOLE PINE ( <i>Pinus contorta</i> )	3.6	0.0-20.0	50	Aspect: Westerly (4), Southerly (2)
<b>Tall Shrub (2 to 5m)</b>				Topographic Position: Midslope (2), Upper Slope (2)
SASKATOON ( <i>Amelanchier alnifolia</i> )	3.9	0.0-23.5	17	<b>Soil Variables</b>
<b>Medium Shrub (0.5 to 2 m)</b>				Soil Drainage: Well drained (3)
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	5.9	0.0-27.7	83	Soil Subgroup: ELUVIATED EUTRIC BRUNISOL (2), ORTHIC EUTRIC BRUNISOL (1), ORTHIC MELANIC BRUNISOL (1)
CANADA BUFFALOBERRY ( <i>Shepherdia canadensis</i> )	5.4	0.0-18.0	67	Surface Texture:
GROUND JUNIPER ( <i>Juniperus communis</i> )	2.6	0.0-11.0	83	Effective Texture:
<b>Tall Forb (&gt;= 30 cm)</b>				Depth to Mottles/Gley:
SHOWY ASTER ( <i>Aster conspicuus</i> )	8.8	1.0-30.0	100	Organic Thickness: 0 - 5 cm (4)
WILD VETCH ( <i>Vicia americana</i> )	1.5	0.0-7.3	33	Parent Material: Morainal (3), Rock (3), Colluvial (1)
<b>Low Forb (&lt; 30 cm)</b>				Soil Type:
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	2.0	1.0-6.0	100	Humus Form
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	1.9	0.0-5.8	83	<b>LFH Thickness</b>
COMMON YARROW ( <i>Achillea millefolium</i> )	1.1	1.0-1.7	100	Mean
<b>Graminoid</b>				Min
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	28.3	6.0-45.0	100	Max
				Count
				cm:
				0.00
				0.00
				0.00
				0

# Msh16 Douglas-fir/Pine grass(cutblock) (n=6)

(*Pseudotsuga menziesii*/*Calamagrostis rubescens*)

This community represents a Douglas-fir dominated community that has been harvested or burned. Often these sites will begin to re-establish with lodgepole pine or spruce regeneration, but the presence of Douglas-fir regen suggests these stands will transition toward Douglas-fir stands. These communities are similar to the drier PI-Fd/Foothills rough fescue [Msh28] sites, however, the absence of rough fescue, and the regeneration of trees suggest these will become forest stands quicker. Analysis of cutblock production data suggests, although minimal forage is available the first 2 years after harvest, cutblocks have as much as three times the productivity of forested sites until 8 years, where productivity reduces each year as established trees close the canopy. For this reason, under normal circumstances, if stocking rates are increased due to available cutblock forage, the increase should be reduced so forested rates are used by 15-20 years after harvest. Pine grass is generally unpalatable to livestock later in the season, but if it is grazed early in the season prior to curing livestock will utilize it as a forage source (Stout & Quinton 1986). Repeated grazing however will reduce pine grass productivity significantly.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

**Ecosite Phase:** d1 creeping mahonia-white meadowsweet Fd

## Plant Composition

## Canopy Cover (%)

	Mean	Range	Const.
<b>Overstory Tree</b>			
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	14.4	1.1-30.0	100
WHITE SPRUCE ( <i>Picea glauca</i> )	10.8	0.0-30.0	50
ASPEN ( <i>Populus tremuloides</i> )	6.1	0.0-20.0	50
LOGEPOLE PINE ( <i>Pinus contorta</i> )	1.8	0.0-5.0	50
<b>Medium Shrub (0.5 to 2 m)</b>			
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	3.0	0.0-7.9	67
TWINFLOWER ( <i>Linnaea borealis</i> )	2.2	0.0-5.3	50
BRISTLY BLACK CURRANT ( <i>Ribes lacustre</i> )	1.3	0.0-6.7	33
<b>Tall Forb (&gt;= 30 cm)</b>			
SHOWY ASTER ( <i>Aster conspicuus</i> )	10.4	4.3-21.3	100
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	4.4	0.0-10.7	83
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	2.5	0.0-12.3	67
WILD VETCH ( <i>Vicia americana</i> )	2.4	0.2-8.3	100
<b>Low Forb (&lt; 30 cm)</b>			
COMMON DANDELION ( <i>Taraxacum officinale</i> )	2.4	0.9-8.3	100
<b>Graminoid</b>			
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	9.0	0.0-20.2	83
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	7.1	0.0-15.3	83
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	2.0	0.0-7.3	67

## Environmental Variables

Ecological Status Score: 25

Moisture Regime: Submesic (moderately fresh) (3), Mesic (fresh) (2)

Nutrient Regime: Mesotrophic (medium) (4), Permesotrophic (rich) (1)

Elevation (range): 1521 (1484-1617) M

Slope (%): 16 - 30.99 (3), 10 - 15.99 (2)

Aspect: Northerly (3), Level (1), Easterly (1), Westerly (1)

Topographic Position: Midslope (3), Crest (1), Lower Slope (1), Upper Slope (1)

## Soil Variables

Soil Drainage: Well drained (6)

Soil Subgroup:

Surface Texture:

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness:

Parent Material:

Soil Type:

Humus Form

## LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0



## d2 creeping mahonia-white meadowsweet PI (n=181)

**Natural Subregion:** Montane  
**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

### General Description

Lodgepole pine stands are considered a successional stage to Douglas-fir and white spruce forests in this ecosite (Archibald et al. 1996). The mesic/medium lodgepole pine phase is the most common forest for logging and tree regeneration. The canopy is usually closed primarily with lodgepole pine. Dense forest stands will have little understory other than moss or needles, whereas pine grass dominates less dense stands, with components of shrubs such as meadowsweet, rose and snowberry.

### Characteristic Species

#### Tree

- [ 40.5 ] LODGEPOLE PINE  
*Pinus contorta*
- [ 1.4 ] DOUGLAS-FIR  
*Pseudotsuga menziesii*

#### Shrub

- [ 4.9 ] GREEN ALDER  
*Alnus crispa*
- [ 4.2 ] TWINFLOWER  
*Linnaea borealis*
- [ 3.4 ] WHITE MEADOWSWEET  
*Spiraea betulifolia*

#### Forb

- [ 4.6 ] SHOWY ASTER  
*Aster conspicuus*
- [ 3.2 ] HEART-LEAVED ARNICA  
*Arnica cordifolia*

#### Moss and Liverwort

- [ 13.3 ] UNDIFFERENTIATED MOSS - ALL GENERA  
*Moss*

#### Graminoid

- [ 12.4 ] PINE REED GRASS  
*Calamagrostis rubescens*

### Environmental Variables

Moisture Regime: Mesic (fresh) (76), Submesic (moderately fresh) (42), Subxeric (moderately dry) (18), Subhygric (moderately moist) (6), Hygric (moist) (3)

Nutrient Regime: Mesotrophic (medium) (111), Permesotrophic (rich) (20), Submesotrophic (poor) (2)

Elevation (range): 1513 (1142-1800) M

Slope (%): strong slope (54), moderate slope (42), very gentle slope (23), gentle slope (20), nearly level (7), level (6), very strong slope (4), steep slope (1)

Aspect: Easterly (49), Northerly (40), Westerly (31), Southerly (30), Level (12), Variable (0)

Topographic Position: Midslope (62), Lower Slope (32), Upper Slope (24), Level (14), Crest (3), Toe (3), Depression (1)

### Soil Variables

Soil Drainage: Well drained (107), Moderately well drained (35), Rapidly drained (11), Imperfectly drained (2)

Soil Subgroup: ELUVIATED EUTRIC BRUNISOL (27), ORTHIC EUTRIC BRUNISOL (18), ORTHIC GRAY LUVISOL (15), GLEYED GRAY LUVISOL (3), BRUNISOLIC GRAY LUVISOL (3), ORTHIC DARK GRAY CHERNOZEM (2), GLEYED BRUNISOLIC GRAY LUVISOL (2), CUMULIC REGOSOL (2), ORTHIC DYSTRIC BRUNISOL (2), ORTHIC LUVIC GLEYSOL (1), ORTHIC MELANIC BRUNISOL (1), ELUVIATED DYSTRIC BRUNISOL (1), DARK GRAY LUVISOL (1)

Surface Texture: Loam (17), Sandy loam (7), Clay loam (6), Silt loam (4), Sandy clay loam (3), Fine sandy loam (3), Very fine sandy loam (2), Silty clay (1), Silty clay loam (1)

Effective Texture: Clay loam (16), Sandy clay loam (7), Sandy loam (6), Loam (3), Silty clay (3), Silty clay loam (2), Silt loam (2), Sandy clay (1), Silt (1), Fine sandy loam (1), Clay (1), Very fine sandy loam (1)

Depth to Mottles/Gley: 26 - 50 (4), 51 - 100 (4), 0 - 25 (2)

Organic Thickness: 0 - 5 cm (81)

Parent Material: Morainal (36), Fluvial (15), Colluvial (11), Residual (10), Rock (10), Glaciofluvial (8), Swamp (2), Tephra (1), Saprolite (1), Fluviolacustrine (1)

Soil Type: Moist/Fine (4), Moist/Coarse (2), Dry/Fine (2), Very Dry/Silty-Loamy (2), Moist/Silty-Loamy (2), Moist/Sandy (1)

Humus Form FIBRIMOR (16), HUMIFIBRIMOR (9), FIBRIHUMIMOR (4), RAW MODER (1), MODER (1), TYPICAL MODER (1)

LFH Thickness	Mean	Min	Max	Count
cm:	6.00	1.00	14.00	44

# Mse11 PI/Feather moss (n=33)

## (*Pinus contorta*/*Pleurozium schreberi*)

This community type is similar to the described PI/Pinegrass [Mse9] and PI/White meadowsweet [Mse8] communities, but represents thicker density stands. This community was described on moister sites, which probably escaped fire and disturbance, allowing infill of the canopy. Continued succession in the absence of disturbance will likely lead to the Sw/Moss [Mse12] or Fd/Moss [Mse10b] dominated community types. This community has low productivity and should be rated as tertiary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

**Ecosite Phase:** d2 creeping mahonia-white meadowsweet PI

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Overstory Tree</b>					Ecological Status Score: 25
LOGEPOLE PINE ( <i>Pinus contorta</i> )	30.1	0.0-65.0	97		Moisture Regime: Mesic (fresh) (8), Hygric (moist) (3)
WHITE SPRUCE ( <i>Picea glauca</i> )	2.6	0.0-24.0	33		Nutrient Regime: Mesotrophic (medium) (8)
<b>Understory Tree</b>					Elevation (range): 1517 (1360-1798) M
LOGEPOLE PINE ( <i>Pinus contorta</i> )	7.5	0.0-50.0	55		Slope (%): 2.5 - 5.99 (7), 16 - 30.99 (7), 10 - 15.99 (4), 0.5 - 2.49 (3), 6 - 9.99 (2)
WHITE SPRUCE ( <i>Picea glauca</i> )	3.0	0.0-20.0	46		Aspect: Easterly (9), Northerly (7), Level (5), Southerly (4), Westerly (3)
<b>Medium Shrub (0.5 to 2 m)</b>					Topographic Position: Midslope (4), Lower Slope (3), Level (1), Toe (1)
CANADA BUFFALOBERRY ( <i>Shepherdia canadensis</i> )	8.8	0.0-65.0	82		<b>Soil Variables</b>
TWINFLOWER ( <i>Linnaea borealis</i> )	6.8	0.0-40.0	85		Soil Drainage: Well drained (6), Moderately well drained (6)
PRICKLY ROSE ( <i>Rosa acicularis</i> )	1.7	0.0-15.0	85		Soil Subgroup: ELUVIATED EUTRIC BRUNISOL (11), ORTHIC EUTRIC BRUNISOL (6), ORTHIC GRAY LUVISOL (5), CUMULIC REGOSOL (2), ORTHIC DYSTRIC BRUNISOL (1), ORTHIC MELANIC BRUNISOL (1)
<b>Tall Forb (&gt;= 30 cm)</b>					Surface Texture: Loam (3), Very fine sandy loam (1)
SHOWY ASTER ( <i>Aster conspicuus</i> )	6.3	0.0-40.0	67		Effective Texture: Sandy loam (2), Sandy clay loam (1), Silt loam (1)
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	3.3	0.0-22.0	42		Depth to Mottles/Gley:
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	2.5	0.0-19.3	67		Organic Thickness: 0 - 5 cm (26)
<b>Low Forb (&lt; 30 cm)</b>					Parent Material: Morainal (12), Fluvial (9), Glaciofluvial (4), Rock (3), Colluvial (1), Fluvioacustrine (1)
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	4.6	0.0-28.9	67		Soil Type:
HEART-LEAVED ARNICA ( <i>Arnica cordifolia</i> )	3.6	0.0-20.0	76		Humus Form FIBRIMOR (2), HUMIFIBRIMOR (2)
BUNCHBERRY ( <i>Cornus canadensis</i> )	1.9	0.0-10.0	64		<b>LFH Thickness</b>
<b>Graminoid</b>					<b>Mean</b> <b>Min</b> <b>Max</b> <b>Count</b>
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	5.0	0.0-30.0	42		cm:                    8.00    3.00    14.00    4
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	4.2	0.0-20.0	73		
SEDGE SPECIES ( <i>Carex</i> )	2.0	0.0-20.3	27		
<b>Moss</b>					
UNDIFFERENTIATED MOSS - ALL GENERA (Moss)	46.0	12.0-65.0	100		

## Mse25 PI/Pine grass-Timothy (n=2)

### (*Pinus contorta*/*Calamagrostis rubescens*-*Phleum pratense*)

This community represents a grazing disclimax of the lodgepole pine, pine grass dominated community types. Pine grass does not recover quickly from heavy grazing (Stout & Quinton 1986). This increased grazing pressure and soil disturbance also favours the growth of agronomic species like Kentucky bluegrass, timothy and clover species. Timothy in particular is adapted to grow in a wide range of climate and soil conditions, and will readily invade native areas (Esser 1993). Continued heavy grazing pressure will eventually lead to a community only dominated by these species in the understory as well as exposed soil. The forage productivity of this community type is generally low. As a result, this community should be rated as tertiary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

**Ecosite Phase:** d2 creeping mahonia-white meadowsweet PI

Plant Composition	Canopy Cover (%)			Environmental Variables	
	Mean	Range	Const.		
<b>Overstory Tree</b>				Ecological Status Score: 15	
LOGEPOLE PINE ( <i>Pinus contorta</i> )	27.5	15.0-40.0	100	Moisture Regime: Mesic (fresh) (1)	
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	5.0	0.0-10.0	50	Nutrient Regime: Mesotrophic (medium) (2)	
ASPEN ( <i>Populus tremuloides</i> )	2.5	0.0-5.0	50	Elevation (range): 1528 (1523-1532) M	
<b>Medium Shrub (0.5 to 2 m)</b>				Slope (%): 2.5 - 5.99 (1), 10 - 15.99 (1)	
DWARF BILBERRY ( <i>Vaccinium caespitosum</i> )	14.9	0.0-29.8	50	Aspect: Easterly (2)	
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	8.5	0.0-17.0	50	Topographic Position: Lower Slope (1), Midslope (1)	
TWINFLOWER ( <i>Linnaea borealis</i> )	4.0	0.0-8.0	50	<b>Soil Variables</b>	
PRICKLY ROSE ( <i>Rosa acicularis</i> )	1.0	1.0-1.0	100	Soil Drainage: Well drained (2)	
<b>Tall Forb (&gt;= 30 cm)</b>				Soil Subgroup:	
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	4.9	3.1-6.7	100	Surface Texture:	
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	2.9	0.0-5.8	50	Effective Texture:	
SHOWY ASTER ( <i>Aster conspicuus</i> )	2.3	1.0-3.7	100	Depth to Mottles/Gley:	
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	2.1	0.0-4.3	50	Organic Thickness:	
<b>Low Forb (&lt; 30 cm)</b>				Parent Material:	
WHITE CLOVER ( <i>Trifolium repens</i> )	7.4	0.0-14.9	50	Soil Type:	
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	1.1	1.0-1.3	100	Humus Form	
<b>Graminoid</b>				<b>LFH Thickness</b>	
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	24.8	22.7-27.0	100	Mean	
TIMOTHY ( <i>Phleum pratense</i> )	6.1	0.0-12.3	50	Min	
AWNLESS BROME ( <i>Bromus inermis</i> )	2.3	0.0-4.7	50	Max	
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	1.5	1.3-1.7	100	Count	
				cm:	
				0.00	
				0.00	
				0.00	
				0	

## Mse4 PI/Green alder (n=10)

### (*Pinus contorta*/*Alnus crispa*)

This community type occurs on slopes that have coarse soils and underground seepage. The underground seepage makes this community type fairly moist and nutrient rich for this ecosite. Available moisture deeper in the profile allows green alder to proliferate but dry surface conditions support dwarf shrubs that are usually associated with drier sites. This community type is not often preferred by livestock grazing because the dense alder cover restricts access. This community should be considered tertiary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

**Ecosite Phase:** d2 creeping mahonia-white meadowsweet PI

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 25
LOGEPOLE PINE ( <i>Pinus contorta</i> )	32.7	0.0-60.0	90	Moisture Regime: Mesic (fresh) (6), Subxeric (moderately dry) (5), Subhygric (moderately moist) (2)
<b>Understory Tree</b>				Nutrient Regime: Mesotrophic (medium) (8), Submesotrophic (poor) (2), Permesotrophic (rich) (2)
LOGEPOLE PINE ( <i>Pinus contorta</i> )	9.8	1.0-61.0	100	Elevation (range): 1534 (1390-1630) M
WHITE SPRUCE ( <i>Picea glauca</i> )	3.5	0.0-15.0	60	Slope (%): 16 - 30.99 (7), 10 - 15.99 (5), 6 - 9.99 (1), 31 - 45.99 (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Aspect: Westerly (5), Northerly (5), Easterly (2)
GREEN ALDER ( <i>Alnus crispa</i> )	29.5	2.0-55.0	100	Topographic Position: Midslope (8), Upper Slope (5)
TWINFLOWER ( <i>Linnaea borealis</i> )	2.6	0.0-10.0	90	<b>Soil Variables</b>
PRICKLY ROSE ( <i>Rosa acicularis</i> )	2.1	1.0-3.0	100	Soil Drainage: Well drained (10), Moderately well drained (2), Imperfectly drained (2)
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	1.5	0.0-5.0	70	Soil Subgroup: ELUVIATED EUTRIC BRUNISOL (2), ORTHIC EUTRIC BRUNISOL (2), BRUNISOLIC GRAY LUVISOL (1), GLEYED GRAY LUVISOL (1), GLEYED BRUNISOLIC GRAY LUVISOL (1), ORTHIC GRAY LUVISOL (1)
<b>Tall Forb (&gt;= 30 cm)</b>				Surface Texture: Sandy loam (4), Loam (2), Sandy clay loam (1), Clay loam (1)
SHOWY ASTER ( <i>Aster conspicuus</i> )	2.9	1.0-10.0	100	Effective Texture: Sandy clay loam (3), Clay loam (2), Loam (1), Silt loam (1), Sandy loam (1)
<b>Low Forb (&lt; 30 cm)</b>				Depth to Mottles/Gley: 0 - 25 (2), 51 - 100 (1)
HEART-LEAVED ARNICA ( <i>Arnica cordifolia</i> )	1.9	0.0-5.0	90	Organic Thickness: 0 - 5 cm (8)
BUNCHBERRY ( <i>Cornus canadensis</i> )	1.3	0.0-3.0	70	Parent Material: Colluvial (6), Morainal (3), Swamp (2), Residual (1)
COMMON PINK WINTERGREEN ( <i>Pyrola asarifolia</i> )	1.2	0.0-3.0	80	Soil Type:
ONE-SIDED WINTERGREEN ( <i>Orthilia secunda</i> )	1.1	0.0-3.0	80	Humus Form HUMIFIBRIMOR (3), RAW MODER (1), FIBRIHUMIMOR (1), MODER (1)
<b>Graminoid</b>				
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	9.5	0.0-22.0	80	
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	1.6	0.0-8.0	60	
				<b>LFH Thickness</b>
				<b>Mean</b>
				<b>Min</b>
				<b>Max</b>
				<b>Count</b>
				cm:
				7.00
				4.00
				10.00
				8

## Mse8 PI/White meadowsweet (n=17)

### (*Pinus contorta/Spiraea betulifolia*)

This community is one of several community types which represent the lodgepole pine phase of the mesic/medium ecosite for the Montane subregion. These communities differ in that the understory can be dominated by pine grass, white meadowsweet or mosses depending on the density of the stand and drainage of the soil. White meadowsweet is well adapted to growing on dry rocky slopes (MacKinnon et al. 1992). The presence of a high cover of white meadowsweet may indicate slightly drier conditions and shallower soils than a community dominated by pine grass. Creeping mahonia grows similarly and is found locally more abundant near the Crowsnest pass. This community type produces little forage for domestic livestock and should be considered tertiary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

**Ecosite Phase:** d2 creeping mahonia-white meadowsweet PI

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 25
LOGEPOLE PINE ( <i>Pinus contorta</i> )	55.8	30.0-80.0	100	Moisture Regime: Mesic (fresh) (9), Submesic (moderately fresh) (8)
SUBALPINE FIR ( <i>Abies lasiocarpa</i> )	3.1	0.0-33.0	12	Nutrient Regime: Mesotrophic (medium) (17)
ASPEN ( <i>Populus tremuloides</i> )	1.8	0.0-32.0	6	Elevation (range): 1554 (1142-1798) M
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	1.1	0.0-20.0	6	Slope (%): 16 - 30.99 (7), 10 - 15.99 (6), 0 - 0.49 (2), 0.5 - 2.49 (1), 2.5 - 5.99 (1)
<b>Understory Tree</b>				Aspect: Southerly (7), Easterly (5), Westerly (4)
LOGEPOLE PINE ( <i>Pinus contorta</i> )	5.5	0.0-72.6	29	Topographic Position: Upper Slope (6), Midslope (5), Level (3), Lower Slope (3)
SUBALPINE FIR ( <i>Abies lasiocarpa</i> )	1.4	0.0-5.0	12	<b>Soil Variables</b>
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	1.2	0.0-15.0	12	Soil Drainage: Well drained (15), Rapidly drained (5), Moderately well drained (4)
<b>Medium Shrub (0.5 to 2 m)</b>				Soil Subgroup: ORTHIC EUTRIC BRUNISOL (2), ORTHIC GRAY LUVISOL (2), BRUNISOLIC GRAY LUVISOL (1), ORTHIC DARK GRAY CHERNOZEM (1)
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	13.2	1.0-50.0	100	Surface Texture: Clay loam (2), Silt loam (1), Sandy clay loam (1), Fine sandy loam (1)
TWINFLOWER ( <i>Linnaea borealis</i> )	4.5	0.0-29.7	77	Effective Texture: Clay loam (2), Sandy clay (1), Sandy clay loam (1), Sandy loam (1)
DWARF BILBERRY ( <i>Vaccinium caespitosum</i> )	4.1	0.0-40.0	47	Depth to Mottles/Gley:
TALL BILBERRY ( <i>Vaccinium membranaceum</i> )	3.0	0.0-35.0	12	Organic Thickness: 0 - 5 cm (9)
CREEPING MAHONIA ( <i>Berberis repens</i> )	2.4	0.0-10.0	47	Parent Material: Glaciofluvial (1), Morainal (1), Residual (1)
CANADA BUFFALOBERRY ( <i>Shepherdia canadensis</i> )	2.0	0.0-6.0	59	Soil Type: Moist/Fine (2), Moist/Coarse (1)
<b>Tall Forb (&gt;= 30 cm)</b>				Humus Form FIBRIMOR (1), FIBRIHUMIMOR (1)
WESTERN MEADOW RUE ( <i>Thalictrum occidentale</i> )	1.5	0.0-15.0	35	<b>LFH Thickness</b>
SHOWY ASTER ( <i>Aster conspicuus</i> )	1.4	0.0-11.3	53	Mean
<b>Low Forb (&lt; 30 cm)</b>				Min
HEART-LEAVED ARNICA ( <i>Arnica cordifolia</i> )	6.8	0.0-65.0	94	Max
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	2.0	0.0-13.3	65	Count
<b>Graminoid</b>				cm:
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	5.1	0.0-35.8	82	4.00
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	0.9	0.0-6.0	29	3.00
				5.00
				5

## Mse9 PI/Pine grass (n=64)

### (*Pinus contorta*/*Calamagrostis rubescens*)

This community is dominated by a lodgepole pine overstory and an understory of pine grass. Succession will be to white spruce or Douglas-fir, but the extensive fire and disturbance history in the Montane has resulted in a predominance of lodgepole pine (Archibald et al. 1996). This community is similar to the PI/White meadowsweet [Mse8] community type, but the high cover of pine grass and low cover of white meadowsweet may indicate slightly moister, better developed soils. Pine grass is generally unpalatable to livestock, but if it is grazed early in the spring they will utilize it as a forage source (Stout & Quinton 1986). As a result, this community should be considered secondary or tertiary range depending on management.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

**Ecosite Phase:** d2 creeping mahonia-white meadowsweet PI

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 25
LOGEPOLE PINE ( <i>Pinus contorta</i> )	43.5	10.0-80.0	100	Moisture Regime: Mesic (fresh) (36), Submesic (moderately fresh) (13), Subhygric (moderately moist) (4)
WHITE SPRUCE ( <i>Picea glauca</i> )	4.1	0.0-50.0	33	Nutrient Regime: Mesotrophic (medium) (31), Permesotrophic (rich) (16)
<b>Understory Tree</b>				Elevation (range): 1528 (1290-1740) M
LOGEPOLE PINE ( <i>Pinus contorta</i> )	3.4	0.0-35.0	45	Slope (%): 10 - 15.99 (20), 16 - 30.99 (15), 6 - 9.99 (9), 2.5 - 5.99 (6), 0 - 0.49 (2), 0.5 - 2.49 (2)
<b>Medium Shrub (0.5 to 2 m)</b>				Aspect: Easterly (17), Northerly (16), Westerly (11), Southerly (10), Level (4)
TWINFLOWER ( <i>Linnaea borealis</i> )	7.1	0.0-50.7	86	Topographic Position: Midslope (25), Lower Slope (11), Upper Slope (8), Level (4), Crest (3), Toe (2)
DWARF BILBERRY ( <i>Vaccinium caespitosum</i> )	2.9	0.0-38.0	58	
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	2.7	0.0-20.0	69	
PRICKLY ROSE ( <i>Rosa acicularis</i> )	2.5	0.0-13.0	89	
GROUND JUNIPER ( <i>Juniperus communis</i> )	1.3	0.0-15.0	39	
<b>Tall Forb (&gt;= 30 cm)</b>				<b>Soil Variables</b>
SHOWY ASTER ( <i>Aster conspicuus</i> )	3.9	0.0-22.0	81	Soil Drainage: Well drained (33), Moderately well drained (17)
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	2.2	0.0-13.0	70	Soil Subgroup: ELUVIATED EUTRIC BRUNISOL (14), ORTHIC EUTRIC BRUNISOL (8), ORTHIC GRAY LUVISOL (7), GLEYED GRAY LUVISOL (2), ORTHIC DARK GRAY CHERNOZEM (1), ELUVIATED DYSTRIC BRUNISOL (1), ORTHIC DYSTRIC BRUNISOL (1), GLEYED BRUNISOLIC GRAY LUVISOL (1), ORTHIC LUVIC GLEYSOL (1), BRUNISOLIC GRAY LUVISOL (1), DARK GRAY LUVISOL (1)
<b>Low Forb (&lt; 30 cm)</b>				Surface Texture: Loam (12), Sandy loam (3), Silt loam (3), Clay loam (3), Fine sandy loam (2), Silty clay (1), Silty clay loam (1), Very fine sandy loam (1), Sandy clay loam (1)
BUNCHBERRY ( <i>Cornus canadensis</i> )	4.2	0.0-40.1	45	Effective Texture: Clay loam (12), Silty clay (3), Silty clay loam (2), Sandy clay loam (2), Sandy loam (2), Loam (2), Clay (1), Fine sandy loam (1), Silt (1), Very fine sandy loam (1)
HEART-LEAVED ARNICA ( <i>Arnica cordifolia</i> )	3.9	0.0-20.7	78	Depth to Mottles/Gley: 26 - 50 (4), 51 - 100 (3)
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	2.7	0.0-36.0	75	Organic Thickness: 0 - 5 cm (38)
<b>Graminoid</b>				Parent Material: Morainal (20), Residual (8), Rock (7), Fluvial (6), Colluvial (4), Glaciofluvial (3), Tephra (1), Saprolite (1)
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	22.4	0.0-80.0	95	Soil Type: Dry/Fine (2), Moist/Silty-Loamy (2), Very Dry/Silty-Loamy (2), Moist/Fine (2), Moist/Coarse (1), Moist/Sandy (1)
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	5.4	0.0-42.7	63	Humus Form FIBRIMOR (13), HUMIFIBRIMOR (4), FIBRIHUMIMOR (2), TYPICAL MODER (1)
				<b>LFH Thickness</b>
				<b>Mean</b> <b>Min</b> <b>Max</b> <b>Count</b>
				cm:                    5.00    1.00    10.00    27

# Msh14 Lodgepole pine/Pine grass (cutblock) (n=28)

(*Pinus contorta/Calamagrostis rubescens*)

This community represents harvested or burned, predominantly north and east facing slope Douglas-fir, lodgepole pine or white spruce stands that are notably being regenerated by lodgepole pine. Typically after fire or harvest, lodgepole pine is the early seral establishing species on dry to mesic sites. Succession after lodgepole pine stand establishment can advance to Douglas-fir or white spruce, depending on seed source and ecosite characteristics (Archibald et al. 1996). Besides trees, the understory for this community is dominated by pine grass, forbs and shrubs. Analysis of cutblock production data suggests, although minimal forage is available the first 2 years after harvest, cutblocks have as much as three times the productivity of forested sites until 8 years, where productivity reduces each following year as established trees close the canopy. For this reason, under normal circumstances, if stocking rates are increased due to available cutblock forage, the increase should be reduced so forested rates are used by 15-20 years after harvest. Pine grass is generally unpalatable to livestock later in the season, but if it is grazed early in the season prior to curing livestock will utilize it as a forage source. Repeated heavy grazing however will reduce pine grass productivity significantly (Stout & Quinton 1986).

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

**Ecosite Phase:** d2 creeping mahonia-white meadowsweet PI

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 25
LOGEPOLE PINE ( <i>Pinus contorta</i> )	31.9	1.8-80.0	100	Moisture Regime: Submesic (moderately fresh) (16), Subxeric (moderately dry) (11), Mesic (fresh) (10)
ASPEN ( <i>Populus tremuloides</i> )	5.0	0.0-30.0	46	Nutrient Regime: Mesotrophic (medium) (35)
WHITE SPRUCE ( <i>Picea glauca</i> )	1.6	0.0-5.0	61	Elevation (range): 1530 (1339-1800) M
<b>Tall Shrub (2 to 5m)</b>				Slope (%): 16 - 30.99 (12), 2.5 - 5.99 (8), 6 - 9.99 (7), 10 - 15.99 (4), 0 - 0.49 (2), 0.5 - 2.49 (1), 31 - 45.99 (1), 46 - 70.99 (1)
GREEN ALDER ( <i>Alnus crispa</i> )	5.5	0.0-60.0	32	Aspect: Northerly (12), Easterly (12), Southerly (5), Westerly (5), Level (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Topographic Position: Midslope (13), Lower Slope (11), Level (6), Upper Slope (4)
PRICKLY ROSE ( <i>Rosa acicularis</i> )	2.7	0.0-10.0	96	<b>Soil Variables</b>
WILD RED RASPBERRY ( <i>Rubus idaeus</i> )	2.3	0.0-14.3	68	Soil Drainage: Well drained (29), Rapidly drained (5), Moderately well drained (4)
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	2.3	0.0-8.7	86	Soil Subgroup:
<b>Low Shrub (&lt; 0.5m)</b>				Surface Texture:
TWINFLOWER ( <i>Linnaea borealis</i> )	2.3	0.0-16.5	57	Effective Texture:
<b>Tall Forb (&gt;= 30 cm)</b>				Depth to Mottles/Gley:
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	7.2	0.0-24.7	96	Organic Thickness:
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	4.9	0.0-26.0	68	Parent Material:
SHOWY ASTER ( <i>Aster conspicuus</i> )	4.0	0.0-17.7	89	Soil Type:
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	1.9	0.0-16.0	61	Humus Form
WILD VETCH ( <i>Vicia americana</i> )	1.5	0.0-16.2	46	<b>LFH Thickness</b>
VEINY MEADOW RUE ( <i>Thalictrum venulosum</i> )	1.2	0.0-8.0	32	cm: Mean Min Max Count
<b>Low Forb (&lt; 30 cm)</b>				0.00 0.00 0.00 0
BUNCHBERRY ( <i>Cornus canadensis</i> )	3.0	0.0-13.4	82	
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	2.2	0.0-11.4	61	
HEART-LEAVED ARNICA ( <i>Arnica cordifolia</i> )	1.5	0.0-7.9	61	
<b>Graminoid</b>				
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	15.5	0.0-34.5	86	
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	7.5	0.0-26.7	89	
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	1.8	0.0-12.6	43	

## Msh17 Pine grass (cutblock) (n=5)

### (*Calamagrostis rubescens*)

This community represents Douglas-fir, lodgepole pine or white spruce dominated stands recently harvested or burned that are currently dominated by pine grass, shrubs and forbs. Although there is not significant regeneration of trees noted in the canopy, they are slowly establishing. Analysis of cutblock production data suggests, although minimal forage is available the first 2 years after harvest, cutblocks have as much as three times the productivity of forested sites until 8 years, where productivity reduces each following year as established trees close the canopy. For this reason, under normal circumstances, if stocking rates are increased due to available cutblock forage, the increase should be reduced so forested rates are used by 15-20 years after harvest. Pine grass is generally unpalatable to livestock later in the season, but if it is grazed early in the season prior to curing livestock will utilize it as a forage source. Repeated grazing however will reduce pine grass productivity significantly (Stout & Quinton 1986).

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

**Ecosite Phase:** d2 creeping mahonia-white meadowsweet Pl

#### Plant Composition

#### Canopy Cover (%)

	Mean	Range	Const.
<b>Medium Shrub (0.5 to 2 m)</b>			
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	5.9	0.0-9.7	80
SASKATOON ( <i>Amelanchier alnifolia</i> )	3.2	0.0-14.1	60
PRICKLY ROSE ( <i>Rosa acicularis</i> )	1.8	0.0-3.8	80
SNOWBERRY ( <i>Symphoricarpos albus</i> )	1.3	0.0-4.0	60
<b>Tall Forb (&gt;= 30 cm)</b>			
SHOWY ASTER ( <i>Aster conspicuus</i> )	3.9	0.0-11.9	80
SILVERY PERENNIAL LUPINE ( <i>Lupinus argenteus</i> )	3.4	0.0-15.6	40
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	3.3	0.2-7.7	100
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	2.9	1.0-5.7	100
<b>Graminoid</b>			
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	20.7	12.6-30.2	100
TIMOTHY ( <i>Phleum pratense</i> )	3.9	0.0-10.5	60
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	3.4	0.0-17.0	20
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	2.2	0.0-11.4	20
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	1.4	0.0-6.7	40

#### Environmental Variables

Ecological Status Score: 15-20  
 Moisture Regime: Submesic (moderately fresh) (3), Mesic (fresh) (3)  
 Nutrient Regime: Mesotrophic (medium) (6)  
 Elevation (range): 1533 (1324-1640) M  
 Slope (%): 16 - 30.99 (4), 10 - 15.99 (2), 31 - 45.99 (2)  
 Aspect: Westerly (3), Southerly (2), Level (2), Easterly (1)  
 Topographic Position: Midslope (5), Lower Slope (2)

#### Soil Variables

Soil Drainage: Well drained (6), Moderately well drained (1), Rapidly drained (1)  
 Soil Subgroup:  
 Surface Texture:  
 Effective Texture:  
 Depth to Mottles/Gley:  
 Organic Thickness:  
 Parent Material:  
 Soil Type:  
 Humus Form

#### LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0



## Msh24 Creeping red fescue-Timothy (cutblock) (n=3)

(*Festuca rubra-Phleum pratense*)

This community type represents a regenerating cutblock that has been invaded by agronomic and weedy plant species. This community type can be formed under heavy grazing pressure before or after logging, or may occur when a cutblock is scarified and introduced species are present. Scarification can rapidly change the species composition of the block and provide an opportunity for invasive species. Species such as raspberry, thistle, dandelion, clover and invasive agronomic species like timothy and Kentucky bluegrass often invade and provide significant competition for tree seedlings. Careful management is required to successfully regenerate back to forested conditions. Stocking rates should not be increased beyond normal cutblock prescriptions.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

**Ecosite Phase:** d2 creeping mahonia-white meadowsweet PI

### Plant Composition

### Canopy Cover (%)

	Mean	Range	Const.
<b>Overstory Tree</b>			
WHITE SPRUCE ( <i>Picea glauca</i> )	3.3	0.0-10.0	33
BALSAM POPLAR ( <i>Populus balsamifera</i> )	1.6	0.0-5.0	33
<b>Understory Tree</b>			
LOGEPOLE PINE ( <i>Pinus contorta</i> )	29.1	20.0-60.0	100
<b>Tall Shrub (2 to 5m)</b>			
SALIX SPECIES ( <i>Salix</i> )	6.6	0.0-20.0	33
<b>Medium Shrub (0.5 to 2 m)</b>			
SASKATOON ( <i>Amelanchier alnifolia</i> )	6.5	0.0-18.7	67
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	2.7	0.0-7.2	67
PRICKLY ROSE ( <i>Rosa acicularis</i> )	1.9	1.7-2.0	100
SNOWBERRY ( <i>Symphoricarpos albus</i> )	1.5	0.0-4.5	33
DWARF BILBERRY ( <i>Vaccinium caespitosum</i> )	1.0	0.0-3.0	33
<b>Tall Forb (&gt;= 30 cm)</b>			
TALL LUNGWORT ( <i>Mertensia paniculata</i> )	2.7	0.0-8.3	33
VEINY MEADOW RUE ( <i>Thalictrum venulosum</i> )	1.7	0.0-5.2	33
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	1.3	0.0-3.1	67
WILD VETCH ( <i>Vicia americana</i> )	1.2	1.0-1.3	100
<b>Low Forb (&lt; 30 cm)</b>			
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	3.2	0.0-7.7	67
COMMON DANDELION ( <i>Taraxacum officinale</i> )	2.5	0.0-6.7	67
COMMON YARROW ( <i>Achillea millefolium</i> )	2.4	1.9-3.5	100
<b>Graminoid</b>			
TIMOTHY ( <i>Phleum pratense</i> )	23.8	3.3-46.0	100
CREEPING RED FESCUE ( <i>Festuca rubra</i> )	13.7	0.0-41.3	33
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	9.2	0.0-21.0	67
AWNLESS BROME ( <i>Bromus inermis</i> )	3.4	0.0-10.3	33

### Environmental Variables

Ecological Status Score: 5-10

Moisture Regime: Subxeric (moderately dry) (2), Submesic (moderately fresh) (1), Mesic (fresh) (1)

Nutrient Regime: Mesotrophic (medium) (2), Permesotrophic (rich) (1)

Elevation (range): 1453 (1358-1521) M

Slope (%): 16 - 30.99 (2), 6 - 9.99 (1)

Aspect: Southerly (2), Easterly (1)

Topographic Position: Lower Slope (1), Midslope (1), Upper Slope (1), Depression (1)

### Soil Variables

Soil Drainage: Well drained (3), Moderately well drained (1)

Soil Subgroup:

Surface Texture:

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness:

Parent Material:

Soil Type:

Humus Form

### LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

## Msh26 Snowberry/Pine grass-Kentucky bluegrass (cutblock/burn) (n=19)

(*Symphoricarpos occidentalis/Calamagrostis rubescens-Poa pratensis*)

This community type represents open lodgepole pine and Douglas-fir stands that have been burned or harvested and are regenerating with significant amounts of introduced species in the understory. This community type is very similar to the described Douglas-fir and pine cutblocks with a dominance of pinegrass in the understory. This particular description depicts a site that shows little sign of tree regeneration, but is exhibiting introduced species invasion. This can either suggest it's a recent disturbance, or a block that is not regenerating well. For the latter, further exploration may be necessary to adapt towards tree regeneration. Introduced species may have been present prior to the disturbance and have since expanded afterward, or may have occurred due to management during or after the disturbance. Livestock distribution issues after the disturbance can also promote these species by excessive grazing. If livestock grazing is the issue, management should be changed as excessive grazing will also increase conifer seedling damage. Excessive amounts of introduced forages may also impede tree regeneration due to competition of resources.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

**Ecosite Phase:** d2 creeping mahonia-white meadowsweet PI

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 15-20
LODGEPOLE PINE ( <i>Pinus contorta</i> )	1.1	0.0-10.3	21	Moisture Regime: Mesic (fresh) (2), Submesic (moderately fresh) (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Nutrient Regime: Mesotrophic (medium) (2), Permesotrophic (rich) (1)
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	8.6	0.0-20.5	95	Elevation (range): 1442 (1410-1506) M
PRICKLY ROSE ( <i>Rosa acicularis</i> )	1.6	0.0-5.1	90	Slope (%):
<b>Low Shrub (&lt; 0.5m)</b>				Aspect: Variable (0)
DWARF BILBERRY ( <i>Vaccinium caespitosum</i> )	3.9	0.0-16.5	53	Topographic Position:
<b>Tall Forb (&gt;= 30 cm)</b>				<b>Soil Variables</b>
YELLOW BEARDTONGUE ( <i>Penstemon confertus</i> )	7.3	0.0-20.0	79	Soil Drainage: Well drained (3)
SHOWY ASTER ( <i>Aster conspicuus</i> )	2.0	0.0-18.8	37	Soil Subgroup:
STICKY PURPLE GERANIUM ( <i>Geranium viscosissimum</i> )	1.8	0.0-5.1	84	Surface Texture:
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	1.7	0.0-22.5	42	Effective Texture:
CANADA THISTLE ( <i>Cirsium arvense</i> )	1.3	0.0-7.7	68	Depth to Mottles/Gley:
VEINY MEADOW RUE ( <i>Thalictrum venulosum</i> )	1.0	0.0-4.5	74	Organic Thickness:
<b>Low Forb (&lt; 30 cm)</b>				Parent Material:
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	6.9	1.0-18.5	100	Soil Type:
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	4.7	1.4-12.5	100	Humus Form
COMMON YARROW ( <i>Achillea millefolium</i> )	3.1	0.0-6.9	95	
THREE-FLOWERED AVENS ( <i>Geum triflorum</i> )	1.7	0.0-21.0	21	
<b>Graminoid</b>				
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	10.9	3.4-19.0	100	
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	6.8	0.0-16.1	79	
BLUNT SEDGE ( <i>Carex obtusata</i> )	5.3	1.0-10.7	100	
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	2.0	0.0-17.5	26	
TIMOTHY ( <i>Phleum pratense</i> )	2.0	0.0-9.6	79	
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	1.0	0.0-4.0	90	
				<b>LFH Thickness</b>
				Mean
				Min
				Max
				Count
cm:	0.00	0.00	0.00	0

### d3 creeping mahonia-white meadowsweet Sw (n=54)

**Natural Subregion:** Montane  
**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

#### General Description

Spruce dominated forests represent the climax forests on the more moist ranges of this ecosite. Dense forests commonly occur, minimizing much understory vegetation in mature stands. Instead, moss and needles form a significant portion of ground cover. Some sites within this phase begin to transition into subalpine communities, hence the inclusion of species such as Engelmann spruce and subalpine fir.

#### Characteristic Species

##### Tree

- [ 20.2 ] WHITE SPRUCE  
*Picea glauca*
- [ 19.9 ] ENGELMANN SPRUCE  
*Picea engelmannii*
- [ 11.2 ] SUBALPINE FIR  
*Abies lasiocarpa*

##### Shrub

- [ 6.0 ] UNDIFFERENTIATED SYMPHORICARPOS  
*Symphoricarpos*
- [ 3.7 ] GROUSEBERRY  
*Vaccinium scoparium*
- [ 2.4 ] TWINFLOWER  
*Linnaea borealis*

##### Forb

- [ 5.3 ] COMMON FIREWEED  
*Epilobium angustifolium*
- [ 2.2 ] HEART-LEAVED ARNICA  
*Arnica cordifolia*

##### Moss and Liverwort

- [ 21.3 ] UNDIFFERENTIATED MOSS - ALL GENERA  
*Moss*

##### Graminoid

- [ 3.3 ] PINE REED GRASS  
*Calamagrostis rubescens*

#### Environmental Variables

Moisture Regime: Mesic (fresh) (28), Submesic (moderately fresh) (19), Subhygric (moderately moist) (4)

Nutrient Regime: Mesotrophic (medium) (37), Permesotrophic (rich) (6), Submesotrophic (poor) (6)

Elevation (range): 1541 (1313-1981) M

Slope (%): strong slope (24), moderate slope (10), gentle slope (9), very gentle slope (6)

Aspect: Northerly (14), Westerly (13), Level (10), Southerly (8), Easterly (7)

Topographic Position: Midslope (14), Lower Slope (12), Upper Slope (6), Depression (2), Toe (1)

#### Soil Variables

Soil Drainage: Well drained (19), Rapidly drained (17), Moderately well drained (8)

Soil Subgroup: ORTHIC EUTRIC BRUNISOL (4), ELUVIATED EUTRIC BRUNISOL (3), REGO GLEYSOL (2), BRUNISOLIC GRAY LUVISOL (2), GLEYED GRAY LUVISOL (2), ORTHIC GRAY LUVISOL (1), ORTHIC HUMIC GLEYSOL (1), CUMULIC REGOSOL (1), GLEYED CUMULIC REGOSOL (1), ORTHIC REGOSOL (1), ORTHIC GLEYSOL (1), ORTHIC BLACK CHERNOZEM (1)

Surface Texture: Loam (6), Fine sandy loam (2), Sandy loam (2), Silt loam (1), Silty clay (1), Very fine sandy loam (1), Clay loam (1)

Effective Texture: Sandy clay loam (6), Clay loam (2), Loam (2), Silt loam (1), Loamy sand (1), Clay (1), Silty clay (1)

Depth to Mottles/Gley: 0 - 25 (4), 26 - 50 (1)

Organic Thickness: 0 - 5 cm (20)

Parent Material: Morainal (6), Colluvial (5), Fluvial (5), Glaciofluvial (3), Residual (2), Fluvio-lacustrine (1)

Soil Type: Dry/Silty-Loamy (2), Dry/Sandy (1)

Humus Form FIBRIMOR (7), HUMIFIBRIMOR (4), FIBRIHUMIMOR (1)

#### LFH Thickness

	Mean	Min	Max	Count
cm:	6.00	2.00	32.00	14

## Mse12 Sw/Feather moss (n=30)

### (*Picea glauca*/*Hylocomium splendens*)

This community was first described on mostly northerly aspects in the more moist range of the ecosite. Moisture probably reduced fire frequency at these sites, allowing advancement of succession to occur. In fact, the Sw/Feather moss community could represent the climax community for the more moist portions of this ecosite both in canopy and understory. As tree canopy increases and light availability depletes in the understory, there is a corresponding drop in forage productivity, until very little vegetation occurs and mosses dominate. Feather moss is common, however many moss species may occur. This community type should be considered tertiary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

**Ecosite Phase:** d3 creeping mahonia-white meadowsweet Sw

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Overstory Tree</b>					Ecological Status Score: 25
WHITE SPRUCE ( <i>Picea glauca</i> )	35.7	0.0-90.0	83		Moisture Regime: Mesic (fresh) (15), Submesic (moderately fresh) (5), Subhygric (moderately moist) (4)
LODGEPOLE PINE ( <i>Pinus contorta</i> )	4.1	0.0-85.0	37		Nutrient Regime: Mesotrophic (medium) (11), Submesotrophic (poor) (6), Permesotrophic (rich) (5)
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	3.3	0.0-17.0	43		Elevation (range): 1458 (1313-1680) M
<b>Understory Tree</b>					Slope (%): 16 - 30.99 (11), 6 - 9.99 (4), 10 - 15.99 (3), 2.5 - 5.99 (3)
WHITE SPRUCE ( <i>Picea glauca</i> )	10.4	0.0-60.0	63		Aspect: Northerly (9), Level (7), Southerly (3), Westerly (2), Easterly (2)
<b>Medium Shrub (0.5 to 2 m)</b>					Topographic Position: Lower Slope (10), Midslope (6), Upper Slope (5), Depression (2)
TWINFLOWER ( <i>Linnaea borealis</i> )	6.1	0.0-20.0	83		<b>Soil Variables</b>
PRICKLY ROSE ( <i>Rosa acicularis</i> )	2.3	0.0-14.0	80		Soil Drainage: Well drained (9), Moderately well drained (7)
<b>Tall Forb (&gt;= 30 cm)</b>					Soil Subgroup: ORTHIC EUTRIC BRUNISOL (4), ELUVIATED EUTRIC BRUNISOL (3), REGO GLEYSOL (2), BRUNISOLIC GRAY LUVISOL (2), GLEYED GRAY LUVISOL (2), ORTHIC GRAY LUVISOL (1), ORTHIC HUMIC GLEYSOL (1), CUMULIC REGOSOL (1), GLEYED CUMULIC REGOSOL (1), ORTHIC REGOSOL (1), ORTHIC GLEYSOL (1)
SHOWY ASTER ( <i>Aster conspicuus</i> )	1.6	0.0-14.0	60		Surface Texture: Loam (5), Fine sandy loam (2), Sandy loam (2), Silt loam (1), Silty clay (1), Very fine sandy loam (1), Clay loam (1)
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	1.0	0.0-10.0	43		Effective Texture: Sandy clay loam (6), Loam (2), Clay loam (2), Clay (1), Silty clay (1), Silt loam (1)
<b>Low Forb (&lt; 30 cm)</b>					Depth to Mottles/Gley: 0 - 25 (4), 26 - 50 (1)
HEART-LEAVED ARNICA ( <i>Arnica cordifolia</i> )	2.2	0.0-18.0	57		Organic Thickness: 0 - 5 cm (19)
BUNCHBERRY ( <i>Cornus canadensis</i> )	1.3	0.0-15.0	33		Parent Material: Morainal (6), Colluvial (5), Fluvial (5), Glaciofluvial (3), Residual (2), Fluvioacustrine (1)
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	1.1	0.0-7.2	50		Soil Type: Dry/Silty-Loamy (2)
<b>Graminoid</b>					Humus Form FIBRIMOR (7), HUMIFIBRIMOR (4), FIBRIHUMIMOR (1)
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	3.2	0.0-35.0	73		
<b>Moss</b>					
UNDIFFERENTIATED MOSS - ALL GENERA (Moss)	46.2	0.0-95.0	67		
					<b>LFH Thickness</b>
					<b>Mean</b>
					<b>Min</b>
					<b>Max</b>
					<b>Count</b>
					cm:
					9.00
					2.00
					32.00
					13

## Mse18 Se/Grouseberry/Moss (n=1)

(*Picea engelmannii*/*Vaccinium scoparium*/Moss)

This community represents a subalpine forested community type with mesic moisture regimes and medium nutrient regimes. Subalpine fir, Engelmann spruce, false azalea and grouseberry rarely occur at lower elevations and therefore are characteristic of the subalpine environment. The Castle area of the province is unusual in that the subalpine forested communities can be found at lower montane elevations and the montane grasslands can be found at alpine and subalpine elevations. Clearly there is a strong overlap between the Montane and Subalpine subregions of this area of the province. It is for this reason that the forested community types for the Castle area are described in this guide. This community should be considered tertiary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

**Ecosite Phase:** d3 creeping mahonia-white meadowsweet Sw

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 25
ENGELMANN SPRUCE ( <i>Picea engelmannii</i> )	20.0	20.0-20.0	100	Moisture Regime: Submesic (moderately fresh) (2)
WHITE SPRUCE ( <i>Picea glauca</i> )	20.0	20.0-20.0	100	Nutrient Regime: Mesotrophic (medium) (1)
<b>Understory Tree</b>				Elevation (range): 1484 (1428-1539) M
BALSAM POPLAR ( <i>Populus balsamifera</i> )	6.5	6.5-6.5	100	Slope (%): 10 - 15.99 (2)
ENGELMANN SPRUCE ( <i>Picea engelmannii</i> )	5.7	5.7-5.7	100	Aspect: Easterly (1), Southerly (1)
WHITE SPRUCE ( <i>Picea glauca</i> )	1.1	1.1-1.1	100	Topographic Position: Toe (1)
<b>Medium Shrub (0.5 to 2 m)</b>				<b>Soil Variables</b>
GROUSEBERRY ( <i>Vaccinium scoparium</i> )	14.9	14.9-14.9	100	Soil Drainage: Well drained (1)
WILD GOOSEBERRY ( <i>Ribes hirtellum</i> )	5.1	5.1-5.1	100	Soil Subgroup:
THIMBLEBERRY ( <i>Rubus parviflorus</i> )	3.5	3.5-3.5	100	Surface Texture:
FALSE AZALEA ( <i>Menziesia ferruginea</i> )	3.3	3.3-3.3	100	Effective Texture:
<b>Tall Forb (&gt;= 30 cm)</b>				Depth to Mottles/Gley:
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	17.5	17.5-17.5	100	Organic Thickness:
YELLOW BEARDTONGUE ( <i>Penstemon confertus</i> )	4.6	4.6-4.6	100	Parent Material:
SMOOTH ASTER ( <i>Aster laevis</i> )	1.3	1.3-1.3	100	Soil Type:
<b>Low Forb (&lt; 30 cm)</b>				Humus Form
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	67.5	67.5-67.5	100	<b>LFH Thickness</b>
COMMON YARROW ( <i>Achillea millefolium</i> )	2.6	2.6-2.6	100	Mean
<b>Graminoid</b>				Min
NORTHERN REED GRASS ( <i>Calamagrostis inexpansa</i> )	23.2	23.2-23.2	100	Max
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	9.8	9.8-9.8	100	Count
FRINGED BROME ( <i>Bromus ciliatus</i> )	4.3	4.3-4.3	100	cm:
<b>Moss</b>				0.00
UNDIFFERENTIATED MOSS - ALL GENERA (Moss)	4.7	4.7-4.7	100	0.00
				0.00
				0

## Mse19 Se/Moss (n=5)

### (*Picea engelmannii*/Moss)

This community represents a subalpine transition forested community type with mesic moisture and medium nutrient regimes. Subalpine fir and Engelmann spruce rarely occur at lower elevations and therefore are characteristic of the subalpine transition. The abundance of moss and low cover of other species in the understory (except some shrubs) shows the canopy has advanced far enough to reduce light penetration. The Castle area of the province is an instance where subalpine communities occur at Montane elevations and conversely some montane grasslands are found at alpine and subalpine elevations. Clearly there is a strong overlap between the Montane and Subalpine subregions in this area of the province. This community should be considered tertiary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

**Ecosite Phase:** d3 creeping mahonia-white meadowsweet Sw

#### Plant Composition

#### Canopy Cover (%)

	Mean	Range	Const.
<b>Overstory Tree</b>			
ENGELMANN SPRUCE ( <i>Picea engelmannii</i> )	54.0	30.0-70.0	100
<b>Understory Tree</b>			
ENGELMANN SPRUCE ( <i>Picea engelmannii</i> )	2.0	0.0-10.0	20
<b>Medium Shrub (0.5 to 2 m)</b>			
UNDIFFERENTIATED SYMPHORICARPOS ( <i>Symphoricarpos</i> )	17.5	0.0-42.8	60
BUNCHBERRY ( <i>Cornus canadensis</i> )	2.8	0.0-14.1	20
THIMBLEBERRY ( <i>Rubus parviflorus</i> )	2.6	0.0-8.7	40
TWINFLOWER ( <i>Linnaea borealis</i> )	2.4	0.0-8.7	40
<b>Tall Forb (&gt;= 30 cm)</b>			
WESTERN MEADOW RUE ( <i>Thalictrum occidentale</i> )	2.9	0.0-14.1	40
SHOWY ASTER ( <i>Aster conspicuus</i> )	2.4	0.0-11.7	40
COMMON HORSETAIL ( <i>Equisetum arvense</i> )	1.0	0.0-3.8	40
<b>Low Forb (&lt; 30 cm)</b>			
HEART-LEAVED ARNICA ( <i>Arnica cordifolia</i> )	6.6	0.0-29.0	60
<b>Moss</b>			
UNDIFFERENTIATED MOSS - ALL GENERA (Moss)	10.5	0.0-44.7	60

#### Environmental Variables

Ecological Status Score: 25  
 Moisture Regime: Submesic (moderately fresh) (2)  
 Nutrient Regime: Mesotrophic (medium) (4)  
 Elevation (range): 1532 (1395-1798) M  
 Slope (%): 2.5 - 5.99 (1), 6 - 9.99 (1), 16 - 30.99 (1)  
 Aspect: Northerly (2), Easterly (1), Southerly (1)  
 Topographic Position: Midslope (1)

#### Soil Variables

Soil Drainage: Rapidly drained (3)  
 Soil Subgroup: ORTHIC BLACK CHERNOZEM (1)  
 Surface Texture: Loam (1)  
 Effective Texture: Loamy sand (1)  
 Depth to Mottles/Gley:  
 Organic Thickness: 0 - 5 cm (1)  
 Parent Material:  
 Soil Type: Dry/Sandy (1)  
 Humus Form

#### LFH Thickness

	Mean	Min	Max	Count
cm:	3.00	3.00	3.00	1

## Mse20 Fa-PI-Sw/White meadowsweet/Pine grass (n=12)

(*Abies lasiocarpa*-*Pinus contorta*-*Picea glauca*/*Spiraea betulifolia*/*Calamagrostis rubescens*)

This community type is indicative of the overlap between the Subalpine and Montane subregions in southwestern Alberta. The overstory is dominated by subalpine fir, a species characteristic of the subalpine environment, but the understory is dominated by white meadowsweet and pine grass species characteristic of the Montane. This community type occupies submesic to mesic sites, on moderate slopes with variable aspects. Forage productivity is considered similar to other forests with pine grass and meadowsweet understories. This community should be considered tertiary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

**Ecosite Phase:** d3 creeping mahonia-white meadowsweet Sw

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Overstory Tree</b>					Ecological Status Score: 25
SUBALPINE FIR ( <i>Abies lasiocarpa</i> )	33.3	0.0-70.0	92		Moisture Regime: Submesic (moderately fresh) (8), Mesic (fresh) (4)
WHITE SPRUCE ( <i>Picea glauca</i> )	25.2	3.0-50.0	100		Nutrient Regime: Mesotrophic (medium) (12)
LODGEPOLE PINE ( <i>Pinus contorta</i> )	19.5	0.0-75.0	83		Elevation (range): 1590 (1493-1981) M
<b>Understory Tree</b>					Slope (%): 10 - 15.99 (4), 16 - 30.99 (3), 6 - 9.99 (3), 2.5 - 5.99 (2)
SUBALPINE FIR ( <i>Abies lasiocarpa</i> )	8.8	0.0-41.0	83		Aspect: Westerly (6), Southerly (3), Easterly (2), Level (1), Northerly (1)
WHITE SPRUCE ( <i>Picea glauca</i> )	8.7	0.0-17.5	92		Topographic Position: Lower Slope (1)
LODGEPOLE PINE ( <i>Pinus contorta</i> )	3.7	0.0-19.3	67		<b>Soil Variables</b>
<b>Medium Shrub (0.5 to 2 m)</b>					Soil Drainage: Rapidly drained (12), Well drained (1)
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	7.0	0.0-30.3	92		Soil Subgroup:
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	6.3	0.0-25.5	83		Surface Texture:
DWARF BILBERRY ( <i>Vaccinium caespitosum</i> )	3.3	0.0-19.3	58		Effective Texture:
FALSE AZALEA ( <i>Menziesia ferruginea</i> )	2.7	0.0-17.7	33		Depth to Mottles/Gley:
THIMBLEBERRY ( <i>Rubus parviflorus</i> )	2.0	0.0-11.7	50		Organic Thickness:
<b>Tall Forb (&gt;= 30 cm)</b>					Parent Material:
SMOOTH ASTER ( <i>Aster laevis</i> )	4.4	0.0-17.7	50		Soil Type:
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	3.0	0.0-9.5	83		Humus Form
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	2.4	0.0-6.3	75		<b>LFH Thickness</b>
MARSH BUTTERWEED ( <i>Senecio foetidus</i> )	2.2	0.0-7.3	58		Mean
<b>Low Forb (&lt; 30 cm)</b>					Min
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	15.6	0.0-40.7	83		Max
<b>Graminoid</b>					Count
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	13.5	0.0-41.0	83		cm:
SEDGE SPECIES ( <i>Carex</i> )	3.3	0.0-10.0	42		0.00
ONION GRASS ( <i>Melica spectabilis</i> )	2.8	0.0-16.7	25		0.00
<b>Moss</b>					0.00
UNDIFFERENTIATED MOSS - ALL GENERA (Moss)	24.1	0.0-49.3	92		0

## Mse21 Fa-Se/Heart-leaved arnica (n=2)

(*Abies lasiocarpa*-*Picea engelmannii*/*Arnica cordifolia*)

This community type is very similar to the Se/Moss (Mse19) community previously described, but contains a high cover of subalpine fir. Succession in the subalpine is from lodgepole pine to Engelmann spruce and subalpine fir (Archibald et al. 1996). This community type appears to represent the climatic climax for sites with subalpine environments in the Castle area of the province. The northerly aspects of the two described sites probably allowed them to escape the recent fire history and undergo succession. As these forested sites succeed towards climax there is very little light reaching the forest floor. As a result, there is little forage for domestic livestock and this community would be rated as non-use

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

**Ecosite Phase:** d3 creeping mahonia-white meadowsweet Sw

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 25
SUBALPINE FIR ( <i>Abies lasiocarpa</i> )	52.5	25.0-80.0	100	Moisture Regime: Submesic (moderately fresh) (2), Mesic (fresh) (1)
LODGEPOLE PINE ( <i>Pinus contorta</i> )	22.5	0.0-45.0	50	Nutrient Regime: Mesotrophic (medium) (2), Permesotrophic (rich) (1)
ENGELMANN SPRUCE ( <i>Picea engelmannii</i> )	16.5	15.0-18.0	100	Elevation (range): 1663 (1495-1753) M
<b>Understory Tree</b>				Slope (%): 16 - 30.99 (2), 6 - 9.99 (1)
SUBALPINE FIR ( <i>Abies lasiocarpa</i> )	11.0	0.0-22.1	50	Aspect: Level (2), Easterly (1)
ENGELMANN SPRUCE ( <i>Picea engelmannii</i> )	3.0	0.0-6.0	50	Topographic Position: Lower Slope (1)
<b>Medium Shrub (0.5 to 2 m)</b>				<b>Soil Variables</b>
FALSE AZALEA ( <i>Menziesia ferruginea</i> )	32.8	0.0-65.6	50	Soil Drainage: Rapidly drained (2), Moderately well drained (1)
GREEN ALDER ( <i>Alnus crispa</i> )	16.6	0.0-33.3	50	Soil Subgroup:
GROUSEBERRY ( <i>Vaccinium scoparium</i> )	10.6	0.0-21.2	50	Surface Texture:
<b>Tall Forb (&gt;= 30 cm)</b>				Effective Texture:
BEAR-GRASS ( <i>Xerophyllum tenax</i> )	3.4	0.0-6.9	50	Depth to Mottles/Gley:
SUGARSCOOP ( <i>Tiarella unifoliata</i> )	1.9	0.0-3.9	50	Organic Thickness:
WESTERN SWEET CICELY ( <i>Osmorhiza occidentalis</i> )	1.0	0.0-2.0	50	Parent Material:
<b>Low Forb (&lt; 30 cm)</b>				Soil Type:
HEART-LEAVED ARNICA ( <i>Arnica cordifolia</i> )	24.1	20.7-27.5	100	Humus Form
COMMON PINK WINTERGREEN ( <i>Pyrola asarifolia</i> )	1.1	0.0-2.3	50	
<b>Graminoid</b>				<b>LFH Thickness</b>
PRAIRIE SEDGE ( <i>Carex prairea</i> )	1.8	0.0-3.7	50	<b>Mean</b>
<b>Moss</b>				<b>Min</b>
UNDIFFERENTIATED MOSS - ALL GENERA ( <i>Moss</i> )	14.2	6.0-22.5	100	<b>Max</b>
				<b>Count</b>
				cm: 0.00 0.00 0.00 0



## Mse22 Se/Clover-Oxeye daisy (n=1)

(*Picea engelmannii*/*Trifolium repens*-*Chrysanthemum leucanthemum*)

This community type represents a forested community type that has been heavily utilized by livestock. The heavy utilization has allowed clover and oxeye daisy to invade into the understory. Once established oxeye daisy is very invasive and difficult to control. The authors have seen whole fields taken over by this plant species. This plant is unpalatable to livestock so when invasion occurs there is a corresponding drop in forage production

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

**Ecosite Phase:** d3 creeping mahonia-white meadowsweet Sw

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables				
	Mean	Range							
<b>Overstory Tree</b>					Ecological Status Score: 5-10				
SUBALPINE FIR ( <i>Abies lasiocarpa</i> )	12.0	0.0-0.0		100	Moisture Regime: Mesic (fresh) (0)				
ENGELMANN SPRUCE ( <i>Picea engelmannii</i> )	11.0	0.0-0.0		100	Nutrient Regime: Mesotrophic (medium) (0)				
<b>Tall Shrub (2 to 5m)</b>					Elevation (range): 1557 (0-0) M				
SASKATOON ( <i>Amelanchier alnifolia</i> )	7.0	0.0-0.0		100	Slope (%): 6 - 9.99 (0)				
<b>Medium Shrub (0.5 to 2 m)</b>					Aspect: Easterly (0)				
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	6.0	0.0-0.0		100	Topographic Position:				
THIMBLEBERRY ( <i>Rubus parviflorus</i> )	4.0	0.0-0.0		100	<b>Soil Variables</b>				
<b>Low Shrub (&lt; 0.5m)</b>					Soil Drainage: Well drained (0)				
COMMON BLUEBERRY ( <i>Vaccinium myrtilloides</i> )	7.0	0.0-0.0		100	Soil Subgroup:				
TWINFLOWER ( <i>Linnaea borealis</i> )	4.0	0.0-0.0		100	Surface Texture:				
<b>Tall Forb (&gt;= 30 cm)</b>					Effective Texture:				
OX-EYE DAISY ( <i>Leucanthemum vulgare</i> )	17.0	0.0-0.0		100	Depth to Mottles/Gley:				
<b>Low Forb (&lt; 30 cm)</b>					Organic Thickness:				
WHITE CLOVER ( <i>Trifolium repens</i> )	15.0	0.0-0.0		100	Parent Material:				
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	3.0	0.0-0.0		100	Soil Type:				
COMMON DANDELION ( <i>Taraxacum officinale</i> )	3.0	0.0-0.0		100	Humus Form				
<b>Graminoid</b>					<b>LFH Thickness</b>				
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	4.0	0.0-0.0		100	Mean	Min	Max	Count	
SEDGE SPECIES ( <i>Carex</i> )	4.0	0.0-0.0		100	cm:	0.00	0.00	0.00	0

## Msh15 White spruce/Pine grass (cutblock) (n=3)

(*Picea glauca/Calamagrostis rubescens*)

This community represents a harvested spruce stand regenerating back to white spruce. These sites are found on lower slope, northerly aspects where there is more moisture which favours the growth of white spruce (Archibald et al. 1996). Ground cover is dominated by pine grass, forbs and shrubs. These communities can increase in productivity by as much as 2 or 3 times relative to the forested phase within the first 10 years after harvest, however, as these site are located on lower slope positions in moister conditions, increased grazing may lead to other issues such as pugging, hummocking and soil erosion. Also, establishment of spruce is a slower process compared to quick growing lodgepole pine and the trees are at risk from trampling for longer periods. Increasing stocking rate is not recommended for these locations.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

**Ecosite Phase:** d3 creeping mahonia-white meadowsweet Sw

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Tall Shrub (2 to 5m)</b>				Ecological Status Score: 25
WHITE SPRUCE ( <i>Picea glauca</i> )	16.0	1.0-25.0	100	Moisture Regime: Mesic (fresh) (8)
GREEN ALDER ( <i>Alnus crispa</i> )	1.5	0.0-4.7	33	Nutrient Regime: Mesotrophic (medium) (7)
<b>Medium Shrub (0.5 to 2 m)</b>				Elevation (range): 1509 (1440-1591) M
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	4.0	0.3-10.3	100	Slope (%): 16 - 30.99 (7), 10 - 15.99 (1)
PRICKLY ROSE ( <i>Rosa acicularis</i> )	3.5	1.3-6.0	100	Aspect: Westerly (5), Northerly (2)
TWINFLOWER ( <i>Linnaea borealis</i> )	3.4	1.0-8.0	100	Topographic Position: Midslope (7), Upper Slope (1)
DWARF BILBERRY ( <i>Vaccinium caespitosum</i> )	2.3	0.0-7.0	33	<b>Soil Variables</b>
BRISTLY BLACK CURRANT ( <i>Ribes lacustre</i> )	2.0	0.7-3.3	100	Soil Drainage: Well drained (8)
<b>Tall Forb (&gt;= 30 cm)</b>				Soil Subgroup:
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	7.0	1.0-14.0	100	Surface Texture:
SHOWY ASTER ( <i>Aster conspicuus</i> )	6.9	2.3-11.0	100	Effective Texture:
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	4.6	2.0-7.4	100	Depth to Mottles/Gley:
WESTERN MEADOW RUE ( <i>Thalictrum occidentale</i> )	1.6	0.0-2.6	67	Organic Thickness:
<b>Low Forb (&lt; 30 cm)</b>				Parent Material:
BUNCHBERRY ( <i>Cornus canadensis</i> )	4.7	3.5-6.2	100	Soil Type:
<b>Graminoid</b>				Humus Form
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	15.2	10.0-19.0	100	<b>LFH Thickness</b>
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	11.6	9.7-14.2	100	Mean
				Min
				Max
				Count
				cm:
				0.00
				0.00
				0.00
				0

## d4 white meadowsweet Aw (n=174)

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

### General Description

The aspen phase of this ecosite has understories dominated by pine grass, however, productivity ranges between dry and moist within this ecosite and coincides with differing shrub canopies. Understories with meadowsweet tend to be lower in production whereas higher production occurs in stands with rose and snowberry. The most productive and rich soils are in communities with high alder cover, however, these large shrubs may reduce the accessibility to much of the forage. Disturbance in these aspen communities often leads to the invasion of non-native species, particularly grasses such as Kentucky bluegrass, timothy and smooth brome. Excessive disturbance such as long-term heavy grazing may reduce all native species and shrubs, leaving an understory dominated by introduced species.

### Characteristic Species

#### Tree

- [ 50.2 ] ASPEN  
*Populus tremuloides*
- [ 1.2 ] WHITE SPRUCE  
*Picea glauca*

#### Shrub

- [ 7.6 ] WHITE MEADOWSWEET  
*Spiraea betulifolia*
- [ 6.3 ] GREEN ALDER  
*Alnus crispa*
- [ 5.0 ] PRICKLY ROSE  
*Rosa acicularis*
- [ 1.0 ] SASKATOON  
*Amelanchier alnifolia*

#### Forb

- [ 6.1 ] CREAM-COLORED VETCHLING  
*Lathyrus ochroleucus*
- [ 6.0 ] WILD STRAWBERRY  
*Fragaria virginiana*
- [ 5.6 ] COMMON FIREWEED  
*Epilobium angustifolium*
- [ 4.8 ] SHOWY ASTER  
*Aster conspicuus*
- [ 4.4 ] LINDLEY'S ASTER  
*Aster ciliolatus*
- [ 1.2 ] WILD WHITE GERANIUM  
*Geranium richardsonii*
- [ 1.1 ] WILD VETCH  
*Vicia americana*
- [ 0.9 ] VEINY MEADOW RUE  
*Thalictrum venulosum*

#### Graminoid

- [ 19.0 ] PINE REED GRASS  
*Calamagrostis rubescens*
- [ 14.7 ] HAIRY WILD RYE  
*Elymus innovatus*

### Environmental Variables

Moisture Regime: Mesic (fresh) (116), Submesic (moderately fresh) (40), Subhygric (moderately moist) (33), Subxeric (moderately dry) (6), Hydric (wet) (2), Hygric (moist) (1)

Nutrient Regime: Mesotrophic (medium) (109), Permesotrophic (rich) (80), Eutrophic (very rich) (4), Submesotrophic (poor) (3)

Elevation (range): 1484 (450-1786) M

Slope (%): moderate slope (67), strong slope (63), very gentle slope (17), gentle slope (14), nearly level (6), level (6), very strong slope (6), steep slope (1)

Aspect: Southerly (89), Westerly (39), Easterly (35), Northerly (12), Level (9)

Topographic Position: Midslope (102), Lower Slope (40), Upper Slope (21), Level (6), Crest (5), Toe (5), Depression (1)

### Soil Variables

Soil Drainage: Well drained (156), Moderately well drained (23), Rapidly drained (14), Imperfectly drained (2), Very rapidly drained (1), Very poorly drained (1)

Soil Subgroup: ORTHIC DARK GRAY CHERNOZEM (4), DARK GRAY LUVISOL (3), ORTHIC BLACK CHERNOZEM (2), REGO DARK GRAY CHERNOZEM (1), ELUVIATED DYSTRIC BRUNISOL (1), ORTHIC EUTRIC BRUNISOL (1), DARK BROWN SOLONETZ (1)

Surface Texture: Loam (5), Clay loam (3), Silt loam (2), Silty clay (1), Silty Sand (1), Fine Sandy Clay Loam (1)

Effective Texture: Silty clay loam (3), Silt loam (2), Clay loam (2), Sandy clay loam (1), Loam (1), Clay (1), Silty clay (1)

Depth to Mottles/Gley: 26 - 50 (1)

Organic Thickness: 0 - 5 cm (18)

Parent Material: Morainal (15), Residual (2), Rock (2), Glaciolacustrine (1), Colluvial (1), Fluvial (1)

Soil Type: Moist/Fine (3), Dry/Silty-Loamy (3), Dry/Fine (2), Moist/Silty-Loamy (1)

Humus Form RAW MODER (1)

### LFH Thickness

	Mean	Min	Max	Count
cm:	6.33	2.00	18.00	10

## Msg18 Aw/Alder (n=3)

### (*Populus tremuloides*/*Alnus crispa*)

This community type is not common in the Montane, often occurring within the transition to the Upper Foothills subregion. It is generally found at low to mid slope elevations on sites with southerly aspects. Green alder dominates the tall shrub layer, and rose and raspberry occur in the low shrub layer. There is a moderate amount of forage being produced for domestic livestock in this community type although the production coming from green alder is not palatable to cattle. Consequently, this community type should be considered secondary or tertiary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

**Ecosite Phase:** d4 white meadowsweet Aw

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 25
ASPEN ( <i>Populus tremuloides</i> )	41.6	15.0-60.0	100	Moisture Regime: Submesic (moderately fresh) (2), Subhygric (moderately moist) (1)
<b>Understory Tree</b>				Nutrient Regime: Permesotrophic (rich) (4)
ASPEN ( <i>Populus tremuloides</i> )	6.2	0.0-10.0	33	Elevation (range): 1508 (1453-1555) M
<b>Tall Shrub (2 to 5m)</b>				Slope (%): 10 - 15.99 (2), 2.5 - 5.99 (1)
GREEN ALDER ( <i>Alnus crispa</i> )	18.9	17.0-20.0	100	Aspect: Easterly (2), Southerly (1), Westerly (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Topographic Position: Midslope (4)
PRICKLY ROSE ( <i>Rosa acicularis</i> )	4.3	1.3-6.2	100	<b>Soil Variables</b>
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	3.0	0.0-6.1	67	Soil Drainage: Well drained (3), Moderately well drained (1)
WHITE SPRUCE ( <i>Picea glauca</i> )	1.6	0.0-5.0	33	Soil Subgroup:
<b>Tall Forb (&gt;= 30 cm)</b>				Surface Texture:
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	9.8	6.7-14.1	100	Effective Texture:
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	7.5	3.5-9.9	100	Depth to Mottles/Gley:
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	4.4	1.7-8.0	100	Organic Thickness:
SHOWY ASTER ( <i>Aster conspicuus</i> )	3.8	1.3-5.7	100	Parent Material:
<b>Low Forb (&lt; 30 cm)</b>				Soil Type:
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	6.5	2.7-10.3	100	Humus Form
<b>Graminoid</b>				<b>LFH Thickness</b>
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	35.1	16.0-46.0	100	Mean
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	20.8	5.8-31.3	100	Min
				Max
				Count
				cm:
				7.00
				3.00
				18.00
				0

## Msg21 Aw/White meadowsweet/Kentucky bluegrass (n=4)

(*Populus tremuloides*/*Spiraea betulifolia*/*Poa pratensis*)

This community represents an Aw/White meadowsweet/Pine grass [Msg4] community that has been moderately disturbed. It falls within the mesic/medium ecosite for the Montane subregion typical of pine grass. The understory has more white meadowsweet than rose, and represents the drier range within this ecosite's edatope as white meadowsweet is well adapted to growing on dry rocky slopes (MacKinnon et al. 1992). With higher levels of grazing, aspen stands are prone to more exposed soil and the introduction of species such as Kentucky bluegrass and timothy. Most aspen stands within this ecosite respond similarly, with prolonged disturbance leading to understories dominated by Kentucky bluegrass and dandelion, timothy or brome.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

**Ecosite Phase:** d4 white meadowsweet Aw

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 15-20
ASPEN ( <i>Populus tremuloides</i> )	56.2	45.0-70.0	100	Moisture Regime: Mesic (fresh) (1)
WHITE SPRUCE ( <i>Picea glauca</i> )	1.0	0.0-4.0	25	Nutrient Regime: Mesotrophic (medium) (1)
<b>Understory Tree</b>				Elevation (range): 1453 (1409-1475) M
ASPEN ( <i>Populus tremuloides</i> )	9.5	3.5-22.0	100	Slope (%): 6 - 9.99 (1), 10 - 15.99 (1)
<b>Tall Shrub (2 to 5m)</b>				Aspect: Northerly (2), Westerly (2)
SASKATOON ( <i>Amelanchier alnifolia</i> )	1.4	0.0-4.5	75	Topographic Position: Midslope (1)
<b>Medium Shrub (0.5 to 2 m)</b>				<b>Soil Variables</b>
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	8.5	0.7-17.7	100	Soil Drainage: Well drained (1)
WILD RED RASPBERRY ( <i>Rubus idaeus</i> )	7.8	0.9-12.7	100	Soil Subgroup:
PRICKLY ROSE ( <i>Rosa acicularis</i> )	5.4	3.3-7.5	100	Surface Texture:
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	4.8	1.1-10.7	100	Effective Texture:
<b>Tall Forb (&gt;= 30 cm)</b>				Depth to Mottles/Gley:
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	6.2	3.5-10.8	100	Organic Thickness:
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	4.2	0.0-16.0	50	Parent Material:
WILD WHITE GERANIUM ( <i>Geranium richardsonii</i> )	3.7	0.0-7.9	75	Soil Type:
VEINY MEADOW RUE ( <i>Thalictrum venulosum</i> )	3.5	0.0-11.3	75	Humus Form
<b>Low Forb (&lt; 30 cm)</b>				<b>LFH Thickness</b>
WESTERN CANADA VIOLET ( <i>Viola canadensis</i> )	8.4	0.0-12.7	75	Mean
WHITE CLOVER ( <i>Trifolium repens</i> )	4.2	0.0-12.5	75	Min
COMMON DANDELION ( <i>Taraxacum officinale</i> )	3.5	1.1-5.7	100	Max
<b>Graminoid</b>				Count
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	7.9	2.2-23.0	100	cm:
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	7.2	0.0-10.9	75	0.00
TIMOTHY ( <i>Phleum pratense</i> )	5.5	0.0-9.3	75	0.00
PRESL SEDGE ( <i>Carex preslii</i> )	1.6	0.0-5.2	75	0.00
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	1.3	0.0-4.1	75	0

## Msg23 Aw/Orchard grass-Kentucky bluegrass (n=10)

### (*Populus tremuloides*/*Dactylis glomerata*-*Poa pratensis*)

This community represents old range improvement areas completed in the 1970's and 1980's throughout the forest reserve. These can also represent aspen stands next to range improvements that have been invaded by introduced species. In general, aspen communities and meadows were cleared by dragging and/or herbicide, and broadcast seeded to mixes of orchard grass, timothy, creeping red fescue and meadow foxtail. In many cases orchard grass and creeping red fescue established well at the onset, however Kentucky bluegrass has since invaded as well. Many of these areas may have been dominated by aspen prior to treatment, and aspen re-establishment is occurring. These are distinguished from the Aw/Timothy-Kentucky bluegrass [Msg7] community type due to the establishment of other seeded introduced species apart from timothy or brome.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

**Ecosite Phase:** d4 white meadowsweet Aw

#### Plant Composition

#### Canopy Cover (%)

	Mean	Range	Const.
<b>Understory Tree</b>			
ASPEN ( <i>Populus tremuloides</i> )	9.9	0.0-35.0	50
BALSAM POPLAR ( <i>Populus balsamifera</i> )	1.0	0.0-5.0	40
<b>Medium Shrub (0.5 to 2 m)</b>			
PRICKLY ROSE ( <i>Rosa acicularis</i> )	2.2	0.0-7.4	80
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	1.4	0.0-7.2	40
<b>Tall Forb (&gt;= 30 cm)</b>			
UNDIFFERENTIATED CLOVER ( <i>Trifolium</i> )	7.6	0.0-32.7	60
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	4.6	0.0-21.7	70
STICKY PURPLE GERANIUM ( <i>Geranium viscosissimum</i> )	1.1	0.0-4.3	40
<b>Low Forb (&lt; 30 cm)</b>			
COMMON DANDELION ( <i>Taraxacum officinale</i> )	6.3	0.9-29.2	100
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	3.6	0.0-9.1	90
<b>Graminoid</b>			
ORCHARD GRASS ( <i>Dactylis glomerata</i> )	18.8	0.5-42.3	100
CREEPING RED FESCUE ( <i>Festuca rubra</i> )	16.2	0.0-68.0	40
TIMOTHY ( <i>Phleum pratense</i> )	4.9	0.0-14.3	90
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	4.9	0.0-14.1	70
AWNLESS BROME ( <i>Bromus inermis</i> )	2.2	0.0-15.3	50
ROUGH HAIR GRASS ( <i>Agrostis scabra</i> )	1.5	0.0-13.8	20

#### Environmental Variables

Ecological Status Score: 5-10

Moisture Regime: Mesic (fresh) (10), Subhygric (moderately moist) (4), Submesic (moderately fresh) (1)

Nutrient Regime: Mesotrophic (medium) (13), Permesotrophic (rich) (2)

Elevation (range): 1415 (450-1555) M

Slope (%): 10 - 15.99 (7), 16 - 30.99 (4), 2.5 - 5.99 (2), 6 - 9.99 (1), 0.5 - 2.49 (1)

Aspect: Southerly (12), Westerly (1), Northerly (1), Easterly (1)

Topographic Position: Midslope (7), Lower Slope (6), Level (1)

#### Soil Variables

Soil Drainage: Well drained (14), Moderately well drained (1)

Soil Subgroup:

Surface Texture:

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (3)

Parent Material: Morainal (4)

Soil Type:

Humus Form

#### LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

## Msg4 Aw/White meadowsweet/Pine grass (n=28)

(*Populus tremuloides*/*Spiraea betulifolia*/*Calamagrostis rubescens*)

This community is one of several community types representing the mesic/medium aspen phase of this ecosite for the Montane subregion. These sites can succeed to Douglas-fir, white spruce or lodgepole pine stands. This community's understory is dominated by white meadowsweet, indicating slightly drier conditions and shallower soils than a community dominated by pine grass. White meadowsweet is well adapted to growing on drier rocky slopes (MacKinnon et al. 1992). In the vicinity of the Crowsnest Pass creeping mahonia is also common on these sites (Archibald et al. 1996). This community produces a moderate amount of forage for domestic livestock and should be considered secondary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

**Ecosite Phase:** d4 white meadowsweet Aw

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 25
ASPEN ( <i>Populus tremuloides</i> )	49.2	15.0-85.0	100	Moisture Regime: Mesic (fresh) (17), Subhygric (moderately moist) (8), Submesic (moderately fresh) (6)
LODGEPOLE PINE ( <i>Pinus contorta</i> )	1.4	0.0-15.0	25	Nutrient Regime: Permesotrophic (rich) (15), Mesotrophic (medium) (14)
WHITE SPRUCE ( <i>Picea glauca</i> )	1.1	0.0-10.0	21	Elevation (range): 1510 (1300-1661) M
<b>Medium Shrub (0.5 to 2 m)</b>				Slope (%): 16 - 30.99 (11), 10 - 15.99 (10), 0.5 - 2.49 (1), 2.5 - 5.99 (1), 6 - 9.99 (1)
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	18.8	0.0-48.0	96	Aspect: Southerly (10), Westerly (9), Easterly (7), Northerly (1)
PRICKLY ROSE ( <i>Rosa acicularis</i> )	3.7	0.0-11.0	93	Topographic Position: Midslope (14), Upper Slope (4), Lower Slope (4), Crest (1)
SASKATOON ( <i>Amelanchier alnifolia</i> )	1.9	0.0-10.8	64	<b>Soil Variables</b>
WILD RED RASPBERRY ( <i>Rubus idaeus</i> )	1.4	0.0-13.1	36	Soil Drainage: Well drained (24), Rapidly drained (5), Moderately well drained (2)
<b>Tall Forb (&gt;= 30 cm)</b>				Soil Subgroup:
SHOWY ASTER ( <i>Aster conspicuus</i> )	6.3	0.0-23.7	93	Surface Texture:
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	6.1	0.0-14.1	93	Effective Texture:
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	3.4	0.0-15.7	79	Depth to Mottles/Gley:
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	3.1	0.0-17.2	79	Organic Thickness:
<b>Low Forb (&lt; 30 cm)</b>				Parent Material:
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	4.7	1.0-15.7	100	Soil Type:
<b>Graminoid</b>				Humus Form
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	18.8	0.0-51.0	96	<b>LFH Thickness</b>
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	3.9	0.0-15.7	61	Mean
				Min
				Max
				Count
				cm: 0.00 0.00 0.00 0

## Msg5 Aw/Rose/Pine grass (n=63)

### (*Populus tremuloides*/*Rosa acicularis*/*Calamagrostis rubescens*)

This community is one of several community types which represent the mesic/medium ecosite for the Montane subregion. These sites can succeed to Douglas-fir, white spruce or lodgepole pine stands, depending on the moisture range within this ecosite. This community, dominated by an aspen overstory and an understory of pine grass, represents an earlier successional stage of the PI/Pine grass community type. It is very similar to the described Aw/White meadowsweet/Pine grass [Msg4] community type, but the high cover of pine grass and low cover of white meadowsweet may indicate slightly moister, better developed soils. Pine grass is generally unpalatable to livestock, but if it is grazed early in the spring they will utilize it as a forage source (Stout and Quinton 1986). The forage productivity of this community type is moderate and decreases with intensive grazing. As a result, this community should be rated as secondary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

**Ecosite Phase:** d4 white meadowsweet Aw

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 20-25
ASPEN ( <i>Populus tremuloides</i> )	48.5	0.0-80.0	97	Moisture Regime: Mesic (fresh) (50), Subhygric (moderately moist) (14), Submesic (moderately fresh) (13), Subxeric (moderately dry) (3), Hydric (wet) (1)
WHITE SPRUCE ( <i>Picea glauca</i> )	1.2	0.0-10.0	30	Nutrient Regime: Mesotrophic (medium) (50), Permesotrophic (rich) (27), Submesotrophic (poor) (2), Eutrophic (very rich) (1)
<b>Understory Tree</b>				Elevation (range): 1511 (1350-1768) M
ASPEN ( <i>Populus tremuloides</i> )	5.2	0.0-70.0	53	Slope (%): 10 - 15.99 (28), 16 - 30.99 (24), 6 - 9.99 (5), 31 - 45.99 (5), 0.5 - 2.49 (3), 2.5 - 5.99 (3), 0 - 0.49 (2)
<b>Medium Shrub (0.5 to 2 m)</b>				Aspect: Southerly (33), Easterly (14), Westerly (13), Northerly (3), Level (3)
PRICKLY ROSE ( <i>Rosa acicularis</i> )	7.1	0.0-25.0	89	Topographic Position: Midslope (50), Lower Slope (13), Upper Slope (8), Crest (3), Level (1), Toe (1)
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	1.4	0.0-10.0	38	
SASKATOON ( <i>Amelanchier alnifolia</i> )	1.2	0.0-11.7	43	
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	1.2	0.0-31.0	30	
<b>Tall Forb (&gt;= 30 cm)</b>				<b>Soil Variables</b>
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	5.4	0.0-25.3	78	Soil Drainage: Well drained (65), Moderately well drained (7), Rapidly drained (7), Imperfectly drained (2)
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	4.7	0.0-22.3	94	Soil Subgroup: ORTHIC DARK GRAY CHERNOZEM (3), DARK GRAY LUVISOL (2), ORTHIC BLACK CHERNOZEM (2), ORTHIC EUTRIC BRUNISOL (1), REGO DARK GRAY CHERNOZEM (1), DARK BROWN SOLONETZ (1), ELUVIATED DYSTRIC BRUNISOL (1)
SHOWY ASTER ( <i>Aster conspicuus</i> )	4.4	0.0-38.7	68	Surface Texture: Loam (4), Clay loam (3), Silt loam (2)
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	4.0	0.0-27.1	64	Effective Texture: Silty clay loam (3), Silt loam (2), Clay loam (2), Clay (1), Loam (1)
WILD WHITE GERANIUM ( <i>Geranium richardsonii</i> )	3.6	0.0-22.0	57	Depth to Mottles/Gley: 26 - 50 (1)
WILD VETCH ( <i>Vicia americana</i> )	3.5	0.0-23.7	92	Organic Thickness: 0 - 5 cm (11)
VEINY MEADOW RUE ( <i>Thalictrum venulosum</i> )	2.7	0.0-21.3	41	Parent Material: Morainal (9), Residual (2), Rock (2), Glaciolacustrine (1), Fluvial (1), Colluvial (1)
<b>Low Forb (&lt; 30 cm)</b>				Soil Type: Dry/Silty-Loamy (3), Moist/Fine (3), Moist/Silty-Loamy (1)
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	7.0	0.0-25.0	94	Humus Form RAW MODER (1)
COMMON DANDELION ( <i>Taraxacum officinale</i> )	2.3	0.0-19.1	84	
COMMON YARROW ( <i>Achillea millefolium</i> )	1.5	0.0-6.2	87	
<b>Graminoid</b>				<b>LFH Thickness</b>
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	17.4	0.0-55.0	89	Mean
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	5.2	0.0-23.5	67	Min
BLUEJOINT ( <i>Calamagrostis canadensis</i> )	1.4	0.0-20.7	18	Max
FRINGED BROME ( <i>Bromus ciliatus</i> )	1.3	0.0-20.0	35	Count
				cm: 6.00 2.00 10.00 8



## Msg6 Aw/Pine grass-Kentucky bluegrass (n=30)

(*Populus tremuloides/Calamagrostis rubescens-Poa pratensis*)

This community type is similar to the Aw/Rose/Pinegrass [Msg5] community, but has experienced disturbance. In this case, the disturbance allowed invasion of introduced species such as Kentucky bluegrass and timothy, yet a diversity of native species still exist. For example, a community heavily grazed in the past but with corrected stocking will allow shrub and forb regeneration to occur. This increase in shrubs and forbs has been noted within aspen range reference areas after protection. There are other vectors however that can introduce non-native species to these stands, such as recreation and proximity to industrial disturbance. This community is productive, however excessive utilization will promote higher cover of introduced species.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

**Ecosite Phase:** d4 white meadowsweet Aw

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 15-20
ASPEN ( <i>Populus tremuloides</i> )	28.5	0.0-70.0	90	Moisture Regime: Mesic (fresh) (25), Submesic (moderately fresh) (10), Subxeric (moderately dry) (2), Hygric (moist) (1)
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	1.2	0.0-20.0	13	Nutrient Regime: Mesotrophic (medium) (21), Permesotrophic (rich) (15), Submesotrophic (poor) (1), Eutrophic (very rich) (1)
<b>Understory Tree</b>				Elevation (range): 1513 (1378-1769) M
ASPEN ( <i>Populus tremuloides</i> )	4.6	0.0-50.0	40	Slope (%): 16 - 30.99 (16), 10 - 15.99 (15), 2.5 - 5.99 (5), 31 - 45.99 (1), 46 - 70.99 (1), 6 - 9.99 (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Aspect: Southerly (18), Westerly (9), Easterly (7), Northerly (3), Level (2)
PRICKLY ROSE ( <i>Rosa acicularis</i> )	5.5	0.0-26.3	90	Topographic Position: Midslope (18), Lower Slope (8), Upper Slope (7), Crest (1), Level (1), Toe (1)
WILD RED RASPBERRY ( <i>Rubus idaeus</i> )	3.4	0.0-26.7	77	
SASKATOON ( <i>Amelanchier alnifolia</i> )	1.1	0.0-15.0	27	
<b>Tall Forb (&gt;= 30 cm)</b>				<b>Soil Variables</b>
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	4.4	0.0-20.3	77	Soil Drainage: Well drained (30), Moderately well drained (5), Rapidly drained (2), Very rapidly drained (1)
WILD WHITE GERANIUM ( <i>Geranium richardsonii</i> )	4.3	0.0-28.8	83	Soil Subgroup:
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	4.1	0.0-13.1	97	Surface Texture:
VEINY MEADOW RUE ( <i>Thalictrum venulosum</i> )	3.0	0.0-14.7	67	Effective Texture:
SHOWY ASTER ( <i>Aster conspicuus</i> )	2.7	0.0-14.7	50	Depth to Mottles/Gley:
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	2.3	0.0-25.9	43	Organic Thickness:
WILD VETCH ( <i>Vicia americana</i> )	2.2	0.0-13.2	97	Parent Material:
<b>Low Forb (&lt; 30 cm)</b>				Soil Type:
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	5.3	1.0-15.5	100	Humus Form
COMMON DANDELION ( <i>Taraxacum officinale</i> )	3.4	0.0-11.7	97	
HEART-LEAVED ARNICA ( <i>Arnica cordifolia</i> )	2.6	0.0-26.3	23	
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	1.5	0.0-5.7	90	
WESTERN CANADA VIOLET ( <i>Viola canadensis</i> )	1.3	0.0-8.7	37	
<b>Graminoid</b>				
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	9.7	0.0-31.2	80	
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	7.9	0.0-27.5	90	
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	4.5	0.0-20.0	63	
TIMOTHY ( <i>Phleum pratense</i> )	3.8	0.0-33.0	70	
				<b>LFH Thickness</b>
				Mean
				Min
				Max
				Count
				cm:
				0.00
				0.00
				0.00
				0

## Msg7 Aw/Timothy-Kentucky bluegrass (n=36)

### (*Populus tremuloides*/*Phleum pratense*-*Poa pratensis*)

Heavy disturbance has shifted the understory away from native species typical to this Aw phase and allowed dandelion, clover, timothy and Kentucky bluegrass to establish and flourish on the site. This change in species composition was seen in analysis by Willoughby (1995) regarding grazing pressure in aspen communities. It appears that aspen grazed heavily for prolonged periods have a low cover of native shrubs, forbs and grass species and a high cover of Kentucky bluegrass, timothy, clover and dandelion. The invasion of non-native species onto this site makes this community very productive and attractive for domestic livestock. If this site has recently been invaded by agronomics, a change in management may allow for some recovery. However, many sites have seen historic heavy grazing and environmental factors favouring the shift to agronomic composition, and these sites may have little potential to recover to a native understory. This community represents all aspen communities in both the d or e ecosite that have experienced heavy grazing, as they all become similar in understory but vary in productivity.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

**Ecosite Phase:** d4 white meadowsweet Aw

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 5-10
ASPEN ( <i>Populus tremuloides</i> )	30.5	0.0-70.0	92	Moisture Regime: Mesic (fresh) (13), Submesic (moderately fresh) (8), Subhygric (moderately moist) (6), Subxeric (moderately dry) (1), Hydric (wet) (1)
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	0.3	0.0-4.7	14	Nutrient Regime: Permesotrophic (rich) (17), Mesotrophic (medium) (10), Eutrophic (very rich) (2)
<b>Medium Shrub (0.5 to 2 m)</b>				Elevation (range): 1481 (1250-1786) M
PRICKLY ROSE ( <i>Rosa acicularis</i> )	3.2	0.0-46.0	44	Slope (%): 16 - 30.99 (8), 2.5 - 5.99 (5), 6 - 9.99 (5), 10 - 15.99 (4), 0 - 0.49 (4), 0.5 - 2.49 (1)
ASPEN ( <i>Populus tremuloides</i> )	2.4	0.0-40.0	19	Aspect: Southerly (15), Westerly (4), Easterly (4), Level (4), Northerly (2)
WILD RED RASPBERRY ( <i>Rubus idaeus</i> )	2.4	0.0-27.0	42	Topographic Position: Lower Slope (9), Midslope (8), Level (3), Toe (3), Upper Slope (2), Depression (1)
<b>Tall Forb (&gt;= 30 cm)</b>				
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	3.5	0.0-14.9	78	<b>Soil Variables</b>
WILD VETCH ( <i>Vicia americana</i> )	1.7	0.0-9.9	75	Soil Drainage: Well drained (19), Moderately well drained (7), Very poorly drained (1)
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	1.6	0.0-10.0	47	Soil Subgroup: ORTHIC DARK GRAY CHERNOZEM (1), DARK GRAY LUVISOL (1)
SHOWY ASTER ( <i>Aster conspicuus</i> )	1.1	0.0-37.3	11	Surface Texture: Silty Sand (1), Fine Sandy Clay Loam (1), Silty clay (1), Loam (1)
VEINY MEADOW RUE ( <i>Thalictrum venulosum</i> )	1.0	0.0-16.7	36	Effective Texture: Sandy clay loam (1), Silty clay (1)
<b>Low Forb (&lt; 30 cm)</b>				Depth to Mottles/Gley:
COMMON DANDELION ( <i>Taraxacum officinale</i> )	8.2	0.0-39.0	81	Organic Thickness: 0 - 5 cm (4)
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	2.8	0.0-10.0	81	Parent Material: Morainal (2)
WHITE CLOVER ( <i>Trifolium repens</i> )	2.6	0.0-23.3	33	Soil Type: Dry/Fine (2)
COMMON YARROW ( <i>Achillea millefolium</i> )	1.5	0.0-7.6	81	Humus Form
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	1.3	0.0-10.0	78	<b>LFH Thickness</b>
WESTERN CANADA VIOLET ( <i>Viola canadensis</i> )	1.3	0.0-11.7	39	<b>Mean</b> <b>Min</b> <b>Max</b> <b>Count</b>
<b>Graminoid</b>				cm:            6.00    5.00    6.00    2
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	30.0	0.0-71.0	83	
TIMOTHY ( <i>Phleum pratense</i> )	12.5	0.0-46.3	81	
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	1.5	0.0-41.7	17	

## d5 creeping mahonia-white meadowsweet shrubland (n=72)

**Natural Subregion:** Montane  
**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

### General Description

This ecosite represents many types of depressional areas on slopes such as swales or gullies. High amounts of rose, saskatoon and snowberry occur in these swales, and without fire disturbance will slowly expand onto grasslands. If left undisturbed, these areas will establish larger shrubs and eventually even aspen and spruce. These sites typically have rich moist soils and are prone to invasion of introduced species, therefore tame species and weeds are often found.

### Characteristic Species

#### Shrub

- [ 13.0 ] SNOWBERRY (BUCKBRUSH)  
*Symphoricarpos occidentalis*
- [ 9.6 ] BIG SAGEBRUSH  
*Artemisia tridentata*
- [ 3.5 ] ALDER-LEAVED BUCKTHORN  
*Rhamnus alnifolia*
- [ 2.9 ] SASKATOON  
*Amelanchier alnifolia*
- [ 2.5 ] PRICKLY ROSE  
*Rosa acicularis*

#### Graminoid

- [ 12.6 ] KENTUCKY BLUEGRASS  
*Poa pratensis*
- [ 4.7 ] TIMOTHY  
*Phleum pratense*
- [ 4.7 ] SEDGE SPECIES  
*Carex*

### Environmental Variables

Moisture Regime: Mesic (fresh) (21), Submesic (moderately fresh) (16), Subhygric (moderately moist) (3)

Nutrient Regime: Mesotrophic (medium) (38), Permesotrophic (rich) (15)

Elevation (range): 1418 (1151-1772) M

Slope (%): strong slope (17), vity strong slope (8), very gentle slope (6), moderate slope (4), level (2), nearly level (1)

Aspect: Southerly (28), Westerly (9), Easterly (4), Level (4), Northerly (3)

Topographic Position: Midslope (17), Upper Slope (8), Lower Slope (8), Level (5), Toe (3)

### Soil Variables

Soil Drainage: Rapidly drained (25), Well drained (21), Moderately well drained (1)

Soil Subgroup: REGO BLACK CHERNOZEM (1)

Surface Texture: Loamy fine sand (2)

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (3)

Parent Material: Fluvial (1)

Soil Type:

Humus Form

### LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

# Msb16 Big sagebrush-Buckthorn/Kentucky bluegrass (n=18)

(*Artemisia tridentata-Rhamnus alnifolia/Poa pratensis*)

This community type is rare and was described on the valley bottoms and meadows adjacent to the South Castle River. Buckthorn tends to grow in the moist areas of the meadows which have fine textured soils. In contrast big sagebrush is found on the drier, gravelly soils of old creek beds. These meadows have been extensively utilized by livestock and recreationists allowing Kentucky bluegrass, timothy and dandelion to establish in the understory of these shrub species. It is difficult to determine what the understory vegetation was prior to disturbance. It is suspected that this site was probably dominated by rough fescue, although may be more moist than rough fescue-dominated communities in the rest of the Montane. Data for this site is primarily from the South Castle Bench Range Reference Area.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

**Ecosite Phase:** d5 creeping mahonia-white meadowsweet shrubland

## Plant Composition

## Canopy Cover (%)

	Mean	Range	Const.
<b>Medium Shrub (0.5 to 2 m)</b>			
SNOWBERRY (BUCKBRUSH) <i>(Symphoricarpos occidentalis)</i>	13.2	3.5-22.7	100
BIG SAGEBRUSH <i>(Artemisia tridentata)</i>	8.7	0.0-21.5	89
ALDER-LEAVED BUCKTHORN <i>(Rhamnus alnifolia)</i>	7.1	0.0-20.7	89
<b>Tall Forb (&gt;= 30 cm)</b>			
YELLOW BEARDTONGUE <i>(Penstemon confertus)</i>	23.2	5.9-49.7	100
COMMON FIREWEED <i>(Epilobium angustifolium)</i>	1.7	0.2-6.4	100
WILD VETCH <i>(Vicia americana)</i>	1.6	0.4-3.3	100
<b>Low Forb (&lt; 30 cm)</b>			
COMMON YARROW <i>(Achillea millefolium)</i>	9.9	5.6-19.9	100
WILD STRAWBERRY <i>(Fragaria virginiana)</i>	4.1	0.8-8.5	100
COMMON DANDELION <i>(Taraxacum officinale)</i>	3.0	0.5-5.8	100
<b>Graminoid</b>			
KENTUCKY BLUEGRASS <i>(Poa pratensis)</i>	13.6	0.2-36.1	100
TIMOTHY <i>(Phleum pratense)</i>	6.5	0.0-11.1	94
SLENDER WHEAT GRASS <i>(Agropyron trachycaulum)</i>	1.2	0.0-5.0	83

## Environmental Variables

Ecological Status Score: 15-20  
 Moisture Regime: Mesic (fresh) (1)  
 Nutrient Regime: Mesotrophic (medium) (1)  
 Elevation (range): 1440 (1440-1440) M  
 Slope (%): 2.5 - 5.99 (2)  
 Aspect: Westerly (2)  
 Topographic Position: Level (1)

## Soil Variables

Soil Drainage: Rapidly drained (1)  
 Soil Subgroup:  
 Surface Texture:  
 Effective Texture:  
 Depth to Mottles/Gley:  
 Organic Thickness:  
 Parent Material:  
 Soil Type:  
 Humus Form

## LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

# Msb16g Big sagebrush-Buckthorn/ (n=0)

(*Artemisia tridentata-Rhamnus alnifolia*)

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

**Ecosite Phase:** d5 creeping mahonia-white meadowsweet shrubland

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables				
	Mean	Range							
<b>Medium Shrub (0.5 to 2 m)</b>					Ecological Status Score: 15-20				
SNOWBERRY (BUCKBRUSH) <i>(Symphoricarpos occidentalis)</i>	13.2	3.5-22.7		100	Moisture Regime: Mesic (fresh) (1)				
BIG SAGEBRUSH <i>(Artemisia tridentata)</i>	8.7	0.0-21.5		89	Nutrient Regime: Mesotrophic (medium) (1)				
ALDER-LEAVED BUCKTHORN <i>(Rhamnus alnifolia)</i>	7.1	0.0-20.7		89	Elevation (range): 1440 (1440-1440) M				
<b>Tall Forb (&gt;= 30 cm)</b>					Slope (%): 2.5 - 5.99 (2)				
YELLOW BEARDTONGUE <i>(Penstemon confertus)</i>	23.2	5.9-49.7		100	Aspect: Westerly (2)				
COMMON FIREWEED <i>(Epilobium angustifolium)</i>	1.7	0.2-6.4		100	Topographic Position: Level (1)				
WILD VETCH <i>(Vicia americana)</i>	1.6	0.4-3.3		100	<b>Soil Variables</b>				
<b>Low Forb (&lt; 30 cm)</b>					Soil Drainage: Rapidly drained (1)				
COMMON YARROW <i>(Achillea millefolium)</i>	9.9	5.6-19.9		100	Soil Subgroup:				
WILD STRAWBERRY <i>(Fragaria virginiana)</i>	4.1	0.8-8.5		100	Surface Texture:				
<b>Graminoid</b>					Effective Texture:				
SLENDER WHEAT GRASS <i>(Agropyron trachycaulum)</i>	1.2	0.0-5.0		83	Depth to Mottles/Gley:				
					Organic Thickness:				
					Parent Material:				
					Soil Type:				
					Humus Form				
					<b>LFH Thickness</b>	<b>Mean</b>	<b>Min</b>	<b>Max</b>	<b>Count</b>
					cm:	0.00	0.00	0.00	0

## Msb6a Snowberry-Rose-Saskatoon (n=30)

(*Symphoricarpos occidentalis*-*Rosa acicularis*-*Amelanchier alnifolia*)

This community type represents moist pockets of shrubland in gullies, swales and depressional areas within rough fescue dominated grasslands. It is similar to shrub dominated ecosite phases in drier ecosites, but this community type has access to higher moisture resulting in less cover of upland grassland species (i.e., rough fescue, Parry oat grass, Idaho fescue). Higher cover of shrub species will trap snow, increasing moisture and shading of the understory to create more forested understory conditions. If left undisturbed by fire, these sites will eventually succeed to aspen to possibly form the Aw/Snowberry-Saskatoon [Msg9] or Aw/Rose/Pinegrass [Msg5] community types. Apart from fire, it has been found that mowing and/or herbicide treatment is effective in controlling snowberry within this community (Llewellyn 2006).

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

**Ecosite Phase:** d5 creeping mahonia-white meadowsweet shrubland

### Plant Composition

### Canopy Cover (%)

	Mean	Range	Const.
<b>Medium Shrub (0.5 to 2 m)</b>			
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	8.2	0.0-42.0	57
SASKATOON ( <i>Amelanchier alnifolia</i> )	5.8	0.0-32.4	67
PRICKLY ROSE ( <i>Rosa acicularis</i> )	5.1	0.0-29.7	63
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	1.8	0.0-13.9	33
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	1.4	0.0-21.7	27
<b>Tall Forb (&gt;= 30 cm)</b>			
SILKY PERENNIAL LUPINE ( <i>Lupinus sericeus</i> )	3.9	0.0-26.3	60
<b>Low Forb (&lt; 30 cm)</b>			
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	3.5	0.0-12.3	93
COMMON YARROW ( <i>Achillea millefolium</i> )	3.1	0.0-11.2	97
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	2.7	0.0-22.8	50
SMALL-LEAVED PUSSYTOES ( <i>Antennaria parvifolia</i> )	2.0	0.0-19.9	43
<b>Graminoid</b>			
SEDGE SPECIES ( <i>Carex</i> )	9.4	0.0-61.9	47
IDAHO FESCUE ( <i>Festuca idahoensis</i> )	6.5	0.0-26.0	47
JUNE GRASS ( <i>Koeleria macrantha</i> )	5.7	0.0-17.6	70
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	5.6	0.0-32.5	60
PARRY OAT GRASS ( <i>Danthonia parryi</i> )	2.1	0.0-12.7	37

### Environmental Variables

Ecological Status Score: 27-40  
 Moisture Regime: Submesic (moderately fresh) (9), Mesic (fresh) (9)  
 Nutrient Regime: Mesotrophic (medium) (22), Permesotrophic (rich) (5)  
 Elevation (range): 1567 (1372-1768) M  
 Slope (%): 16 - 30.99 (9), 31 - 45.99 (8), 2.5 - 5.99 (2)  
 Aspect: Southerly (17), Westerly (3)  
 Topographic Position: Midslope (10), Upper Slope (4), Lower Slope (3)

### Soil Variables

Soil Drainage: Rapidly drained (17), Well drained (7)  
 Soil Subgroup:  
 Surface Texture:  
 Effective Texture:  
 Depth to Mottles/Gley:  
 Organic Thickness:  
 Parent Material:  
 Soil Type:  
 Humus Form

### LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

# Msc11 Snowberry-Rose/Kentucky bluegrass (n=22)

(*Symphoricarpos occidentalis-Rosa acicularis/Poa pratensis*)

This community represents swales and snow catchment areas that have been both encroached by shrubs and invaded by introduced grasses. The increased moisture content on these sites favours the growth of rose and snowberry, and lack of fire disturbance allows them to establish. This community will likely succeed to an aspen stand unless fire suppresses tree encroachment. The high moisture and nutrient content of the site makes this community productive, however the high moisture also provides opportunity for introduced species to invade.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

**Ecosite Phase:** d5 creeping mahonia-white meadowsweet shrubland

## Plant Composition

## Canopy Cover (%)

## Environmental Variables

	Canopy Cover (%)			
	Mean	Range	Const.	
<b>Medium Shrub (0.5 to 2 m)</b>				
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	19.8	0.0-70.0	55	Ecological Status Score: 15-20
PRICKLY ROSE ( <i>Rosa acicularis</i> )	11.1	0.0-44.0	77	Moisture Regime: Mesic (fresh) (8), Submesic (moderately fresh) (7)
SASKATOON ( <i>Amelanchier alnifolia</i> )	4.5	0.0-49.0	36	Nutrient Regime: Mesotrophic (medium) (12), Permesotrophic (rich) (7)
WILD RED RASPBERRY ( <i>Rubus idaeus</i> )	2.0	0.0-20.0	23	Elevation (range): 1476 (1151-1772) M
CHOKE CHERRY ( <i>Prunus virginiana</i> )	1.8	0.0-17.1	23	Slope (%): 16 - 30.99 (8), 10 - 15.99 (4)
<b>Tall Forb (&gt;= 30 cm)</b>				
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	3.5	0.0-50.0	32	Aspect: Southerly (10), Easterly (4), Northerly (3), Westerly (2), Level (2)
STICKY PURPLE GERANIUM ( <i>Geranium viscosissimum</i> )	2.1	0.0-7.7	50	Topographic Position: Midslope (7), Lower Slope (5), Upper Slope (4), Toe (3)
SHOWY ASTER ( <i>Aster conspicuus</i> )	1.6	0.0-19.3	32	
<b>Low Forb (&lt; 30 cm)</b>				
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	2.4	0.0-27.7	50	<b>Soil Variables</b>
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	1.9	0.0-16.1	55	Soil Drainage: Well drained (12), Rapidly drained (6)
<b>Graminoid</b>				
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	15.6	0.0-43.6	86	Soil Subgroup: REGO BLACK CHERNOZEM (1)
TIMOTHY ( <i>Phleum pratense</i> )	3.5	0.0-25.7	55	Surface Texture:
GREEN NEEDLE GRASS ( <i>Stipa viridula</i> )	1.3	0.0-20.0	27	Effective Texture:
PARRY OAT GRASS ( <i>Danthonia parryi</i> )	1.1	0.0-7.9	41	Depth to Mottles/Gley:
				Organic Thickness: 0 - 5 cm (1)
				Parent Material: Fluvial (1)
				Soil Type:
				Humus Form
				<b>LFH Thickness</b>
				<b>Mean</b>
				<b>Min</b>
				<b>Max</b>
				<b>Count</b>
cm:	0.00	0.00	0.00	0

## Msd15 Silverberry-Saskatoon/Kentucky bluegrass (n=2)

(*Elaeagnus commutata*-*Amelanchier alnifolia*/*Poa pratensis*)

In the Montane region, silverberry dominated plant communities occur on alluvial floodplain terraces, in V-shaped ravines and swale-like depressions where overland flows provide additional moisture (Thompson and Hansen 2002). Silverberry and saskatoon dominate this community with rose and snowberry also common. Forage production can be low in dense silverberry stands, however in more open stands livestock use can be extensive which leads to the invasion of Kentucky bluegrass, timothy and dandelion. In the absence of fire disturbance silverberry dominated communities can undergo succession eventually to aspen, balsam poplar or white spruce.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

**Ecosite Phase:** d5 creeping mahonia-white meadowsweet shrubland

Plant Composition	Canopy Cover (%)		
	Mean	Range	Const.
<b>Understory Tree</b>			
ASPEN ( <i>Populus tremuloides</i> )	2.7	0.5-5.0	100
<b>Tall Shrub (2 to 5m)</b>			
SILVERBERRY ( <i>Elaeagnus commutata</i> )	69.3	60.0-78.7	100
<b>Medium Shrub (0.5 to 2 m)</b>			
CREEPING MAHONIA ( <i>Berberis repens</i> )	18.1	0.0-36.3	50
SASKATOON ( <i>Amelanchier alnifolia</i> )	14.0	0.0-28.0	50
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	10.0	0.0-20.0	50
UNDIFFERENTIATED ROSE ( <i>Rosa</i> )	7.5	5.1-10.0	100
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	2.3	0.0-4.7	50
PIN CHERRY ( <i>Prunus pensylvanica</i> )	1.5	0.0-3.0	50
<b>Tall Forb (&gt;= 30 cm)</b>			
GRACEFUL CINQUEFOIL ( <i>Potentilla gracilis</i> )	1.5	0.0-3.0	50
WILD BERGAMOT ( <i>Monarda fistulosa</i> )	1.3	0.0-2.7	50
<b>Low Forb (&lt; 30 cm)</b>			
WHITE CLOVER ( <i>Trifolium repens</i> )	10.0	0.0-20.0	50
COMMON DANDELION ( <i>Taraxacum officinale</i> )	5.6	1.3-10.0	100
COMMON YARROW ( <i>Achillea millefolium</i> )	5.0	0.0-10.0	50
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	5.0	0.0-10.0	50
LOW EVERLASTING ( <i>Antennaria aprica</i> )	1.5	0.0-3.0	50
REFLEXED LOCOWEED ( <i>Oxytropis deflexa</i> )	1.5	0.0-3.0	50
<b>Graminoid</b>			
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	40.0	40.0-40.0	100
CREEPING RED FESCUE ( <i>Festuca rubra</i> )	5.0	0.0-10.0	50
TIMOTHY ( <i>Phleum pratense</i> )	1.5	0.0-3.0	50

### Environmental Variables

Ecological Status Score: 15-20

Moisture Regime: Mesic (fresh) (1), Subhygric (moderately moist) (1)

Nutrient Regime: Mesotrophic (medium) (1), Permesotrophic (rich) (1)

Elevation (range): 1229 (1229-1229) M

Slope (%): 0 - 0.49 (1)

Aspect: Level (1)

Topographic Position: Level (1)

### Soil Variables

Soil Drainage: Well drained (1)

Soil Subgroup:

Surface Texture: Loamy fine sand (1)

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (1)

Parent Material:

Soil Type:

Humus Form

LFH Thickness	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0



## Msd15a Silverberry-Saskatoon (n=0)

(*Elaeagnus commutata*-*Amelanchier alnifolia*)

This community type has currently not been described, but is the expected climax community of the Silverberry-Saskatoon/Kentucky bluegrass (Msd15) dominated community type. Increased grazing pressure favours the growth of Kentucky bluegrass in the understory.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

**Ecosite Phase:** d5 creeping mahonia-white meadowsweet shrubland

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Tall Shrub (2 to 5m)</b>					Ecological Status Score: 15-20
SILVERBERRY ( <i>Elaeagnus commutata</i> )	43.3	0.0-70.0	67		Moisture Regime: Subhygric (moderately moist) (2), Mesic (fresh) (1)
<b>Medium Shrub (0.5 to 2 m)</b>					Nutrient Regime: Permesotrophic (rich) (2), Mesotrophic (medium) (1)
CREEPING MAHONIA ( <i>Berberis repens</i> )	12.1	0.0-36.3	33		Elevation (range): 1360 (1229-1491) M
SASKATOON ( <i>Amelanchier alnifolia</i> )	9.3	0.0-28.0	33		Slope (%): 0 - 0.49 (1), 0.5 - 2.49 (1)
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	6.6	0.0-20.0	33		Aspect: Level (1), Southerly (1)
PRICKLY ROSE ( <i>Rosa acicularis</i> )	5.0	0.0-5.1	99		Topographic Position: Level (2)
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	4.3	0.0-13.0	33		<b>Soil Variables</b>
SILVERBERRY ( <i>Elaeagnus commutata</i> )	4.3	0.0-8.7	67		Soil Drainage: Well drained (1), Moderately well drained (1)
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	4.2	0.0-7.9	67		Soil Subgroup:
<b>Tall Forb (&gt;= 30 cm)</b>					Surface Texture: Loamy fine sand (1)
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	2.2	0.0-6.1	67		Effective Texture:
<b>Low Forb (&lt; 30 cm)</b>					Depth to Mottles/Gley:
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	6.6	0.0-10.0	67		Organic Thickness: 0 - 5 cm (1)
COMMON YARROW ( <i>Achillea millefolium</i> )	3.3	0.0-10.0	67		Parent Material:
LOW EVERLASTING ( <i>Antennaria aprica</i> )	1.0	0.0-3.0	33		Soil Type:
					Humus Form
					<b>LFH Thickness</b>
					<b>Mean</b>
					<b>Min</b>
					<b>Max</b>
					<b>Count</b>
					cm:
					0.00
					0.00
					0.00
					0

## d6 pine grass grassland (n=16)

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

### General Description

This phase represents mesic areas dominated by grass and forbs, usually created by fire or other disturbance. In most cases, these sites will succeed to the shrub phase without ongoing disturbance. Due to moist soils, invasion of introduced species and weeds are common if soil disturbance occurs.

### Characteristic Species

#### Shrub

- [ 2.5 ] PRICKLY ROSE  
*Rosa acicularis*

#### Forb

- [ 10.8 ] WILD STRAWBERRY  
*Fragaria virginiana*
- [ 4.8 ] SHOWY ASTER  
*Aster conspicuus*
- [ 4.8 ] COMMON FIREWEED  
*Epilobium angustifolium*
- [ 4.2 ] SILKY PERENNIAL LUPINE  
*Lupinus sericeus*
- [ 3.3 ] CREAM-COLORED VETCHLING  
*Lathyrus ochroleucus*

#### Graminoid

- [ 19.6 ] PINE REED GRASS  
*Calamagrostis rubescens*
- [ 7.3 ] HAIRY WILD RYE  
*Elymus innovatus*

### Environmental Variables

Moisture Regime: Mesic (fresh) (8), Submesic (moderately fresh) (3), Subhygric (moderately moist) (1)

Nutrient Regime: Mesotrophic (medium) (8), Permesotrophic (rich) (5)

Elevation (range): 1545 (1372-1920) M

Slope (%): strong slope (5), very gentle slope (3), nearly level (1)

Aspect: Easterly (6), Level (3), Westerly (3), Southerly (2)

Topographic Position: Midslope (5), Upper Slope (3)

### Soil Variables

Soil Drainage: Rapidly drained (7), Well drained (5), Moderately well drained (1)

Soil Subgroup:

Surface Texture:

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness:

Parent Material:

Soil Type:

Humus Form

### LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

## Msb21 Pine grass-Kentucky bluegrass (n=2)

### (*Calamagrostis rubescens*-*Poa pratensis*)

This community type forms when the pinegrass dominated community type is grazed and becomes invaded by Kentucky bluegrass. The pinegrass dominated grasslands represent the transition from grassland to forest and therefore the moisture is favourable for the growth of Kentucky bluegrass. This community type is highly productive and can produce over 2000 kg/ha.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

**Ecosite Phase:** d6 pine grass grassland

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Tall Shrub (2 to 5m)</b>					Ecological Status Score: 20
SASKATOON ( <i>Amelanchier alnifolia</i> )	1.5	0.0-3.1	50		Moisture Regime: Mesic (fresh) (1), Subhygric (moderately moist) (1)
<b>Medium Shrub (0.5 to 2 m)</b>					Nutrient Regime: Mesotrophic (medium) (1), Permesotrophic (rich) (1)
COMMON WILD ROSE ( <i>Rosa woodsii</i> )	6.6	0.0-13.3	50		Elevation (range): 1540 (1491-1590) M
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	2.0	0.0-4.0	50		Slope (%): 2.5 - 5.99 (1), 16 - 30.99 (1)
<b>Tall Forb (&gt;= 30 cm)</b>					Aspect: Easterly (1), Southerly (1)
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	6.9	0.7-13.2	100		Topographic Position: Midslope (2)
WILD BERGAMOT ( <i>Monarda fistulosa</i> )	6.1	0.0-12.3	50		
WILD WHITE GERANIUM ( <i>Geranium richardsonii</i> )	4.9	0.0-9.9	50		
STICKY PURPLE GERANIUM ( <i>Geranium viscosissimum</i> )	4.8	0.7-9.0	100		
WILD VETCH ( <i>Vicia americana</i> )	4.3	1.5-7.2	100		
SMOOTH ASTER ( <i>Aster laevis</i> )	2.8	0.0-5.7	50		
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	2.3	2.0-2.7	100		
<b>Low Forb (&lt; 30 cm)</b>					
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	4.2	2.7-5.7	100		
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	3.0	1.7-4.3	100		
COMMON YARROW ( <i>Achillea millefolium</i> )	1.6	1.1-2.2	100		
<b>Graminoid</b>					
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	10.3	7.0-13.7	100		
TIMOTHY ( <i>Phleum pratense</i> )	9.4	0.0-18.9	50		
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	8.3	0.0-16.6	50		
SMOOTH WILD RYE ( <i>Elymus glaucus</i> )	6.0	3.6-8.5	100		
AWNLESS BROME ( <i>Bromus inermis</i> )	2.0	0.0-4.0	50		
SEDGE SPECIES ( <i>Carex</i> )	2.0	0.0-4.0	50		
CREEPING RED FESCUE ( <i>Festuca rubra</i> )	2.0	0.0-4.0	50		
					<b>Soil Variables</b>
					Soil Drainage: Well drained (1), Moderately well drained (1)
					Soil Subgroup:
					Surface Texture:
					Effective Texture:
					Depth to Mottles/Gley:
					Organic Thickness:
					Parent Material:
					Soil Type:
					Humus Form
					<b>LFH Thickness</b>
					<b>Mean</b>
					<b>Min</b>
					<b>Max</b>
					<b>Count</b>
					cm:
					0.00
					0.00
					0.00
					0

## Msb7 Pine grass-Hairy wild rye/Strawberry (n=14)

(*Calamagrostis rubescens*-*Elymus innovatus*/*Fragaria virginiana*)

This community type represents the transition from grassland to forest on mesic sites commonly on easterly or northerly aspects. It appears this community occurs in areas that have some seepage throughout the growing season. There is usually high forb cover with strawberry, asters, vetches and lupine being common. Pine grass and hairy wild rye are the common grass species in the understory of conifer and deciduous stands and their dominance in this community type may indicate a transition to a forested community. This community is also seen in meadows after a fire where forests within this ecosite have been burned creating temporarily open conditions. Shrubs will soon encroach this community in the absence of fire disturbance.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

**Ecosite Phase:** d6 pine grass grassland

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Medium Shrub (0.5 to 2 m)</b>				Ecological Status Score: 40
DWARF BILBERRY ( <i>Vaccinium caespitosum</i> )	3.5	0.0-26.5	50	Moisture Regime: Mesic (fresh) (7), Submesic (moderately fresh) (3)
PRICKLY ROSE ( <i>Rosa acicularis</i> )	2.5	0.0-15.8	57	Nutrient Regime: Mesotrophic (medium) (7), Permesotrophic (rich) (4)
CANADA BUFFALOBERRY ( <i>Shepherdia canadensis</i> )	1.5	0.0-8.3	29	Elevation (range): 1550 (1372-1920) M
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	1.5	0.0-10.3	36	Slope (%): 16 - 30.99 (4), 2.5 - 5.99 (2), 0.5 - 2.49 (1)
<b>Tall Forb (&gt;= 30 cm)</b>				Aspect: Easterly (5), Level (3), Westerly (3), Southerly (1)
SHOWY ASTER ( <i>Aster conspicuus</i> )	4.8	0.0-20.3	79	Topographic Position: Midslope (3), Upper Slope (3)
SILKY PERENNIAL LUPINE ( <i>Lupinus sericeus</i> )	4.8	0.0-20.5	71	<b>Soil Variables</b>
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	3.7	0.0-13.4	93	Soil Drainage: Rapidly drained (7), Well drained (4)
WILD VETCH ( <i>Vicia americana</i> )	3.4	0.0-18.5	71	Soil Subgroup:
<b>Low Forb (&lt; 30 cm)</b>				Surface Texture:
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	12.1	1.5-32.0	100	Effective Texture:
<b>Graminoid</b>				Depth to Mottles/Gley:
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	21.8	3.0-66.3	100	Organic Thickness:
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	7.8	0.0-48.0	57	Parent Material:
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	3.3	0.0-13.3	50	Soil Type:
SEDGE SPECIES ( <i>Carex</i> )	1.5	0.0-11.0	14	Humus Form
				<b>LFH Thickness</b>
				<b>Mean</b>
				<b>Min</b>
				<b>Max</b>
				<b>Count</b>
cm:	0.00	0.00	0.00	0

## d8 creeping mahonia-white meadowsweet Aw-PI-Sw-Fd (n=30)

**Natural Subregion:** Montane  
**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

### General Description

Mixedwood communities typically have at least 30 percent occurrence of both coniferous and deciduous trees. In this ecosite, they represent successional transitions from aspen leading to coniferous leading forests. The coniferous species can be white spruce, lodgepole pine or Douglas-fir, depending on the slope, aspect and age of the stand. Aspen stands have a more productive and diverse understory than coniferous stands, thus these communities are in between, with pine grass a common occurrence in the understory.

### Characteristic Species

#### Tree

- [ 26.7 ] ASPEN  
*Populus tremuloides*
- [ 12.9 ] DOUGLAS-FIR  
*Pseudotsuga menziesii*
- [ 7.0 ] LODGEPOLE PINE  
*Pinus contorta*
- [ 5.6 ] WHITE SPRUCE  
*Picea glauca*

#### Shrub

- [ 6.5 ] PRICKLY ROSE  
*Rosa acicularis*
- [ 5.4 ] SNOWBERRY  
*Symphoricarpos albus*
- [ 4.2 ] SNOWBERRY (BUCKBRUSH)  
*Symphoricarpos occidentalis*
- [ 3.7 ] WHITE MEADOWSWEET  
*Spiraea betulifolia*

#### Forb

- [ 7.8 ] SHOWY ASTER  
*Aster conspicuus*

#### Graminoid

- [ 13.8 ] PINE REED GRASS  
*Calamagrostis rubescens*

### Environmental Variables

Moisture Regime: Mesic (fresh) (21), Submesic (moderately fresh) (7), Subhygric (moderately moist) (4)  
 Nutrient Regime: Mesotrophic (medium) (17), Permesotrophic (rich) (14)  
 Elevation (range): 1539 (1370-1745) M  
 Slope (%): strong slope (9), moderate slope (7), very gentle slope (6), gentle slope (4), level (1), nearly level (1)  
 Aspect: Westerly (13), Easterly (8), Southerly (6), Level (2), Northerly (1)  
 Topographic Position: Midslope (16), Lower Slope (5), Upper Slope (4), Crest (3), Toe (3), Level (1)

### Soil Variables

Soil Drainage: Well drained (22), Moderately well drained (8), Rapidly drained (4)  
 Soil Subgroup: ORTHIC EUTRIC BRUNISOL (1), DARK GRAY LUVISOL (1)  
 Surface Texture: Loam (2)  
 Effective Texture: Silt loam (1), Silty clay loam (1)  
 Depth to Mottles/Gley:  
 Organic Thickness: 0 - 5 cm (2)  
 Parent Material: Morainial (2)  
 Soil Type: Moist/Fine (1), Moist/Silty-Loamy (1)  
 Humus Form

### LFH Thickness

	Mean	Min	Max	Count
cm:	5.00	5.00	5.00	1

## Msf15 Aw-Sw/Rose/Pine grass (n=5)

(*Populus tremuloides*-*Picea glauca*/*Rosa spp.*/*Calamagrostis rubescens*)

This community type is similar to the Aw/Rose/Pine grass [Msg5] community type, but is successional more advanced with spruce a component of the overstory. Typically with the advancement of conifers, shrubs, tall forbs and grasses reduce in abundance and productivity. Grazing also reduces the tall forb component as low-growing forbs (e.g., strawberry) increase, and with continual grazing may degrade to introduced species. Under natural succession and no fire disturbance, this community will eventually become a spruce dominated community type with little understory. As it is, this community type can provide secondary range for livestock but this is likely not sustainable as succession advances.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

**Ecosite Phase:** d8 creeping mahonia-white meadowsweet Aw-Pl-Sw-Fd

Plant Composition	Canopy Cover (%)		
	Mean	Range	Const.
<b>Overstory Tree</b>			
ASPEN ( <i>Populus tremuloides</i> )	31.0	15.0-40.0	100
WHITE SPRUCE ( <i>Picea glauca</i> )	29.6	3.0-50.0	100
<b>Understory Tree</b>			
WHITE SPRUCE ( <i>Picea glauca</i> )	6.6	0.0-10.0	60
ASPEN ( <i>Populus tremuloides</i> )	4.8	0.0-7.0	80
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	2.0	0.0-5.0	40
<b>Medium Shrub (0.5 to 2 m)</b>			
SNOWBERRY ( <i>Symphoricarpos albus</i> )	10.1	2.0-28.8	100
PRICKLY ROSE ( <i>Rosa acicularis</i> )	6.2	2.4-12.0	100
CREEPING MAHONIA ( <i>Berberis repens</i> )	1.8	0.0-9.1	20
<b>Tall Forb (&gt;= 30 cm)</b>			
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	3.3	0.0-7.4	80
VEINY MEADOW RUE ( <i>Thalictrum venulosum</i> )	2.1	0.0-5.9	60
WILD WHITE GERANIUM ( <i>Geranium richardsonii</i> )	1.5	0.0-4.3	60
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	1.2	0.1-2.4	100
<b>Low Forb (&lt; 30 cm)</b>			
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	3.9	1.0-8.7	100
WESTERN CANADA VIOLET ( <i>Viola canadensis</i> )	1.3	0.0-3.8	60
<b>Graminoid</b>			
PURPLE OAT GRASS ( <i>Schizachne purpurascens</i> )	5.4	0.0-15.0	80
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	3.7	0.0-15.0	40
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	2.4	0.0-10.0	60
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	1.9	0.0-7.0	60

### Environmental Variables

Ecological Status Score: 20-27

Moisture Regime: Mesic (fresh) (7)

Nutrient Regime: Mesotrophic (medium) (4), Permesotrophic (rich) (3)

Elevation (range): 1458 (1387-1539) M

Slope (%): 2.5 - 5.99 (2), 6 - 9.99 (1), 10 - 15.99 (1), 16 - 30.99 (1), 0 - 0.49 (1), 0.5 - 2.49 (1)

Aspect: Westerly (4), Easterly (2)

Topographic Position: Lower Slope (2), Midslope (2), Toe (2), Level (1)

### Soil Variables

Soil Drainage: Well drained (5), Moderately well drained (2)

Soil Subgroup: ORTHIC EUTRIC BRUNISOL (1), DARK GRAY LUVISOL (1)

Surface Texture: Loam (2)

Effective Texture: Silt loam (1), Silty clay loam (1)

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (2)

Parent Material: Morainal (2)

Soil Type: Moist/Fine (1), Moist/Silty-Loamy (1)

Humus Form

LFH Thickness	Mean	Min	Max	Count
cm:	5.00	5.00	5.00	1

## Msf4 Aw-PI/Pine grass (n=2)

### (*Populus tremuloides*-*Pinus contorta*/*Calamagrostis rubescens*)

This community type is dominated by an overstory of aspen and lodgepole pine, and represents the mid successional stage between an Aw/Rose/Pine grass [Msg5] and PI/Pine grass [Mse9] community types. Pine grass is generally unpalatable to livestock, but if grazed early in the spring they will utilize it as a forage source (Stout & Quinton 1986). Typical for mixed woods, the forage productivity of this community type is midway between the aspen dominated community and the pine dominated community. This community would be rated as secondary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

**Ecosite Phase:** d8 creeping mahonia-white meadowsweet Aw-PI-Sw-Fd

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables				
	Mean	Range							
<b>Overstory Tree</b>					Ecological Status Score: 25				
ASPEN ( <i>Populus tremuloides</i> )	40.0	40.0-40.0		100	Moisture Regime: Mesic (fresh) (2), Subhygric (moderately moist) (1)				
LOGEPOLE PINE ( <i>Pinus contorta</i> )	20.0	0.0-40.0		50	Nutrient Regime: Permesotrophic (rich) (3), Mesotrophic (medium) (2)				
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	5.0	0.0-10.0		50	Elevation (range): 1613 (1431-1745) M				
<b>Understory Tree</b>					Slope (%): 16 - 30.99 (2), 6 - 9.99 (1)				
LOGEPOLE PINE ( <i>Pinus contorta</i> )	10.0	0.0-20.0		50	Aspect: Westerly (2), Level (1)				
ASPEN ( <i>Populus tremuloides</i> )	10.0	0.0-20.0		50	Topographic Position: Midslope (4), Crest (1)				
<b>Medium Shrub (0.5 to 2 m)</b>					<b>Soil Variables</b>				
TWINFLOWER ( <i>Linnaea borealis</i> )	12.5	0.0-25.0		50	Soil Drainage: Moderately well drained (4), Rapidly drained (1)				
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	2.1	0.0-4.2		50	Soil Subgroup:				
PRICKLY ROSE ( <i>Rosa acicularis</i> )	1.8	1.6-2.0		100	Surface Texture:				
SASKATOON ( <i>Amelanchier alnifolia</i> )	1.5	0.0-3.0		50	Effective Texture:				
<b>Tall Forb (&gt;= 30 cm)</b>					Depth to Mottles/Gley:				
SHOWY ASTER ( <i>Aster conspicuus</i> )	15.6	0.0-31.3		50	Organic Thickness:				
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	7.2	0.7-13.7		100	Parent Material:				
WILD WHITE GERANIUM ( <i>Geranium richardsonii</i> )	6.0	0.0-12.0		50	Soil Type:				
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	5.4	5.4-5.5		100	Humus Form				
<b>Low Forb (&lt; 30 cm)</b>					<b>LFH Thickness</b>				
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	10.4	4.7-16.1		100		<b>Mean</b>	<b>Min</b>	<b>Max</b>	<b>Count</b>
<b>Graminoid</b>					cm:	0.00	0.00	0.00	0
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	27.2	16.7-37.7		100					
FRINGED BROME ( <i>Bromus ciliatus</i> )	6.5	0.0-13.0		50					
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	2.1	1.6-2.7		100					
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	1.2	0.0-2.5		50					

## Msf4a Fd-Aw/Pine grass (n=8)

### (*Pseudotsuga menziesii*-*Populus tremuloides*/*Calamagrostis rubescens*)

This community type is dominated by an overstory of aspen and Douglas-fir, and represents the mid successional stage between aspen and Douglas-fir dominated forests in this ecosite. Pine grass is generally unpalatable to livestock, but if grazed early in the spring they will utilize it as a forage source (Stout and Quinton 1986). The forage productivity of this community type is midway between the aspen dominated community and the Douglas-fir dominated communities. This community would be rated as secondary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

**Ecosite Phase:** d8 creeping mahonia-white meadowsweet Aw-PI-Sw-Fd

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 25
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	31.3	15.0-60.0	100	Moisture Regime: Submesic (moderately fresh) (5), Mesic (fresh) (2), Subhygric (moderately moist) (1)
ASPEN ( <i>Populus tremuloides</i> )	26.9	10.0-50.0	100	Nutrient Regime: Mesotrophic (medium) (4), Permesotrophic (rich) (3)
WHITE SPRUCE ( <i>Picea glauca</i> )	1.2	0.0-5.0	25	Elevation (range): 1547 (1433-1646) M
BALSAM POPLAR ( <i>Populus balsamifera</i> )	1.2	0.0-10.0	13	Slope (%): 10 - 15.99 (3), 2.5 - 5.99 (2)
<b>Understory Tree</b>				Aspect: Westerly (4), Level (1), Easterly (1), Southerly (1)
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	2.5	0.0-20.0	13	Topographic Position: Midslope (4), Crest (2), Lower Slope (2), Upper Slope (1)
<b>Medium Shrub (0.5 to 2 m)</b>				<b>Soil Variables</b>
PRICKLY ROSE ( <i>Rosa acicularis</i> )	5.7	1.0-15.1	100	Soil Drainage: Well drained (6), Rapidly drained (1)
SNOWBERRY ( <i>Symphoricarpos albus</i> )	1.9	0.0-7.5	50	Soil Subgroup:
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	1.4	0.0-7.7	38	Surface Texture:
WILD RED RASPBERRY ( <i>Rubus idaeus</i> )	1.0	0.0-3.7	50	Effective Texture:
<b>Tall Forb (&gt;= 30 cm)</b>				Depth to Mottles/Gley:
SHOWY ASTER ( <i>Aster conspicuus</i> )	10.9	0.0-30.0	88	Organic Thickness:
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	3.0	0.0-11.7	63	Parent Material:
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	2.1	0.0-4.1	88	Soil Type:
<b>Low Forb (&lt; 30 cm)</b>				Humus Form
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	3.9	1.0-7.5	100	
<b>Graminoid</b>				
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	20.1	0.0-44.3	88	
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	6.9	0.0-18.0	75	
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	2.8	0.0-15.0	38	
				<b>LFH Thickness</b>
				Mean
				Min
				Max
				Count
				cm:
				0.00
				0.00
				0.00
				0



## Msf6 Aw-Fd/White meadowsweet (n=3)

### (*Populus tremuloides*-*Pseudotsuga menziesii*/*Spiraea betulifolia*)

This community type represents an intermediate stage of succession between the Fd/White meadowsweet [Mse10] and Aw/White meadowsweet/Pinegrass [Msg4] community types. White meadowsweet is indicative of sites with mesic moisture and medium nutrient regimes (Archibald et al. 1996), but within the drier range of this ecosite. When this community succeeds to a conifer dominated type there will be reduced forage for domestic livestock. Presently, with the high aspen cover there will be a moderate forage base and this community type should be rated as secondary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

**Ecosite Phase:** d8 creeping mahonia-white meadowsweet Aw-PI-Sw-Fd

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables				
	Mean	Range							
<b>Overstory Tree</b>					Ecological Status Score: 25				
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	28.3	20.0-40.0		100	Moisture Regime: Mesic (fresh) (2), Subhygric (moderately moist) (1)				
ASPEN ( <i>Populus tremuloides</i> )	18.3	0.0-30.0		67	Nutrient Regime: Permesotrophic (rich) (2)				
WHITE SPRUCE ( <i>Picea glauca</i> )	1.6	0.0-5.0		33	Elevation (range): 1538 (1395-1626) M				
<b>Understory Tree</b>					Slope (%): 16 - 30.99 (2)				
ASPEN ( <i>Populus tremuloides</i> )	17.0	0.0-30.0		67	Aspect: Southerly (2), Westerly (1)				
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	10.0	0.0-30.0		33	Topographic Position: Lower Slope (1), Midslope (1)				
<b>Medium Shrub (0.5 to 2 m)</b>					<b>Soil Variables</b>				
PRICKLY ROSE ( <i>Rosa acicularis</i> )	11.0	1.1-23.3		100	Soil Drainage: Rapidly drained (1), Well drained (1), Moderately well drained (1)				
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	9.6	0.0-19.3		67	Soil Subgroup:				
SNOWBERRY ( <i>Symphoricarpos albus</i> )	7.6	0.0-19.3		67	Surface Texture:				
WILD RED RASPBERRY ( <i>Rubus idaeus</i> )	3.3	0.0-7.3		67	Effective Texture:				
<b>Tall Forb (&gt;= 30 cm)</b>					Depth to Mottles/Gley:				
SHOWY ASTER ( <i>Aster conspicuus</i> )	10.8	5.5-18.7		100	Organic Thickness:				
WILD WHITE GERANIUM ( <i>Geranium richardsonii</i> )	7.0	0.0-13.2		67	Parent Material:				
COW PARSNIP ( <i>Heraclium lanatum</i> )	3.6	0.0-11.0		33	Soil Type:				
<b>Low Forb (&lt; 30 cm)</b>					Humus Form				
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	7.4	6.3-8.9		100	<b>LFH Thickness</b>				
<b>Graminoid</b>									
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	5.7	0.0-13.0		67	<b>Mean</b>	<b>Min</b>	<b>Max</b>	<b>Count</b>	
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	4.6	0.0-9.6		67					
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	1.4	0.0-3.5		67	cm:	0.00	0.00	0.00	0

## Msf9 PI-Aw/Snowberry/Kentucky bluegrass (n=2)

(*Pinus contorta*-*Populus tremuloides*/*Symphoricarpos occidentalis*/*Poa pratensis*)

This community type represents an earlier successional stage of the PI/White meadowsweet and PI/Pinegrass community types. These communities occupy mesic sites with medium nutrient regimes (Archibald et al. 1996). It appears that this community type was grazed heavily in the past and then rested. Willoughby (1995) found that aspen stands that have been heavily grazed for prolonged periods have a low cover of native shrubs, forbs and grass species and a high cover of Kentucky bluegrass, clover and dandelion. This community has a high cover of Kentucky bluegrass, but it also has a high cover of native shrubs, forbs and grass, which may indicate that it has been grazed heavily to the point of Kentucky bluegrass invasion and then rested allowing recovery of the native species. This community is very productive for domestic livestock, but Kentucky bluegrass provides a poor source of forage for wintering wildlife.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

**Ecosite Phase:** d8 creeping mahonia-white meadowsweet Aw-PI-Sw-Fd

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 10-15
ASPEN ( <i>Populus tremuloides</i> )	22.5	15.0-30.0	100	Moisture Regime: Submesic (moderately fresh) (1), Mesic (fresh) (1)
LOGEPOLE PINE ( <i>Pinus contorta</i> )	15.0	0.0-30.0	50	Nutrient Regime: Mesotrophic (medium) (1), Permesotrophic (rich) (1)
WHITE SPRUCE ( <i>Picea glauca</i> )	2.5	0.0-5.0	50	Elevation (range): 1562 (1449-1676) M
<b>Medium Shrub (0.5 to 2 m)</b>				Slope (%): 6 - 9.99 (1), 16 - 30.99 (1)
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	17.0	0.0-34.0	50	Aspect: Easterly (1), Westerly (1)
SNOWBERRY ( <i>Symphoricarpos albus</i> )	10.5	0.0-21.0	50	Topographic Position: Upper Slope (1)
PRICKLY ROSE ( <i>Rosa acicularis</i> )	8.8	8.0-9.7	100	<b>Soil Variables</b>
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	7.2	1.3-13.2	100	Soil Drainage: Rapidly drained (1), Well drained (1)
THIMBLEBERRY ( <i>Rubus parviflorus</i> )	6.8	0.0-13.7	50	Soil Subgroup:
SASKATOON ( <i>Amelanchier alnifolia</i> )	3.3	3.3-3.3	100	Surface Texture:
<b>Tall Forb (&gt;= 30 cm)</b>				Effective Texture:
STICKY PURPLE GERANIUM ( <i>Geranium viscosissimum</i> )	5.8	4.0-7.7	100	Depth to Mottles/Gley:
WILD VETCH ( <i>Vicia americana</i> )	5.5	4.2-6.8	100	Organic Thickness:
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	4.1	3.0-5.3	100	Parent Material:
SMOOTH ASTER ( <i>Aster laevis</i> )	3.1	0.0-6.3	50	Soil Type:
<b>Low Forb (&lt; 30 cm)</b>				Humus Form
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	6.8	1.7-11.9	100	<b>LFH Thickness</b>
COMMON DANDELION ( <i>Taraxacum officinale</i> )	3.0	1.0-5.0	100	Mean
COMMON YARROW ( <i>Achillea millefolium</i> )	2.4	1.7-3.2	100	Min
<b>Graminoid</b>				Max
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	17.8	15.0-20.7	100	Count
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	12.9	11.7-14.2	100	cm:
TIMOTHY ( <i>Phleum pratense</i> )	5.5	4.5-6.5	100	0.00
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	3.1	0.0-6.3	50	0.00
				0.00
				0

# Msh18 Aw/Kentucky bluegrass-Timothy (cutblock) (n=10)

## (*Populus tremuloides*/*Poa pratensis*-*Phleum pratense*)

This community type is typical of blocks that have been invaded by agronomic and weedy plant species either prior to or post harvesting or fire. Often if the species exist prior to disturbance, the nutrient flush after harvesting promotes the growth of introduced species. Often (but not always), aspen is present with introduced species indicating these sites are on the wetter/richer side of this ecosite. Livestock distribution issues after the disturbance can also promote these species by excessive grazing. If livestock grazing is the issue, management should be changed as heavier grazing will also increase conifer seedling damage. Excessive amounts of introduced forages may also impede tree regeneration due to competition for resources, therefore some carefully managed grazing may need to be prescribed.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

**Ecosite Phase:** d8 creeping mahonia-white meadowsweet Aw-Pl-Sw-Fd

### Plant Composition

### Canopy Cover (%)

	Mean	Range	Const.
<b>Overstory Tree</b>			
ASPEN ( <i>Populus tremuloides</i> )	9.2	0.0-70.0	40
<b>Medium Shrub (0.5 to 2 m)</b>			
WILD RED RASPBERRY ( <i>Rubus idaeus</i> )	2.5	0.0-13.5	40
PRICKLY ROSE ( <i>Rosa acicularis</i> )	2.2	0.0-13.0	60
<b>Tall Forb (&gt;= 30 cm)</b>			
CANADA THISTLE ( <i>Cirsium arvense</i> )	3.1	0.0-19.3	40
SHOWY ASTER ( <i>Aster conspicuus</i> )	2.6	0.0-15.0	60
<b>Low Forb (&lt; 30 cm)</b>			
COMMON YARROW ( <i>Achillea millefolium</i> )	4.3	0.0-25.7	80
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	4.1	0.0-20.1	70
COMMON DANDELION ( <i>Taraxacum officinale</i> )	3.0	0.3-10.9	100
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	2.7	0.0-20.9	60
<b>Graminoid</b>			
TIMOTHY ( <i>Phleum pratense</i> )	16.9	0.0-46.0	80
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	15.9	1.0-36.3	100
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	3.5	0.0-17.1	50
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	3.3	0.0-15.1	40

### Environmental Variables

Ecological Status Score: 5-10

Moisture Regime: Mesic (fresh) (7), Submesic (moderately fresh) (1), Subhygric (moderately moist) (1)

Nutrient Regime: Mesotrophic (medium) (6), Permesotrophic (rich) (2)

Elevation (range): 1521 (1370-1634) M

Slope (%): 10 - 15.99 (3), 16 - 30.99 (3), 2.5 - 5.99 (2), 6 - 9.99 (1)

Aspect: Easterly (4), Southerly (3), Northerly (1), Westerly (1)

Topographic Position: Midslope (5), Upper Slope (2), Toe (1)

### Soil Variables

Soil Drainage: Well drained (9), Moderately well drained (1)

Soil Subgroup:

Surface Texture:

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness:

Parent Material:

Soil Type:

Humus Form

### LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

## d9 industrial/tame (n=19)

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

### General Description

Industrial disturbances such as linear cut lines are common in the Montane forests. Often in these cases the un-forested conditions are maintained through vegetation management that includes clearing trees and seeding to agronomics. Creeping red fescue was commonly used for seeding.

### Environmental Variables

Moisture Regime: Mesic (fresh) (8), Submesic (moderately fresh) (6), Subhygric (moderately moist) (4), Subxeric (moderately dry) (3)

Nutrient Regime: Mesotrophic (medium) (15), Permesotrophic (rich) (6)

Elevation (range): 1471 (1364-1615) M

Slope (%): moderate slope (7), very gentle slope (3), strong slope (3)

Aspect: Southerly (8), Easterly (5), Level (3)

Topographic Position: Lower Slope (5), Midslope (4), Level (4), Toe (3)

### Characteristic Species

#### Forb

- [ 8.1 ] ALSIKE CLOVER  
*Trifolium hybridum*
- [ 4.9 ] WHITE CLOVER  
*Trifolium repens*
- [ 4.6 ] COMMON DANDELION  
*Taraxacum officinale*
- [ 3.4 ] WILD STRAWBERRY  
*Fragaria virginiana*
- [ 2.5 ] UNDIFFERENTIATED CLOVER  
*Trifolium*
- [ 1.7 ] ALFALFA  
*Medicago sativa*

#### Graminoid

- [ 36.4 ] CREEPING RED FESCUE  
*Festuca rubra*
- [ 9.4 ] KENTUCKY BLUEGRASS  
*Poa pratensis*
- [ 5.4 ] TIMOTHY  
*Phleum pratense*
- [ 1.7 ] CANADA BLUEGRASS  
*Poa compressa*
- [ 1.1 ] AWNLESS BROME  
*Bromus inermis*

### Soil Variables

Soil Drainage: Well drained (14), Rapidly drained (6), Moderately well drained (4), Imperfectly drained (1)

Soil Subgroup:

Surface Texture:

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness:

Parent Material:

Soil Type:

Humus Form

### LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

## Msc7 Creeping red fescue/Dandelion-Clover (n=19)

(*Festuca rubra*/*Taraxacum officinale*-*Trifolium spp.*)

This community is an example of Montane areas which have been modified for range improvements or during reclamation of natural gas pipelines and power transmission lines. Soil disturbance and seed from reclamation has influenced the plant association such that creeping red fescue and Kentucky bluegrass now dominate the site. Previously tame species like creeping red fescue were used in reclamation with little thought given to compatibility with surrounding native vegetation. It is now recognized that native species that promote the recovery of the original community structure and function should be used in reclamation (Gerling et al. 1996).

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** d mahonia-meadowsweet(mesic/medium)

**Ecosite Phase:** d9 industrial/tame

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Tall Forb (&gt;= 30 cm)</b>				Ecological Status Score: 8-15
ALSIKE CLOVER ( <i>Trifolium hybridum</i> )	8.1	0.0-76.3	42	Moisture Regime: Mesic (fresh) (8), Submesic (moderately fresh) (6), Subhygric (moderately moist) (4), Subxeric (moderately dry) (3)
UNDIFFERENTIATED CLOVER ( <i>Trifolium</i> )	2.5	0.0-48.0	5	Nutrient Regime: Mesotrophic (medium) (15), Permesotrophic (rich) (6)
ALFALFA ( <i>Medicago sativa</i> )	1.7	0.0-26.0	11	Elevation (range): 1471 (1364-1615) M
<b>Low Forb (&lt; 30 cm)</b>				Slope (%): 10 - 15.99 (7), 16 - 30.99 (3), 2.5 - 5.99 (3)
WHITE CLOVER ( <i>Trifolium repens</i> )	4.9	0.0-49.0	37	Aspect: Southerly (8), Easterly (5), Level (3)
COMMON DANDELION ( <i>Taraxacum officinale</i> )	4.6	0.0-18.0	95	Topographic Position: Lower Slope (5), Midslope (4), Level (4), Toe (3)
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	3.4	0.0-15.7	68	<b>Soil Variables</b>
<b>Graminoid</b>				Soil Drainage: Well drained (14), Rapidly drained (6), Moderately well drained (4), Imperfectly drained (1)
CREEPING RED FESCUE ( <i>Festuca rubra</i> )	36.4	10.0-83.2	100	Soil Subgroup:
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	9.4	0.0-32.7	90	Surface Texture:
TIMOTHY ( <i>Phleum pratense</i> )	5.4	0.0-19.2	84	Effective Texture:
CANADA BLUEGRASS ( <i>Poa compressa</i> )	1.7	0.0-30.2	11	Depth to Mottles/Gley:
AWNLESS BROME ( <i>Bromus inermis</i> )	1.1	0.0-9.4	32	Organic Thickness:
				Parent Material:
				Soil Type:
				Humus Form
				<b>LFH Thickness</b>
				<b>Mean Min Max Count</b>
cm:	0.00	0.00	0.00	0

## e thimbleberry/pine grass(mesic/rich) (n=229)

Natural Subregion: Montane

Ecosection: Ms Montane South Ecosection

### General Description

Moisture conditions are mesic for this ecosite; however, nutrient conditions are better than average. In spring or after heavy rain, seepage may occur. The humus layers are generally well developed indicating the better than average nutrient regime.



### Successional Relationships

Aspen and white spruce form pure and mixed stands on this ecosite. Succession is toward white spruce. Shrub and forb layers are well developed on these sites due to the favourable moisture and nutrient status. Disturbance can result in rapid increase of shrub and forb cover, which results in higher competition levels for coniferous seedlings.

### Indicator Species

#### Shrub

THIMBLEBERRY

*Rubus parviflorus*

UNDIFFERENTIATED SYMPHORICARPOS

*Symphoricarpos*

SASKATOON

*Amelanchier alnifolia*

#### Forb

COW PARSNIP

*Heracleum lanatum*

#### Graminoid

BLUEJOINT

*Calamagrostis canadensis*

PINE REED GRASS

*Calamagrostis rubescens*

### Site Index at 50 Years

Site Index at 50 Years	Height (m)	Variation (m)	Count
WHITE SPRUCE ( <i>Picea glauca</i> )	12.50	0.40	0
SUBALPINE FIR ( <i>Abies lasiocarpa</i> )	13.20	1.30	0
LODGEPOLE PINE ( <i>Pinus contorta</i> )	14.10	0.30	0
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	11.10	0.00	0
ASPEN ( <i>Populus tremuloides</i> )	11.60	0.60	0

### Environmental Variables

Moisture Regime: Mesic (fresh) (120), Subhygric (moderately moist) (44), Submesic (moderately fresh) (13), Hygric (moist) (11), Hydric (wet) (1), Subxeric (moderately dry) (1)

Nutrient Regime: Permesotrophic (rich) (121), Mesotrophic (medium) (73), Eutrophic (very rich) (12)

Elevation (range): 1529 (537-4462) M

Slope (%): strong slope (53), moderate slope (50), very gentle slope (27), gentle slope (19), nearly level (16), level (10), very strong slope (8), steep slope (2), very steep slope (1)

Aspect: Easterly (64), Southerly (51), Westerly (44), Northerly (34), Level (21)

Topographic Position: Midslope (97), Lower Slope (51), Upper Slope (19), Toe (13), Level (7), Crest (2)

### Soil Variables

Soil Drainage: Well drained (114), Moderately well drained (68), Rapidly drained (5), Imperfectly drained (2), Very rapidly drained (1)

Soil Subgroup: ELUVIATED EUTRIC BRUNISOL (17), ORTHIC EUTRIC BRUNISOL (14), ORTHIC GRAY LUVISOL (8), ORTHIC BLACK CHERNOZEM (7), ORTHIC DARK GRAY CHERNOZEM (5), BRUNISOLIC GRAY LUVISOL (5), CUMULIC REGOSOL (4), ORTHIC MELANIC BRUNISOL (4), ORTHIC REGOSOL (4), GLEYED DARK GRAY LUVISOL (3), DARK GRAY LUVISOL (3), CALCAREOUS BLACK CHERNOZEM (3), GLEYED BLACK CHERNOZEM (2), ORTHIC HUMIC REGOSOL (1), ORTHIC GLEYSOL (1)

Surface Texture: Loam (37), Clay loam (11), Sandy loam (8), Silt loam (6), Silty clay loam (4), Silty Sand (2), Fine sandy loam (2), Loamy sand (2), Sandy clay loam (2), Sandy clay (1)

Effective Texture: Clay loam (27), Loam (10), Sandy loam (8), Clay (6), Sandy clay loam (5), Silty clay loam (4), Silty clay (3), Loamy sand (2), Fine sandy loam (2), Sand (1)

Depth to Mottles/Gley: 0 - 25 (4), 26 - 50 (4), 51 - 100 (4)

Organic Thickness: 0 - 5 cm (94)

Parent Material: Morainal (41), Fluvial (17), Colluvial (12), Residual (8), Rock (6), Glaciofluvial (6), Saprolite (2), Lacustrine (1)

Soil Type: Moist/Fine (8), Moist/Silty-Loamy (7), Dry/Fine (4), Moist/Coarse (4), Dry/Sandy (1), Very Dry/Sandy (1)

Humus Form FIBRIMOR (23), HUMIFIBRIMOR (7), FIBRIHUMIMOR (3), MODER (2), RAW MODER (2)

### LFH Thickness

LFH Thickness	Mean	Min	Max	Count
cm:	6.00	1.00	10.00	69

# e1 thimbleberry/pine grass Pl (n=37)

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** e thimbleberry/pine grass(mesic/rich)

## General Description

This phase is lodgepole pine leading with understories of thimbleberry or cow parsnip, indicating the rich nature of the soil. Aspen usually comprises some component of the canopy, with balsam poplar occurring in the more moist portions of this ecosite. Grasses also range with moisture as drier ranges have pine grass, whereas marsh reed grass becomes more prevalent at locations near the Subalpine and Lower Foothills subregions to the north or at higher elevations.

## Characteristic Species

### Tree

- [ 36.1 ] LODGEPOLE PINE  
*Pinus contorta*
- [ 24.3 ] ASPEN  
*Populus tremuloides*

### Shrub

- [ 6.2 ] THIMBLEBERRY  
*Rubus parviflorus*

### Forb

- [ 2.3 ] CREAM-COLORED VETCHLING  
*Lathyrus ochroleucus*
- [ 2.2 ] YELLOW AVENS  
*Geum aleppicum*
- [ 1.2 ] TALL LUNGWORT  
*Mertensia paniculata*

### Graminoid

- [ 6.5 ] BLUEJOINT  
*Calamagrostis canadensis*
- [ 2.8 ] PINE REED GRASS  
*Calamagrostis rubescens*

## Environmental Variables

Moisture Regime: Mesic (fresh) (27), Submesic (moderately fresh) (2), Subhygric (moderately moist) (1)

Nutrient Regime: Mesotrophic (medium) (18), Permesotrophic (rich) (17), Eutrophic (very rich) (1)

Elevation (range): 1488 (537-1661) M

Slope (%): strong slope (15), moderate slope (6), very gentle slope (3), gentle slope (2)

Aspect: Westerly (12), Easterly (12), Northerly (10), Southerly (3), Level (1)

Topographic Position: Midslope (19), Lower Slope (8), Upper Slope (5), Level (2)

## Soil Variables

Soil Drainage: Well drained (22), Moderately well drained (11), Rapidly drained (1)

Soil Subgroup: ELUVIATED EUTRIC BRUNISOL (8), ORTHIC GRAY LUVISOL (5), ORTHIC EUTRIC BRUNISOL (3), ORTHIC MELANIC BRUNISOL (2), BRUNISOLIC GRAY LUVISOL (2), DARK GRAY LUVISOL (1), ORTHIC GLEYSOL (1)

Surface Texture: Loam (11), Clay loam (6), Sandy loam (2), Silt loam (1), Silty clay loam (1), Loamy sand (1)

Effective Texture: Clay loam (10), Sandy clay loam (3), Loam (3), Clay (3), Silty clay loam (2), Silty clay (1)

Depth to Mottles/Gley: 0 - 25 (3), 51 - 100 (2)

Organic Thickness: 0 - 5 cm (23)

Parent Material: Morainal (14), Colluvial (3), Glaciofluvial (2), Residual (2), Rock (2), Fluvial (1)

Soil Type: Moist/Fine (4), Moist/Silty-Loamy (3), Dry/Fine (1)

Humus Form HUMIFIBRIMOR (5), FIBRIMOR (4), RAW MODER (2), FIBRIHUMIMOR (1)

## LFH Thickness

	Mean	Min	Max	Count
cm:	5.00	1.00	10.00	21

## Mse13 PI/Thimbleberry (n=26)

### (*Pinus contorta*/*Rubus parviflorus*)

Nutrient rich seepage occurs under this community type at some point in the growing season favouring the growth of thimbleberry. On these sites thimbleberry is common south of the Crownsnest Pass and is generally replaced by cow parsnip north of the Pass. Cow parsnip is not represented in these plots however, has been seen anecdotally in these communities. Succession is from aspen to pine and then on to white spruce. Thimbleberry is generally unpalatable to livestock, but if the site has an abundance of cow parsnip it may be extensively utilized. This community type should be rated as tertiary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** e thimbleberry/pine grass(mesic/rich)

**Ecosite Phase:** e1 thimbleberry/pine grass PI

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Overstory Tree</b>					Ecological Status Score: 25
LOGEPOLE PINE ( <i>Pinus contorta</i> )	41.6	0.0-70.0	96		Moisture Regime: Mesic (fresh) (18)
WHITE SPRUCE ( <i>Picea glauca</i> )	2.5	0.0-25.0	27		Nutrient Regime: Mesotrophic (medium) (15), Permesotrophic (rich) (9)
<b>Understory Tree</b>					Elevation (range): 1459 (537-1661) M
LOGEPOLE PINE ( <i>Pinus contorta</i> )	5.1	0.0-24.0	77		Slope (%): 16 - 30.99 (14)
<b>Medium Shrub (0.5 to 2 m)</b>					Aspect: Easterly (11), Westerly (9), Northerly (6)
THIMBLEBERRY ( <i>Rubus parviflorus</i> )	12.5	0.0-55.9	96		Topographic Position: Midslope (15), Lower Slope (5), Upper Slope (2), Level (2)
SNOWBERRY ( <i>Symphoricarpos albus</i> )	2.3	0.0-18.0	42		<b>Soil Variables</b>
COMMON BLUEBERRY ( <i>Vaccinium myrtilloides</i> )	1.4	0.0-20.0	27		Soil Drainage: Well drained (15), Moderately well drained (7)
PRICKLY ROSE ( <i>Rosa acicularis</i> )	1.0	0.0-5.7	50		Soil Subgroup: ELUVIATED EUTRIC BRUNISOL (7), ORTHIC GRAY LUVISOL (5), ORTHIC EUTRIC BRUNISOL (3), BRUNISOLIC GRAY LUVISOL (2), DARK GRAY LUVISOL (1), ORTHIC GLEYSOL (1), ORTHIC MELANIC BRUNISOL (1)
<b>Tall Forb (&gt;= 30 cm)</b>					Surface Texture: Loam (11), Clay loam (5), Sandy loam (2), Silty clay loam (1), Loamy sand (1)
SHOWY ASTER ( <i>Aster conspicuus</i> )	2.3	0.0-8.0	89		Effective Texture: Clay loam (10), Clay (3), Loam (3), Sandy clay loam (3), Silty clay (1)
VEINY MEADOW RUE ( <i>Thalictrum venulosum</i> )	2.2	0.0-20.0	50		Depth to Mottles/Gley: 0 - 25 (3), 51 - 100 (2)
WESTERN MEADOW RUE ( <i>Thalictrum occidentale</i> )	1.5	0.0-8.0	39		Organic Thickness: 0 - 5 cm (21)
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	1.4	0.0-18.8	73		Parent Material: Morainal (14), Colluvial (3), Glaciofluvial (2), Rock (2), Residual (2), Fluvial (1)
<b>Low Forb (&lt; 30 cm)</b>					Soil Type: Moist/Fine (3), Moist/Silty-Loamy (3)
HEART-LEAVED ARNICA ( <i>Arnica cordifolia</i> )	4.8	0.0-25.0	92		Humus Form HUMIFIBRIMOR (5), FIBRIMOR (3), RAW MODER (2)
<b>Graminoid</b>					
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	5.6	0.0-30.0	92		
					<b>LFH Thickness</b>
					<b>Mean</b>
					<b>Min</b>
					<b>Max</b>
					<b>Count</b>
				cm:	5.00
					1.00
					10.00
					19



## Mse14 PI/Thimbleberry/Bear-grass (n=2)

### (*Pinus contorta*/*Rubus parviflorus*/*Xerophyllum tenax*)

This community type is very similar to the PI/Thimbleberry community type previously described, but contains a high cover of bear-grass. Archibald et al. (1996) recognized these bear-grass-dominated community types in the extreme southern portion of the subregion. Bear-grass is well suited to growing on hillsides and dry subalpine meadows and appears to indicate the transition from the lower elevation Montane subregion to the higher elevation Subalpine subregion. The tender seed pods are often eaten by small rodents and elk. In the winter Mountain goats often eat the leaves (Craighead et al. 1963). The tough leaves of bear-grass are unpalatable to livestock.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** e thimbleberry/pine grass(mesic/rich)

**Ecosite Phase:** e1 thimbleberry/pine grass PI

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 25
LOGEPOLE PINE ( <i>Pinus contorta</i> )	37.5	30.0-45.0	100	Moisture Regime: Submesic (moderately fresh) (2)
ENGELMANN SPRUCE ( <i>Picea engelmannii</i> )	12.5	0.0-25.0	50	Nutrient Regime: Mesotrophic (medium) (1), Permesotrophic (rich) (1)
<b>Understory Tree</b>				Elevation (range): 1487 (1480-1494) M
LOGEPOLE PINE ( <i>Pinus contorta</i> )	20.6	1.0-40.3	100	Slope (%): 6 - 9.99 (1), 10 - 15.99 (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Aspect: Southerly (2)
THIMBLEBERRY ( <i>Rubus parviflorus</i> )	17.0	0.0-34.1	50	Topographic Position: Lower Slope (1)
GROUSEBERRY ( <i>Vaccinium scoparium</i> )	11.4	0.0-22.9	50	<b>Soil Variables</b>
SALIX SPECIES ( <i>Salix</i> )	9.6	0.0-19.2	50	Soil Drainage: Rapidly drained (1), Well drained (1)
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	9.1	1.0-17.3	100	Soil Subgroup: ELUVIATED EUTRIC BRUNISOL (1)
MOUNTAIN-LOVER ( <i>Pachistima myrsinites</i> )	5.0	0.0-10.0	50	Surface Texture: Silt loam (1)
RED-OSIER DOGWOOD ( <i>Cornus stolonifera</i> )	3.5	0.0-7.0	50	Effective Texture: Silty clay loam (1)
CREeping MAHONIA ( <i>Berberis repens</i> )	2.2	2.0-2.4	100	Depth to Mottles/Gley:
SNOWBERRY ( <i>Symphoricarpos albus</i> )	2.1	0.0-4.3	50	Organic Thickness: 0 - 5 cm (1)
LOW BILBERRY ( <i>Vaccinium myrtillus</i> )	2.0	0.0-4.0	50	Parent Material:
RED TWINBERRY ( <i>Lonicera utahensis</i> )	1.5	1.0-2.1	100	Soil Type: Dry/Fine (1)
PURPLE CLEMATIS ( <i>Clematis occidentalis</i> )	1.1	1.0-1.2	100	Humus Form FIBRIMOR (1)
<b>Tall Forb (&gt;= 30 cm)</b>				<b>LFH Thickness</b>
BEAR-GRASS ( <i>Xerophyllum tenax</i> )	42.1	30.0-54.2	100	Mean
VEINY MEADOW RUE ( <i>Thalictrum venulosum</i> )	11.8	8.7-15.0	100	Min
<b>Low Forb (&lt; 30 cm)</b>				Max
HEART-LEAVED ARNICA ( <i>Arnica cordifolia</i> )	7.2	4.5-10.0	100	Count
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	5.3	2.0-8.7	100	cm:
GLACIER LILY ( <i>Erythronium grandiflorum</i> )	2.7	0.0-5.5	50	3.00
WESTERN CANADA VIOLET ( <i>Viola canadensis</i> )	2.0	1.0-3.1	100	3.00
EVERGREEN VIOLET ( <i>Viola orbiculata</i> )	1.8	0.0-3.7	50	3.00
<b>Graminoid</b>				1
WOODLAND BROME ( <i>Bromus vulgaris</i> )	1.7	0.0-3.5	50	

## Msf8a Aw-PI/Marsh reed grass (Bluejoint) (n=4)

### (*Populus tremuloides*-*Pinus contorta*/*Calamagrostis canadensis*)

This community type is very similar to the Aw-Pb/Marsh reed grass [Msg9a] community and also found in mesic/rich lower slope positions. It is successional more advanced as lodgepole pine is increasing in the canopy, although continued succession in the absence of disturbance is expected to lead to white spruce. The absence of balsam poplar and establishment of lodgepole pine indicates slightly drier conditions than the balsam poplar leading ecosite, however marsh reed grass and instances of tufted hair grass show this community moving toward the more moist portion of this ecosite. The forage productivity of this community type is moderate, but the majority of production comes from marsh reed grass which is generally only palatable to livestock early in the season. This community should be rated as secondary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** e thimbleberry/pine grass(mesic/rich)

**Ecosite Phase:** e1 thimbleberry/pine grass PI

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 25
ASPEN ( <i>Populus tremuloides</i> )	43.2	20.0-63.0	100	Moisture Regime: Mesic (fresh) (4), Subhygric (moderately moist) (1)
LODGEPOLE PINE ( <i>Pinus contorta</i> )	25.7	10.0-40.0	100	Nutrient Regime: Permesotrophic (rich) (5)
WHITE SPRUCE ( <i>Picea glauca</i> )	11.7	0.0-32.0	75	Elevation (range): 1515 (1419-1645) M
<b>Understory Tree</b>				Slope (%): 2.5 - 5.99 (3), 6 - 9.99 (1), 10 - 15.99 (1)
ASPEN ( <i>Populus tremuloides</i> )	5.5	0.0-18.0	25	Aspect: Northerly (2), Westerly (2), Southerly (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Topographic Position: Lower Slope (2), Midslope (2)
PRICKLY ROSE ( <i>Rosa acicularis</i> )	7.3	4.1-10.0	100	<b>Soil Variables</b>
DWARF BILBERRY ( <i>Vaccinium caespitosum</i> )	3.4	0.0-12.7	50	Soil Drainage: Moderately well drained (3), Well drained (2)
<b>Low Shrub (&lt; 0.5m)</b>				Soil Subgroup: ORTHIC MELANIC BRUNISOL (1)
DEWBERRY ( <i>Rubus pubescens</i> )	1.8	0.0-7.3	25	Surface Texture: Clay loam (1)
<b>Tall Forb (&gt;= 30 cm)</b>				Effective Texture: Silty clay loam (1)
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	4.7	1.0-10.3	100	Depth to Mottles/Gley:
YELLOW AVENS ( <i>Geum aleppicum</i> )	4.5	0.0-18.0	25	Organic Thickness: 0 - 5 cm (1)
TALL LUNGWORT ( <i>Mertensia paniculata</i> )	2.5	0.0-5.7	75	Parent Material:
<b>Low Forb (&lt; 30 cm)</b>				Soil Type: Moist/Fine (1)
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	3.6	0.0-8.0	75	Humus Form FIBRIHUMIMOR (1)
<b>Graminoid</b>				<b>LFH Thickness</b>
BLUEJOINT ( <i>Calamagrostis canadensis</i> )	13.1	2.0-18.0	100	Mean
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	5.6	0.0-21.1	50	Min
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	4.5	0.0-18.0	25	Max
TUFTED HAIR GRASS ( <i>Deschampsia cespitosa</i> )	4.5	0.0-18.0	25	Count
MOUNTAIN TIMOTHY ( <i>Phleum commutatum</i> )	4.5	0.0-18.0	25	cm:

## Msh20 Lodgepole pine/Thimbleberry (cutblock) (n=5)

### (*Pinus contorta/Rubus parviflora*)

This community type occurs when the spruce, fir or pine forests with thimbleberry or cow parsnip have been harvested and has either been seeded or is regenerating back to lodgepole pine. Succession on the thimbleberry dominated ecosites will be from aspen and pine and then to white spruce (Archibald et al. 1996). Note as succession occurs there is a corresponding drop in forage productivity as the site moves back to a lodgepole pine/thimbleberry [Mse13] community type. The increase in forage production on these harvested communities will only be temporary. As with most areas with richer soils in the Montane, a disturbance will often lead to introduced species becoming more prevalent in the understory.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** e thimbleberry/pine grass(mesic/rich)

**Ecosite Phase:** e1 thimbleberry/pine grass PI

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 25
LOGEPOLE PINE ( <i>Pinus contorta</i> )	19.3	1.0-60.0	100	Moisture Regime: Mesic (fresh) (5)
WHITE SPRUCE ( <i>Picea glauca</i> )	2.2	0.0-10.0	40	Nutrient Regime: Mesotrophic (medium) (2), Permesotrophic (rich) (2), Eutrophic (very rich) (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Elevation (range): 1491 (1360-1600) M
THIMBLEBERRY ( <i>Rubus parviflorus</i> )	19.8	14.7-27.4	100	Slope (%): 10 - 15.99 (4), 16 - 30.99 (1)
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	7.9	1.5-10.9	100	Aspect: Northerly (2), Easterly (1), Westerly (1), Level (1)
SNOWBERRY ( <i>Symphoricarpos albus</i> )	5.2	0.0-23.5	40	Topographic Position: Upper Slope (3), Midslope (2)
CREEPING MAHONIA ( <i>Berberis repens</i> )	1.3	0.0-4.7	60	
PRICKLY ROSE ( <i>Rosa acicularis</i> )	1.3	0.0-3.4	60	
<b>Tall Forb (&gt;= 30 cm)</b>				<b>Soil Variables</b>
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	11.0	0.0-34.0	80	Soil Drainage: Well drained (4), Moderately well drained (1)
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	3.7	1.0-7.0	100	Soil Subgroup:
SHOWY ASTER ( <i>Aster conspicuus</i> )	2.6	0.0-6.3	80	Surface Texture:
WILD VETCH ( <i>Vicia americana</i> )	2.1	0.0-4.3	80	Effective Texture:
PEARLY EVERLASTING ( <i>Anaphalis margaritacea</i> )	1.1	0.0-2.2	80	Depth to Mottles/Gley:
GREEN FALSE HELLEBORE ( <i>Veratrum eschscholtzii</i> )	1.1	0.0-2.8	60	Organic Thickness:
<b>Low Forb (&lt; 30 cm)</b>				Parent Material:
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	2.3	0.0-7.3	80	Soil Type:
COMMON YARROW ( <i>Achillea millefolium</i> )	1.1	0.0-2.8	80	Humus Form
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	1.0	0.0-3.1	60	
<b>Graminoid</b>				<b>LFH Thickness</b>
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	6.7	0.0-17.7	80	Mean
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	1.7	0.0-6.0	60	Min
TIMOTHY ( <i>Phleum pratense</i> )	1.6	0.0-5.9	60	Max
				Count
				cm: 0.00 0.00 0.00 0

## e2 thimbleberry/pine grass Aw (n=144)

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** e thimbleberry/pine grass(mesic/rich)

### General Description

This aspen phase of this mesic/rich ecosite is represented by a number of reference communities. Thimbleberry dominated understories commonly occur south of the Crowsnest Pass, whereas cow parsnip occurs more commonly to the north. Some understories are dominated by shrubs such as snowberry, saskatoon, raspberry, rose, thimbleberry and chokecherry and are commonly a mix of these. Pine grass is the most common grass, however this changes to marsh reed grass to the north or at higher elevations as sites near the Subalpine and Lower Foothills subregions.

### Environmental Variables

Moisture Regime: Mesic (fresh) (80), Subhygric (moderately moist) (28), Submesic (moderately fresh) (11), Hygric (moist) (5)

Nutrient Regime: Permesotrophic (rich) (82), Mesotrophic (medium) (43), Eutrophic (very rich) (7)

Elevation (range): 1488 (1221-4462) M

Slope (%): strong slope (37), moderate slope (35), very gentle slope (21), nearly level (15), gentle slope (14), very strong slope (6), level (2)

Aspect: Easterly (43), Southerly (42), Westerly (27), Northerly (17), Level (8)

Topographic Position: Midslope (66), Lower Slope (38), Toe (11), Upper Slope (9), Crest (2), Level (1)

### Characteristic Species

#### Tree

[ 52.4 ] ASPEN  
*Populus tremuloides*

[ 4.2 ] BALSAM POPLAR  
*Populus balsamifera*

#### Shrub

[ 10.9 ] UNDIFFERENTIATED SYMPHORICARPOS  
*Symphoricarpos*

[ 8.4 ] THIMBLEBERRY  
*Rubus parviflorus*

[ 2.6 ] SASKATOON  
*Amelanchier alnifolia*

[ 2.0 ] PRICKLY ROSE  
*Rosa acicularis*

#### Forb

[ 6.8 ] COW PARSNIP  
*Heracleum lanatum*

[ 3.7 ] VEINY MEADOW RUE  
*Thalictrum venulosum*

[ 3.4 ] ASTER SPECIES  
*Aster*

[ 3.2 ] COMMON FIREWEED  
*Epilobium angustifolium*

#### Graminoid

[ 3.6 ] BLUEJOINT  
*Calamagrostis canadensis*

[ 3.1 ] PINE REED GRASS  
*Calamagrostis rubescens*

### Soil Variables

Soil Drainage: Well drained (78), Moderately well drained (47), Imperfectly drained (1), Rapidly drained (1)

Soil Subgroup: ORTHIC BLACK CHERNOZEM (5), ORTHIC EUTRIC BRUNISOL (4), ORTHIC DARK GRAY CHERNOZEM (3), DARK GRAY LUVISOL (2), CUMULIC REGOSOL (2), GLEYED DARK GRAY LUVISOL (1), ORTHIC GRAY LUVISOL (1), ORTHIC HUMIC REGOSOL (1), ORTHIC MELANIC BRUNISOL (1), ELUVIATED EUTRIC BRUNISOL (1), BRUNISOLIC GRAY LUVISOL (1), CALCAREOUS BLACK CHERNOZEM (1)

Surface Texture: Loam (6), Sandy loam (4), Clay loam (3), Silt loam (2), Sandy clay (1), Sandy clay loam (1)

Effective Texture: Clay loam (5), Sandy loam (3), Loam (3), Silty clay (2), Sandy clay loam (1), Sand (1), Clay (1)

Depth to Mottles/Gley: 0 - 25 (1)

Organic Thickness: 0 - 5 cm (28)

Parent Material: Morainal (12), Fluvial (8), Residual (4), Colluvial (3), Glaciofluvial (2), Rock (2), Lacustrine (1)

Soil Type: Moist/Fine (3), Moist/Coarse (3), Moist/Silty-Loamy (1), Dry/Fine (1), Dry/Sandy (1)

Humus Form FIBRIHUMIMOR (2), FIBRIMOR (2), HUMIFIBRIMOR (2)

### LFH Thickness

	Mean	Min	Max	Count
cm:	6.60	1.00	9.00	18

# Msg10 Aw/Thimbleberry (n=18)

(*Populus tremuloides*/*Rubus parviflorus*)

Nutrient rich seepage occurs at some point in the growing season for this community type favouring the growth of thimbleberry. Thimbleberry is common in the understory south of the Crowsnest Pass and is generally replaced by cow parsnip north of the Pass. Succession on these sites will be from aspen to pine and then to white spruce. Forage productivity on these sites is generally high because of the favourable moisture and nutrient conditions, however, thimbleberry is generally unpalatable to livestock. This is contrary to the Aw/Cow parsnip [Msg11] community in this phase, which is preferred by cattle. This community type should be rated as secondary range.

**Natural Subregion:** Montane  
**Ecosection:** Ms Montane South Ecosection

**Ecosite:** e thimbleberry/pine grass(mesic/rich)  
**Ecosite Phase:** e2 thimbleberry/pine grass Aw

Plant Composition	Canopy Cover (%)		
	Mean	Range	Const.
<b>Overstory Tree</b>			
ASPEN ( <i>Populus tremuloides</i> )	59.7	0.0-90.0	94
<b>Understory Tree</b>			
ASPEN ( <i>Populus tremuloides</i> )	4.4	0.0-20.0	44
<b>Medium Shrub (0.5 to 2 m)</b>			
THIMBLEBERRY ( <i>Rubus parviflorus</i> )	33.9	0.0-66.0	94
SNOWBERRY ( <i>Symphoricarpos albus</i> )	7.3	0.0-33.9	56
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	7.1	0.0-40.0	67
SASKATOON ( <i>Amelanchier alnifolia</i> )	2.3	0.0-33.7	44
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	2.3	0.0-15.7	28
<b>Tall Forb (&gt;= 30 cm)</b>			
SHOWY ASTER ( <i>Aster conspicuus</i> )	3.8	0.0-40.0	67
COW PARSNIP ( <i>Heraclium lanatum</i> )	3.1	0.0-24.7	50
RED AND WHITE BANE BERRY ( <i>Actaea rubra</i> )	2.9	0.0-20.0	39
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	2.4	0.0-7.0	83
<b>Low Forb (&lt; 30 cm)</b>			
WESTERN CANADA VIOLET ( <i>Viola canadensis</i> )	2.4	0.0-20.0	44
<b>Graminoid</b>			
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	4.4	0.0-30.0	44

## Environmental Variables

Ecological Status Score: 25  
 Moisture Regime: Mesic (fresh) (9), Subhygric (moderately moist) (4)  
 Nutrient Regime: Permesotrophic (rich) (9), Mesotrophic (medium) (6)  
 Elevation (range): 1553 (1382-1707) M  
 Slope (%): 16 - 30.99 (8), 10 - 15.99 (4), 2.5 - 5.99 (2)  
 Aspect: Southerly (10), Easterly (5), Northerly (2), Westerly (1)  
 Topographic Position: Midslope (5), Lower Slope (4), Upper Slope (1), Crest (1)

## Soil Variables

Soil Drainage: Well drained (8), Moderately well drained (5)  
 Soil Subgroup: ORTHIC DARK GRAY CHERNOZEM (2), ORTHIC EUTRIC BRUNISOL (1), ORTHIC BLACK CHERNOZEM (1)  
 Surface Texture: Loam (3), Silt loam (1)  
 Effective Texture: Loam (2), Clay loam (1), Sandy loam (1)  
 Depth to Mottles/Gley:  
 Organic Thickness: 0 - 5 cm (6)  
 Parent Material: Morainal (2), Colluvial (1), Fluvial (1)  
 Soil Type: Moist/Silty-Loamy (1), Moist/Coarse (1)  
 Humus Form HUMIFIBRIMOR (1)

LFH Thickness	Mean	Min	Max	Count
cm:	7.00	6.00	9.00	3

# Msg11 Aw/Cow parsnip (n=19)

## (*Populus tremuloides*/*Heracleum lanatum*)

Nutrient rich seepage occurs at some point in the growing season favouring the growth of cow parsnip. This community type is very similar to the Aw/Thimbleberry [Msg10] community, but cow parsnip commonly occurs north of the Crowsnest Pass. Forage productivity on these sites is generally high because of the favourable moisture and nutrient conditions. Cow parsnip is palatable to livestock and maybe extensively utilized. Also due to moist and rich conditions introduced species readily invade these areas. This community type should be rated as secondary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** e thimbleberry/pine grass(mesic/rich)

**Ecosite Phase:** e2 thimbleberry/pine grass Aw

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Overstory Tree</b>					Ecological Status Score: 25
ASPEN ( <i>Populus tremuloides</i> )	41.3	0.0-75.0		95	Moisture Regime: Mesic (fresh) (11), Subhygric (moderately moist) (11)
BALSAM POPLAR ( <i>Populus balsamifera</i> )	6.0	0.0-40.0		68	Nutrient Regime: Permesotrophic (rich) (13), Mesotrophic (medium) (6), Eutrophic (very rich) (3)
WHITE SPRUCE ( <i>Picea glauca</i> )	2.2	0.0-20.0		26	Elevation (range): 1689 (1402-4462) M
<b>Medium Shrub (0.5 to 2 m)</b>					Slope (%): 10 - 15.99 (7), 16 - 30.99 (7), 6 - 9.99 (3), 0.5 - 2.49 (2), 31 - 45.99 (2)
ASPEN ( <i>Populus tremuloides</i> )	3.8	0.0-23.0		47	Aspect: Easterly (10), Westerly (4), Southerly (3), Northerly (3)
UNDIFFERENTIATED ROSE ( <i>Rosa</i> )	2.4	0.0-6.5		90	Topographic Position: Midslope (16), Lower Slope (4), Upper Slope (1), Toe (1)
UNDIFFERENTIATED SYMPHORICARPOS ( <i>Symphoricarpos</i> )	2.3	0.0-23.7		58	<b>Soil Variables</b>
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	2.2	0.0-15.7		42	Soil Drainage: Well drained (14), Moderately well drained (6), Imperfectly drained (1), Rapidly drained (1)
WILD RED RASPBERRY ( <i>Rubus idaeus</i> )	1.7	0.0-14.6		47	Soil Subgroup: ORTHIC EUTRIC BRUNISOL (1), GLEYED DARK GRAY LUVISOL (1)
<b>Tall Forb (&gt;= 30 cm)</b>					Surface Texture:
COW PARSNIP ( <i>Heracleum lanatum</i> )	24.3	0.3-65.7		100	Effective Texture:
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	8.1	0.0-32.3		95	Depth to Mottles/Gley:
VEINY MEADOW RUE ( <i>Thalictrum venulosum</i> )	6.9	1.0-17.3		100	Organic Thickness: 0 - 5 cm (3)
UNDIFFERENTIATED GERANIUM ( <i>Geranium</i> )	6.3	0.0-19.0		90	Parent Material: Colluvial (1), Lacustrine (1), Morainal (1), Residual (1)
<b>Low Forb (&lt; 30 cm)</b>					Soil Type: Moist/Fine (1)
ASTER SPECIES ( <i>Aster</i> )	13.6	2.6-35.6		100	Humus Form HUMIFIBRIMOR (1), FIBRIHUMIMOR (1)
WESTERN CANADA VIOLET ( <i>Viola canadensis</i> )	9.9	0.0-29.0		68	<b>LFH Thickness</b>
<b>Graminoid</b>					<b>Mean</b> <b>Min</b> <b>Max</b> <b>Count</b>
UNDIFFERENTIATED REED GRASS ( <i>Calamagrostis</i> )	9.3	0.0-19.3		89	cm:            6.00    5.00    6.00    2
UNDIFFERENTIATED ELYMUS ( <i>Elymus</i> )	3.9	0.0-7.9		74	
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	1.9	0.0-13.1		42	
TIMOTHY ( <i>Phleum pratense</i> )	1.7	0.0-5.6		47	
AWNLESS BROME ( <i>Bromus inermis</i> )	1.5	0.0-14.3		26	

## Msg17 Aw/Cow parsnip/Kentucky bluegrass (n=6)

### (*Populus tremuloides*/*Heracleum lanatum*/*Poa pratensis*)

This community type represents a grazing disclimax of the Aw/Cow parsnip dominated community. As grazing pressure increases native grasses and forbs will decline and are replaced by Kentucky bluegrass and timothy. Under extreme grazing pressure only Kentucky bluegrass will dominate the understory. Forage productivity on these sites is generally quite high because of the favourable moisture and nutrient conditions. Cow parsnip is palatable to livestock and may be extensively utilized. This community type should be rated as secondary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** e thimbleberry/pine grass(mesic/rich)

**Ecosite Phase:** e2 thimbleberry/pine grass Aw

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 15-20
ASPEN ( <i>Populus tremuloides</i> )	40.0	30.0-50.0	100	Moisture Regime: Mesic (fresh) (5), Subhygric (moderately moist) (3)
<b>Understory Tree</b>				Nutrient Regime: Permesotrophic (rich) (9), Mesotrophic (medium) (1)
ASPEN ( <i>Populus tremuloides</i> )	6.5	0.0-15.0	33	Elevation (range): 1471 (1376-1565) M
<b>Tall Shrub (2 to 5m)</b>				Slope (%): 16 - 30.99 (6), 31 - 45.99 (2), 10 - 15.99 (2)
SASKATOON ( <i>Amelanchier alnifolia</i> )	3.4	0.0-10.6	50	Aspect: Easterly (5), Southerly (3), Northerly (2)
<b>Medium Shrub (0.5 to 2 m)</b>				Topographic Position: Midslope (7), Lower Slope (4)
WILD RED RASPBERRY ( <i>Rubus idaeus</i> )	4.2	0.0-11.0	83	<b>Soil Variables</b>
PRICKLY ROSE ( <i>Rosa acicularis</i> )	2.7	0.0-7.9	83	Soil Drainage: Well drained (4), Moderately well drained (4)
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	1.7	0.0-9.3	33	Soil Subgroup:
<b>Tall Forb (&gt;= 30 cm)</b>				Surface Texture:
COW PARSNIP ( <i>Heracleum lanatum</i> )	15.0	2.5-32.0	100	Effective Texture:
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	7.2	1.0-12.1	100	Depth to Mottles/Gley:
WILD WHITE GERANIUM ( <i>Geranium richardsonii</i> )	6.5	0.0-25.1	33	Organic Thickness:
BICKNELL'S GERANIUM ( <i>Geranium bicknellii</i> )	5.0	0.0-24.3	33	Parent Material:
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	4.0	0.0-15.8	67	Soil Type:
<b>Graminoid</b>				Humus Form
TIMOTHY ( <i>Phleum pratense</i> )	8.2	0.8-21.5	100	<b>LFH Thickness</b>
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	6.3	0.0-19.4	67	Mean
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	5.5	0.0-26.7	67	Min
BLUEJOINT ( <i>Calamagrostis canadensis</i> )	3.0	0.0-17.3	33	Max
				Count
				cm:
				0.00
				0.00
				0.00
				0

## Msg22 Aw/Marsh reed grass-Kentucky bluegrass (n=4)

(*Populus tremuloides*/*Calamagrostis canadensis*-*Poa pratensis*)

This community represents a moderately disturbed aspen or poplar community with marsh reed grass common in the understory. It typically occurs on lower slope positions where some nutrient rich seepage occurs during the growing season. Marsh reed grass is not common in the Montane subregion and the presence of this grass species may indicate that the climate is closer to the Lower Foothills or Subalpine subregions. Mixed shrub cover of snowberry, rose, raspberry, saskatoon and gooseberry is common, along with extensive cover of grasses, making this community fairly attractive to livestock. Although this community is maintaining a diversity of shrubs and forbs, the presence of timothy and Kentucky bluegrass indicate there has been some disturbance. Further disturbance will cause timothy and Kentucky bluegrass to dominate and lead to an Aw/Timothy-Kentucky bluegrass [Msg7] community.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** e thimbleberry/pine grass(mesic/rich)

**Ecosite Phase:** e2 thimbleberry/pine grass Aw

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 15-20
ASPEN ( <i>Populus tremuloides</i> )	45.0	30.0-70.0	100	Moisture Regime: Mesic (fresh) (2), Subhygric (moderately moist) (2)
WHITE SPRUCE ( <i>Picea glauca</i> )	4.2	0.0-10.0	75	Nutrient Regime: Permesotrophic (rich) (2), Eutrophic (very rich) (1), Mesotrophic (medium) (1)
<b>Tall Shrub (2 to 5m)</b>				Elevation (range): 1413 (1362-1460) M
ASPEN ( <i>Populus tremuloides</i> )	20.0	3.0-50.0	100	Slope (%): 2.5 - 5.99 (4)
SASKATOON ( <i>Amelanchier alnifolia</i> )	1.1	0.0-3.0	50	Aspect: Easterly (3), Westerly (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Topographic Position: Midslope (2), Toe (1), Lower Slope (1)
PRICKLY ROSE ( <i>Rosa acicularis</i> )	9.7	0.7-15.0	100	<b>Soil Variables</b>
SNWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	4.4	0.0-10.1	75	Soil Drainage: Moderately well drained (3), Well drained (1)
WILD RED RASPBERRY ( <i>Rubus idaeus</i> )	3.2	0.0-11.8	75	Soil Subgroup: DARK GRAY LUVISOL (1)
<b>Tall Forb (&gt;= 30 cm)</b>				Surface Texture: Sandy clay (1)
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	8.6	2.0-13.9	100	Effective Texture: Sandy clay loam (1)
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	4.9	1.0-8.0	100	Depth to Mottles/Gley:
WILD WHITE GERANIUM ( <i>Geranium richardsonii</i> )	3.2	0.0-5.3	75	Organic Thickness: 0 - 5 cm (1)
WILD VETCH ( <i>Vicia americana</i> )	2.7	1.0-4.2	100	Parent Material: Fluvial (1), Morainal (1)
<b>Low Forb (&lt; 30 cm)</b>				Soil Type: Moist/Fine (1)
COMMON DANDELION ( <i>Taraxacum officinale</i> )	4.3	0.0-7.9	75	Humus Form
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	3.5	1.7-5.0	100	<b>LFH Thickness</b>
WESTERN CANADA VIOLET ( <i>Viola canadensis</i> )	2.8	0.0-6.3	75	Mean
<b>Graminoid</b>				Min
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	8.5	2.0-12.0	100	Max
TIMOTHY ( <i>Phleum pratense</i> )	7.4	0.0-15.3	75	Count
BLUEJOINT ( <i>Calamagrostis canadensis</i> )	6.7	1.3-16.3	100	cm:
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	5.4	0.0-14.8	50	5.00
FRINGED BROME ( <i>Bromus ciliatus</i> )	1.8	0.0-5.0	75	5.00
				5.00
				1



## Msg8 Aw/Snowberry-Saskatoon (n=40)

(*populus tremuloides*/*Symphoricarpos occidentalis*-*Amelanchier alnifolia*)

This community is one of several aspen community types which represent the mesic/rich ecosite for the Montane subregion (Archibald et al. 1996). The understory can be dominated by shrubs, including rose, snowberry or saskatoon, with pine grass the dominant grass species. Continued succession of this community type will likely be to white spruce. The Aw/Thimbleberry [Msg10] and Aw/Cow parsnip [Msg11] community types are probably slightly richer than this community, however the palatable forage production of this community is generally higher. In general, this community type is moderately productive for domestic livestock and should be rated as secondary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** e thimbleberry/pine grass(mesic/rich)

**Ecosite Phase:** e2 thimbleberry/pine grass Aw

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 25
ASPEN ( <i>Populus tremuloides</i> )	45.7	0.0-99.0	88	Moisture Regime: Mesic (fresh) (30), Subhygric (moderately moist) (7)
BALSAM POPLAR ( <i>Populus balsamifera</i> )	1.0	0.0-25.0	10	Nutrient Regime: Permesotrophic (rich) (21), Mesotrophic (medium) (13)
<b>Understory Tree</b>				Elevation (range): 1478 (1313-1680) M
ASPEN ( <i>Populus tremuloides</i> )	18.4	0.0-92.1	45	Slope (%): 10 - 15.99 (10), 16 - 30.99 (9), 2.5 - 5.99 (6), 6 - 9.99 (5), 0.5 - 2.49 (5)
<b>Medium Shrub (0.5 to 2 m)</b>				Aspect: Easterly (12), Southerly (12), Westerly (9), Northerly (3), Level (2)
UNDIFFERENTIATED SYMPHORICARPOS ( <i>Symphoricarpos</i> )	29.5	1.0-97.9	100	Topographic Position: Midslope (17), Lower Slope (9), Upper Slope (4), Level (1)
SASKATOON ( <i>Amelanchier alnifolia</i> )	8.3	0.0-50.0	78	
PRICKLY ROSE ( <i>Rosa acicularis</i> )	5.9	0.0-50.0	83	
<b>Tall Forb (&gt;= 30 cm)</b>				<b>Soil Variables</b>
SHOWY ASTER ( <i>Aster conspicuus</i> )	3.0	0.0-25.0	63	Soil Drainage: Well drained (25), Moderately well drained (11)
VEINY MEADOW RUE ( <i>Thalictrum venulosum</i> )	3.0	0.0-21.7	63	Soil Subgroup: ORTHIC BLACK CHERNOZEM (4), ORTHIC EUTRIC BRUNISOL (2), CUMULIC REGOSOL (2), ELUVIATED EUTRIC BRUNISOL (1), BRUNISOLIC GRAY LUVISOL (1), DARK GRAY LUVISOL (1), ORTHIC GRAY LUVISOL (1), ORTHIC HUMIC REGOSOL (1), ORTHIC MELANIC BRUNISOL (1), CALCAREOUS BLACK CHERNOZEM (1)
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	2.8	0.0-24.5	83	Surface Texture: Sandy loam (4), Clay loam (3), Loam (3), Silt loam (1)
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	2.2	0.0-19.0	58	Effective Texture: Clay loam (4), Sandy loam (2), Clay (1), Sand (1), Loam (1), Silty clay (1)
<b>Low Forb (&lt; 30 cm)</b>				Depth to Mottles/Gley: 0 - 25 (1)
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	3.5	0.0-15.5	90	Organic Thickness: 0 - 5 cm (17)
<b>Graminoid</b>				Parent Material: Morainal (7), Fluvial (5), Residual (3), Rock (2), Glaciofluvial (2), Colluvial (1)
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	8.1	0.0-60.0	65	Soil Type: Moist/Coarse (2), Moist/Fine (1), Dry/Sandy (1)
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	3.3	0.0-50.0	40	Humus Form FIBRIMOR (2), FIBRIHUMIMOR (1)
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	1.2	0.0-22.0	28	
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	1.1	0.0-9.7	38	
				<b>LFH Thickness</b>
				<b>Mean</b>
				<b>Min</b>
				<b>Max</b>
				<b>Count</b>
				cm: 6.00 1.00 9.00 11

## Msg9 Aw/Snowberry/Kentucky bluegrass (n=23)

(*Populus tremuloides*/*Symphoricarpos spp.*/*Poa pratensis*)

This community type is similar to the Aw/Snowberry-Saskatoon [Msg8] community, but has undergone a disturbance that has introduced tame species. For example, Willoughby (1995) found that aspen stands that have been heavily grazed for prolonged periods have a low cover of native shrubs, forbs and grass species and a high cover of Kentucky bluegrass, clover and dandelion. This community has a high cover of Kentucky bluegrass, but it also has a high cover of native shrubs, forbs and grasses, which indicate that although disturbed to the point of Kentucky bluegrass invasion, current management is still promoting native species. This community is very productive for domestic livestock, however, increased grazing will reduce abundant shrub cover. Continued heavy grazing will reduce shrubs and forbs and move to the Aw/Timothy-Kentucky bluegrass [Msg7] community. Although described in a drier ecosite, the modified plant community becomes similar in composition and production.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** e thimbleberry/pine grass(mesic/rich)

**Ecosite Phase:** e2 thimbleberry/pine grass Aw

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 15
ASPEN ( <i>Populus tremuloides</i> )	50.2	0.0-78.1	96	Moisture Regime: Mesic (fresh) (15), Submesic (moderately fresh) (9)
<b>Understory Tree</b>				Nutrient Regime: Permesotrophic (rich) (18), Mesotrophic (medium) (11)
ASPEN ( <i>Populus tremuloides</i> )	1.7	0.0-15.0	26	Elevation (range): 1462 (1221-1680) M
<b>Tall Shrub (2 to 5m)</b>				Slope (%): 10 - 15.99 (8), 16 - 30.99 (6), 6 - 9.99 (6), 2.5 - 5.99 (5), 0.5 - 2.49 (3), 0 - 0.49 (1)
ASPEN ( <i>Populus tremuloides</i> )	5.6	0.0-80.0	13	Aspect: Southerly (10), Westerly (9), Northerly (5), Easterly (4), Level (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Topographic Position: Lower Slope (11), Midslope (10), Toe (7), Upper Slope (2)
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	7.7	0.0-47.7	39	<b>Soil Variables</b>
PRICKLY ROSE ( <i>Rosa acicularis</i> )	5.7	0.0-24.0	87	Soil Drainage: Well drained (15), Moderately well drained (12)
SASKATOON ( <i>Amelanchier alnifolia</i> )	4.0	0.0-39.3	74	Soil Subgroup: ORTHIC DARK GRAY CHERNOZEM (1)
CREeping MAHONIA ( <i>Berberis repens</i> )	2.0	0.0-21.7	17	Surface Texture: Sandy clay loam (1)
WILD RED RASPBERRY ( <i>Rubus idaeus</i> )	1.8	0.0-15.7	44	Effective Texture: Silty clay (1)
<b>Tall Forb (&gt;= 30 cm)</b>				Depth to Mottles/Gley:
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	3.2	0.0-15.3	87	Organic Thickness: 0 - 5 cm (1)
SHOWY ASTER ( <i>Aster conspicuus</i> )	2.6	0.0-13.5	48	Parent Material: Fluvial (1), Morainal (1)
WILD VETCH ( <i>Vicia americana</i> )	2.6	0.0-19.0	87	Soil Type: Dry/Fine (1)
<b>Low Forb (&lt; 30 cm)</b>				Humus Form
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	3.1	0.0-13.8	96	<b>LFH Thickness</b>
<b>Graminoid</b>				Mean Min Max Count
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	9.3	0.0-31.4	91	cm: 9.00 9.00 9.00 1
TIMOTHY ( <i>Phleum pratense</i> )	4.8	0.0-25.0	83	
AWNLESS BROME ( <i>Bromus inermis</i> )	3.7	0.0-28.7	39	
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	2.8	0.0-24.7	44	
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	2.3	0.0-18.0	74	

## Msg9a Aw-Pb/Marsh reed grass (n=12)

(*Populus tremuloides*-*P.balsamifera*/*Calamagrostis canadensis*)

This community type was described on lower slope positions where nutrient rich seepage occurs during the growing season, and is one of a number of reference aspen plant communities described in this ecosite. Pine grass has been replaced by marsh reed grass as the predominant grass species, indicating transition to the Lower Foothills or Subalpine subregions. This community type has a low shrub cover and extensive cover of productive grass which makes it fairly attractive to livestock. Often these community types are heavily utilized, leading to increases of introduced species.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** e thimbleberry/pine grass(mesic/rich)

**Ecosite Phase:** e2 thimbleberry/pine grass Aw

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Overstory Tree</b>					Ecological Status Score: 25
ASPEN ( <i>Populus tremuloides</i> )	40.4	20.0-60.0	100		Moisture Regime: Hygric (moist) (5), Mesic (fresh) (4)
BALSAM POPLAR ( <i>Populus balsamifera</i> )	12.6	0.0-30.0	67		Nutrient Regime: Permesotrophic (rich) (8), Eutrophic (very rich) (3)
WHITE SPRUCE ( <i>Picea glauca</i> )	1.8	0.0-15.0	25		Elevation (range): 1495 (1417-1676) M
<b>Understory Tree</b>					Slope (%): 0.5 - 2.49 (5), 2.5 - 5.99 (3), 10 - 15.99 (1), 0 - 0.49 (1)
WHITE SPRUCE ( <i>Picea glauca</i> )	1.0	0.0-10.0	17		Aspect: Southerly (3), Westerly (2), Level (2), Northerly (2), Easterly (2)
<b>Tall Shrub (2 to 5m)</b>					Topographic Position: Midslope (5), Lower Slope (4), Toe (2), Crest (1)
GREEN ALDER ( <i>Alnus crispa</i> )	1.6	0.0-20.0	8		<b>Soil Variables</b>
<b>Medium Shrub (0.5 to 2 m)</b>					Soil Drainage: Well drained (6), Moderately well drained (5)
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	2.7	0.0-12.0	25		Soil Subgroup:
PRICKLY ROSE ( <i>Rosa acicularis</i> )	2.4	0.0-9.0	83		Surface Texture:
WILD RED RASPBERRY ( <i>Rubus idaeus</i> )	2.0	0.0-12.3	50		Effective Texture:
NORTHERN GOOSEBERRY ( <i>Ribes oxycanthoides</i> )	1.1	0.0-6.3	25		Depth to Mottles/Gley:
<b>Tall Forb (&gt;= 30 cm)</b>					Organic Thickness:
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	11.1	0.0-26.0	75		Parent Material:
WILD WHITE GERANIUM ( <i>Geranium richardsonii</i> )	8.7	0.0-27.0	58		Soil Type:
VEINY MEADOW RUE ( <i>Thalictrum venulosum</i> )	5.1	0.0-18.0	58		Humus Form
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	5.0	0.0-10.7	92		<b>LFH Thickness</b>
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	4.9	0.0-14.3	83		Mean
<b>Low Forb (&lt; 30 cm)</b>					Min
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	5.5	1.3-8.7	100		Max
<b>Graminoid</b>					Count
BLUEJOINT ( <i>Calamagrostis canadensis</i> )	14.6	0.0-32.7	92		cm:
ALPINE FOXTAIL ( <i>Alopecurus occidentalis</i> )	3.5	0.0-22.0	25		0.00
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	2.6	0.0-8.5	50		0.00
FRINGED BROME ( <i>Bromus ciliatus</i> )	2.2	0.0-7.5	67		0.00
					0

## Msh22 Thimbleberry (cutblock) (n=5)

### (*Rubus parviflora*)

This community type is found in the transition zone between the Subalpine and Montane subregions and may occur when the Sw, Fa or PI/Thimbleberry dominated community type is harvested. This community type is very similar to the previously described PI/Thimbleberry [Msh20] cutblock, but presently lacks tree regeneration cover. This may be a recent harvest where trees have not had the opportunity to establish yet, or be an older block that is not progressing to regeneration standards. The forage production on this particular community type is moderate, but any increase in forage supply is only temporary. As the community succeeds back to a conifer dominated forest the forage supply will decrease. These rich-soil communities are susceptible to introduced species invasion.

**Natural Subregion:** Montane  
**Ecosection:** Ms Montane South Ecosection

**Ecosite:** e thimbleberry/pine grass(mesic/rich)  
**Ecosite Phase:** e2 thimbleberry/pine grass Aw

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Medium Shrub (0.5 to 2 m)</b>				Ecological Status Score: 10-15
THIMBLEBERRY ( <i>Rubus parviflorus</i> )	11.3	3.5-21.7	100	Moisture Regime: Mesic (fresh) (4), Submesic (moderately fresh) (2)
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	8.7	0.0-18.3	80	Nutrient Regime: Mesotrophic (medium) (5), Permesotrophic (rich) (1)
GREEN ALDER ( <i>Alnus crispa</i> )	2.7	0.0-13.7	40	Elevation (range): 1567 (1494-1662) M
BUNCHBERRY ( <i>Cornus canadensis</i> )	1.4	0.0-7.2	20	Slope (%): 10 - 15.99 (3), 31 - 45.99 (2), 2.5 - 5.99 (1)
LODGEPOLE PINE ( <i>Pinus contorta</i> )	1.1	0.0-4.7	40	Aspect: Level (3), Easterly (2), Westerly (1)
<b>Tall Forb (&gt;= 30 cm)</b>				Topographic Position: Midslope (4), Lower Slope (1), Upper Slope (1)
SHOWY ASTER ( <i>Aster conspicuus</i> )	7.6	0.0-17.7	80	<b>Soil Variables</b>
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	6.5	0.0-30.0	60	Soil Drainage: Well drained (5)
WILD VETCH ( <i>Vicia americana</i> )	4.0	0.0-11.7	80	Soil Subgroup:
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	3.7	0.0-9.7	80	Surface Texture:
<b>Low Forb (&lt; 30 cm)</b>				Effective Texture:
HEART-LEAVED ARNICA ( <i>Arnica cordifolia</i> )	8.0	0.0-26.7	80	Depth to Mottles/Gley:
<b>Graminoid</b>				Organic Thickness:
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	6.1	0.0-25.3	80	Parent Material:
SEDGE SPECIES ( <i>Carex</i> )	2.8	0.0-6.0	60	Soil Type:
BLUEJOINT ( <i>Calamagrostis canadensis</i> )	1.0	0.0-2.5	60	Humus Form
				<b>LFH Thickness</b>
				Mean
				Min
				Max
				Count
				cm:
				0.00
				0.00
				0.00
				0

## Msh29 Snowberry-Thimbleberry (Aw) (burn) (n=14)

### (*Symphoricarpos occidentalis*-*Rubus parviflorus* (*Populus tremuloides*))

This community type represents a Aw/Snowberry-Saskatoon (Msg8) or Aw/Thimbleberry (Msg10) that burned in 2000 as part of the Cherry Hill Fire. This community is one of several aspen community types which represent the mesic/rich ecosite for the Montane subregion (Archibald et al. 1996). The understory can be dominated by shrubs, including rose, thimbleberry, snowberry or saskatoon, with pine grass the dominant grass species. The Cherry Hill Fire was an intense fire that initially killed the tree canopy. However, since the fire aspen regeneration has been vigorous and the site is now dominated by a dense understory of aspen. The dense understory restricts livestock access to the forage and this site should be rated as secondary or tertiary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** e thimbleberry/pine grass(mesic/rich)

**Ecosite Phase:** e2 thimbleberry/pine grass Aw

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 20-25
ASPEN ( <i>Populus tremuloides</i> )	21.5	5.0-39.3	100	Moisture Regime: Subhygric (moderately moist) (1)
<b>Tall Shrub (2 to 5m)</b>				Nutrient Regime: Permesotrophic (rich) (1)
SASKATOON ( <i>Amelanchier alnifolia</i> )	4.4	0.0-16.7	79	Elevation (range): 1350 (1350-1350) M
<b>Medium Shrub (0.5 to 2 m)</b>				Slope (%): 16 - 30.99 (1)
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	44.0	23.1-65.0	100	Aspect: Southerly (1)
PRICKLY ROSE ( <i>Rosa acicularis</i> )	7.7	1.0-14.8	100	Topographic Position:
THIMBLEBERRY ( <i>Rubus parviflorus</i> )	7.3	0.0-21.0	50	
<b>Tall Forb (&gt;= 30 cm)</b>				<b>Soil Variables</b>
STICKY PURPLE GERANIUM ( <i>Geranium viscosissimum</i> )	3.2	0.0-7.7	93	Soil Drainage: Moderately well drained (1)
VEINY MEADOW RUE ( <i>Thalictrum venulosum</i> )	3.2	0.0-8.7	93	Soil Subgroup:
WILD VETCH ( <i>Vicia americana</i> )	3.1	0.1-9.8	100	Surface Texture:
WHITE ANGELICA ( <i>Angelica arguta</i> )	2.2	0.0-8.9	57	Effective Texture:
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	2.0	0.0-5.8	71	Depth to Mottles/Gley:
YELLOW ANGELICA ( <i>Angelica dawsonii</i> )	1.7	0.0-13.6	29	Organic Thickness:
SHOWY ASTER ( <i>Aster conspicuus</i> )	1.7	0.0-14.7	36	Parent Material:
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	1.7	0.0-6.7	86	Soil Type:
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	1.4	0.0-4.3	93	Humus Form
<b>Low Forb (&lt; 30 cm)</b>				<b>LFH Thickness</b>
COMMON YARROW ( <i>Achillea millefolium</i> )	2.5	0.5-12.9	100	Mean
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	2.3	0.0-7.0	93	Min
COMMON DANDELION ( <i>Taraxacum officinale</i> )	2.3	0.7-4.5	100	Max
<b>Graminoid</b>				Count
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	5.2	0.0-14.8	86	cm:
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	4.3	0.1-8.6	100	0.00
TIMOTHY ( <i>Phleum pratense</i> )	2.3	0.3-7.7	100	0.00
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	1.8	0.0-8.9	79	0.00
				0

## e3 thimbleberry/pine grass Sw (n=22)

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** e thimbleberry/pine grass(mesic/rich)

### General Description

The spruce phase is the climax stand for this mesic/rich ecosite. Succession on the thimbleberry dominated ecosite is typically from aspen and pine and then to white spruce (Archibald et al. 1996). Understories are sparse in this phase, however, thimbleberry occurs more commonly south of the Crowsnest Pass, whereas cow parsnip may occur to the north. Engelmann spruce and subalpine fir may mix into these forest stands at higher elevations nearing the Subalpine transition.

### Characteristic Species

#### Tree

- [ 27.7 ] ENGELMANN SPRUCE  
*Picea engelmannii*
- [ 12.4 ] WHITE SPRUCE  
*Picea glauca*
- [ 5.6 ] SUBALPINE FIR  
*Abies lasiocarpa*

#### Shrub

- [ 4.5 ] THIMBLEBERRY  
*Rubus parviflorus*
- [ 1.2 ] SNOWBERRY  
*Symphoricarpos albus*
- [ 1.2 ] BRACTED HONEYSUCKLE  
*Lonicera involucrata*

#### Forb

- [ 2.0 ] BUNCHBERRY  
*Cornus canadensis*

### Environmental Variables

Moisture Regime: Mesic (fresh) (10), Subhygric (moderately moist) (9), Hydric (wet) (1)

Nutrient Regime: Permesotrophic (rich) (9), Mesotrophic (medium) (9), Eutrophic (very rich) (3)

Elevation (range): 1654 (1430-1749) M

Slope (%): moderate slope (7), very gentle slope (3), gentle slope (3), steep slope (1)

Aspect: Easterly (6), Northerly (4), Level (4), Westerly (3), Southerly (3)

Topographic Position: Midslope (9), Upper Slope (4), Level (4), Lower Slope (3), Toe (2)

### Soil Variables

Soil Drainage: Well drained (12), Moderately well drained (7), Imperfectly drained (1)

Soil Subgroup: ELUVIATED EUTRIC BRUNISOL (8), ORTHIC EUTRIC BRUNISOL (7), ORTHIC REGOSOL (4), CUMULIC REGOSOL (2), BRUNISOLIC GRAY LUVISOL (2), GLEYED DARK GRAY LUVISOL (2), ORTHIC GRAY LUVISOL (2), CALCAREOUS BLACK CHERNOZEM (2), GLEYED BLACK CHERNOZEM (2), ORTHIC BLACK CHERNOZEM (2), ORTHIC DARK GRAY CHERNOZEM (2), ORTHIC MELANIC BRUNISOL (1)

Surface Texture: Loam (18), Silt loam (3), Silty clay loam (3), Clay loam (2), Fine sandy loam (2), Loamy sand (1), Sandy clay loam (1)

Effective Texture: Clay loam (12), Sandy loam (5), Loam (4), Silty clay loam (2), Clay (2), Fine sandy loam (2), Loamy sand (2), Sandy clay loam (1)

Depth to Mottles/Gley: 26 - 50 (4), 51 - 100 (2)

Organic Thickness: 0 - 5 cm (37)

Parent Material: Morainal (15), Fluvial (8), Colluvial (6), Glaciofluvial (2), Saprolite (2), Residual (2), Rock (2)

Soil Type: Moist/Silty-Loamy (3), Dry/Fine (2), Moist/Fine (1), Very Dry/Sandy (1), Moist/Coarse (1)

Humus Form FIBRIMOR (17), MODER (2)

### LFH Thickness

	Mean	Min	Max	Count
cm:	6.00	2.00	8.00	30

# Mse16 Sw/Thimbleberry (n=20)

(*Picea glauca/Rubus parviflorus*)

This community type is very similar to the PI/Thimbleberry [Mse13] community described, but is successionaly more advanced. Succession on the thimbleberry dominated ecosite is from aspen and pine and then to white spruce (Archibald et al. 1996). The easterly and northerly aspects common of this community have allowed the site to escape disturbance by fire and succession has occurred to white spruce. Note, although called a white spruce community, Engelmann spruce and subalpine fir may interchange in these stands at higher elevations close to the Subalpine subregion. There is little understory production in this climax community, and should be considered tertiary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** e thimbleberry/pine grass(mesic/rich)

**Ecosite Phase:** e3 thimbleberry/pine grass Sw

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 25
ENGELMANN SPRUCE ( <i>Picea engelmannii</i> )	17.7	0.0-63.0	50	Moisture Regime: Subhygric (moderately moist) (9), Mesic (fresh) (8)
WHITE SPRUCE ( <i>Picea glauca</i> )	11.8	0.0-75.0	25	Nutrient Regime: Mesotrophic (medium) (9), Permesotrophic (rich) (6), Eutrophic (very rich) (3)
SUBALPINE FIR ( <i>Abies lasiocarpa</i> )	5.4	0.0-42.0	30	Elevation (range): 1538 (1430-1710) M
LOGEPOLE PINE ( <i>Pinus contorta</i> )	4.5	0.0-25.0	60	Slope (%): 10 - 15.99 (7), 2.5 - 5.99 (3), 6 - 9.99 (3)
<b>Understory Tree</b>				Aspect: Easterly (5), Level (4), Northerly (4), Southerly (3), Westerly (3)
ENGELMANN SPRUCE ( <i>Picea engelmannii</i> )	5.3	0.0-29.0	40	Topographic Position: Midslope (8), Level (4), Lower Slope (3), Upper Slope (2), Toe (2)
SUBALPINE FIR ( <i>Abies lasiocarpa</i> )	3.7	0.0-25.0	35	<b>Soil Variables</b>
<b>Medium Shrub (0.5 to 2 m)</b>				Soil Drainage: Well drained (10), Moderately well drained (7)
THIMBLEBERRY ( <i>Rubus parviflorus</i> )	4.3	0.0-25.0	75	Soil Subgroup: ELUVIATED EUTRIC BRUNISOL (4), ORTHIC EUTRIC BRUNISOL (4), ORTHIC REGOSOL (2), BRUNISOLIC GRAY LUVISOL (1), GLEYED DARK GRAY LUVISOL (1), ORTHIC GRAY LUVISOL (1), ORTHIC MELANIC BRUNISOL (1), CUMULIC REGOSOL (1), CALCAREOUS BLACK CHERNOZEM (1), GLEYED BLACK CHERNOZEM (1), ORTHIC BLACK CHERNOZEM (1), ORTHIC DARK GRAY CHERNOZEM (1)
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	2.2	0.0-20.0	60	Surface Texture: Loam (9), Silty clay loam (2), Silt loam (2), Sandy clay loam (1), Loamy sand (1), Clay loam (1), Fine sandy loam (1)
BRACTED HONEYSUCKLE ( <i>Lonicera involucrata</i> )	1.2	0.0-10.0	50	Effective Texture: Clay loam (6), Sandy loam (3), Silty clay loam (2), Loam (2), Clay (1), Fine sandy loam (1), Sandy clay loam (1), Loamy sand (1)
SNOWBERRY ( <i>Symphoricarpos albus</i> )	1.1	0.0-10.0	30	Depth to Mottles/Gley: 26 - 50 (2), 51 - 100 (1)
<b>Tall Forb (&gt;= 30 cm)</b>				Organic Thickness: 0 - 5 cm (19)
YELLOW ANGELICA ( <i>Angelica dawsonii</i> )	2.0	0.0-15.0	55	Parent Material: Morainal (8), Fluvial (4), Colluvial (3), Glaciofluvial (1), Saprolite (1), Rock (1), Residual (1)
WESTERN MEADOW RUE ( <i>Thalictrum occidentale</i> )	1.5	0.0-10.0	50	Soil Type: Moist/Silty-Loamy (2), Dry/Fine (2), Moist/Coarse (1), Moist/Fine (1), Very Dry/Sandy (1)
<b>Low Forb (&lt; 30 cm)</b>				Humus Form FIBRIMOR (9), MODER (1)
HEART-LEAVED ARNICA ( <i>Arnica cordifolia</i> )	4.1	0.0-25.0	80	
BUNCHBERRY ( <i>Cornus canadensis</i> )	2.1	0.0-18.0	65	
<b>Moss</b>				
UNDIFFERENTIATED MOSS - ALL GENERA ( <i>Moss</i> )	6.5	0.0-68.0	45	
				<b>LFH Thickness</b>
				Mean
				Min
				Max
				Count
cm:				6.00
				2.00
				8.00
				17

## Mse27 Fd/Thimbleberry (n=1)

### (*Pseudotsuga menziesii*/*Rubus parviflorus*)

This community type is not common in the Montane subregion. It is very similar to the PI/Thimbleberry dominated community types previously described, but is successional more advanced. Succession on the thimbleberry dominated ecosites will be from aspen and pine, Douglas fir and then to white spruce (Archibald et al. 1996). The northeasterly aspect of this particular community type has allowed the site to escape disturbance by fire and succession has occurred to white spruce. Note as succession occurs there is a corresponding drop in forage productivity from 500-600 kg/ha in the PI community types to 250 kg/ha in this community type. This community type would be rated as non-use for domestic livestock

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** e thimbleberry/pine grass(mesic/rich)

**Ecosite Phase:** e3 thimbleberry/pine grass Sw

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 25
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	20.0	20.0-20.0	100	Moisture Regime: Mesic (fresh) (1)
<b>Understory Tree</b>				Nutrient Regime: Permesotrophic (rich) (1)
DOUGLAS-FIR ( <i>Pseudotsuga menziesii</i> )	5.0	5.0-5.0	100	Elevation (range): 1749 (1749-1749) M
<b>Medium Shrub (0.5 to 2 m)</b>				Slope (%): 46 - 70.99 (1)
THIMBLEBERRY ( <i>Rubus parviflorus</i> )	25.9	25.9-25.9	100	Aspect: Easterly (1)
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	10.3	10.3-10.3	100	Topographic Position: Upper Slope (1)
PRICKLY ROSE ( <i>Rosa acicularis</i> )	1.0	1.0-1.0	100	
<b>Low Shrub (&lt; 0.5m)</b>				<b>Soil Variables</b>
COMMON BLUEBERRY ( <i>Vaccinium myrtilloides</i> )	5.7	5.7-5.7	100	Soil Drainage: Well drained (1)
<b>Tall Forb (&gt;= 30 cm)</b>				Soil Subgroup: ELUVIATED EUTRIC BRUNISOL (4), ORTHIC EUTRIC BRUNISOL (3), ORTHIC REGOSOL (2), BRUNISOLIC GRAY LUVISOL (1), GLEYED DARK GRAY LUVISOL (1), ORTHIC GRAY LUVISOL (1), CUMULIC REGOSOL (1), CALCAREOUS BLACK CHERNOZEM (1), GLEYED BLACK CHERNOZEM (1), ORTHIC BLACK CHERNOZEM (1), ORTHIC DARK GRAY CHERNOZEM (1)
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	19.1	19.1-19.1	100	Surface Texture: Loam (9), Silt loam (1), Silty clay loam (1), Clay loam (1), Fine sandy loam (1)
SITKA VALERIAN ( <i>Valeriana sitchensis</i> )	16.1	16.1-16.1	100	Effective Texture: Clay loam (6), Sandy loam (2), Loam (2), Clay (1), Fine sandy loam (1), Loamy sand (1)
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	9.1	9.1-9.1	100	Depth to Mottles/Gley: 26 - 50 (2), 51 - 100 (1)
COW PARSNIP ( <i>Heracleum lanatum</i> )	4.7	4.7-4.7	100	Organic Thickness: 0 - 5 cm (18)
YELLOW BEARDTONGUE ( <i>Penstemon confertus</i> )	2.1	2.1-2.1	100	Parent Material: Morainal (7), Fluvial (4), Colluvial (3), Saprolite (1), Rock (1), Residual (1), Glaciofluvial (1)
SILVERY PERENNIAL LUPINE ( <i>Lupinus argenteus</i> )	1.7	1.7-1.7	100	Soil Type: Moist/Silty-Loamy (1)
VEINY MEADOW RUE ( <i>Thalictrum venulosum</i> )	1.3	1.3-1.3	100	Humus Form FIBRIMOR (8), MODER (1)
<b>Low Forb (&lt; 30 cm)</b>				<b>LFH Thickness</b>
COMMON YARROW ( <i>Achillea millefolium</i> )	2.0	2.0-2.0	100	Mean
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	1.9	1.9-1.9	100	Min
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	1.5	1.5-1.5	100	Max
<b>Graminoid</b>				Count
IDAHO FESCUE ( <i>Festuca idahoensis</i> )	5.9	5.9-5.9	100	cm: 6.00 4.00 8.00 13
RICHARDSON NEEDLE GRASS ( <i>Stipa richardsonii</i> )	5.0	5.0-5.0	100	
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	4.7	4.7-4.7	100	
TIMOTHY ( <i>Phleum pratense</i> )	3.7	3.7-3.7	100	
PARRY OAT GRASS ( <i>Danthonia parryi</i> )	1.5	1.5-1.5	100	



## e4 thimbleberry shrubland (n=26)

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** e thimbleberry/pine grass(mesic/rich)

### General Description

Shrubs establish early in succession in this ecosite. Along with a diversity of shrubs, these sites usually contain characteristic species such as thimbleberry, cow parsnip and marsh reed grass, all signifying nutrient rich soils. These may occur after a disturbance event such as a fire, and will typically progress to aspen and pine then finally to spruce stands.

### Characteristic Species

#### Shrub

- [ 25.4 ] THIMBLEBERRY  
*Rubus parviflorus*
- [ 7.8 ] SASKATOON  
*Amelanchier alnifolia*
- [ 3.8 ] SNOWBERRY (BUCKBRUSH)  
*Symphoricarpos occidentalis*
- [ 1.2 ] BRISTLY BLACK CURRANT  
*Ribes lacustre*
- [ 0.9 ] CHOKE CHERRY  
*Prunus virginiana*
- [ 0.6 ] WILD RED RASPBERRY  
*Rubus idaeus*

#### Forb

- [ 7.3 ] COMMON FIREWEED  
*Epilobium angustifolium*
- [ 2.7 ] COW PARSNIP  
*Heracleum lanatum*
- [ 2.5 ] RED AND WHITE BANE BERRY  
*Actaea rubra*

#### Graminoid

- [ 3.7 ] BLUEJOINT  
*Calamagrostis canadensis*

### Environmental Variables

Moisture Regime: Subhygric (moderately moist) (6), Hygric (moist) (6), Mesic (fresh) (3), Subxeric (moderately dry) (1)

Nutrient Regime: Permesotrophic (rich) (13), Mesotrophic (medium) (3), Eutrophic (very rich) (1)

Elevation (range): 1597 (1445-1860) M

Slope (%): level (8), moderate slope (2), very strong slope (2), very steep slope (1), strong slope (1), steep slope (1), nearly level (1)

Aspect: Level (8), Easterly (3), Southerly (3), Northerly (3), Westerly (2)

Topographic Position: Midslope (3), Lower Slope (2), Upper Slope (1)

### Soil Variables

Soil Drainage: Moderately well drained (3), Rapidly drained (3), Well drained (2), Very rapidly drained (1)

Soil Subgroup:

Surface Texture: Loam (2), Sandy loam (2), Silty Sand (2)

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (6)

Parent Material:

Soil Type:

Humus Form

### LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

# Msb11 Thimbleberry (n=5)

## (*Rubus parviflorus*)

This community type is characteristic of nutrient-rich seepage areas throughout the Montane. It is similar to the Aw/Thimbleberry [Msg10] and Pl/Thimbleberry [Msg13] community types, but it is not as successional advanced. Similar to these other communities, production is high due to moisture and nutrient content of the soil, but the thick cover of thimbleberry which is generally unpalatable to livestock limits the overall forage value. As a result this community should be considered tertiary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** e thimbleberry/pine grass(mesic/rich)

**Ecosite Phase:** e4 thimbleberry shrubland

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Medium Shrub (0.5 to 2 m)</b>				Ecological Status Score: 40
THIMBLEBERRY ( <i>Rubus parviflorus</i> )	50.8	8.8-72.7	100	Moisture Regime: Mesic (fresh) (3), Subhygric (moderately moist) (1), Hygric (moist) (1)
WESTERN MOUNTAIN-ASH ( <i>Sorbus scopulina</i> )	3.8	0.0-10.0	40	Nutrient Regime: Permesotrophic (rich) (3), Mesotrophic (medium) (1), Eutrophic (very rich) (1)
SASKATOON ( <i>Amelanchier alnifolia</i> )	3.7	0.0-17.6	40	Elevation (range): 1798 (1736-1860) M
BRISTLY BLACK CURRANT ( <i>Ribes lacustre</i> )	2.4	0.0-6.5	60	Slope (%): 31 - 45.99 (2), 46 - 70.99 (1), 71 - 100.99 (1), 10 - 15.99 (1)
DWARF BILBERRY ( <i>Vaccinium caespitosum</i> )	2.1	0.0-9.8	40	Aspect: Easterly (3), Southerly (1), Westerly (1)
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	1.9	0.0-7.8	40	Topographic Position: Midslope (1), Upper Slope (1)
PURPLE CLEMATIS ( <i>Clematis occidentalis</i> )	1.4	0.0-5.4	60	
<b>Tall Forb (&gt;= 30 cm)</b>				<b>Soil Variables</b>
ASTER SPECIES ( <i>Aster</i> )	25.0	1.0-64.6	100	Soil Drainage: Moderately well drained (2), Rapidly drained (2), Very rapidly drained (1)
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	6.9	1.0-22.0	100	Soil Subgroup:
RED AND WHITE BANE BERRY ( <i>Actaea rubra</i> )	5.0	0.0-15.3	40	Surface Texture:
SITKA VALERIAN ( <i>Valeriana sitchensis</i> )	3.5	0.0-7.2	60	Effective Texture:
VEINY MEADOW RUE ( <i>Thalictrum venulosum</i> )	2.1	0.0-4.1	60	Depth to Mottles/Gley:
GREEN FALSE HELLEBORE ( <i>Veratrum eschscholtzii</i> )	1.5	0.0-6.0	40	Organic Thickness:
<b>Low Forb (&lt; 30 cm)</b>				Parent Material:
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	6.8	0.1-14.5	100	Soil Type:
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	1.7	0.0-6.7	60	Humus Form
COMMON YARROW ( <i>Achillea millefolium</i> )	1.5	0.0-3.6	80	
<b>Graminoid</b>				
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	5.3	0.0-26.9	20	
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	1.3	0.0-5.8	60	
				<b>LFH Thickness</b>
				<b>Mean</b>
				<b>Min</b>
				<b>Max</b>
				<b>Count</b>
				cm:
				0.00
				0.00
				0.00
				0

# Msd1 Saskatoon-Snowberry/Marsh reed grass (n=5)

(*Amelanchier alnifolia*-*Symphoricarpos occidentalis*/*Calamagrostis canadensis*)

This community represents wetter/richer swales that are typically dominated by saskatoon, as these plots suggest, but can also be dominated by snowberry, chokecherry, raspberry or a mix with rose and snowberry. Shrubs quickly dominate these richer areas typically after a fire or other disturbance in a forest. Without further disturbance, these will advance to a deciduous and eventually coniferous communities. Another successional pathway is a rose and/or snowberry community that has developed richer soils due to long-term snow catchment and moisture retention. This higher productivity enriches the soils and further promotes establishment of these larger shrubs. Although this reference community has a small portion of non-natives, greater disturbance will often increase these to a point where they dominate below the shrubs.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** e thimbleberry/pine grass(mesic/rich)

**Ecosite Phase:** e4 thimbleberry shrubland

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Tall Shrub (2 to 5m)</b>				Ecological Status Score: 40
SASKATOON ( <i>Amelanchier alnifolia</i> )	12.0	0.0-50.0	80	Moisture Regime: Subhygric (moderately moist) (1), Hygric (moist) (1)
CHOKE CHERRY ( <i>Prunus virginiana</i> )	1.8	0.0-4.5	60	Nutrient Regime: Permesotrophic (rich) (2), Mesotrophic (medium) (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Elevation (range): 1508 (1445-1570) M
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	7.6	0.0-15.4	60	Slope (%): 0.5 - 2.49 (1)
PRICKLY ROSE ( <i>Rosa acicularis</i> )	7.2	0.0-11.3	80	Aspect: Southerly (2), Northerly (1)
WILD RED RASPBERRY ( <i>Rubus idaeus</i> )	1.2	0.0-6.1	20	Topographic Position: Midslope (2), Lower Slope (1)
<b>Tall Forb (&gt;= 30 cm)</b>				<b>Soil Variables</b>
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	7.7	0.0-15.2	80	Soil Drainage: Rapidly drained (1), Well drained (1), Moderately well drained (1)
COW PARSNIP ( <i>Heracleum lanatum</i> )	5.5	0.0-27.7	20	Soil Subgroup:
VEINY MEADOW RUE ( <i>Thalictrum venulosum</i> )	3.3	0.0-10.1	60	Surface Texture:
WESTERN MEADOW RUE ( <i>Thalictrum occidentale</i> )	3.0	0.0-15.2	20	Effective Texture:
<b>Low Forb (&lt; 30 cm)</b>				Depth to Mottles/Gley:
WESTERN CANADA VIOLET ( <i>Viola canadensis</i> )	3.9	0.0-19.7	20	Organic Thickness:
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	2.9	0.5-6.0	100	Parent Material:
<b>Graminoid</b>				Soil Type:
BLUEJOINT ( <i>Calamagrostis canadensis</i> )	7.4	0.0-37.3	20	Humus Form
TIMOTHY ( <i>Phleum pratense</i> )	7.2	0.0-29.0	80	<b>LFH Thickness</b>
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	5.9	0.0-12.8	60	Mean
SMOOTH WILD RYE ( <i>Elymus glaucus</i> )	1.9	0.0-5.3	80	Min
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	1.5	0.0-5.3	60	Max
				Count
				cm: 0.00 0.00 0.00 0

# Msd14 Raspberry-Chokecherry/Kentucky bluegrass (n=12)

(*Rubus idaeus-Prunus virginiana/Poa pratensis*)

Saskatoon, chokecherry and/or raspberry shrublands have understories that are typically easily invaded by introduced grasses such as timothy or Kentucky bluegrass once disturbed. Disturbance also causes the shrub complex to become much more variable. In the plots making up this community, raspberry and gooseberry seem to dominate however there could be many others in the mix including saskatoon and chokecherry. The cause of disturbance can be from forest harvesting, fire or grazing. Browsing at high levels (from wildlife or livestock) may also promote less palatable shrubs in the complex.

**Natural Subregion:** Montane  
**Ecosection:** Ms Montane South Ecosection

**Ecosite:** e thimbleberry/pine grass(mesic/rich)  
**Ecosite Phase:** e4 thimbleberry shrubland

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables				
	Mean	Range							
<b>Overstory Tree</b>					Ecological Status Score: 15-20				
ASPEN ( <i>Populus tremuloides</i> )	1.3	0.0-10.0		33	Moisture Regime: Subxeric (moderately dry) (1)				
<b>Medium Shrub (0.5 to 2 m)</b>					Nutrient Regime: Mesotrophic (medium) (1)				
WILD RED RASPBERRY ( <i>Rubus idaeus</i> )	8.5	0.5-16.3		100	Elevation (range): 1487 (1461-1535) M				
NORTHERN GOOSEBERRY ( <i>Ribes oxycanthoides</i> )	5.9	0.0-26.4		50	Slope (%): 16 - 30.99 (1), 10 - 15.99 (1)				
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	2.1	0.0-11.4		33	Aspect: Northerly (2), Westerly (1)				
CHOKE CHERRY ( <i>Prunus virginiana</i> )	1.7	0.0-11.9		17	Topographic Position: Lower Slope (1)				
PRICKLY ROSE ( <i>Rosa acicularis</i> )	1.5	0.0-5.8		83	<b>Soil Variables</b>				
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	1.0	0.0-3.2		58	Soil Drainage: Well drained (1)				
<b>Tall Forb (&gt;= 30 cm)</b>					Soil Subgroup:				
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	5.7	0.0-17.3		75	Surface Texture:				
CANADA THISTLE ( <i>Cirsium arvense</i> )	3.7	0.0-24.3		58	Effective Texture:				
SPREADING DOGBANE ( <i>Apocynum androsaemifolium</i> )	2.6	0.0-19.3		17	Depth to Mottles/Gley:				
WESTERN MEADOW RUE ( <i>Thalictrum occidentale</i> )	2.3	0.0-14.4		33	Organic Thickness:				
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	2.0	0.0-10.3		50	Parent Material:				
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	1.6	0.0-10.4		50	Soil Type:				
SMOOTH ASTER ( <i>Aster laevis</i> )	1.5	0.0-6.6		50	Humus Form				
BLUNT-FRUITED SWEET CICELY ( <i>Osmorhiza chilensis</i> )	1.3	0.0-4.3		42	<b>LFH Thickness</b>				
STAR-FLOWERED SOLOMON'S-SEAL ( <i>Smilacina stellata</i> )	1.3	0.0-9.5		25					
COMMON NETTLE ( <i>Urtica dioica</i> )	1.3	0.0-8.0		17					
<b>Low Forb (&lt; 30 cm)</b>									
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	3.6	1.2-9.7		100					
COMMON DANDELION ( <i>Taraxacum officinale</i> )	1.6	0.0-5.0		50					
<b>Graminoid</b>									
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	10.3	0.4-25.2		100					
TIMOTHY ( <i>Phleum pratense</i> )	7.7	0.0-13.2		92					
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	1.5	0.0-9.3		50					
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	1.3	0.0-4.3		92					
					<b>LFH Thickness</b>	<b>Mean</b>	<b>Min</b>	<b>Max</b>	<b>Count</b>
					cm:	0.00	0.00	0.00	0

# Msd19 Beaked willow/Cow parsnip/Kentucky bluegrass (n=4)

(*Salix bebbiana*/*Heracleum lanatum*/*Poa pratensis*)

This community type is transitional between the Foothills Parkland and Montane subregions. Similar to the Beaked willow/Cow parsnip associations in the Parkland, it is typically on fine textured soils in lowland positions where moisture accumulates. In this case, the significant ground water is close to the surface allowing Beaked willow to establish. The moisture and nutrient regime of this site makes it productive and palatable for domestic livestock. With disturbance, this community is easily invaded by agronomic species, however, proper stocking will allow a diversity of native species to occur under the shrubs.

**Natural Subregion:** Montane  
**Ecosection:** Ms Montane South Ecosection

**Ecosite:** e thimbleberry/pine grass(mesic/rich)  
**Ecosite Phase:** e4 thimbleberry shrubland

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Tall Shrub (2 to 5m)</b>				Ecological Status Score: 40
BEAKED WILLOW ( <i>Salix bebbiana</i> )	37.5	20.0-60.0	100	Moisture Regime: Subhygric (moderately moist) (2), Hygric (moist) (2)
<b>Medium Shrub (0.5 to 2 m)</b>				Nutrient Regime: Permesotrophic (rich) (4)
SALIX SPECIES ( <i>Salix</i> )	22.0	0.0-25.0	100	Elevation (range): 0 (0-0) M
NORTHERN GOOSEBERRY ( <i>Ribes oxycanthoides</i> )	5.8	0.0-20.0	75	Slope (%): 0 - 0.49 (4)
UNDIFFERENTIATED ROSE ( <i>Rosa</i> )	1.6	0.0-3.0	75	Aspect: Level (4)
<b>Tall Forb (&gt;= 30 cm)</b>				Topographic Position:
COW PARSNIP ( <i>Heracleum lanatum</i> )	10.7	3.0-20.0	100	<b>Soil Variables</b>
CANADA GOLDENROD ( <i>Solidago canadensis</i> )	5.7	0.0-20.0	50	Soil Drainage:
COMMON HORSETAIL ( <i>Equisetum arvense</i> )	4.7	3.0-10.0	100	Soil Subgroup:
LARGE-LEAVED YELLOW AVENS ( <i>Geum macrophyllum</i> )	4.0	0.0-10.0	75	Surface Texture: Silty Sand (1), Sandy loam (1), Loam (1)
COMMON NETTLE ( <i>Urtica dioica</i> )	3.3	0.0-10.0	75	Effective Texture:
SMOOTH ASTER ( <i>Aster laevis</i> )	2.5	0.0-10.0	25	Depth to Mottles/Gley:
<b>Graminoid</b>				Organic Thickness: 0 - 5 cm (3)
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	7.2	3.0-20.0	100	Parent Material:
TIMOTHY ( <i>Phleum pratense</i> )	4.7	3.0-10.0	100	Soil Type:
FOWL BLUEGRASS ( <i>Poa palustris</i> )	3.3	0.0-10.0	75	Humus Form
BLUEJOINT ( <i>Calamagrostis canadensis</i> )	3.0	3.0-3.0	100	<b>LFH Thickness</b>
FOWL MANNA GRASS ( <i>Glyceria striata</i> )	2.6	0.0-10.0	50	<b>Mean</b>
SEDGE SPECIES ( <i>Carex</i> )	2.2	0.0-3.0	75	<b>Min</b>
				<b>Max</b>
				<b>Count</b>
				cm: 0.00 0.00 0.00 0

# Msd19a Beaked willow/Cow parsnip (n=0)

(*Salix bebbiana*/*Heracleum lanatum*)

This community type has currently not been described, but is the expected reference community type for the Beaked willow/Cow parsnip/Kentucky bluegrass (Msd19) dominated community type. These beaked willow community types are highly productive and any livestock grazing will allow for the establishment of Kentucky bluegrass, smooth brome and timothy plant species.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** e thimbleberry/pine grass(mesic/rich)

**Ecosite Phase:** e4 thimbleberry shrubland

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Tall Shrub (2 to 5m)</b>				Ecological Status Score: 40
BEAKED WILLOW ( <i>Salix bebbiana</i> )	37.5	20.0-60.0	100	Moisture Regime: Subhygric (moderately moist) (2), Hygric (moist) (2)
<b>Medium Shrub (0.5 to 2 m)</b>				Nutrient Regime: Permesotrophic (rich) (4)
SALIX SPECIES ( <i>Salix</i> )	22.0	0.0-25.0	100	Elevation (range): 0 (0-0) M
NORTHERN GOOSEBERRY ( <i>Ribes oxycanthoides</i> )	5.8	0.0-20.0	75	Slope (%): 0 - 0.49 (4)
UNDIFFERENTIATED ROSE ( <i>Rosa</i> )	1.6	0.0-3.0	75	Aspect: Level (4)
<b>Tall Forb (&gt;= 30 cm)</b>				Topographic Position:
COW PARSNIP ( <i>Heracleum lanatum</i> )	10.7	3.0-20.0	100	<b>Soil Variables</b>
CANADA GOLDENROD ( <i>Solidago canadensis</i> )	5.7	0.0-20.0	50	Soil Drainage:
COMMON HORSETAIL ( <i>Equisetum arvense</i> )	4.7	3.0-10.0	100	Soil Subgroup:
LARGE-LEAVED YELLOW AVENS ( <i>Geum macrophyllum</i> )	4.0	0.0-10.0	75	Surface Texture: Silty Sand (1), Sandy loam (1), Loam (1)
COMMON NETTLE ( <i>Urtica dioica</i> )	3.3	0.0-10.0	75	Effective Texture:
SMOOTH ASTER ( <i>Aster laevis</i> )	2.5	0.0-10.0	25	Depth to Mottles/Gley:
<b>Graminoid</b>				Organic Thickness: 0 - 5 cm (3)
FOWL BLUEGRASS ( <i>Poa palustris</i> )	3.3	0.0-10.0	75	Parent Material:
BLUEJOINT ( <i>Calamagrostis canadensis</i> )	3.0	3.0-3.0	100	Soil Type:
FOWL MANNA GRASS ( <i>Glyceria striata</i> )	2.6	0.0-10.0	50	Humus Form
SEDGE SPECIES ( <i>Carex</i> )	2.2	0.0-3.0	75	
				<b>LFH Thickness</b>
				<b>Mean</b>
				<b>Min</b>
				<b>Max</b>
				<b>Count</b>
				cm: 0.00 0.00 0.00 0

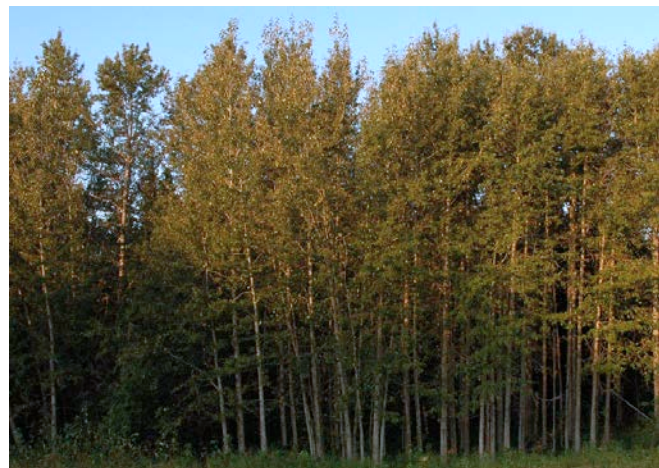
## f balsam poplar(subhygric/rich) (n=56)

Natural Subregion: Montane

Ecosection: Ms Montane South Ecosection

### General Description

This ecosite occurs on a variety of parent materials and is usually associated with lower positions on steeper slopes or with gravelly river flood plains. Seepage could be expected in spring or after heavy rainfall and on river floodplains subsurface water will often support the growth of willows and trees. The presence of balsam poplar indicates the enhanced moisture regime.



### Successional Relationships

Balsam poplar is a pioneer species on this ecosite. White spruce is the expected climax species; however, its establishment may be slow due to high vegetation competition.

### Indicator Species

#### Tree

BALSAM POPLAR  
*Populus balsamifera*

#### Forb

RED AND WHITE BANE BERRY  
*Actaea rubra*

#### Graminoid

BLUEJOINT  
*Calamagrostis canadensis*

### Site Index at 50 Years

Site Index at 50 Years	Height (m)	Variation (m)	Count
WHITE SPRUCE ( <i>Picea glauca</i> )	15.10	0.00	0
ASPEN ( <i>Populus tremuloides</i> )	12.60	1.20	0

### Environmental Variables

Moisture Regime: Mesic (fresh) (30), Subhygric (moderately moist) (15), Submesic (moderately fresh) (1), Hygric (moist) (1)

Nutrient Regime: Permesotrophic (rich) (34), Mesotrophic (medium) (17), Eutrophic (very rich) (2)

Elevation (range): 1483 (1257-1707) M

Slope (%): very gentle slope (13), level (10), gentle slope (7), strong slope (6), moderate slope (4), nearly level (4)

Aspect: Easterly (11), Southerly (11), Westerly (11), Northerly (9), Level (7)

Topographic Position: Lower Slope (17), Midslope (11), Level (7), Depression (6), Toe (4), Upper Slope (1)

### Soil Variables

Soil Drainage: Well drained (23), Moderately well drained (16), Rapidly drained (8), Imperfectly drained (4)

Soil Subgroup: ORTHIC EUTRIC BRUNISOL (3), ORTHIC DARK GRAY CHERNOZEM (2), ORTHIC LUVIC GLEYSOL (1)

Surface Texture: Silt loam (4), Loam (3), Silty Sand (2), Sand (1), Clay loam (1)

Effective Texture: Silt loam (2), Silty clay loam (1), Loam (1), Sandy clay loam (1)

Depth to Mottles/Gley: 0 - 25 (1)

Organic Thickness: 0 - 5 cm (11)

Parent Material: Morainal (3), Fluvial (2), Glaciofluvial (1), Glaciolacustrine (1)

Soil Type: Moist/Silty-Loamy (2), Dry/Silty-Loamy (1), Moist/Fine (1)

Humus Form HUMIFIBRIMOR (1)

### LFH Thickness

LFH Thickness	Mean	Min	Max	Count
cm:	6.00	1.00	14.00	5

# f1 balsam poplar Pb (n=56)

**Natural Subregion:** Montane  
**Ecosection:** Ms Montane South Ecosection

**Ecosite:** f balsam poplar(subhygric/rich)

## General Description

Dominant balsam poplar stands occur on a narrow ecosite range, although more sporadic balsam poplar can occur in ecosites above and below. This ecosite phase has high amounts of forbs and shrubs under a reasonably thick overstory. Shrubs range from rose to willow, the latter occurring on wetter areas. On the drier side, the nutrient rich soils are easily invaded by agronomic species if disturbances occur.

## Characteristic Species

### Tree

- [ 34.2 ] BALSAM POPLAR  
*Populus balsamifera*
- [ 12.4 ] ASPEN  
*Populus tremuloides*
- [ 8.2 ] WHITE SPRUCE  
*Picea glauca*

### Shrub

- [ 10.8 ] THIMBLEBERRY  
*Rubus parviflorus*
- [ 6.0 ] SALIX SPECIES  
*Salix*
- [ 4.6 ] SNOWBERRY (BUCKBRUSH)  
*Symphoricarpos occidentalis*
- [ 3.3 ] PRICKLY ROSE  
*Rosa acicularis*

### Forb

- [ 2.9 ] RED AND WHITE BANE BERRY  
*Actaea rubra*

## Environmental Variables

Moisture Regime: Mesic (fresh) (30), Subhygric (moderately moist) (15), Hygric (moist) (1), Submesic (moderately fresh) (1)

Nutrient Regime: Permesotrophic (rich) (34), Mesotrophic (medium) (17), Eutrophic (very rich) (2)

Elevation (range): 1483 (1257-1707) M

Slope (%): very gentle slope (13), level (10), gentle slope (7), strong slope (6), nearly level (4), moderate slope (4)

Aspect: Easterly (11), Southerly (11), Westerly (11), Northerly (9), Level (7)

Topographic Position: Lower Slope (17), Midslope (11), Level (7), Depression (6), Toe (4), Upper Slope (1)

## Soil Variables

Soil Drainage: Well drained (23), Moderately well drained (16), Rapidly drained (8), Imperfectly drained (4)

Soil Subgroup: ORTHIC EUTRIC BRUNISOL (3), ORTHIC DARK GRAY CHERNOZEM (2), ORTHIC LUVIC GLEYSOL (1)

Surface Texture: Silt loam (4), Loam (3), Silty Sand (2), Sand (1), Clay loam (1)

Effective Texture: Silt loam (2), Sandy clay loam (1), Loam (1), Silty clay loam (1)

Depth to Mottles/Gley: 0 - 25 (1)

Organic Thickness: 0 - 5 cm (11)

Parent Material: Morainal (3), Fluvial (2), Glaciolacustrine (1), Glaciofluvial (1)

Soil Type: Moist/Silty-Loamy (2), Moist/Fine (1), Dry/Silty-Loamy (1)

Humus Form HUMIFIBRIMOR (1)

## LFH Thickness

	Mean	Min	Max	Count
cm:	6.00	1.00	14.00	5



# Msf11 Sw-Pb/Snowberry (n=13)

## (*Picea glauca*-*Populus balsamifera*/*Symphoricarpos occidentalis*)

Archibald et al. (1996) described a similar Pb/Snowberry dominated community on moist lower slope positions where seepage occurs in the spring and after heavy rainfalls. They felt succession would be to white spruce. This community is successional more advanced than the Pb/Snowberry [Msg14] community type. Likely the northerly and easterly aspects and higher moisture regime allowed this community to escape the extensive fire history in the area. Engelmann spruce may occur in these stands at higher elevations. The high canopy cover of trees and shrubs limits the amount of light reaching the forest floor and therefore there is only moderate amounts of forage available for domestic livestock. This community type would be rated as secondary range.

**Natural Subregion:** Montane  
**Ecosection:** Ms Montane South Ecosection

**Ecosite:** f balsam poplar(subhygric/rich)  
**Ecosite Phase:** f1 balsam poplar Pb

### Plant Composition

### Canopy Cover (%)

	Mean	Range	Const.
<b>Overstory Tree</b>			
BALSAM POPLAR ( <i>Populus balsamifera</i> )	25.2	0.0-60.0	85
WHITE SPRUCE ( <i>Picea glauca</i> )	17.6	0.0-50.0	69
ASPEN ( <i>Populus tremuloides</i> )	1.9	0.0-20.0	15
<b>Understory Tree</b>			
BALSAM POPLAR ( <i>Populus balsamifera</i> )	3.8	0.0-33.1	31
ENGELMANN SPRUCE ( <i>Picea engelmannii</i> )	3.5	0.0-45.9	8
WHITE SPRUCE ( <i>Picea glauca</i> )	1.6	0.0-10.0	23
<b>Medium Shrub (0.5 to 2 m)</b>			
PRICKLY ROSE ( <i>Rosa acicularis</i> )	8.0	0.0-20.0	77
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	5.9	0.0-30.7	39
THIMBLEBERRY ( <i>Rubus parviflorus</i> )	4.4	0.0-55.7	23
CANADA BUFFALOBERRY ( <i>Shepherdia canadensis</i> )	1.5	0.0-12.5	31
<b>Tall Forb (&gt;= 30 cm)</b>			
COMMON HORSETAIL ( <i>Equisetum arvense</i> )	4.9	0.0-29.0	62
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	3.2	0.0-9.7	85
RED AND WHITE BANE BERRY ( <i>Actaea rubra</i> )	3.1	0.0-17.3	23
<b>Low Forb (&lt; 30 cm)</b>			
COMMON DANDELION ( <i>Taraxacum officinale</i> )	2.8	0.0-20.0	85
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	2.4	0.0-5.0	85
<b>Graminoid</b>			
TIMOTHY ( <i>Phleum pratense</i> )	7.3	0.0-50.0	39
PURPLE OAT GRASS ( <i>Schizachne purpurascens</i> )	2.1	0.0-25.0	15
BLUEJOINT ( <i>Calamagrostis canadensis</i> )	1.7	0.0-13.0	23
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	1.3	0.0-15.0	31

### Environmental Variables

Ecological Status Score: 25  
 Moisture Regime: Subhygric (moderately moist) (4), Mesic (fresh) (3)  
 Nutrient Regime: Permesotrophic (rich) (8), Mesotrophic (medium) (4)  
 Elevation (range): 1473 (1257-1698) M  
 Slope (%): 0 - 0.49 (3), 6 - 9.99 (3), 2.5 - 5.99 (1)  
 Aspect: Easterly (4), Level (2), Northerly (2)  
 Topographic Position: Depression (3), Lower Slope (2), Midslope (2), Level (1)

### Soil Variables

Soil Drainage: Well drained (5), Imperfectly drained (4)  
 Soil Subgroup: ORTHIC EUTRIC BRUNISOL (2)  
 Surface Texture: Silt loam (2), Silty Sand (1), Sand (1)  
 Effective Texture: Silt loam (2)  
 Depth to Mottles/Gley:  
 Organic Thickness: 0 - 5 cm (4)  
 Parent Material: Fluvial (1), Morainal (1)  
 Soil Type: Moist/Silty-Loamy (2)  
 Humus Form

LFH Thickness	Mean	Min	Max	Count
cm:	7.00	7.00	7.00	1

## Msf14 Pb-Sw/Rose/Forbs (n=6)

### (*Populus balsamifera*-*Picea glauca*/*Rosa acicularis*/Forbs)

This community type is somewhat similar to the Aw-Pb/Marsh reed grass [Msg9a] community, but is slightly more moist and successional more advanced. This community type is found on lower slope positions where some nutrient rich seepage occurs throughout the growing season. Forbs dominate the understory, and introduced species easily invade. In the absence of disturbance spruce cover will continue to increase and the community will eventually transition to a spruce/moss dominated community type. Forage production on this community is moderate and this community should be rated as secondary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** f balsam poplar(subhygric/rich)

**Ecosite Phase:** f1 balsam poplar Pb

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 25
BALSAM POPLAR ( <i>Populus balsamifera</i> )	28.3	0.0-40.0	83	Moisture Regime: Mesic (fresh) (8), Subhygric (moderately moist) (1)
WHITE SPRUCE ( <i>Picea glauca</i> )	23.0	3.0-35.0	100	Nutrient Regime: Permesotrophic (rich) (10)
ASPEN ( <i>Populus tremuloides</i> )	8.4	0.0-20.0	83	Elevation (range): 1484 (1394-1557) M
<b>Medium Shrub (0.5 to 2 m)</b>				Slope (%): 2.5 - 5.99 (4), 6 - 9.99 (2), 10 - 15.99 (2), 0 - 0.49 (2)
UNDIFFERENTIATED ROSE ( <i>Rosa</i> )	10.0	1.0-20.3	100	Aspect: Easterly (4), Westerly (4), Level (1), Northerly (1)
WILD RED RASPBERRY ( <i>Rubus idaeus</i> )	5.8	0.0-33.0	50	Topographic Position: Lower Slope (4), Level (2), Midslope (2), Toe (2), Upper Slope (1)
<b>Tall Forb (&gt;= 30 cm)</b>				<b>Soil Variables</b>
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	8.8	1.3-16.5	100	Soil Drainage: Moderately well drained (8), Well drained (2)
WILD WHITE GERANIUM ( <i>Geranium richardsonii</i> )	6.7	0.0-27.6	67	Soil Subgroup:
COMMON HORSETAIL ( <i>Equisetum arvense</i> )	3.0	0.0-13.7	67	Surface Texture: Silty Sand (1)
<b>Graminoid</b>				Effective Texture:
TIMOTHY ( <i>Phleum pratense</i> )	5.4	0.0-14.1	67	Depth to Mottles/Gley:
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	3.2	0.0-7.7	67	Organic Thickness: 0 - 5 cm (1)
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	2.2	0.0-10.3	33	Parent Material:
BLUEJOINT ( <i>Calamagrostis canadensis</i> )	2.0	0.0-10.5	67	Soil Type:
				Humus Form
				<b>LFH Thickness</b>
				<b>Mean</b>
				<b>Min</b>
				<b>Max</b>
				<b>Count</b>
				cm:
				0.00
				0.00
				0.00
				0

## Msf7 Aw-Pb-Sw/Snowberry/Forbs (n=12)

(*Populus tremuloides*-*Populus balsamifera*-*Picea glauca*/*Symphoricarpos occidentalis*/Forbs)

This community type occurs on moist, lower slope positions where seepage occurs in the spring or after heavy rainfall and represents Pb-Sw communities with moderate disturbance. Introduced species easily invade these moist, nutrient rich stands although native shrubs, forbs and other grasses persist creating high diversity. Forest succession will be to a spruce dominated forest. A moderate amount of forage is produced for domestic livestock although pine grass, marsh reed grass and introduced species can occur in this community at relatively high percentages. This should be considered secondary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** f balsam poplar(subhygric/rich)

**Ecosite Phase:** f1 balsam poplar Pb

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables				
	Mean	Range							
<b>Overstory Tree</b>					Ecological Status Score: 25				
ASPEN ( <i>Populus tremuloides</i> )	31.2	0.0-95.0		83	Moisture Regime: Mesic (fresh) (7), Subhygric (moderately moist) (2)				
WHITE SPRUCE ( <i>Picea glauca</i> )	15.6	0.0-40.0		83	Nutrient Regime: Mesotrophic (medium) (7), Permesotrophic (rich) (4)				
BALSAM POPLAR ( <i>Populus balsamifera</i> )	13.1	0.0-40.0		67	Elevation (range): 1464 (1370-1666) M				
LOGEPOLE PINE ( <i>Pinus contorta</i> )	2.5	0.0-10.0		42	Slope (%): 2.5 - 5.99 (3), 16 - 30.99 (2), 0 - 0.49 (2)				
<b>Medium Shrub (0.5 to 2 m)</b>					Aspect: Westerly (3), Level (2), Northerly (2), Southerly (2)				
UNDIFFERENTIATED SYMPHORICARPOS ( <i>Symphoricarpos</i> )	8.0	0.0-59.4		67	Topographic Position: Lower Slope (3), Midslope (2), Depression (2), Level (1), Toe (1)				
PRICKLY ROSE ( <i>Rosa acicularis</i> )	4.5	0.0-28.5		75	<b>Soil Variables</b>				
CANADA BUFFALOBERRY ( <i>Shepherdia canadensis</i> )	2.0	0.0-9.5		33	Soil Drainage: Well drained (7), Rapidly drained (3)				
<b>Tall Forb (&gt;= 30 cm)</b>					Soil Subgroup:				
WILD WHITE GERANIUM ( <i>Geranium richardsonii</i> )	5.2	0.0-47.5		58	Surface Texture:				
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	2.3	0.0-8.3		75	Effective Texture:				
<b>Low Forb (&lt; 30 cm)</b>					Depth to Mottles/Gley:				
COMMON DANDELION ( <i>Taraxacum officinale</i> )	6.4	0.0-49.1		75	Organic Thickness:				
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	4.8	1.0-21.4		100	Parent Material:				
WHITE CLOVER ( <i>Trifolium repens</i> )	4.3	0.0-40.0		50	Soil Type:				
<b>Graminoid</b>					Humus Form				
TIMOTHY ( <i>Phleum pratense</i> )	4.2	0.0-36.8		25	<b>LFH Thickness</b>				
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	4.1	0.0-35.0		42					
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	2.8	0.0-16.3		42					
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	2.3	0.0-21.3		33					
					<b>Mean</b>	<b>Min</b>	<b>Max</b>	<b>Count</b>	
					0.00	0.00	0.00	0	

## Msg12 Pb/Thimbleberry (n=1)

(*Populus balsamifera*/*Rubus parviflorus*)

This community type was described in the Southend allotment just north of Waterton Lakes National Park and the Allison McGillivray allotment west of Coleman at a higher subalpine elevation. It was found in a moist, nutrient rich, lower slope position, which favours the growth of both balsam poplar and thimbleberry. It is very similar to the Aw/Thimbleberry [Msg10] community, but at a higher elevation. Thimbleberry is generally unpalatable to livestock contrary to understories dominated by cow parsnip in this phase, which is more preferred by cattle.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** f balsam poplar(subhygric/rich)

**Ecosite Phase:** f1 balsam poplar Pb

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 25
BALSAM POPLAR ( <i>Populus balsamifera</i> )	85.0	85.0-85.0	100	Moisture Regime: Submesic (moderately fresh) (1), Mesic (fresh) (1)
ASPEN ( <i>Populus tremuloides</i> )	3.0	3.0-3.0	100	Nutrient Regime: Mesotrophic (medium) (1), Permesotrophic (rich) (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Elevation (range): 1672 (1637-1707) M
THIMBLEBERRY ( <i>Rubus parviflorus</i> )	58.3	58.3-58.3	100	Slope (%): 2.5 - 5.99 (1), 10 - 15.99 (1)
SALIX SPECIES ( <i>Salix</i> )	30.0	30.0-30.0	100	Aspect: Southerly (2)
MOUNTAIN GOOSEBERRY ( <i>Ribes inerme</i> )	13.0	13.0-13.0	100	Topographic Position: Midslope (1)
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	6.9	6.9-6.9	100	<b>Soil Variables</b>
<b>Tall Forb (&gt;= 30 cm)</b>				Soil Drainage: Rapidly drained (1), Moderately well drained (1)
JESSICA'S STICKSEED ( <i>Hackelia jessicae</i> )	10.0	10.0-10.0	100	Soil Subgroup:
WESTERN SWEET CICELY ( <i>Osmorhiza occidentalis</i> )	7.7	7.7-7.7	100	Surface Texture:
RED AND WHITE BANE BERRY ( <i>Actaea rubra</i> )	6.3	6.3-6.3	100	Effective Texture:
VEINY MEADOW RUE ( <i>Thalictrum venulosum</i> )	3.7	3.7-3.7	100	Depth to Mottles/Gley:
<b>Low Forb (&lt; 30 cm)</b>				Organic Thickness:
WESTERN CANADA VIOLET ( <i>Viola canadensis</i> )	7.5	7.5-7.5	100	Parent Material:
UNDIFFERENTIATED WINTERGREEN ( <i>Pyrola</i> )	4.0	4.0-4.0	100	Soil Type:
<b>Graminoid</b>				Humus Form
ALASKA ONION GRASS ( <i>Melica subulata</i> )	1.5	1.5-1.5	100	<b>LFH Thickness</b>
NODDING TRisetum ( <i>Trisetum cernuum</i> )	1.1	1.1-1.1	100	Mean
				Min
				Max
				Count
				cm:
				0.00
				0.00
				0.00
				0

## Msg13 Pb/Cow parsnip/Kentucky bluegrass (n=6)

(*Populus balsamifera*/*Heracleum lanatum*/*Poa pratensis*)

This community type occupies subhygric, lower slope positions. It is similar to the Pb/Thimbleberry community [Msg12] type described, but the understory cover of thimbleberry has changed to cow parsnip and the community is invaded with introduced species. Generally, thimbleberry is replaced by cow parsnip north of the Crowsnest Pass. The high moisture and nutrient content of this site make it productive and domestic livestock find cow parsnip palatable. Moderate to high levels of grazing often allow introduced species to invade due to the rich soils, although diversity may remain high. This community should be rated as secondary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** f balsam poplar(subhygric/rich)

**Ecosite Phase:** f1 balsam poplar Pb

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 15-20
BALSAM POPLAR ( <i>Populus balsamifera</i> )	37.5	15.0-50.0	100	Moisture Regime: Mesic (fresh) (4), Subhygric (moderately moist) (4)
ASPEN ( <i>Populus tremuloides</i> )	12.5	0.0-30.0	67	Nutrient Regime: Permesotrophic (rich) (5), Eutrophic (very rich) (2)
<b>Understory Tree</b>				Elevation (range): 1478 (1389-1593) M
ASPEN ( <i>Populus tremuloides</i> )	2.1	0.0-10.0	33	Slope (%): 16 - 30.99 (4), 2.5 - 5.99 (1), 6 - 9.99 (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Aspect: Westerly (3), Southerly (2), Northerly (2), Easterly (1)
WILD RED RASPBERRY ( <i>Rubus idaeus</i> )	2.7	0.0-6.7	67	Topographic Position: Lower Slope (6), Midslope (2)
<b>Tall Forb (&gt;= 30 cm)</b>				<b>Soil Variables</b>
COW PARSNIP ( <i>Heracleum lanatum</i> )	20.7	0.5-54.3	100	Soil Drainage: Well drained (4), Moderately well drained (3)
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	7.5	1.0-18.8	100	Soil Subgroup:
COMMON NETTLE ( <i>Urtica dioica</i> )	6.6	0.0-28.7	50	Surface Texture:
WILD WHITE GERANIUM ( <i>Geranium richardsonii</i> )	4.2	0.0-12.0	50	Effective Texture:
VEINY MEADOW RUE ( <i>Thalictrum venulosum</i> )	3.2	0.0-6.7	83	Depth to Mottles/Gley:
<b>Low Forb (&lt; 30 cm)</b>				Organic Thickness:
WESTERN CANADA VIOLET ( <i>Viola canadensis</i> )	8.0	1.1-30.0	100	Parent Material:
<b>Graminoid</b>				Soil Type:
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	6.3	0.0-25.3	67	Humus Form
TIMOTHY ( <i>Phleum pratense</i> )	3.8	0.0-18.3	50	<b>LFH Thickness</b>
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	2.4	0.0-5.5	67	Mean
SEDGE SPECIES ( <i>Carex</i> )	1.7	0.0-6.0	50	Min
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	1.0	0.0-6.3	17	Max
				Count
				cm: 0.00 0.00 0.00 0

## Msg14 Pb/Snowberry (n=6)

### (*Populus balsamifera*/*Symphoricarpos occidentalis*)

This community is very similar to the Pb/Snowberry dominated community described by Archibald et al. (1996) on moist mid to lower slope positions where seepage occurs in the spring or after heavy rain. It is also similar to the previously described Sw-Pb/Snowberry [Msf11], but this community is not as successional advanced. The high moisture and nutrient content of the site makes this community highly productive, but the majority of the production comes from snowberry which is generally unpalatable to cattle. The Kentucky bluegrass indicates the susceptibility of this site to introduced species, where moderate to heavy grazing could cause high cover of these species. This community should be rated as secondary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** f balsam poplar(subhygric/rich)

**Ecosite Phase:** f1 balsam poplar Pb

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 25
BALSAM POPLAR ( <i>Populus balsamifera</i> )	56.0	36.0-65.0	100	Moisture Regime: Mesic (fresh) (2), Subhygric (moderately moist) (2)
<b>Understory Tree</b>				Nutrient Regime: Mesotrophic (medium) (2), Permesotrophic (rich) (2)
BALSAM POPLAR ( <i>Populus balsamifera</i> )	8.3	0.0-44.9	50	Elevation (range): 1454 (1260-1527) M
ASPEN ( <i>Populus tremuloides</i> )	1.3	0.0-5.0	33	Slope (%): 0.5 - 2.49 (2), 10 - 15.99 (1), 0 - 0.49 (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Aspect: Southerly (2), Level (1), Northerly (1), Easterly (1)
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	22.7	0.0-54.0	50	Topographic Position: Level (1), Lower Slope (1)
WATER BIRCH ( <i>Betula occidentalis</i> )	7.3	0.0-44.3	17	
RED-OSIER DOGWOOD ( <i>Cornus stolonifera</i> )	2.0	0.0-10.0	33	
<b>Tall Forb (&gt;= 30 cm)</b>				<b>Soil Variables</b>
RED AND WHITE BANE BERRY ( <i>Actaea rubra</i> )	6.6	0.0-35.0	33	Soil Drainage: Rapidly drained (3), Moderately well drained (2)
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	5.2	0.0-30.0	33	Soil Subgroup: ORTHIC EUTRIC BRUNISOL (1)
VEINY MEADOW RUE ( <i>Thalictrum venulosum</i> )	4.2	0.0-15.3	67	Surface Texture: Silt loam (1), Loam (1)
COMMON HORSETAIL ( <i>Equisetum arvense</i> )	3.3	0.0-20.0	17	Effective Texture:
<b>Low Forb (&lt; 30 cm)</b>				Depth to Mottles/Gley:
WESTERN CANADA VIOLET ( <i>Viola canadensis</i> )	12.5	0.0-30.0	83	Organic Thickness: 0 - 5 cm (2)
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	3.0	0.2-5.9	100	Parent Material: Fluvial (1)
<b>Graminoid</b>				Soil Type:
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	6.9	0.0-20.0	50	Humus Form HUMIFIBRIMOR (1)
				<b>LFH Thickness</b>
				<b>Mean</b>
				<b>Min</b>
				<b>Max</b>
				<b>Count</b>
				cm:
				7.00
				7.00
				7.00
				1

## Msg15 Aw/Willow (n=4)

(*Populus tremuloides*/*Salix spp.*)

This community type includes plots described in riparian areas adjacent to water. Willows and water birch are well adapted to growing adjacent to streams and ponds. What is unusual about this community is the high aspen and pine grass cover, both are usually associated with drier sites indicating more water drainage than the Pb/willow [Msg20] community described. This community should be used when aspen dominates the overstory, although it could have a minor component of balsam poplar. The high cover of willows, water birch and aspen limit the light reaching the forest floor. Therefore there is only moderate production for domestic livestock. This community should be considered tertiary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** f balsam poplar(subhygric/rich)

**Ecosite Phase:** f1 balsam poplar Pb

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 25
ASPEN ( <i>Populus tremuloides</i> )	68.5	50.0-90.0	100	Moisture Regime: Mesic (fresh) (3)
WHITE SPRUCE ( <i>Picea glauca</i> )	1.0	0.0-4.0	25	Nutrient Regime: Mesotrophic (medium) (3)
<b>Understory Tree</b>				Elevation (range): 1521 (1470-1600) M
ASPEN ( <i>Populus tremuloides</i> )	9.7	0.0-10.0	50	Slope (%): 0 - 0.49 (1), 0.5 - 2.49 (1), 2.5 - 5.99 (1), 6 - 9.99 (1)
WHITE SPRUCE ( <i>Picea glauca</i> )	4.4	0.0-5.0	75	Aspect: Northerly (1), Southerly (1), Westerly (1)
BALSAM POPLAR ( <i>Populus balsamifera</i> )	2.5	0.0-10.0	25	Topographic Position: Lower Slope (1), Midslope (1)
<b>Tall Shrub (2 to 5m)</b>				<b>Soil Variables</b>
WATER BIRCH ( <i>Betula occidentalis</i> )	5.2	0.0-21.0	25	Soil Drainage: Well drained (3), Rapidly drained (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Soil Subgroup: ORTHIC DARK GRAY CHERNOZEM (2)
SALIX SPECIES ( <i>Salix</i> )	11.2	2.5-21.0	100	Surface Texture: Loam (2)
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	4.9	0.0-14.9	50	Effective Texture: Loam (1), Sandy clay loam (1)
CANADA BUFFALOBERRY ( <i>Shepherdia canadensis</i> )	3.9	0.0-14.7	50	Depth to Mottles/Gley:
PRICKLY ROSE ( <i>Rosa acicularis</i> )	2.5	0.0-7.0	75	Organic Thickness: 0 - 5 cm (2)
<b>Tall Forb (&gt;= 30 cm)</b>				Parent Material: Morainal (2)
SHOWY ASTER ( <i>Aster conspicuus</i> )	2.6	0.0-9.7	50	Soil Type: Dry/Silty-Loamy (1), Moist/Fine (1)
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	2.0	1.0-4.1	100	Humus Form
<b>Low Forb (&lt; 30 cm)</b>				<b>LFH Thickness</b>
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	3.2	1.0-7.9	100	Mean
COMMON PINK WINTERGREEN ( <i>Pyrola asarifolia</i> )	2.0	0.0-7.3	50	Min
<b>Graminoid</b>				Max
UNDIFFERENTIATED REED GRASS ( <i>Calamagrostis</i> )	10.0	0.0-15.3	75	Count
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	3.5	0.0-7.0	50	cm:
BLUEGRASSES ( <i>Poa</i> )	2.9	0.0-7.0	25	5.00
TIMOTHY ( <i>Phleum pratense</i> )	1.2	0.0-2.0	75	5.00
				5.00
				2

## Msg16 Pb-Aw/Red-osier dogwood/Kentucky bluegrass (n=1)

(*Populus balsamifera*-*Populus tremuloides*/*Cornus stolonifera*/*Poa pratensis*)

This community type is found scattered throughout riparian areas on river floodplains and tends to have a subhygric moisture and rich nutrient regime in this subregion. In the northern forests Beckingham and Archibald (1996) found this community type on mid to lower slope topographic positions or near water courses where there is nutrient-rich seepage or flood waters for a portion of the growing season. This community type is productive, but the high cover of shrubs may limit access to livestock and also make it vulnerable to browsing/loafing. Consequently, this community should be rated as secondary range. As grazing pressure increases there will be further invasion of Kentucky bluegrass and timothy into the community, as well as decreases in shrub cover.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** f balsam poplar(subhygric/rich)

**Ecosite Phase:** f1 balsam poplar Pb

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 5-10
BALSAM POPLAR ( <i>Populus balsamifera</i> )	50.0	0.0-0.0	100	Moisture Regime: Subhygric (moderately moist) (0)
ASPEN ( <i>Populus tremuloides</i> )	15.0	0.0-0.0	100	Nutrient Regime: Permesotrophic (rich) (0)
<b>Medium Shrub (0.5 to 2 m)</b>				Elevation (range): 1380 (0-0) M
RED-OSIER DOGWOOD ( <i>Cornus stolonifera</i> )	49.0	0.0-0.0	100	Slope (%):
PRICKLY ROSE ( <i>Rosa acicularis</i> )	5.0	0.0-0.0	100	Aspect:
WILD RED RASPBERRY ( <i>Rubus idaeus</i> )	1.0	0.0-0.0	100	Topographic Position:
<b>Tall Forb (&gt;= 30 cm)</b>				<b>Soil Variables</b>
COMMON HORSETAIL ( <i>Equisetum arvense</i> )	2.0	0.0-0.0	100	Soil Drainage: Moderately well drained (0)
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	1.0	0.0-0.0	100	Soil Subgroup:
<b>Low Forb (&lt; 30 cm)</b>				Surface Texture:
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	5.0	0.0-0.0	100	Effective Texture:
ALSIKE CLOVER ( <i>Trifolium hybridum</i> )	3.0	0.0-0.0	100	Depth to Mottles/Gley:
<b>Graminoid</b>				Organic Thickness:
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	21.0	0.0-0.0	100	Parent Material:
TIMOTHY ( <i>Phleum pratense</i> )	10.0	0.0-0.0	100	Soil Type:
BLUEJOINT ( <i>Calamagrostis canadensis</i> )	6.0	0.0-0.0	100	Humus Form
				<b>LFH Thickness</b>
				<b>Mean</b>
				<b>Min</b>
				<b>Max</b>
				<b>Count</b>
				cm:
				10.00
				6.00
				14.00
				0



## Msg20 Balsam poplar/Willow (n=6)

(*Populus balsamifera*/*Salix spp*)

This community type represents the drier edge of the Willow/Sedge [Msd11] community type associated with riparian areas around wetlands and streams or rivers. Deciduous tree species will slowly establish moving upland from wetlands. In the absence of disturbance these sites will eventually succeed to spruce dominated. The sites with drier moisture regimes (i.e., submesic/subxeric) were associated with gravelly river floodplains. Moisture occurs at depth on these fluvial sites allowing willow and balsam poplar to grow but the surface is rapidly drained. Yellow mountain avens is often found in the understory of these gravelly fluvial floodplains. This community should be considered tertiary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** f balsam poplar(subhygric/rich)

**Ecosite Phase:** f1 balsam poplar Pb

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 25
BALSAM POPLAR ( <i>Populus balsamifera</i> )	25.8	0.0-40.0	83	Moisture Regime: Mesic (fresh) (2), Subhygric (moderately moist) (2)
ASPEN ( <i>Populus tremuloides</i> )	4.1	0.0-25.0	17	Nutrient Regime: Permesotrophic (rich) (3)
<b>Understory Tree</b>				Elevation (range): 1426 (1361-1518) M
WHITE SPRUCE ( <i>Picea glauca</i> )	3.6	0.0-9.7	83	Slope (%): 2.5 - 5.99 (2), 0.5 - 2.49 (1)
BALSAM POPLAR ( <i>Populus balsamifera</i> )	3.3	0.0-20.0	17	Aspect: Southerly (2), Easterly (1)
<b>Tall Shrub (2 to 5m)</b>				Topographic Position: Level (2), Midslope (1), Toe (1), Depression (1)
SALIX SPECIES ( <i>Salix</i> )	20.0	0.0-50.0	33	<b>Soil Variables</b>
<b>Medium Shrub (0.5 to 2 m)</b>				Soil Drainage: Well drained (2), Moderately well drained (2)
YELLOW MOUNTAIN AVENS ( <i>Dryas drummondii</i> )	2.9	0.0-16.7	33	Soil Subgroup: ORTHIC LUVIC GLEYSOL (1)
PRICKLY ROSE ( <i>Rosa acicularis</i> )	2.8	0.0-5.0	83	Surface Texture: Clay loam (1)
<b>Tall Forb (&gt;= 30 cm)</b>				Effective Texture: Silty clay loam (1)
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	4.2	0.0-9.3	67	Depth to Mottles/Gley: 0 - 25 (1)
COMMON HORSETAIL ( <i>Equisetum arvense</i> )	2.6	0.0-8.7	50	Organic Thickness: 0 - 5 cm (1)
<b>Low Forb (&lt; 30 cm)</b>				Parent Material: Glaciofluvial (1), Glaciolacustrine (1)
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	7.4	0.0-40.0	67	Soil Type:
BISHOP'S-CAP ( <i>Mitella nuda</i> )	1.4	0.0-6.8	33	Humus Form
<b>Graminoid</b>				<b>LFH Thickness</b>
SEDGE SPECIES ( <i>Carex</i> )	10.2	0.0-13.7	33	Mean
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	7.1	0.0-40.0	67	Min
UNDIFFERENTIATED REED GRASS ( <i>Calamagrostis</i> )	4.2	0.0-14.8	33	Max
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	3.6	0.0-20.0	50	Count
				cm:
				1.00
				1.00
				1.00
				1

## Msg3 Pb/Snowberry/Smooth brome (n=1)

(*Populus balsamifera*/*Symphoricarpos occidentalis*/*Bromus inermis*)

This community type represents Pb/Snowberry [Msg14] community that has been disturbed where introduced species have invaded. Moderate to heavy livestock disturbance often favours the growth of agronomic species in the forest understory, particularly in rich environments. Although productivity may be perceived to increase due to agronomic species, stocking levels should correspond to the reference community to promote diversity within all strata.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** f balsam poplar(subhygric/rich)

**Ecosite Phase:** f1 balsam poplar Pb

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 10-15
BALSAM POPLAR ( <i>Populus balsamifera</i> )	60.0	60.0-60.0	100	Moisture Regime: Hygric (moist) (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Nutrient Regime: Permesotrophic (rich) (1)
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	1.0	0.0-1.0	1	Elevation (range): 0 (0-0) M
<b>Tall Forb (&gt;= 30 cm)</b>				Slope (%): 0 - 0.49 (1)
WILD WHITE GERANIUM ( <i>Geranium richardsonii</i> )	10.0	10.0-10.0	100	Aspect: Level (1)
COW PARSNIP ( <i>Heraclium lanatum</i> )	10.0	10.0-10.0	100	Topographic Position:
COMMON HORSETAIL ( <i>Equisetum arvense</i> )	3.0	3.0-3.0	100	<b>Soil Variables</b>
<b>Low Forb (&lt; 30 cm)</b>				Soil Drainage:
COMMON DANDELION ( <i>Taraxacum officinale</i> )	10.0	10.0-10.0	100	Soil Subgroup:
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	3.0	3.0-3.0	100	Surface Texture: Silt loam (1)
WESTERN CANADA VIOLET ( <i>Viola canadensis</i> )	3.0	3.0-3.0	100	Effective Texture:
<b>Graminoid</b>				Depth to Mottles/Gley:
AWNLESS BROME ( <i>Bromus inermis</i> )	80.0	80.0-80.0	100	Organic Thickness: 0 - 5 cm (1)
SEDGE SPECIES ( <i>Carex</i> )	3.0	3.0-3.0	100	Parent Material:
TIMOTHY ( <i>Phleum pratense</i> )	3.0	3.0-3.0	100	Soil Type:
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	3.0	3.0-3.0	100	Humus Form
<b>Not Applicable</b>				<b>LFH Thickness</b>
UNDIFFERENTIATED THALICTRUM ( <i>Thalictrum</i> )	10.0	10.0-10.0	100	<b>Mean</b>
				<b>Min</b>
				<b>Max</b>
				<b>Count</b>
				cm: 0.00 0.00 0.00 0

## g meadow(subhygric/very rich) (n=102)

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

### General Description

The meadow ecosite tends to be mesic to subhygric and occurs on fluvial parent materials where flooding and/or high water tables increase soil water content and replenish nutrients. The soils on these sites tend to have thick Ah horizons and loamy textures.



### Environmental Variables

**Moisture Regime:** Subhygric (moderately moist) (24), Mesic (fresh) (21), Hygric (moist) (19), Subhydric (moderately wet) (8), Hydric (wet) (2), Submesic (moderately fresh) (1), Subxeric (moderately dry) (1)

**Nutrient Regime:** Permesotrophic (rich) (45), Mesotrophic (medium) (33), Eutrophic (very rich) (1)

**Elevation (range):** 1481 (1330-1601) M

**Slope (%):** level (24), nearly level (19), very gentle slope (12), moderate slope (2), gentle slope (2), very strong slope (1)

**Aspect:** Level (15), Easterly (14), Southerly (11), Northerly (7), Westerly (5)

**Topographic Position:** Level (26), Depression (19), Toe (15), Lower Slope (9), Midslope (5), Upper Slope (1)

### Soil Variables

**Soil Drainage:** Well drained (21), Imperfectly drained (19), Moderately well drained (17), Poorly drained (12), Very poorly drained (4), Rapidly drained (1)

**Soil Subgroup:** ORTHIC DARK GRAY CHERNOZEM (2), ORTHIC GLEYSOL (1), ORTHIC HUMIC GLEYSOL (1), ORTHIC LUVIC GLEYSOL (1), ORTHIC MELANIC BRUNISOL (1), REGO GLEYSOL (1), HUMIC LUVIC GLEYSOL (1)

**Surface Texture:** Loam (3), Organic (2), Silt loam (2), Silty clay loam (1), Loamy sand (1), Clay loam (1), Fine sandy loam (1)

**Effective Texture:** Clay loam (2), Silty clay (1), Silty clay loam (1), Clay (1)

**Depth to Mottles/Gley:**

**Organic Thickness:** 0 - 5 cm (20)

**Parent Material:** Fluvial (4), Morainal (2), Undifferentiated Organic (1), Lacustrine (1)

**Soil Type:** Moist/Fine (3), Wet/Mineral (1), Wet/Peaty (1)

**Humus Form:** MULL (1)

### Successional Relationships

The meadow ecosite is generally successional stable. Subhygric conditions, disturbance regime, cold air drainage and competition from a diverse cover of shrubs, forbs and grasses slow or inhibit the establishment of trees. If this site dries and trees become established, the rich, moist loamy soils are conducive to rapid growth. Early successional communities will typically be graminoid dominated, however, shrubs will encroach and stabilize.

### Indicator Species

#### Shrub

SALIX SPECIES

*Salix*

BOG BIRCH

*Betula glandulosa*

GREEN ALDER

*Alnus crispa*

#### Graminoid

SEDGE SPECIES

*Carex*

TUFTED HAIR GRASS

*Deschampsia cespitosa*

BLUEJOINT

*Calamagrostis canadensis*

### LFH Thickness

	Mean	Min	Max	Count
cm:	11.67	4.00	25.00	5

# g1 shrubby meadow (n=60)

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** g meadow(subhygric/very rich)

## General Description

This ecosite is wet enough that willows and alder begin to dominate the shrub phase. Willow species are commonly those that occur on relatively drier range, like beaked, basket, Scouler's and smooth willows. Bog birch is also common in this ecosite. Graminoid species include marsh reed grass, tufted hair grass and sedge species that occur on drier soil conditions in comparison to sedges that tend to grow on wetter ecosites. Although it will not dominate, rough fescue can occur particularly on drier pedestals. Due to rich/wet conditions yet still being accessible for grazing, this phase is susceptible to invasion from agronomic and weed species.

## Characteristic Species

### Shrub

- [ 15.8 ] BEAKED WILLOW  
*Salix bebbiana*
- [ 10.0 ] BASKET WILLOW  
*Salix petiolaris*
- [ 4.4 ] GREEN ALDER  
*Alnus crispa*
- [ 3.8 ] SCOULER'S WILLOW  
*Salix scouleriana*
- [ 3.5 ] BOG BIRCH  
*Betula glandulosa*
- [ 2.8 ] SMOOTH WILLOW  
*Salix glauca*
- [ 2.5 ] RIVER ALDER  
*Alnus tenuifolia*

### Graminoid

- [ 3.3 ] BLUEJOINT  
*Calamagrostis canadensis*
- [ 2.8 ] TUFTED HAIR GRASS  
*Deschampsia cespitosa*

## Environmental Variables

**Moisture Regime:** Subhygric (moderately moist) (18), Hygric (moist) (16), Mesic (fresh) (12), Subhydric (moderately wet) (8), Hydric (wet) (2), Subxeric (moderately dry) (1), Submesic (moderately fresh) (1)

**Nutrient Regime:** Permesotrophic (rich) (36), Mesotrophic (medium) (19), Eutrophic (very rich) (1)

**Elevation (range):** 1494 (1347-1601) M

**Slope (%):** level (16), nearly level (13), very gentle slope (7), gentle slope (2), moderate slope (2), very strong slope (1)

**Aspect:** Level (11), Southerly (10), Northerly (5), Easterly (5), Westerly (3)

**Topographic Position:** Level (18), Depression (16), Toe (9), Lower Slope (7), Midslope (2), Upper Slope (1)

## Soil Variables

**Soil Drainage:** Imperfectly drained (16), Moderately well drained (13), Poorly drained (11), Well drained (7), Very poorly drained (2), Rapidly drained (1)

**Soil Subgroup:** ORTHIC DARK GRAY CHERNOZEM (2), ORTHIC GLEYSOL (1), REGO GLEYSOL (1), ORTHIC HUMIC GLEYSOL (1), HUMIC LUVIC GLEYSOL (1), ORTHIC LUVIC GLEYSOL (1), ORTHIC MELANIC BRUNISOL (1)

**Surface Texture:** Loam (3), Organic (2), Silt loam (2), Silty clay loam (1), Loamy sand (1), Fine sandy loam (1), Clay loam (1)

**Effective Texture:** Clay loam (2), Clay (1), Silty clay (1), Silty clay loam (1)

**Depth to Mottles/Gley:**

**Organic Thickness:** 0 - 5 cm (15)

**Parent Material:** Fluvial (4), Morainal (2), Lacustrine (1), Undifferentiated Organic (1)

**Soil Type:** Moist/Fine (3), Wet/Mineral (1), Wet/Peaty (1)

**Humus Form:** MULL (1)

## LFH Thickness

	Mean	Min	Max	Count
cm:	11.67	4.00	25.00	5

## Msd13 Water birch-Smooth willow/Pine grass (n=1)

(*Betula occidentalis*-*Salix glauca*/*Calamagrostis rubescens*)

This community type has only been described from one site on the eastern slopes of the Porcupine Hills. It may represent a transitional community to the Foothills Parkland subregion. This community was described on a hilltop depression with a high moisture and nutrient regime. The depression also provides protection from the prevailing winds. Therefore, shrubs are abundant, however, due to wet conditions at the bottom of the depression, trees will likely only develop on the drier edges. The surrounding wind-exposed areas support grassland vegetation, therefore, this community type would provide good shelter for livestock later in the fall when the site has dried.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** g meadow(subhygric/very rich)

**Ecosite Phase:** g1 shrubby meadow

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 40
WATER BIRCH ( <i>Betula occidentalis</i> )	21.0	0.0-0.0	100	Moisture Regime: Subhygric (moderately moist) (0)
<b>Medium Shrub (0.5 to 2 m)</b>				Nutrient Regime: Permesotrophic (rich) (0)
SMOOTH WILLOW ( <i>Salix glauca</i> )	21.0	0.0-0.0	100	Elevation (range): 1600 (0-0) M
SNOWBERRY (BUCKBRUSH) ( <i>Symphoricarpos occidentalis</i> )	15.0	0.0-0.0	100	Slope (%):
BRACTED HONEYSUCKLE ( <i>Lonicera involucrata</i> )	6.0	0.0-0.0	100	Aspect:
<b>Tall Forb (&gt;= 30 cm)</b>				Topographic Position:
SHOWY ASTER ( <i>Aster conspicuus</i> )	10.0	0.0-0.0	100	<b>Soil Variables</b>
SMOOTH ASTER ( <i>Aster laevis</i> )	7.0	0.0-0.0	100	Soil Drainage: Poorly drained (0)
<b>Low Forb (&lt; 30 cm)</b>				Soil Subgroup:
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	8.0	0.0-0.0	100	Surface Texture:
COMMON PINK WINTERGREEN ( <i>Pyrola asarifolia</i> )	7.0	0.0-0.0	100	Effective Texture:
<b>Graminoid</b>				Depth to Mottles/Gley:
PINE REED GRASS ( <i>Calamagrostis rubescens</i> )	15.0	0.0-0.0	100	Organic Thickness:
PRAIRIE SEDGE ( <i>Carex prairea</i> )	1.0	0.0-0.0	100	Parent Material:
				Soil Type:
				Humus Form
				<b>LFH Thickness</b>
				<b>Mean</b>
				<b>Min</b>
				<b>Max</b>
				<b>Count</b>
				cm:
				0.00
				0.00
				0.00
				0

## Msd16 Willow/Marsh reed grass (Bluejoint) (n=3)

(*Salix spp./Calamagrostis canadensis*)

This community type occurs in small willow pockets in depressions on upland sites and in transitions between wet lowland and drier upland communities. The main factor is that the water table is high enough at some point during the year so that vegetation can access more moisture than drier uplands. A number of willows can occur on this ecosite; beaked and basket willows are common. Marsh reed grass dominated areas are not common in the Montane or Foothills Parkland subregions indicating the climate of these particular sites is more closely related to the Lower Foothills or Subalpine subregions. This community type may persist for long periods of time before undergoing succession to forest. As organic matter accumulates, these sites will dry out and typically succeed to white spruce, however, black spruce, tamarack, balsam poplar, or paper birch may establish depending on soils and proximity to other subregions (Beckingham 1994). Cattle will utilize this community for both forage and shelter as they are productive, however moderate to heavy grazing will lead to agronomic species invading. These areas should usually be considered secondary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** g meadow(subhygric/very rich)

**Ecosite Phase:** g1 shrubby meadow

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Tall Shrub (2 to 5m)</b>				Ecological Status Score: 40
SALIX SPECIES ( <i>Salix</i> )	34.6	4.3-50.7	100	Moisture Regime: Hygric (moist) (1), Hydric (wet) (1)
BOG BIRCH ( <i>Betula glandulosa</i> )	3.9	0.0-6.0	66	Nutrient Regime: Mesotrophic (medium) (2), Permesotrophic (rich) (1)
GREEN ALDER ( <i>Alnus crispa</i> )	1.6	0.0-5.0	33	Elevation (range): 1445 (1400-1475) M
<b>Tall Forb (&gt;= 30 cm)</b>				Slope (%): 2.5 - 5.99 (1)
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	3.7	0.0-6.3	67	Aspect: Southerly (1)
LARGE-LEAVED YELLOW AVENS ( <i>Geum macrophyllum</i> )	2.4	1.0-4.7	100	Topographic Position: Level (2), Depression (1)
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	1.4	0.0-3.0	67	<b>Soil Variables</b>
<b>Low Forb (&lt; 30 cm)</b>				Soil Drainage: Well drained (1), Imperfectly drained (1), Poorly drained (1)
ARROW-LEAVED COLTSFOOT ( <i>Petasites sagittatus</i> )	3.4	0.0-8.9	67	Soil Subgroup:
<b>Graminoid</b>				Surface Texture: Organic (1)
BLUEJOINT ( <i>Calamagrostis canadensis</i> )	20.9	18.3-23.7	100	Effective Texture:
SEDGE SPECIES ( <i>Carex</i> )	11.4	4.7-14.4	100	Depth to Mottles/Gley:
TUFTED HAIR GRASS ( <i>Deschampsia cespitosa</i> )	5.2	0.0-15.7	33	Organic Thickness: 0 - 5 cm (1)
FRINGED BROME ( <i>Bromus ciliatus</i> )	4.3	0.0-12.7	67	Parent Material:
BOG MUHLY ( <i>Muhlenbergia glomerata</i> )	2.3	0.0-7.0	33	Soil Type:
MEADOW FOXTAIL ( <i>Alopecurus pratensis</i> )	2.2	0.0-6.7	33	Humus Form
BOG BLUEGRASS ( <i>Poa leptocoma</i> )	2.2	0.0-6.7	33	<b>LFH Thickness</b>
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	1.6	0.0-5.0	33	<b>Mean</b>
				<b>Min</b>
				<b>Max</b>
				<b>Count</b>
				cm: 0.00 0.00 0.00 0

# Msd17 Willow-Bog birch/Tufted hair grass-Foothills rough fescue (n=7)

(*Salix spp.-Betula glandulosa/Deschampsia cespitosa-Festuca campestris*)

This community is similar to drier willow-bog birch communities in the Upper Foothills and Subalpine subregions. In the Montane, it represents a drier willow-bog birch complex associated with rough fescue and/or tufted hair grass. Although a number of willows can grow in this ecosite, beaked and basket willow are common. Typically, rough fescue is more dominant in the south, whereas tufted hair grass increases to the north. Tufted hair grass will replace marsh reed grass at higher elevations (Lane et al. 2000). This community represents a shrub encroached grassy meadow. Historically, fire played an important role in the maintenance of grassland communities within this ecosite. Continued fire suppression will eventually allow willow and bog birch to fully encroach many of these grassy meadows. This encroachment causes a decline in forage production compared to grassland phase production. Continued protection of this community from fire disturbance will most likely lead to higher cover of willow and bog birch and in turn lower productivity and accessibility under the shrubs, therefore the minimum stocking rate ranges to a low value and this community should be considered either secondary to tertiary depending on access.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** g meadow(subhygric/very rich)

**Ecosite Phase:** g1 shrubby meadow

Plant Composition	Canopy Cover (%)		
	Mean	Range	Const.
<b>Overstory Tree</b>			
WHITE SPRUCE ( <i>Picea glauca</i> )	3.1	0.0-20.0	29
<b>Medium Shrub (0.5 to 2 m)</b>			
SALIX SPECIES ( <i>Salix</i> )	21.0	5.0-35.0	100
BOG BIRCH ( <i>Betula glandulosa</i> )	16.1	3.0-32.3	100
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	4.5	0.0-7.5	86
COMMON BEARBERRY ( <i>Arctostaphylos uva-ursi</i> )	2.8	0.0-19.0	29
<b>Tall Forb (&gt;= 30 cm)</b>			
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	2.2	0.0-11.7	43
VEINY MEADOW RUE ( <i>Thalictrum venulosum</i> )	1.8	0.0-10.0	43
TALL JACOB'S-LADDER ( <i>Polemonium acutiflorum</i> )	1.1	0.0-7.3	29
PURPLE AVENS ( <i>Geum rivale</i> )	1.0	0.0-6.0	29
<b>Low Forb (&lt; 30 cm)</b>			
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	2.7	0.0-12.3	57
COMMON YARROW ( <i>Achillea millefolium</i> )	1.2	0.0-2.9	71
<b>Graminoid</b>			
TUFTED HAIR GRASS ( <i>Deschampsia cespitosa</i> )	10.0	0.0-40.0	71
WIRE RUSH ( <i>Juncus balticus</i> )	5.1	0.0-14.3	57
SEDGE SPECIES ( <i>Carex</i> )	2.6	1.0-13.4	100
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	2.4	0.0-6.5	86
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	2.3	0.0-10.3	71

Environmental Variables
Ecological Status Score: 40
Moisture Regime: Subhygric (moderately moist) (3), Mesic (fresh) (2), Hygric (moist) (2), Subhydric (moderately wet) (2), Hydric (wet) (1)
Nutrient Regime: Mesotrophic (medium) (6), Permesotrophic (rich) (4)
Elevation (range): 1470 (1347-1576) M
Slope (%): 0 - 0.49 (4), 0.5 - 2.49 (1), 2.5 - 5.99 (1)
Aspect: Level (3), Northerly (1), Easterly (1), Southerly (1)
Topographic Position: Level (5), Depression (3), Lower Slope (1), Toe (1)

Soil Variables
Soil Drainage: Imperfectly drained (4), Poorly drained (2), Very poorly drained (2)
Soil Subgroup: ORTHIC GLEYSOL (1)
Surface Texture: Fine sandy loam (1)
Effective Texture: Clay loam (1)
Depth to Mottles/Gley:
Organic Thickness: 0 - 5 cm (1)
Parent Material: Fluvial (1)
Soil Type: Moist/Fine (1)
Humus Form

LFH Thickness	Mean	Min	Max	Count
cm:	7.00	7.00	7.00	1

# Msd17a Willow-Bog birch/Kentucky bluegrass (n=18)

(*Salix spp.*-*Betula glandulosa*/*Poa pratensis*)

This community represents a Willow-Bog birch/Tufted hair grass-Foothills rough fescue [Msd17] community that has been disturbed enough to allow introduction of agronomic species. Typically, rough fescue is more dominant in the south, whereas tufted hair grass increases to the north, however both are susceptible to invasion of introduced species. Livestock prefer this community for both shade and forage especially as they dry throughout the season. Willow and bog birch cover influences production negatively, although introduced species will still invade a closed canopy.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** g meadow(subhygric/very rich)

**Ecosite Phase:** g1 shrubby meadow

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Tall Shrub (2 to 5m)</b>				Ecological Status Score: 15-27
MYRTLE-LEAVED WILLOW ( <i>Salix myrtillifolia</i> )	6.2	0.0-20.3	67	Moisture Regime: Subhygric (moderately moist) (3), Hygric (moist) (2), Subxeric (moderately dry) (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Nutrient Regime: Permesotrophic (rich) (4), Mesotrophic (medium) (2)
BOG BIRCH ( <i>Betula glandulosa</i> )	7.4	0.0-16.7	94	Elevation (range): 1458 (1403-1499) M
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	4.7	0.0-12.2	89	Slope (%): 2.5 - 5.99 (2), 6 - 9.99 (2), 0.5 - 2.49 (2)
BEAKED WILLOW ( <i>Salix bebbiana</i> )	4.2	0.0-66.7	17	Aspect: Westerly (2), Easterly (2), Southerly (1), Northerly (1)
PUSSY WILLOW ( <i>Salix discolor</i> )	1.0	0.0-13.5	11	Topographic Position: Lower Slope (2), Depression (2), Level (1), Midslope (1)
<b>Tall Forb (&gt;= 30 cm)</b>				<b>Soil Variables</b>
GRACEFUL CINQUEFOIL ( <i>Potentilla gracilis</i> )	3.7	0.0-13.2	78	Soil Drainage: Poorly drained (3), Moderately well drained (2), Imperfectly drained (1), Well drained (1)
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	1.9	0.0-13.4	50	Soil Subgroup: ORTHIC LUVIC GLEYSOL (1), ORTHIC DARK GRAY CHERNOZEM (1), ORTHIC MELANIC BRUNISOL (1)
VEINY MEADOW RUE ( <i>Thalictrum venulosum</i> )	1.9	0.0-5.5	83	Surface Texture: Silty clay loam (1), Clay loam (1)
HEART-LEAVED ALEXANDER ( <i>Zizia aptera</i> )	1.9	0.0-5.9	83	Effective Texture: Clay (1), Silty clay (1)
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	1.8	0.0-4.3	89	Depth to Mottles/Gley:
<b>Low Forb (&lt; 30 cm)</b>				Organic Thickness: 0 - 5 cm (2)
COMMON YARROW ( <i>Achillea millefolium</i> )	3.6	0.0-9.8	94	Parent Material: Fluvial (1), Morainal (1), Lacustrine (1)
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	1.8	0.0-6.0	89	Soil Type: Wet/Peaty (1), Moist/Fine (1)
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	1.4	0.0-5.1	94	Humus Form MULL (1)
COMMON DANDELION ( <i>Taraxacum officinale</i> )	1.2	0.0-4.1	89	
<b>Graminoid</b>				
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	7.8	0.0-20.0	89	
ROUGH FESCUE ( <i>Festuca scabrella</i> )	5.6	0.0-28.0	61	
MEADOW SEDGE ( <i>Carex praticola</i> )	4.0	0.0-42.7	39	
TUFTED HAIR GRASS ( <i>Deschampsia cespitosa</i> )	3.9	0.0-20.0	67	
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	3.8	0.0-16.4	78	
AWNLESS BROME ( <i>Bromus inermis</i> )	1.9	0.0-26.3	17	
TIMOTHY ( <i>Phleum pratense</i> )	1.5	0.0-9.0	56	
PARRY OAT GRASS ( <i>Danthonia parryi</i> )	1.1	0.0-6.7	44	
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	1.1	0.0-8.7	28	
				<b>LFH Thickness</b>
				<b>Mean</b>
				<b>Min</b>
				<b>Max</b>
				<b>Count</b>
				cm:
				14.00
				4.00
				25.00
				2



## Msd22 River alder/Marsh reedgrass (n=1)

### (*Alnus tenuifolia*/*Calamagrostis canadensis*)

This community type was found on a subhydryc lower Montane site and represents the only community dominated by river alder. River alder occurs on moist fluvial sites and narrow bands along stream, river banks, and lakeshores (Thompson and Hansen 2003). It is also comparable to the Willow-Alder-Low-bush cranberry/Shield fern type described by Lane et al. (2000) in the Lower Foothills subregion on similar site types. White spruce, aspen, willow, balsam poplar and lodgepole pine can often be found to regenerate in this community type, therefore this community type will likely succeed to white spruce (Corns and Achuff 1982). Marsh reed grass and wetter sedges are common in the understory, as well as a diversity of forbs. This community should be considered tertiary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** g meadow(subhydryc/very rich)

**Ecosite Phase:** g1 shrubby meadow

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Tall Shrub (2 to 5m)</b>				Ecological Status Score: 27-40
RIVER ALDER ( <i>Alnus tenuifolia</i> )	23.7	23.7-23.7	100	Moisture Regime: Subhydryc (moderately wet) (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Nutrient Regime: Eutrophic (very rich) (1)
WILD RED RASPBERRY ( <i>Rubus idaeus</i> )	1.3	1.3-1.3	100	Elevation (range): 1446 (1446-1446) M
<b>Tall Forb (&gt;= 30 cm)</b>				Slope (%): 0 - 0.49 (1)
COW PARSNIP ( <i>Heraclium lanatum</i> )	5.3	5.3-5.3	100	Aspect:
CANADA THISTLE ( <i>Cirsium arvense</i> )	5.1	5.1-5.1	100	Topographic Position: Depression (1)
COMMON HORSETAIL ( <i>Equisetum arvense</i> )	5.0	5.0-5.0	100	
LARGE-LEAVED YELLOW AVENS ( <i>Geum macrophyllum</i> )	3.7	3.7-3.7	100	<b>Soil Variables</b>
MARSH HEDGE-NETTLE ( <i>Stachys palustris</i> )	2.7	2.7-2.7	100	Soil Drainage: Poorly drained (1)
WHITE ANGELICA ( <i>Angelica arguta</i> )	1.3	1.3-1.3	100	Soil Subgroup:
WILD VETCH ( <i>Vicia americana</i> )	1.3	1.3-1.3	100	Surface Texture:
<b>Low Forb (&lt; 30 cm)</b>				Effective Texture:
WILLOWHERB ( <i>Epilobium glaberrimum</i> )	10.7	10.7-10.7	100	Depth to Mottles/Gley:
ARROW-LEAVED COLTSFOOT ( <i>Petasites sagittatus</i> )	4.0	4.0-4.0	100	Organic Thickness:
<b>Graminoid</b>				Parent Material:
FOWL MANNA GRASS ( <i>Glyceria striata</i> )	12.7	12.7-12.7	100	Soil Type:
BLUEJOINT ( <i>Calamagrostis canadensis</i> )	8.7	8.7-8.7	100	Humus Form
BROOK GRASS ( <i>Catabrosa aquatica</i> )	7.3	7.3-7.3	100	
SEDGE SPECIES ( <i>Carex</i> )	3.1	3.1-3.1	100	
NODDING BROME ( <i>Bromus anomalus</i> )	3.0	3.0-3.0	100	
				<b>LFH Thickness</b>
				Mean
				Min
				Max
				Count
				cm:
				0.00
				0.00
				0.00
				0

## Msd3 Willow-Snowberry (n=2)

(*Salix spp.-Symphoricarpos spp.*)

This community type represents a drier upland willow type which can be found on north-facing slopes, ravines and seepage areas. This community type was described in Banff and Jasper National Parks. The moisture and nutrient regimes favour an abundance of willow and the presence of a few scattered spruce trees. Beaked willow is common and is highly palatable to wild ungulates, therefore, this community should be considered important wildlife habitat. In the absence of disturbances such as fire, this community type will likely succeed to white spruce.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** g meadow(subhygric/very rich)

**Ecosite Phase:** g1 shrubby meadow

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables				
	Mean	Range							
<b>Tall Shrub (2 to 5m)</b>					Ecological Status Score: 40				
SALIX SPECIES ( <i>Salix</i> )	62.5	50.0-75.0		100	Moisture Regime: Mesic (fresh) (2)				
<b>Medium Shrub (0.5 to 2 m)</b>					Nutrient Regime: Permesotrophic (rich) (1)				
UNDIFFERENTIATED SYMPHORICARPOS ( <i>Symphoricarpos</i> )	9.0	7.1-10.0		100	Elevation (range): 1553 (1553-1553) M				
NORTHERN GOOSEBERRY ( <i>Ribes oxycanthoides</i> )	3.5	2.0-5.0		100	Slope (%): 0.5 - 2.49 (1)				
WILD RED RASPBERRY ( <i>Rubus idaeus</i> )	2.5	0.0-5.0		50	Aspect: Northerly (1)				
COMMON WILD ROSE ( <i>Rosa woodsii</i> )	1.5	0.0-3.0		50	Topographic Position: Lower Slope (1), Upper Slope (1)				
SASKATOON ( <i>Amelanchier alnifolia</i> )	1.0	1.0-1.0		100	<b>Soil Variables</b>				
<b>Tall Forb (&gt;= 30 cm)</b>					Soil Drainage: Moderately well drained (2)				
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	9.8	1.0-18.6		100	Soil Subgroup:				
SPREADING SWEET CICELY ( <i>Osmorhiza depauperata</i> )	2.4	1.9-3.0		100	Surface Texture:				
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	1.5	1.0-2.0		100	Effective Texture:				
COW PARSNIP ( <i>Heracleum lanatum</i> )	1.2	1.0-1.4		100	Depth to Mottles/Gley:				
FAIRYBELLS ( <i>Disporum trachycarpum</i> )	1.0	1.0-1.0		100	Organic Thickness:				
CREAM-COLORED VETCHLING ( <i>Lathyrus ochroleucus</i> )	1.0	1.0-1.0		100	Parent Material:				
STAR-FLOWERED SOLOMON'S-SEAL ( <i>Smilacina stellata</i> )	1.0	1.0-1.0		100	Soil Type:				
<b>Low Forb (&lt; 30 cm)</b>					Humus Form				
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	1.0	1.0-1.0		100	<b>LFH Thickness</b>				
WESTERN CANADA VIOLET ( <i>Viola canadensis</i> )	1.0	1.0-1.0		100					
<b>Graminoid</b>									
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	2.5	2.0-3.1		100					
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	1.1	1.0-1.2		100					
TIMOTHY ( <i>Phleum pratense</i> )	1.0	1.0-1.0		100					
					<b>LFH Thickness</b>	<b>Mean</b>	<b>Min</b>	<b>Max</b>	<b>Count</b>
					cm:	0.00	0.00	0.00	0

## Msd3a Willow/Tufted hairgrass (n=1)

(*Salix sp./Deschampsia cespitosa*)

This community type was described as a mosaic of willow clumps amid a graminoid matrix. In general, the willows included in the plant community are associated with slightly drier soils, as is the presence of Baltic rush, tufted hair grass and marsh reed grass, compared to those dominated by sedges. Rough fescue may become more prevalent in these sites moving southward in the ecosection. The open nature of this site and the drier site conditions favours livestock use. Heavier use will promote introduced species such as Kentucky bluegrass and timothy, moving this community to resemble the Willow/Kentucky bluegrass-Timothy [Msd4] community type or a variant of it.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** g meadow(subhygric/very rich)

**Ecosite Phase:** g1 shrubby meadow

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Medium Shrub (0.5 to 2 m)</b>				Ecological Status Score: 40
BEAKED WILLOW ( <i>Salix bebbiana</i> )	11.3	11.3-11.3	100	Moisture Regime: Subhygric (moderately moist) (1)
<b>Low Forb (&lt; 30 cm)</b>				Nutrient Regime: Mesotrophic (medium) (1)
ARROW-LEAVED COLTSFOOT ( <i>Petasites sagittatus</i> )	2.0	2.0-2.0	100	Elevation (range): 1592 (1592-1592) M
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	1.0	1.0-1.0	100	Slope (%):
<b>Graminoid</b>				Aspect:
WIRE RUSH ( <i>Juncus balticus</i> )	19.7	19.7-19.7	100	Topographic Position: Level (1)
TUFTED HAIR GRASS ( <i>Deschampsia cespitosa</i> )	18.8	18.8-18.8	100	<b>Soil Variables</b>
SMALL BOTTLE SEDGE ( <i>Carex utriculata</i> )	11.7	11.7-11.7	100	Soil Drainage: Imperfectly drained (1)
TWO-STAMENED SEDGE ( <i>Carex diandra</i> )	8.1	8.1-8.1	100	Soil Subgroup: ORTHIC DARK GRAY CHERNOZEM (1), REGO GLEYSOL (1)
WATER SEDGE ( <i>Carex aquatilis</i> )	3.1	3.1-3.1	100	Surface Texture:
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	2.0	2.0-2.0	100	Effective Texture:
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	1.0	1.0-1.0	100	Depth to Mottles/Gley:
				Organic Thickness: 0 - 5 cm (2)
				Parent Material: Morainal (1), Undifferentiated Organic (1)
				Soil Type:
				Humus Form

LFH Thickness	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

# Msd4 Willow/Kentucky bluegrass-Timothy (n=17)

## (*Salix spp./Poa pratensis-Phleum pratense*)

This community type is similar to the Willow/Marsh reed grass or Willow/Tufted hair grass [Msd16, Msd3a] community types, however, this community type has been disturbed. This disturbance has promoted the establishment of species such as timothy, Kentucky bluegrass, smooth brome and forbs such as dandelion. These sites are often productive because of the higher nutrients and moisture and with the addition of Kentucky bluegrass and timothy establishing these sites will be readily grazed by livestock. Although agronomics have invaded, proper management will promote diversity among this community's various layers. In the absence of disturbance to the canopy, this type will likely slowly succeed to white spruce.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** g meadow(subhygric/very rich)

**Ecosite Phase:** g1 shrubby meadow

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Tall Shrub (2 to 5m)</b>				Ecological Status Score: 15-20
SALIX SPECIES ( <i>Salix</i> )	60.3	20.0-80.0	100	Moisture Regime: Subhygric (moderately moist) (8), Hygric (moist) (4), Mesic (fresh) (4), Submesic (moderately fresh) (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Nutrient Regime: Permesotrophic (rich) (11), Mesotrophic (medium) (5)
WILD RED RASPBERRY ( <i>Rubus idaeus</i> )	2.8	0.0-20.0	24	Elevation (range): 1466 (1391-1601) M
UNDIFFERENTIATED ROSE ( <i>Rosa</i> )	2.6	0.0-18.7	29	Slope (%): 0 - 0.49 (6), 0.5 - 2.49 (2), 2.5 - 5.99 (1), 10 - 15.99 (1)
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	1.6	0.0-16.0	29	Aspect: Level (4), Northerly (1), Easterly (1), Westerly (1)
NORTHERN GOOSEBERRY ( <i>Ribes oxycanthoides</i> )	1.5	0.0-10.7	41	Topographic Position: Depression (6), Toe (4), Lower Slope (3), Level (1)
<b>Tall Forb (&gt;= 30 cm)</b>				<b>Soil Variables</b>
COW PARSNIP ( <i>Heracleum lanatum</i> )	2.6	0.0-37.3	24	Soil Drainage: Moderately well drained (5), Imperfectly drained (3), Poorly drained (3), Well drained (2), Rapidly drained (1)
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	2.4	0.0-25.3	53	Soil Subgroup: ORTHIC HUMIC GLEYSOL (1), HUMIC LUVIC GLEYSOL (1)
CANADA GOLDENROD ( <i>Solidago canadensis</i> )	2.2	0.0-34.0	18	Surface Texture: Loam (2), Silt loam (1), Loamy sand (1)
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	1.4	0.0-11.1	35	Effective Texture: Clay loam (1), Silty clay loam (1)
BICKNELL'S GERANIUM ( <i>Geranium bicknellii</i> )	1.2	0.0-12.2	12	Depth to Mottles/Gley:
<b>Low Forb (&lt; 30 cm)</b>				Organic Thickness: 0 - 5 cm (5)
COMMON DANDELION ( <i>Taraxacum officinale</i> )	2.1	0.0-10.0	77	Parent Material: Fluvial (2)
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	1.6	0.0-16.0	59	Soil Type: Wet/Mineral (1), Moist/Fine (1)
WHITE CLOVER ( <i>Trifolium repens</i> )	1.1	0.0-15.2	18	Humus Form
<b>Graminoid</b>				<b>LFH Thickness</b>
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	10.3	7.0-31.0	100	Mean
TIMOTHY ( <i>Phleum pratense</i> )	7.5	0.0-41.5	65	Min
AWNLESS BROME ( <i>Bromus inermis</i> )	6.4	0.0-80.0	47	Max
SEDGE SPECIES ( <i>Carex</i> )	4.0	0.0-39.0	48	Count
BLUEJOINT ( <i>Calamagrostis canadensis</i> )	3.0	0.0-20.0	24	cm:
TUFTED HAIR GRASS ( <i>Deschampsia cespitosa</i> )	2.5	0.0-35.0	29	14.00
WIRE RUSH ( <i>Juncus balticus</i> )	2.4	0.0-17.7	24	12.00
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	1.5	0.0-14.3	24	15.00
				2

## Msd5 Green alder-Scoulers willow (n=1)

### (*Alnus crispa-Salix scouleriana*)

This community type is generally found on mesic to hygric lower subalpine sites on moderate, northerly slopes. Soils are moderately well to well-drained on morainal landforms with the community occurring in seepage areas (Corns and Achuff 1982). This community is similar to Jaques and Corbin's (1981) Scouler's willow-Beaked willow type. It is also comparable to the Willow-Alder-Low-bush cranberry/Shield fern type described by Lane et al. (2000) in the Lower Foothills subregion on similar site types. *Salix scouleriana* dominates the overstory and alder makes up a major portion of the understory cover. Dominance of alder may indicate a recent fire or other disturbance in the understory since alder regenerates faster than *Salix scouleriana*. White spruce, aspen, balsam poplar and lodgepole pine can often be found to regenerate in this community type, therefore this community type will likely succeed to white spruce (Corns and Achuff 1982). This community should be considered tertiary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** g meadow(subhygric/very rich)

**Ecosite Phase:** g1 shrubby meadow

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 40
GREEN ALDER ( <i>Alnus crispa</i> )	40.0	40.0-40.0	100	Moisture Regime: Mesic (fresh) (1)
WHITE SPRUCE ( <i>Picea glauca</i> )	2.5	2.5-2.5	100	Nutrient Regime:
LODGEPOLE PINE ( <i>Pinus contorta</i> )	1.0	1.0-1.0	100	Elevation (range): 0 (0-0) M
<b>Tall Shrub (2 to 5m)</b>				Slope (%): 31 - 45.99 (1)
SCOULER'S WILLOW ( <i>Salix scouleriana</i> )	35.0	35.0-35.0	100	Aspect:
<b>Medium Shrub (0.5 to 2 m)</b>				Topographic Position: Midslope (1)
WHITE MEADOWSWEET ( <i>Spiraea betulifolia</i> )	3.0	3.0-3.0	100	<b>Soil Variables</b>
NORTHERN GOOSEBERRY ( <i>Ribes oxycanthoides</i> )	1.0	1.0-1.0	100	Soil Drainage: Moderately well drained (1)
<b>Tall Forb (&gt;= 30 cm)</b>				Soil Subgroup:
VEINY MEADOW RUE ( <i>Thalictrum venulosum</i> )	3.0	3.0-3.0	100	Surface Texture:
SHOWY ASTER ( <i>Aster conspicuus</i> )	2.0	2.0-2.0	100	Effective Texture:
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	2.0	2.0-2.0	100	Depth to Mottles/Gley:
COW PARSNIP ( <i>Heraclium lanatum</i> )	1.0	1.0-1.0	100	Organic Thickness:
BRACKETED LOUSEWORT ( <i>Pedicularis bracteosa</i> )	1.0	1.0-1.0	100	Parent Material:
<b>Low Forb (&lt; 30 cm)</b>				Soil Type:
BUNCHBERRY ( <i>Cornus canadensis</i> )	3.0	3.0-3.0	100	Humus Form
SWEET-SCENTED BEDSTRAW ( <i>Galium triflorum</i> )	2.0	2.0-2.0	100	
<b>Graminoid</b>				
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	2.0	2.0-2.0	100	

LFH Thickness	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

## Msd9 Basket willow/Sedge-Marsh reedgrass (n=3)

(*Salix petiolaris*/*Carex spp.*-*Calamagrostis canadensis*)

Basket willow prefers moderately-well drained soils where the water table is near the surface such that their roots have prolonged access to moisture. The soils of this community type tend to be drier than the Myrtle-leaved and flat-leaved willow community types, but may be slightly wetter than the beaked willow dominated sites. Basket willow is not particularly palatable to wild ungulates, however the understory shrubs and forbs can provide a substantial amount of forage. Heavy grazing of this community type will allow Kentucky bluegrass and timothy to invade to form the Basket willow/Kentucky bluegrass [Msd9a] community type.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** g meadow(subhygric/very rich)

**Ecosite Phase:** g1 shrubby meadow

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Tall Shrub (2 to 5m)</b>				Ecological Status Score: 40
BASKET WILLOW ( <i>Salix petiolaris</i> )	59.5	38.7-90.0	100	Moisture Regime: Hygric (moist) (5), Subhydric (moderately wet) (3), Mesic (fresh) (1), Subhygric (moderately moist) (1)
BOG BIRCH ( <i>Betula glandulosa</i> )	1.6	0.0-5.0	33	Nutrient Regime: Permesotrophic (rich) (10)
<b>Medium Shrub (0.5 to 2 m)</b>				Elevation (range): 1417 (1370-1450) M
SALIX SPECIES ( <i>Salix</i> )	6.7	1.0-10.0	100	Slope (%): 0.5 - 2.49 (4), 0 - 0.49 (2), 2.5 - 5.99 (2), 10 - 15.99 (1)
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	3.0	0.0-9.1	33	Aspect: Southerly (6), Level (1), Easterly (1)
<b>Low Shrub (&lt; 0.5m)</b>				Topographic Position: Level (4), Toe (3), Depression (2)
DWARF RASPBERRY ( <i>Rubus arcticus</i> )	1.4	0.0-4.3	33	<b>Soil Variables</b>
<b>Tall Forb (&gt;= 30 cm)</b>				Soil Drainage: Imperfectly drained (3), Well drained (2), Moderately well drained (2)
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	13.2	0.5-37.0	100	Soil Subgroup:
LARGE-LEAVED YELLOW AVENS ( <i>Geum macrophyllum</i> )	5.1	0.0-12.3	67	Surface Texture: Organic (1)
TALL LUNGWORT ( <i>Mertensia paniculata</i> )	3.9	0.0-11.3	67	Effective Texture:
PURPLE AVENS ( <i>Geum rivale</i> )	2.0	0.0-6.0	33	Depth to Mottles/Gley:
VEINY MEADOW RUE ( <i>Thalictrum venulosum</i> )	0.8	0.0-2.0	67	Organic Thickness: 0 - 5 cm (1)
<b>Graminoid</b>				Parent Material:
BLUEJOINT ( <i>Calamagrostis canadensis</i> )	17.0	0.0-44.7	67	Soil Type:
SEDGE SPECIES ( <i>Carex</i> )	15.5	3.0-40.0	100	Humus Form
WIRE RUSH ( <i>Juncus balticus</i> )	3.4	0.0-10.3	33	<b>LFH Thickness</b>
ALPINE FOXTAIL ( <i>Alopecurus occidentalis</i> )	3.3	0.0-10.0	33	<b>Mean</b>
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	2.4	0.0-7.3	33	<b>Min</b>
				<b>Max</b>
				<b>Count</b>
				cm: 0.00 0.00 0.00 0

## Msd9a Basket willow/Kentucky bluegrass (n=2)

(*Salix petiolaris*/*Poa pratensis*)

This community type represents a disturbed basket willow shrubland. Basket willow occurs in areas where the water table is shallow, yet there is some soil drainage, allowing the soil to dry at some point of the year. Livestock prefer these communities for forage and shelter, and their proximity to water. This community usually occurs in upper terraces of riparian areas. Heavy grazing of this type has affected the understory vegetation allowing an increase in Kentucky bluegrass and other introduced agronomic species on the drier areas. Even though introduced species have invaded, proper management will ensure that the riparian habitat is not over-utilized to allow for deep rooted plants and diversity.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** g meadow(subhygric/very rich)

**Ecosite Phase:** g1 shrubby meadow

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Tall Shrub (2 to 5m)</b>				Ecological Status Score: 15-20
BASKET WILLOW ( <i>Salix petiolaris</i> )	65.0	60.0-70.0	100	Moisture Regime: Hygric (moist) (2), Subhydric (moderately wet) (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Nutrient Regime: Permesotrophic (rich) (3)
SALIX SPECIES ( <i>Salix</i> )	3.2	0.5-6.0	100	Elevation (range): 1480 (1480-1480) M
NORTHERN GOOSEBERRY ( <i>Ribes oxycanthoides</i> )	3.0	3.0-3.0	100	Slope (%): 0 - 0.49 (2), 0.5 - 2.49 (1)
<b>Tall Forb (&gt;= 30 cm)</b>				Aspect: Level (2)
LARGE-LEAVED YELLOW AVENS ( <i>Geum macrophyllum</i> )	5.0	0.0-10.0	50	Topographic Position: Level (1)
VEINY MEADOW RUE ( <i>Thalictrum venulosum</i> )	5.0	0.0-10.0	50	
WESTERN DOCK ( <i>Rumex occidentalis</i> )	1.7	0.5-3.0	100	
<b>Low Forb (&lt; 30 cm)</b>				<b>Soil Variables</b>
ASTER SPECIES ( <i>Aster</i> )	5.0	0.0-10.0	50	Soil Drainage: Moderately well drained (1)
COMMON DANDELION ( <i>Taraxacum officinale</i> )	1.7	0.5-3.0	100	Soil Subgroup:
<b>Graminoid</b>				Surface Texture: Silt loam (1), Loam (1)
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	25.0	20.0-30.0	100	Effective Texture:
SEDGE SPECIES ( <i>Carex</i> )	5.4	1.0-10.0	100	Depth to Mottles/Gley:
REDTOP ( <i>Agrostis stolonifera</i> )	5.0	0.0-10.0	50	Organic Thickness: 0 - 5 cm (2)
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	5.0	0.0-10.0	50	Parent Material:
ALPINE FOXTAIL ( <i>Alopecurus occidentalis</i> )	5.0	0.0-10.0	50	Soil Type:
BLUEJOINT ( <i>Calamagrostis canadensis</i> )	5.0	0.0-10.0	50	Humus Form
TIMOTHY ( <i>Phleum pratense</i> )	5.0	0.0-10.0	50	
				<b>LFH Thickness</b>
				<b>Mean</b>
				<b>Min</b>
				<b>Max</b>
				<b>Count</b>
cm:	0.00	0.00	0.00	0

## g2 grassy meadow (n=42)

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** g meadow(subhygric/very rich)

### General Description

This phase represents meadows that are early successional to the shrub phase. Graminoid species include marsh reed grass, tufted hair grass and sedge species that occur on drier soil conditions in comparison to sedges that tend to grow on wetter ecosites. Although it will not dominate, rough and Idaho fescue can occur particularly on drier elevated pedestals. Due to rich/wet conditions yet still accessible for grazing, this phase is susceptible to invasion from agronomic and weed species.

### Environmental Variables

Moisture Regime: Mesic (fresh) (9), Subhygric (moderately moist) (6), Hygric (moist) (3)

Nutrient Regime: Mesotrophic (medium) (14), Permesotrophic (rich) (9)

Elevation (range): 1457 (1330-1598) M

Slope (%): level (8), nearly level (6), very gentle slope (5)

Aspect: Easterly (9), Level (4), Westerly (2), Northerly (2), Southerly (1)

Topographic Position: Level (8), Toe (6), Depression (3), Midslope (3), Lower Slope (2)

### Characteristic Species

#### Forb

- [ 3.1 ] MOUNTAIN CINQUEFOIL  
*Potentilla diversifolia*
- [ 2.8 ] GRACEFUL CINQUEFOIL  
*Potentilla gracilis*

#### Graminoid

- [ 27.8 ] TUFTED HAIR GRASS  
*Deschampsia cespitosa*
- [ 16.4 ] SEDGE SPECIES  
*Carex*
- [ 4.5 ] WIRE RUSH  
*Juncus balticus*
- [ 1.3 ] BLUEJOINT  
*Calamagrostis canadensis*

### Soil Variables

Soil Drainage: Well drained (14), Moderately well drained (4), Imperfectly drained (3), Very poorly drained (2), Poorly drained (1)

Soil Subgroup:

Surface Texture:

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (5)

Parent Material:

Soil Type:

Humus Form

### LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0



## Msb13 Tufted hair grass-Graceful sedge (n=3)

### (*Deschampsia cespitosa*-*Carex praegracilis*)

This community type is similar to the tufted hair grass-dominated communities described in the Upper Foothills and Subalpine subregions (Willoughby 2007, Willoughby & Alexander 2007), and may indicate the transition from the Montane to the Subalpine subregion in the southern ecosection. This community occurs on moist sites that are better drained and slightly drier than the pure sedge meadows, such that rough and Idaho fescues can occur as subdominant species. This community is considered quite productive, but is susceptible to soil pugging and hummocking and invasion of introduced species if grazed during vulnerable seasons. When protected from grazing and fire, willow and bog birch expand and productivity may decline.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** g meadow(subhygric/very rich)

**Ecosite Phase:** g2 grassy meadow

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Medium Shrub (0.5 to 2 m)</b>				Ecological Status Score: 27-40
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	6.4	0.0-19.3	33	Moisture Regime: Mesic (fresh) (2), Hygric (moist) (1)
<b>Tall Forb (&gt;= 30 cm)</b>				Nutrient Regime: Mesotrophic (medium) (2), Permesotrophic (rich) (2)
MOUNTAIN CINQUEFOIL ( <i>Potentilla diversifolia</i> )	6.3	0.0-19.0	33	Elevation (range): 1506 (1448-1598) M
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	2.8	0.0-5.9	67	Slope (%): 0 - 0.49 (2)
WESTERN MEADOW RUE ( <i>Thalictrum occidentale</i> )	2.6	0.0-7.8	33	Aspect:
YELLOW BEARDTONGUE ( <i>Penstemon confertus</i> )	1.2	0.0-3.7	33	Topographic Position: Level (2), Lower Slope (1), Depression (1)
<b>Low Forb (&lt; 30 cm)</b>				<b>Soil Variables</b>
THREE-FLOWERED AVENS ( <i>Geum triflorum</i> )	7.1	0.0-21.3	33	Soil Drainage: Well drained (1), Moderately well drained (1), Imperfectly drained (1), Very poorly drained (1)
COMMON YARROW ( <i>Achillea millefolium</i> )	4.5	3.2-6.5	100	Soil Subgroup:
<b>Graminoid</b>				Surface Texture:
TUFTED HAIR GRASS ( <i>Deschampsia cespitosa</i> )	43.6	24.1-82.0	100	Effective Texture:
WIRE RUSH ( <i>Juncus balticus</i> )	9.0	0.0-26.2	67	Depth to Mottles/Gley:
IDAHO FESCUE ( <i>Festuca idahoensis</i> )	8.4	0.0-25.3	33	Organic Thickness:
SEDGE SPECIES ( <i>Carex</i> )	7.2	0.0-10.0	33	Parent Material:
NORTHERN WHEAT GRASS ( <i>Agropyron dasystachyum</i> )	3.9	0.0-11.8	33	Soil Type:
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	2.7	0.0-8.1	33	Humus Form
				<b>LFH Thickness</b>
				<b>Mean</b>
				<b>Min</b>
				<b>Max</b>
				<b>Count</b>
cm:	0.00	0.00	0.00	0

## Msb13a Baltic rush (n=7)

### (*Juncus balticus*)

This community type is a grazing disclimax of the tufted hair grass or sedge dominated communities (Thompson and Hansen 2002). Baltic rush is generally unpalatable to livestock and will increase with an increase in grazing pressure. It is also likely that agronomic forage species such as Kentucky bluegrass and timothy will increase. Reducing pressure should allow increases in more palatable species such as tufted hair grass, rough fescue and drier sedges. Although mainly dominated by graminoids, shrubs may be present including willows, shrubby cinquefoil and bog birch (although not represented in these sampled plots), and may increase as disturbance decreases as well. Until it recovers, this community should be considered secondary range.

**Natural Subregion:** Montane  
**Ecosection:** Ms Montane South Ecosection

**Ecosite:** g meadow(subhygric/very rich)  
**Ecosite Phase:** g2 grassy meadow

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Medium Shrub (0.5 to 2 m)</b>				Ecological Status Score: 15
SALIX SPECIES ( <i>Salix</i> )	5.4	0.0-16.6	67	Moisture Regime: Hygric (moist) (2)
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	0.7	0.0-1.9	33	Nutrient Regime: Permesotrophic (rich) (2)
<b>Tall Forb (&gt;= 30 cm)</b>				Elevation (range): 1450 (1439-1460) M
GRACEFUL CINQUEFOIL ( <i>Potentilla gracilis</i> )	2.3	0.0-7.7	67	Slope (%): 0 - 0.49 (3), 0.5 - 2.49 (2)
CANADA GOLDENROD ( <i>Solidago canadensis</i> )	1.6	0.0-6.8	33	Aspect: Level (2), Northerly (2)
<b>Low Forb (&lt; 30 cm)</b>				Topographic Position: Level (1)
ASTER SPECIES ( <i>Aster</i> )	2.4	0.0-10.0	50	<b>Soil Variables</b>
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	1.1	0.0-3.8	43	Soil Drainage: Imperfectly drained (2), Poorly drained (1), Very poorly drained (1), Well drained (1)
<b>Graminoid</b>				Soil Subgroup:
SEDGE SPECIES ( <i>Carex</i> )	29.9	1.7-56.4	100	Surface Texture:
WIRE RUSH ( <i>Juncus balticus</i> )	16.9	0.5-34.0	100	Effective Texture:
TUFTED HAIR GRASS ( <i>Deschampsia cespitosa</i> )	6.2	0.0-16.0	86	Depth to Mottles/Gley:
BLUEJOINT ( <i>Calamagrostis canadensis</i> )	4.2	0.0-28.0	43	Organic Thickness: 0 - 5 cm (5)
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	3.0	0.0-13.3	57	Parent Material:
TIMOTHY ( <i>Phleum pratense</i> )	2.8	0.0-11.9	57	Soil Type:
MAT MUHLY ( <i>Muhlenbergia richardsonis</i> )	2.4	0.0-7.8	43	Humus Form
WHEAT GRASS SPECIES ( <i>Agropyron</i> )	1.3	0.0-3.2	67	
ALPINE FOXTAIL ( <i>Alopecurus occidentalis</i> )	1.1	0.0-3.5	43	
FOWL MANNA GRASS ( <i>Glyceria striata</i> )	1.1	0.0-4.3	29	
				<b>LFH Thickness</b>
				<b>Mean</b>
				<b>Min</b>
				<b>Max</b>
				<b>Count</b>
cm:	0.00	0.00	0.00	0

## Msb24 Foothills rough fescue-Tufted hair grass (n=1)

### (*Festuca campestris*-*Deschampsia cespitosa*)

Rough fescue-Tufted hair grass communities are also described in the Upper Foothills and Subalpine subregions (Willoughby 2007, Willoughby & Alexander 2007), and this community may indicate transition to these subregions. It is located slightly elevated above the Tufted hair grass-Baltic rush [Msb13] community type on drier soils. Similar to [Msb13], in the absence of fire and grazing this community type will become dominated by willow and bog birch. Heavy grazing pressure also decreases the cover of rough fescue and tufted hair grass and allows Kentucky bluegrass and dandelion to increase (Willoughby 1992). The dominant plant species on this community are highly palatable and the sites are easily accessible to livestock. Consequently, this community would be rated as primary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** g meadow(subhygric/very rich)

**Ecosite Phase:** g2 grassy meadow

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Medium Shrub (0.5 to 2 m)</b>				Ecological Status Score: 40
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	5.0	5.0-5.0	100	Moisture Regime: Mesic (fresh) (1)
<b>Tall Forb (&gt;= 30 cm)</b>				Nutrient Regime: Permesotrophic (rich) (2)
GRACEFUL CINQUEFOIL ( <i>Potentilla gracilis</i> )	5.7	5.7-5.7	100	Elevation (range): 1431 (1431-1431) M
VEINY MEADOW RUE ( <i>Thalictrum venulosum</i> )	3.8	3.8-3.8	100	Slope (%): 0 - 0.49 (1)
WILD VETCH ( <i>Vicia americana</i> )	2.6	2.6-2.6	100	Aspect:
<b>Low Forb (&lt; 30 cm)</b>				Topographic Position: Level (2)
THREE-FLOWERED AVENS ( <i>Geum triflorum</i> )	5.3	5.3-5.3	100	<b>Soil Variables</b>
COMMON YARROW ( <i>Achillea millefolium</i> )	3.5	3.5-3.5	100	Soil Drainage: Well drained (2)
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	3.5	3.5-3.5	100	Soil Subgroup:
<b>Graminoid</b>				Surface Texture:
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	23.0	23.0-23.0	100	Effective Texture:
PARRY OAT GRASS ( <i>Danthonia parryi</i> )	19.7	19.7-19.7	100	Depth to Mottles/Gley:
SILVERY-FLOWERED SEDGE ( <i>Carex aenea</i> )	14.8	14.8-14.8	100	Organic Thickness:
TUFTED HAIR GRASS ( <i>Deschampsia cespitosa</i> )	12.0	12.0-12.0	100	Parent Material:
SANDBERG BLUEGRASS ( <i>Poa sandbergii</i> )	7.0	7.0-7.0	100	Soil Type:
				Humus Form
				<b>LFH Thickness</b>
				<b>Mean</b>
				<b>Min</b>
				<b>Max</b>
				<b>Count</b>
				cm:
				0.00
				0.00
				0.00
				0

## Msc16 Kentucky bluegrass-Tufted hairgrass (n=7)

(*Poa pratensis-Deschampsia cespitosa*)

This community type represents a tufted hair grass dominated community [i.e., Msb13], that has been disturbed. Native plant species are still abundant, such as veiny meadow rue, slender wheatgrass, tufted hair grass and sedges, but there has been an increase in grazing resistant species like Kentucky bluegrass, dandelion and clover. If this community is protected from grazing it will probably revert back to tufted hair grass dominated, however, once Kentucky bluegrass is established, it appears to be a successful competitor. These Kentucky bluegrass dominated community types are productive, but they have lost two of the most functionally advantageous species (tufted hair grass and rough fescue). The forage quality of these native species are better, particularly in the drier dormant season, when access to these communities causes less soil damage.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** g meadow(subhygric/very rich)

**Ecosite Phase:** g2 grassy meadow

### Plant Composition

### Canopy Cover (%)

	Mean	Range	Const.
<b>Tall Forb (&gt;= 30 cm)</b>			
UNDIFFERENTIATED CLOVER ( <i>Trifolium</i> )	6.2	0.0-28.3	57
GRACEFUL CINQUEFOIL ( <i>Potentilla gracilis</i> )	3.0	0.0-7.0	57
<b>Low Forb (&lt; 30 cm)</b>			
COMMON DANDELION ( <i>Taraxacum officinale</i> )	7.6	1.2-13.7	100
COMMON YARROW ( <i>Achillea millefolium</i> )	7.4	0.0-27.6	86
WHITE CLOVER ( <i>Trifolium repens</i> )	5.6	0.0-35.3	29
FIELD MOUSE-EAR CHICKWEED ( <i>Cerastium arvense</i> )	1.6	0.0-6.2	71
<b>Graminoid</b>			
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	23.7	1.0-62.7	100
TUFTED HAIR GRASS ( <i>Deschampsia cespitosa</i> )	21.7	1.0-52.7	100
TIMOTHY ( <i>Phleum pratense</i> )	4.1	0.0-11.7	86
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	4.0	0.0-14.0	29

### Environmental Variables

Ecological Status Score: 15-20  
 Moisture Regime: Mesic (fresh) (6), Subhygric (moderately moist) (5)  
 Nutrient Regime: Mesotrophic (medium) (12), Permesotrophic (rich) (2)  
 Elevation (range): 1455 (1330-1565) M  
 Slope (%): 2.5 - 5.99 (5), 0 - 0.49 (2), 0.5 - 2.49 (1)  
 Aspect: Easterly (6), Westerly (2), Level (2), Southerly (1)  
 Topographic Position: Toe (6), Level (3), Midslope (3), Lower Slope (1), Depression (1)

### Soil Variables

Soil Drainage: Well drained (10), Moderately well drained (2)  
 Soil Subgroup:  
 Surface Texture:  
 Effective Texture:  
 Depth to Mottles/Gley:  
 Organic Thickness:  
 Parent Material:  
 Soil Type:  
 Humus Form

### LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

## Msc22 Kentucky bluegrass-Timothy-Rough fescue-Tufted hairgrass (n=9)

(*Poa pratensis-Phleum pratense-Festuca campestris-Deschampsia cespitosa*)

This community type develops when the Foothills rough fescue-Tufted hair grass plant community type (Msb24) is disturbed. There is still an abundance of native plant species such as veiny meadow rue, slender wheatgrass, tufted hair grass, and Foothills rough fescue but there has been an increase in grazing resistant introduced species such as Kentucky bluegrass, timothy, dandelion, and clover. Kentucky bluegrass and timothy once established, appears to be a successful competitor. These Kentucky bluegrass-timothy dominated community types are very productive, but they have lost two of the most functionally advantageous species (tufted hair grass and Foothills rough fescue). The forage quality of these native species is better, particularly in the dormant season. This community type was described at the Sandy McNabb rangeland reference area on both the grazed and ungrazed transects in the 1960s and 1970s. The inside ungrazed transect has been encroached by willow and bog birch to form the Msd17a community type and outside grazed transect has continued to be heavily grazed to form the Msc23 Kentucky bluegrass-Timothy dominated community type.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** g meadow(subhygric/very rich)

**Ecosite Phase:** g2 grassy meadow

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Tall Forb (&gt;= 30 cm)</b>				Ecological Status Score: 15-20
GRACEFUL CINQUEFOIL ( <i>Potentilla gracilis</i> )	2.9	0.0-9.2	78	Moisture Regime: Subhygric (moderately moist) (1)
VEINY MEADOW RUE ( <i>Thalictrum venulosum</i> )	1.1	0.0-3.4	56	Nutrient Regime: Permesotrophic (rich) (1)
<b>Low Forb (&lt; 30 cm)</b>				Elevation (range): 1450 (1450-1450) M
COMMON YARROW ( <i>Achillea millefolium</i> )	2.7	0.0-9.6	89	Slope (%): 0.5 - 2.49 (2)
WHITE CLOVER ( <i>Trifolium repens</i> )	2.3	0.0-18.1	56	Aspect: Easterly (2)
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	1.8	0.0-5.3	89	Topographic Position: Depression (1)
COMMON DANDELION ( <i>Taraxacum officinale</i> )	1.8	0.0-4.8	89	<b>Soil Variables</b>
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	1.4	0.0-3.4	78	Soil Drainage: Moderately well drained (1)
<b>Graminoid</b>				Soil Subgroup:
TIMOTHY ( <i>Phleum pratense</i> )	12.9	2.7-24.5	100	Surface Texture:
MEADOW SEDGE ( <i>Carex praticola</i> )	11.2	6.7-15.0	100	Effective Texture:
ROUGH FESCUE ( <i>Festuca scabrella</i> )	4.5	0.5-11.4	100	Depth to Mottles/Gley:
TUFTED HAIR GRASS ( <i>Deschampsia cespitosa</i> )	4.4	0.0-18.3	78	Organic Thickness:
PARRY OAT GRASS ( <i>Danthonia parryi</i> )	2.3	0.0-7.0	78	Parent Material:
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	2.1	0.0-6.7	78	Soil Type:
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	2.0	0.0-5.6	89	Humus Form
INTERMEDIATE OAT GRASS ( <i>Danthonia intermedia</i> )	1.4	0.0-5.1	44	<b>LFH Thickness</b>
JUNE GRASS ( <i>Koeleria macrantha</i> )	1.4	0.0-5.3	44	cm: Mean Min Max Count
				0.00 0.00 0.00 0

## Msc23 Kentucky bluegrass-Timothy/Clover (n=15)

(*Poa pratensis*-*Phleum pratense*/*Trifolium spp.*)

This community type develops when the Foothills rough fescue-Tufted hair grass plant community type (Msb24) is disturbed for prolonged periods of time. Willoughby (1992) felt these grasslands exhibited signs of historic heavy grazing pressure. Willoughby felt that under long-term moderate to heavy disturbance, Foothills rough fescue and tufted hair grass decline and sedge, slender wheatgrass, and low growing forbs increase. When these plant communities are protected from disturbance, they appear to begin to succeed back to the original communities dominated by Foothills rough fescue and tufted hair grass. However, when Kentucky bluegrass establishes, the community appears to stabilize only to Foothills rough fescue or tufted hair grass-Kentucky bluegrass dominated plant community types (Willoughby et al. 2020). These community types are highly productive for domestic livestock during the growing season but the poor quality of Kentucky bluegrass, particularly in the dormant season, limits wildlife use.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** g meadow(subhygric/very rich)

**Ecosite Phase:** g2 grassy meadow

### Plant Composition

### Canopy Cover (%)

### Environmental Variables

	Mean	Range	Const.	
<b>Medium Shrub (0.5 to 2 m)</b>				Ecological Status Score: 10-15
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	1.2	0.0-3.5	93	Moisture Regime:
<b>Tall Forb (&gt;= 30 cm)</b>				Nutrient Regime:
GRACEFUL CINQUEFOIL ( <i>Potentilla gracilis</i> )	8.5	0.4-18.0	100	Elevation (range): 1450 (1450-1450) M
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	2.2	0.0-14.4	47	Slope (%): 0.5 - 2.49 (1)
SMOOTH ASTER ( <i>Aster laevis</i> )	1.9	0.0-9.7	67	Aspect: Easterly (1)
WILD VETCH ( <i>Vicia americana</i> )	1.9	0.5-5.6	100	Topographic Position:
VEINY MEADOW RUE ( <i>Thalictrum venulosum</i> )	1.7	0.0-6.2	93	<b>Soil Variables</b>
HEART-LEAVED ALEXANDER ( <i>Zizia aptera</i> )	1.2	0.0-3.5	93	Soil Drainage:
<b>Low Forb (&lt; 30 cm)</b>				Soil Subgroup:
COMMON DANDELION ( <i>Taraxacum officinale</i> )	8.9	0.0-43.3	93	Surface Texture:
WHITE CLOVER ( <i>Trifolium repens</i> )	5.8	0.0-25.6	80	Effective Texture:
COMMON YARROW ( <i>Achillea millefolium</i> )	5.2	1.7-15.6	100	Depth to Mottles/Gley:
YELLOW FALSE DANDELION ( <i>Agoseris glauca</i> )	3.4	0.0-12.1	93	Organic Thickness:
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	2.7	0.0-14.6	93	Parent Material:
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	1.4	0.3-6.2	100	Soil Type:
<b>Graminoid</b>				Humus Form
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	31.8	2.4-58.5	100	<b>LFH Thickness</b>
TIMOTHY ( <i>Phleum pratense</i> )	16.1	2.0-40.5	100	Mean
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	5.2	1.5-16.9	100	Min
MEADOW SEDGE ( <i>Carex praticola</i> )	2.0	0.0-9.0	53	Max
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	1.4	0.0-5.9	80	Count
				cm:
				0.00
				0.00
				0.00
				0

# h horsetail(hygric/rich) (n=35)

Natural Subregion: Montane

Ecosection: Ms Montane South Ecosection

## General Description

The horsetail ecosite is wet and nutrient rich. These sites are commonly found on toe and lower slope positions with fluvial parent materials where flooding or seepage periodically replenishes the substrate nutrient availability. Wet gleysolic soils are common and organic matter tends to accumulate. Mottles were within 25cm of the soil surface in over 80% of the sites. Horsetails commonly form a blanket over the forest floor.



## Successional Relationships

Balsam poplar is a pioneer species on this ecosite. White spruce is the expected climax species; however, its establishment may be slow due to high vegetation competition and periodic flooding.

## Indicator Species

### Tree

WHITE SPRUCE  
*Picea glauca*  
BALSAM POPLAR  
*Populus balsamifera*

### Forb

COMMON HORSETAIL  
*Equisetum arvense*  
MEADOW HORSETAIL  
*Equisetum pratense*

### Moss and Liverwort

UNDIFFERENTIATED MOSS - ALL GENERA  
*Moss*

Site Index at 50 Years	Height (m)	Variation (m)	Count
WHITE SPRUCE <i>(Picea glauca)</i>	10.30	0.60	0
LOGEPOLE PINE <i>(Pinus contorta)</i>	11.50	0.20	0
BALSAM POPLAR <i>(Populus balsamifera)</i>	10.40	1.30	0

## Environmental Variables

Moisture Regime: Subhygric (moderately moist) (18), Hygric (moist) (10), Mesic (fresh) (2), Subhydric (moderately wet) (2), Submesic (moderately fresh) (2), Hydric (wet) (2)

Nutrient Regime: Permesotrophic (rich) (22), Mesotrophic (medium) (8), Eutrophic (very rich) (1), Submesotrophic (poor) (1)

Elevation (range): 1466 (1280-1614) M

Slope (%): level (15), moderate slope (6), nearly level (6), very gentle slope (6), gentle slope (3), strong slope (2)

Aspect: Level (18), Northerly (6), Southerly (6), Easterly (6), Westerly (1)

Topographic Position: Level (10), Midslope (5), Toe (5), Depression (5), Lower Slope (4)

## Soil Variables

Soil Drainage: Imperfectly drained (10), Moderately well drained (9), Poorly drained (5), Well drained (3), Rapidly drained (1), Very poorly drained (1)

Soil Subgroup: ORTHIC GLEYSOL (3), CUMULIC REGOSOL (3), CUMULIC HUMIC REGOSOL (2), REGO HUMIC GLEYSOL (2), ORTHIC GRAY LUVISOL (2), ORTHIC HUMIC GLEYSOL (1), ORTHIC MELANIC BRUNISOL (1), REGO GLEYSOL (1), GLEYED HUMIC REGOSOL (1)

Surface Texture: Loam (4), Organic (2), Silt loam (2), Silty Sand (2), Very Coarse Sand (1), Clay loam (1), Sandy clay loam (1), Sandy loam (1)

Effective Texture: Clay loam (2), Loam (2), Sand (1), Sandy clay loam (1), Silt loam (1), Silty clay (1)

Depth to Mottles/Gley: 0 - 25 (2)

Organic Thickness: 0 - 5 cm (21), 16 - 25 cm (1)

Parent Material: Fluvial (12), Morainal (3), Rock (3), Colluvial (1), Residual (1)

Soil Type: Moist/Silty-Loamy (3), Dry/Fine (1), Moist/Sandy (1)

Humus Form FIBRIMOR (4), HUMIC PEATYMOR (1)

LFH Thickness	Mean	Min	Max	Count
cm:	6.00	1.00	19.00	7

# h1 horsetail Sw-Pb (n=8)

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** h horsetail(hygric/rich)

## General Description

This phase could also be included in balsam poplar Pb [f1], however, the predominance of horsetail species on the forest floor moves to this ecosite and phase. If horsetail is not a significant part of the understory use [f1]. It would be expected that this phase succeed to one dominated by spruce if the forest is left undisturbed.

## Characteristic Species

### Tree

- [ 28.0 ] WHITE SPRUCE  
*Picea glauca*
- [ 17.0 ] BALSAM POPLAR  
*Populus balsamifera*

### Forb

- [ 30.0 ] MEADOW HORSETAIL  
*Equisetum pratense*
- [ 10.0 ] COMMON HORSETAIL  
*Equisetum arvense*

## Environmental Variables

Moisture Regime: Subhygric (moderately moist) (3), Submesic (moderately fresh) (2), Mesic (fresh) (2), Hygric (moist) (1)

Nutrient Regime: Permesotrophic (rich) (4), Mesotrophic (medium) (2), Submesotrophic (poor) (1), Eutrophic (very rich) (1)

Elevation (range): 1430 (1280-1525) M

Slope (%): nearly level (3), level (2), gentle slope (2), very gentle slope (1)

Aspect: Southerly (2), Easterly (2), Northerly (2), Level (2)

Topographic Position: Level (3), Midslope (2), Lower Slope (1), Toe (1)

## Soil Variables

Soil Drainage: Moderately well drained (4), Well drained (2), Poorly drained (1), Rapidly drained (1)

Soil Subgroup: CUMULIC REGOSOL (2), ORTHIC GRAY LUVISOL (1), REGO HUMIC GLEYSOL (1), ORTHIC MELANIC BRUNISOL (1)

Surface Texture: Loam (2), Silt loam (1), Sandy clay loam (1)

Effective Texture: Loam (2), Clay loam (1), Silt loam (1)

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (5)

Parent Material: Fluvial (2), Morainal (1)

Soil Type: Moist/Silty-Loamy (3), Dry/Fine (1)

Humus Form FIBRIMOR (3)

## LFH Thickness

	Mean	Min	Max	Count
cm:	7.00	1.00	19.00	4



## Msg19 Sw-Pb/Horsetail (n=8)

### (*Picea glauca*-*Populus balsamifera*/*Equisetum arvense*)

This community type is found on moist-rich Gleysolic soils, and is part of this ecosite due to a high cover of horsetails. These sites are characterized by high water tables and will likely succeed to white spruce. The shrub species diversity restricts livestock access, however horses have been noticed to selectively graze different species of horsetail during the summer and winter months when solid ground provides accessibility. This community type should be considered tertiary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** h horsetail(hygric/rich)

**Ecosite Phase:** h1 horsetail Sw-Pb

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Overstory Tree</b>					Ecological Status Score: 25
BALSAM POPLAR ( <i>Populus balsamifera</i> )	28.6	1.0-60.0	100		Moisture Regime: Subhygric (moderately moist) (3), Submesic (moderately fresh) (2), Mesic (fresh) (2), Hygric (moist) (1)
WHITE SPRUCE ( <i>Picea glauca</i> )	28.4	1.0-78.0	90		Nutrient Regime: Permesotrophic (rich) (4), Mesotrophic (medium) (2), Eutrophic (very rich) (1), Submesotrophic (poor) (1)
ASPEN ( <i>Populus tremuloides</i> )	5.6	0.0-15.0	50		Elevation (range): 1430 (1280-1525) M
LODGEPOLE PINE ( <i>Pinus contorta</i> )	1.2	0.0-8.0	25		Slope (%): 0.5 - 2.49 (3), 6 - 9.99 (2), 0 - 0.49 (2), 2.5 - 5.99 (1)
<b>Understory Tree</b>					Aspect: Level (2), Northerly (2), Easterly (2), Southerly (2)
WHITE SPRUCE ( <i>Picea glauca</i> )	5.4	0.0-6.0	25		Topographic Position: Level (3), Midslope (2), Toe (1), Lower Slope (1)
BALSAM POPLAR ( <i>Populus balsamifera</i> )	3.8	0.0-10.0	25		<b>Soil Variables</b>
<b>Tall Shrub (2 to 5m)</b>					Soil Drainage: Moderately well drained (4), Well drained (2), Poorly drained (1), Rapidly drained (1)
RIVER ALDER ( <i>Alnus tenuifolia</i> )	4.3	0.0-15.0	25		Soil Subgroup: CUMULIC REGOSOL (2), ORTHIC GRAY LUVISOL (1), REGO HUMIC GLEYSOL (1), ORTHIC MELANIC BRUNISOL (1)
<b>Medium Shrub (0.5 to 2 m)</b>					Surface Texture: Loam (2), Silt loam (1), Sandy clay loam (1)
RED-OSIER DOGWOOD ( <i>Cornus stolonifera</i> )	6.8	0.0-42.0	38		Effective Texture: Loam (2), Clay loam (1), Silt loam (1)
PRICKLY ROSE ( <i>Rosa acicularis</i> )	3.0	0.0-10.5	75		Depth to Mottles/Gley:
<b>Tall Forb (&gt;= 30 cm)</b>					Organic Thickness: 0 - 5 cm (5)
MEADOW HORSETAIL ( <i>Equisetum pratense</i> )	14.7	0.0-63.0	50		Parent Material: Fluvial (2), Morainal (1)
COMMON HORSETAIL ( <i>Equisetum arvense</i> )	9.9	0.0-40.7	63		Soil Type: Moist/Silty-Loamy (3), Dry/Fine (1)
COW PARSNIP ( <i>Heraclium lanatum</i> )	6.5	0.0-27.1	88		Humus Form FIBRIMOR (3)
<b>Low Forb (&lt; 30 cm)</b>					<b>LFH Thickness</b>
WESTERN CANADA VIOLET ( <i>Viola canadensis</i> )	5.0	1.0-25.0	100		Mean
<b>Graminoid</b>					Min
BLUEJOINT ( <i>Calamagrostis canadensis</i> )	7.7	0.0-20.0	63		Max
SEDGE SPECIES ( <i>Carex</i> )	5.0	0.0-20.0	25		Count
TUFTED HAIR GRASS ( <i>Deschampsia cespitosa</i> )	1.2	0.0-5.0	25		cm:
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	1.2	0.0-6.7	25		7.00
					1.00
					19.00
					4

## h2 horsetail Sw (n=23)

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** h horsetail(hygric/rich)

### General Description

This phase represents the wettest and most nutrient-rich coniferous forest phase in the Montane. It is the most successional advanced, with spruce dominating the overstory, and horsetails and mosses the primary forest floor cover.

### Environmental Variables

Moisture Regime: Subhygric (moderately moist) (14), Hygric (moist) (8), Hydric (wet) (2)

Nutrient Regime: Permesotrophic (rich) (15), Mesotrophic (medium) (6)

Elevation (range): 1507 (1340-1614) M

Slope (%): level (11), moderate slope (6), very gentle slope (4), nearly level (3), strong slope (2), gentle slope (1)

Aspect: Level (14), Northerly (4), Southerly (4), Easterly (3), Westerly (1)

Topographic Position: Level (7), Depression (4), Lower Slope (3), Toe (3), Midslope (3)

### Characteristic Species

#### Tree

[ 45.5 ] WHITE SPRUCE\*  
*Picea glauca*

[ 8.6 ] BALSAM POPLAR  
*Populus balsamifera*

#### Forb

[ 10.8 ] COMMON HORSETAIL\*  
*Equisetum arvense*

[ 2.2 ] MEADOW HORSETAIL  
*Equisetum pratense*

#### Moss and Liverwort

[ 10.0 ] UNDIFFERENTIATED MOSS - ALL GENERA  
*Moss*

### Soil Variables

Soil Drainage: Imperfectly drained (10), Moderately well drained (5), Poorly drained (3), Well drained (1)

Soil Subgroup: ORTHIC GLEYSOL (3), CUMULIC HUMIC REGOSOL (2), GLEYED HUMIC REGOSOL (1), CUMULIC REGOSOL (1), REGO GLEYSOL (1), ORTHIC GRAY LUVISOL (1), ORTHIC HUMIC GLEYSOL (1)

Surface Texture: Loam (2), Silt loam (1), Silty Sand (1), Very Coarse Sand (1), Sandy loam (1), Organic (1), Clay loam (1)

Effective Texture: Sandy clay loam (1), Sand (1), Clay loam (1), Silty clay (1)

Depth to Mottles/Gley: 0 - 25 (2)

Organic Thickness: 0 - 5 cm (13), 16 - 25 cm (1)

Parent Material: Fluvial (9), Morainal (2), Rock (2), Residual (1), Colluvial (1)

Soil Type: Moist/Sandy (1)

Humus Form FIBRIMOR (1), HUMIC PEATYMOR (1)

### LFH Thickness

	Mean	Min	Max	Count
cm:	5.00	2.00	8.00	3

## Mse12a Sw/Horsetail (n=20)

### (*Picea glauca*/*Equisetum arvense*)

This community type represents one of the wettest and most nutrient-rich forests in the Montane. Seepage and high water tables can be expected. Nutrient levels are high resulting in high diversity in shrub and forb layers. Generally, there is little palatable forage for domestic livestock and this community should be considered tertiary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** h horsetail(hygric/rich)

**Ecosite Phase:** h2 horsetail Sw

Plant Composition	Canopy Cover (%)			Const.	Environmental Variables
	Mean	Range			
<b>Overstory Tree</b>					Ecological Status Score: 25 Moisture Regime: Subhygric (moderately moist) (11), Hygric (moist) (8), Hydric (wet) (2) Nutrient Regime: Permesotrophic (rich) (12), Mesotrophic (medium) (6) Elevation (range): 1429 (1340-1518) M Slope (%): 0 - 0.49 (10), 10 - 15.99 (5), 2.5 - 5.99 (4), 0.5 - 2.49 (3), 16 - 30.99 (2), 6 - 9.99 (1) Aspect: Level (13), Northerly (4), Southerly (4), Easterly (2), Westerly (1) Topographic Position: Level (7), Lower Slope (3), Toe (3), Depression (3), Midslope (2)
WHITE SPRUCE ( <i>Picea glauca</i> )	31.6	0.0-90.0	80		
BALSAM POPLAR ( <i>Populus balsamifera</i> )	2.3	0.0-15.0	40		
<b>Understory Tree</b>					
WHITE SPRUCE ( <i>Picea glauca</i> )	11.7	0.0-60.0	70		
<b>Medium Shrub (0.5 to 2 m)</b>					
PRICKLY ROSE ( <i>Rosa acicularis</i> )	3.5	0.0-18.0	75		
SALIX SPECIES ( <i>Salix</i> )	2.6	0.0-22.8	20		
SNOWBERRY ( <i>Symphoricarpos albus</i> )	1.7	0.0-23.3	30		
LOW-BUSH CRANBERRY ( <i>Viburnum edule</i> )	1.4	0.0-20.0	15		
<b>Tall Forb (&gt;= 30 cm)</b>					
COMMON HORSETAIL ( <i>Equisetum arvense</i> )	21.6	0.0-90.0	90		
MEADOW HORSETAIL ( <i>Equisetum pratense</i> )	4.5	0.0-50.0	25		
<b>Low Forb (&lt; 30 cm)</b>					
BISHOP'S-CAP ( <i>Mitella nuda</i> )	1.8	0.0-10.9	55		
BUNCHBERRY ( <i>Cornus canadensis</i> )	1.6	0.0-10.0	50		
<b>Graminoid</b>					
HAIRY WILD RYE ( <i>Elymus innovatus</i> )	4.1	0.0-65.0	30		
BLUEJOINT ( <i>Calamagrostis canadensis</i> )	1.2	0.0-10.0	45		
<b>Moss</b>					
UNDIFFERENTIATED MOSS - ALL GENERA ( <i>Moss</i> )	11.5	0.0-80.0	30		
				<b>Soil Variables</b>	
				Soil Drainage: Imperfectly drained (9), Moderately well drained (5), Poorly drained (3)	
				Soil Subgroup: ORTHIC GLEYSOL (3), CUMULIC HUMIC REGOSOL (2), GLEYED HUMIC REGOSOL (1), CUMULIC REGOSOL (1), REGO GLEYSOL (1), ORTHIC GRAY LUVISOL (1), ORTHIC HUMIC GLEYSOL (1)	
				Surface Texture: Loam (2), Sandy loam (1), Silt loam (1), Very Coarse Sand (1), Organic (1), Clay loam (1)	
				Effective Texture: Clay loam (1), Sand (1), Sandy clay loam (1), Silty clay (1)	
				Depth to Mottles/Gley: 0 - 25 (2)	
				Organic Thickness: 0 - 5 cm (12), 16 - 25 cm (1)	
				Parent Material: Fluvial (9), Morainal (2), Rock (2), Residual (1), Colluvial (1)	
				Soil Type: Moist/Sandy (1)	
				Humus Form HUMIC PEATYMOR (1), FIBRIMOR (1)	
				<b>LFH Thickness</b>	
				<b>Mean</b> <b>Min</b> <b>Max</b> <b>Count</b>	
				cm:                    5.00    2.00    8.00    3	

## Mse12b Sw/Silverberry (n=1)

### (*Picea glauca*/*Elaeagnus commutata*)

This community type was described by Thompson and Hansen (2002) on an old floodplain bar that was 0.5 to 1.0 m above the current water table. The community represents succession to a Sw/Horsetail dominated type. As more sediment is deposited over the gravel it will favour the growth of horsetail over silverberry. Silverberry is common on gravelly river bars, but as the sediment increases and the drainage becomes poorer silverberry will decline in cover. There is little forage available for domestic livestock in this community type and it should be rated as non-use.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** h horsetail(hygric/rich)

**Ecosite Phase:** h2 horsetail Sw

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 25
WHITE SPRUCE ( <i>Picea glauca</i> )	40.0	40.0-40.0	100	Moisture Regime: Subhygric (moderately moist) (1)
BALSAM POPLAR ( <i>Populus balsamifera</i> )	10.0	10.0-10.0	100	Nutrient Regime: Permesotrophic (rich) (1)
<b>Understory Tree</b>				Elevation (range): 0 (0-0) M
WHITE SPRUCE ( <i>Picea glauca</i> )	5.0	5.0-5.0	100	Slope (%): 0 - 0.49 (1)
BALSAM POPLAR ( <i>Populus balsamifera</i> )	5.0	5.0-5.0	100	Aspect: Level (1)
<b>Tall Shrub (2 to 5m)</b>				Topographic Position:
SILVERBERRY ( <i>Elaeagnus commutata</i> )	20.0	20.0-20.0	100	<b>Soil Variables</b>
<b>Medium Shrub (0.5 to 2 m)</b>				Soil Drainage:
UNDIFFERENTIATED ROSE ( <i>Rosa</i> )	3.0	3.0-3.0	100	Soil Subgroup:
<b>Low Shrub (&lt; 0.5m)</b>				Surface Texture: Silty Sand (1)
YELLOW MOUNTAIN AVENS ( <i>Dryas drummondii</i> )	3.0	3.0-3.0	100	Effective Texture:
<b>Tall Forb (&gt;= 30 cm)</b>				Depth to Mottles/Gley:
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	3.0	3.0-3.0	100	Organic Thickness: 0 - 5 cm (1)
<b>Low Forb (&lt; 30 cm)</b>				Parent Material:
WHITE CLOVER ( <i>Trifolium repens</i> )	20.0	20.0-20.0	100	Soil Type:
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	10.0	10.0-10.0	100	Humus Form
REFLEXED LOCOWEED ( <i>Oxytropis deflexa</i> )	10.0	10.0-10.0	100	
COMMON YARROW ( <i>Achillea millefolium</i> )	3.0	3.0-3.0	100	
COMMON DANDELION ( <i>Taraxacum officinale</i> )	3.0	3.0-3.0	100	
<b>Graminoid</b>				
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	20.0	20.0-20.0	100	
REDTOP ( <i>Agrostis stolonifera</i> )	10.0	10.0-10.0	100	
TIMOTHY ( <i>Phleum pratense</i> )	10.0	10.0-10.0	100	
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	3.0	3.0-3.0	100	
				<b>LFH Thickness</b>
				Mean
				Min
				Max
				Count
				cm:
				0.00
				0.00
				0.00
				0

## Msh25 Horsetail-Fireweed (n=2)

### (*Equisetum arvense*-*Epilobium angustifolium*)

This community type represents a Sw/Horsetail [Mse12a] plant community type that was recently burned. The lack of tree cover and the moist and nutrient rich conditions support a flush of horsetail and fireweed. Typically this community is not harvested due to wet forest floor conditions, however, there may be small incidental patches that emerge after logging. This community occupies small isolated areas near meadows, seepage areas, along creeks and rivers. Although there is a productivity flush due to the removal of live trees, this community should be rated low for stocking due to the palatability of fireweed, accessibility and susceptibility to damage due to its wet conditions.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** h horsetail(hygric/rich)

**Ecosite Phase:** h2 horsetail Sw

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Medium Shrub (0.5 to 2 m)</b>				Ecological Status Score: 25
SNOWBERRY ( <i>Symphoricarpos albus</i> )	5.4	0.0-10.8	50	Moisture Regime: Subhygric (moderately moist) (2)
THIMBLEBERRY ( <i>Rubus parviflorus</i> )	2.6	0.0-5.3	50	Nutrient Regime: Permesotrophic (rich) (2)
<b>Tall Forb (&gt;= 30 cm)</b>				Elevation (range): 1586 (1559-1614) M
COMMON HORSETAIL ( <i>Equisetum arvense</i> )	22.5	10.4-34.6	100	Slope (%): 10 - 15.99 (1)
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	12.0	3.8-20.3	100	Aspect: Easterly (1)
WILD VETCH ( <i>Vicia americana</i> )	9.2	1.0-17.5	100	Topographic Position: Midslope (1), Depression (1)
SHOWY ASTER ( <i>Aster conspicuus</i> )	5.3	0.0-10.7	50	<b>Soil Variables</b>
SMOOTH ASTER ( <i>Aster laevis</i> )	5.0	0.0-10.1	50	Soil Drainage: Well drained (1), Imperfectly drained (1)
YELLOW AVENS ( <i>Geum aleppicum</i> )	3.5	0.0-7.1	50	Soil Subgroup:
<b>Low Forb (&lt; 30 cm)</b>				Surface Texture:
COMMON DANDELION ( <i>Taraxacum officinale</i> )	3.7	1.0-6.4	100	Effective Texture:
WILLOWHERB ( <i>Epilobium glaberrimum</i> )	3.6	2.3-4.9	100	Depth to Mottles/Gley:
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	1.1	1.0-1.3	100	Organic Thickness:
<b>Graminoid</b>				Parent Material:
BLUEJOINT ( <i>Calamagrostis canadensis</i> )	14.8	8.1-21.5	100	Soil Type:
SEDGE SPECIES ( <i>Carex</i> )	9.0	3.6-10.9	100	Humus Form
TUFTED HAIR GRASS ( <i>Deschampsia cespitosa</i> )	7.0	0.0-14.0	50	<b>LFH Thickness</b>
TIMOTHY ( <i>Phleum pratense</i> )	1.0	1.0-1.0	100	Mean
				Min
				Max
				Count
				cm:
				0.00
				0.00
				0.00
				0

### h3 horsetail shrubland (n=4)

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** h horsetail(hygric/rich)

#### General Description

The shrub phase of this ecosite is considered rare for this subregion and only occurs in riparian conditions. Willows that grow in wetter conditions usually compose the overstory, while horsetail and sedges dominate the understory. Left undisturbed, this community may increase in balsam poplar, but this pathway may be slow.

#### Characteristic Species

##### Shrub

- [ 28.7 ] FLAT-LEAVED WILLOW  
*Salix planifolia*
- [ 25.5 ] VELVET-FRUITED WILLOW  
*Salix maccalliana*

##### Forb

- [ 12.7 ] COMMON HORSETAIL  
*Equisetum arvense*
- [ 6.0 ] COMMON FIREWEED  
*Epilobium angustifolium*

##### Graminoid

- [ 17.5 ] SEDGE SPECIES  
*Carex*

#### Environmental Variables

Moisture Regime: Subhydryc (moderately wet) (2), Hygric (moist) (1), Subhygric (moderately moist) (1)

Nutrient Regime: Permesotrophic (rich) (3)

Elevation (range): 1421 (1421-1421) M

Slope (%): level (2), very gentle slope (1)

Aspect: Level (2), Easterly (1)

Topographic Position: Depression (1), Toe (1)

#### Soil Variables

Soil Drainage: Poorly drained (1), Very poorly drained (1)

Soil Subgroup: REGO HUMIC GLEYSOL (1)

Surface Texture: Silty Sand (1), Organic (1)

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (3)

Parent Material: Rock (1), Fluvial (1)

Soil Type:

Humus Form

#### LFH Thickness

	Mean	Min	Max	Count
cm:	0.00	0.00	0.00	0

## Msd7 Flat leaved willow/Horsetail/Sedge (n=4)

(*Salix planifolia*/*Equisetum arvense*/*Carex* spp.)

This is a highly unusual community type for the Montane, and is commonly associated with riparian areas. Corns and Achuff (1982) describe this community type on hygric, level to gently sloping fluvial landforms of various aspects. The soils are imperfectly to poorly drained and are subject to periodic flooding and sediment deposition. Tree cover is rare and willow cover is high. Common horsetail is the dominant understory species. Other species may also be found, such as dwarf shrubs and sedges. This community should be considered tertiary range and stocked low due to wet and periodic flooding conditions.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** h horsetail(hygric/rich)

**Ecosite Phase:** h3 horsetail shrubland

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Understory Tree</b>				Ecological Status Score: 40
BALSAM POPLAR ( <i>Populus balsamifera</i> )	2.5	0.0-5.0	50	Moisture Regime: Subhydryc (moderately wet) (2), Subhygric (moderately moist) (1), Hygric (moist) (1)
<b>Tall Shrub (2 to 5m)</b>				Nutrient Regime: Permesotrophic (rich) (3)
FLAT-LEAVED WILLOW ( <i>Salix planifolia</i> )	28.7	0.0-40.0	75	Elevation (range): 1421 (1421-1421) M
VELVET-FRUITED WILLOW ( <i>Salix maccalliana</i> )	25.5	0.0-40.0	50	Slope (%): 0 - 0.49 (2), 2.5 - 5.99 (1)
DWARF BIRCH ( <i>Betula pumila</i> )	1.7	0.0-7.0	25	Aspect: Level (2), Easterly (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Topographic Position: Toe (1), Depression (1)
NORTHERN GOOSEBERRY ( <i>Ribes oxycanthoides</i> )	3.2	0.0-10.0	50	<b>Soil Variables</b>
DWARF RASPBERRY ( <i>Rubus arcticus</i> )	1.3	0.0-5.0	50	Soil Drainage: Poorly drained (1), Very poorly drained (1)
<b>Tall Forb (&gt;= 30 cm)</b>				Soil Subgroup: REGO HUMIC GLEYSOL (1)
COMMON HORSETAIL ( <i>Equisetum arvense</i> )	12.7	1.0-30.0	100	Surface Texture: Silty Sand (1), Organic (1)
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	6.0	0.0-20.0	75	Effective Texture:
LARGE-LEAVED YELLOW AVENS ( <i>Geum macrophyllum</i> )	3.7	0.0-10.0	75	Depth to Mottles/Gley:
CANADA GOLDENROD ( <i>Solidago canadensis</i> )	2.5	0.0-10.0	25	Organic Thickness: 0 - 5 cm (3)
MARSH WILLOWHERB ( <i>Epilobium palustre</i> )	1.5	0.0-6.0	25	Parent Material: Fluvial (1), Rock (1)
<b>Graminoid</b>				Soil Type:
SEDGE SPECIES ( <i>Carex</i> )	17.5	0.0-20.0	50	Humus Form
WIRE RUSH ( <i>Juncus balticus</i> )	5.0	0.0-20.0	25	<b>LFH Thickness</b>
				<b>Mean</b>
				<b>Min</b>
				<b>Max</b>
				<b>Count</b>
				cm:
				0.00
				0.00
				0.00
				0

# ij fen(subhydric/rich) (n=84)

**Natural Subregion:** Montane

## General Description

The rich and poor fens are combined in this ecosite. The fen ecosite is generally characterized by flowing oxygenated water and alkaline, nutrient-rich conditions. This ecosite occupies level, depressional and lower slope positions where impeded drainage or high water tables enhance the accumulation of organic matter consisting of sedges, golden moss, tufted moss and brown moss. Black spruce, white spruce and/or tamarack dominate the sparse canopy on the treed phase. Dwarf birch or willow form the canopy of the shrubby phase and sedges dominate the graminoid phase of this ecosite.



## Successional Relationships

Black spruce or white spruce are the edaphic climax trees on this ecosite. On calcareous materials black spruce may be replaced by white spruce as the climax tree species. Species composition and direction of succession changes with changing hydrologic regime. As with other wetlands, fens have slow successional rates so recovery from disturbance may also be slow.

## Indicator Species

### Tree

WHITE SPRUCE

*Picea glauca*

BLACK SPRUCE

*Picea mariana*

### Shrub

SALIX SPECIES

*Salix*

BOG BIRCH

*Betula glandulosa*

DWARF BIRCH

*Betula pumila*

### Forb

PURPLE AVENS

*Geum rivale*

SWEET COLTSFOOT

*Petasites nivalis*

### Graminoid

SEDGE SPECIES

*Carex*

**Ecosection:** Ms Montane South Ecosection

## Environmental Variables

Moisture Regime: Subhydric (moderately wet) (32), Hydric (wet) (24), Hygric (moist) (16), Subhygric (moderately moist) (5)

Nutrient Regime: Permesotrophic (rich) (43), Mesotrophic (medium) (29), Submesotrophic (poor) (7), Eutrophic (very rich) (2)

Elevation (range): 1463 (940-1739) M

Slope (%): level (50), nearly level (8), very gentle slope (7), gentle slope (4)

Aspect: Level (42), Easterly (8), Southerly (6), Westerly (3), Northerly (2)

Topographic Position: Depression (45), Level (14), Lower Slope (3), Toe (3), Midslope (1)

## Soil Variables

Soil Drainage: Poorly drained (30), Very poorly drained (23), Imperfectly drained (13)

Soil Subgroup: REGO GLEYSOL (4), REGO HUMIC GLEYSOL (1), TERRIC FIBRISOL (1), TERRIC FIBRIC MESISOL (1), ORTHIC DARK GRAY CHERNOZEM (1)

Surface Texture: Organic (3), Silt (2), Silt loam (2), Silty clay (1), Sand (1), Loam (1)

Effective Texture: Silty clay (1)

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (17)

Parent Material: Fluvial (4), Fen (2), Lacustrine (1), Morainal (1), Undifferentiated Organic (1)

Soil Type: Moist/Silty-Loamy (1)

Humus Form



# ij1 treed fen (n=8)

**Natural Subregion:** Montane  
**Ecosection:** Ms Montane South Ecosection

**Ecosite:** ij fen(subhydric/rich)

## General Description

The treed fen phase in the Montane characteristic species is black spruce, and is characterized by wet ground at some time in the season that may persist throughout. There are also other shrubs that grow in these wet conditions, such as tolerant willows and birches. Due to the wet ground conditions, this ecosite is generally thought inaccessible for much of a normal season.

## Characteristic Species

### Tree

- [ 18.8 ] BLACK SPRUCE  
*Picea mariana*
- [ 7.2 ] WHITE SPRUCE  
*Picea glauca*

### Shrub

- [ 10.4 ] SALIX SPECIES  
*Salix*
- [ 9.3 ] BEAKED WILLOW  
*Salix bebbiana*
- [ 8.4 ] BOG BIRCH  
*Betula glandulosa*
- [ 3.6 ] DWARF BIRCH  
*Betula pumila*

### Forb

- [ 8.3 ] COMMON HORSETAIL  
*Equisetum arvense*
- [ 6.4 ] LARGE-LEAVED YELLOW AVENS  
*Geum macrophyllum*

### Graminoid

- [ 15.6 ] SEDGE SPECIES  
*Carex*

## Environmental Variables

Moisture Regime: Subhydric (moderately wet) (4), Hygric (moist) (2), Subhygric (moderately moist) (1)

Nutrient Regime: Permesotrophic (rich) (4), Mesotrophic (medium) (3), Submesotrophic (poor) (0)

Elevation (range): 1438 (1220-1532) M

Slope (%): level (4), very gentle slope (1), nearly level (1)

Aspect: Easterly (2), Level (2), Northerly (0)

Topographic Position: Depression (6), Midslope (1)

## Soil Variables

Soil Drainage: Imperfectly drained (3), Poorly drained (3), Very poorly drained (1)

Soil Subgroup:

Surface Texture:

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness:

Parent Material:

Soil Type:

Humus Form

## Msd12 Sb/Willow/Sedge (n=2)

(*Picea mariana*/*Salix spp.*/*Carex spp.*)

This community type represents a wet willow shrubland succeeding to black spruce. It is most similar to the Myrtle-leaved willow/Sedge [Msd8], but has the addition of black spruce. Myrtle-leaved willow is characteristic of mossy bogs, muskegs and moist conifer forests (Jaques and Corbin 1981).

Although a diversity of species can occur, the understory is characteristically dominated by wetter growing sedges. Productivity below the willow can be high, however, this should be considered tertiary range because forage access is limited as the ground is often flooded.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** ij fen(subhydric/rich)

**Ecosite Phase:** ij1 treed fen

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 25
BLACK SPRUCE ( <i>Picea mariana</i> )	7.5	5.0-10.0	100	Moisture Regime: Hygric (moist) (2), Subhydric (moderately wet) (1), Subhygric (moderately moist) (1)
WHITE SPRUCE ( <i>Picea glauca</i> )	5.0	0.0-10.0	50	Nutrient Regime: Permesotrophic (rich) (3), Mesotrophic (medium) (1)
<b>Understory Tree</b>				Elevation (range): 1468 (1427-1532) M
LODGEPOLE PINE ( <i>Pinus contorta</i> )	2.5	0.0-5.0	50	Slope (%): 0 - 0.49 (3)
<b>Tall Shrub (2 to 5m)</b>				Aspect: Level (2)
RIVER ALDER ( <i>Alnus tenuifolia</i> )	6.7	0.0-13.5	50	Topographic Position: Depression (3), Midslope (1)
<b>Medium Shrub (0.5 to 2 m)</b>				<b>Soil Variables</b>
SALIX SPECIES ( <i>Salix</i> )	25.3	9.3-33.3	100	Soil Drainage: Imperfectly drained (3), Poorly drained (1)
BOG BIRCH ( <i>Betula glandulosa</i> )	2.0	0.0-4.0	50	Soil Subgroup:
<b>Tall Forb (&gt;= 30 cm)</b>				Surface Texture:
COMMON HORSETAIL ( <i>Equisetum arvense</i> )	18.1	4.5-31.7	100	Effective Texture:
LARGE-LEAVED YELLOW AVENS ( <i>Geum macrophyllum</i> )	10.8	10.3-11.3	100	Depth to Mottles/Gley:
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	7.5	1.0-14.0	100	Organic Thickness:
NORTHERN VALERIAN ( <i>Valeriana dioica</i> )	4.5	0.0-9.0	50	Parent Material:
<b>Low Forb (&lt; 30 cm)</b>				Soil Type:
ARROW-LEAVED COLTSFOOT ( <i>Petasites sagittatus</i> )	4.9	3.6-6.3	100	Humus Form
<b>Graminoid</b>				
SMALL BOTTLE SEDGE ( <i>Carex utriculata</i> )	27.3	6.7-48.0	100	
BLUEJOINT ( <i>Calamagrostis canadensis</i> )	10.2	6.2-14.3	100	
WIRE RUSH ( <i>Juncus balticus</i> )	7.2	0.0-14.5	50	
FRINGED BROME ( <i>Bromus ciliatus</i> )	4.6	0.3-9.0	100	

## Mse17 Sb-Lt/Labrador tea (n=2)

### (*Picea mariana*-*Larix laricina*/*Ledum groenlandicum*)

This community type occurs in association with lowland wetland areas. Generally, black spruce-larch dominated communities are considered successional stable because of poor drainage, acidic soils and low soil nutrients which prevent succession to white spruce. Indeed, both black spruce and Labrador tea in the understory suggests a poor fen. This community type is likely flooded in the spring, therefore, it may provide a source of water for livestock early in the year. However, due to poor access and the limited number of palatable plants available, this community type would be considered tertiary use.

**Natural Subregion:** Montane  
**Ecosection:** Ms Montane South Ecosection

**Ecosite:** ij fen(subhydric/rich)  
**Ecosite Phase:** ij1 treed fen

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 25
BLACK SPRUCE ( <i>Picea mariana</i> )	40.0	20.0-60.0	100	Moisture Regime: Subhygric (moderately moist) (0)
WHITE SPRUCE ( <i>Picea glauca</i> )	10.0	0.0-20.0	50	Nutrient Regime: Submesotrophic (poor) (0)
TAMARACK ( <i>Larix laricina</i> )	5.0	0.0-10.0	50	Elevation (range): 1299 (1220-1379) M
<b>Tall Shrub (2 to 5m)</b>				Slope (%):
MYRTLE-LEAVED WILLOW ( <i>Salix myrtillifolia</i> )	7.0	4.0-10.0	100	Aspect:
<b>Medium Shrub (0.5 to 2 m)</b>				Topographic Position:
COMMON LABRADOR TEA ( <i>Ledum groenlandicum</i> )	7.0	4.0-10.0	100	<b>Soil Variables</b>
<b>Tall Forb (&gt;= 30 cm)</b>				Soil Drainage: Poorly drained (0)
COMMON HORSETAIL ( <i>Equisetum arvense</i> )	7.0	3.0-10.0	100	Soil Subgroup:
<b>Low Forb (&lt; 30 cm)</b>				Surface Texture:
DWARF SCOURING-RUSH ( <i>Equisetum scirpoides</i> )	4.0	4.0-4.0	100	Effective Texture:
NORTHERN BASTARD TOADFLAX ( <i>Geocaulon lividum</i> )	1.0	0.0-2.0	50	Depth to Mottles/Gley:
<b>Graminoid</b>				Organic Thickness:
SHEATHED SEDGE ( <i>Carex vaginata</i> )	20.0	15.0-24.0	100	Parent Material:
HAIR-LIKE SEDGE ( <i>Carex capillaris</i> )	3.0	0.0-5.0	50	Soil Type:
				Humus Form

## Mse23 Sb/Bog birch/Sedge (n=3)

(*Picea mariana*/*Betula glandulosa*/*Carex aquatilis*)

This community type is transitional to the Upper Foothills subregion and characterized by a dominant cover of black spruce, bog birch and Labrador tea. The sites are wet early in the season, but may dry later in the growing season. Corns and Annas (1986), found that these forests have a fire origin and can persist for more than 150 years. Although productivity may be high in some cases in the understory, this community type should be considered tertiary range due to accessibility.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** ij fen(subhydric/rich)

**Ecosite Phase:** ij1 treed fen

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 25
WHITE SPRUCE ( <i>Picea glauca</i> )	7.6	0.0-20.0	67	Moisture Regime: Subhydric (moderately wet) (3)
LOGEPOLE PINE ( <i>Pinus contorta</i> )	3.3	0.0-10.0	33	Nutrient Regime: Mesotrophic (medium) (2), Permesotrophic (rich) (1)
<b>Understory Tree</b>				Elevation (range): 1451 (1435-1465) M
BLACK SPRUCE ( <i>Picea mariana</i> )	15.4	3.3-20.0	100	Slope (%): 0 - 0.49 (1), 0.5 - 2.49 (1), 2.5 - 5.99 (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Aspect: Easterly (2)
BOG BIRCH ( <i>Betula glandulosa</i> )	24.8	10.8-32.5	100	Topographic Position: Depression (3)
BEAKED WILLOW ( <i>Salix bebbiana</i> )	11.3	6.0-21.0	100	<b>Soil Variables</b>
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	2.9	0.0-8.8	33	Soil Drainage: Poorly drained (2), Very poorly drained (1)
<b>Tall Forb (&gt;= 30 cm)</b>				Soil Subgroup:
LARGE-LEAVED YELLOW AVENS ( <i>Geum macrophyllum</i> )	8.4	0.0-23.8	67	Surface Texture:
STAR-FLOWERED SOLOMON'S-SEAL ( <i>Smilacina stellata</i> )	2.8	0.0-7.7	67	Effective Texture:
SMOOTH ASTER ( <i>Aster laevis</i> )	1.6	0.0-5.0	33	Depth to Mottles/Gley:
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	1.6	0.0-5.0	33	Organic Thickness:
<b>Graminoid</b>				Parent Material:
SEDGE SPECIES ( <i>Carex</i> )	18.2	0.0-31.7	33	Soil Type:
WIRE RUSH ( <i>Juncus balticus</i> )	6.6	0.0-15.5	67	Humus Form
TUFTED HAIR GRASS ( <i>Deschampsia cespitosa</i> )	4.2	0.0-11.1	67	
NORTHERN REED GRASS ( <i>Calamagrostis inexpansa</i> )	1.5	0.0-4.5	33	

## Msh27 Sedge cutblock (n=1)

### (*Carex utriculata*)

This community type represents pipeline right-of-way through a mixedwood forest. Compaction along the right-of-way has impeded drainage resulting in a perched water table that has created very wet conditions that favours the growth of beaked sedge and rush species. Similar sites occur in cutblocks when the compacted haul roads impede drainage. These sites are very productive for livestock and when they are the only clearings in forested areas they often become primary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** ij fen(subhydric/rich)

**Ecosite Phase:** ij1 treed fen

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Tall Forb (&gt;= 30 cm)</b>				Ecological Status Score: 15-20
SMOOTH ASTER ( <i>Aster laevis</i> )	2.0	0.0-0.0	100	Moisture Regime: Hygric (moist) (0), Subhydric (moderately wet) (0)
<b>Low Forb (&lt; 30 cm)</b>				Nutrient Regime: Permesotrophic (rich) (0)
LARGE-LEAVED YELLOW AVENS ( <i>Geum macrophyllum</i> )	7.0	0.0-0.0	100	Elevation (range): 1534 (0-0) M
BUNCHBERRY ( <i>Cornus canadensis</i> )	1.0	0.0-0.0	100	Slope (%): 0.5 - 2.49 (0)
COMMON HORSETAIL ( <i>Equisetum arvense</i> )	1.0	0.0-0.0	100	Aspect: Northerly (0)
COMMON PINK WINTERGREEN ( <i>Pyrola asarifolia</i> )	0.0	0.0-0.0	0	Topographic Position:
<b>Graminoid</b>				<b>Soil Variables</b>
REDTOP ( <i>Agrostis stolonifera</i> )	14.0	0.0-0.0	100	Soil Drainage: Imperfectly drained (0), Poorly drained (0)
SMALL BOTTLE SEDGE ( <i>Carex utriculata</i> )	7.0	0.0-0.0	100	Soil Subgroup:
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	6.0	0.0-0.0	100	Surface Texture:
NORTHERN REED GRASS ( <i>Calamagrostis inexpansa</i> )	5.0	0.0-0.0	100	Effective Texture:
COMMON GREAT BULRUSH ( <i>Scirpus validus</i> )	3.0	0.0-0.0	100	Depth to Mottles/Gley:
BLUEJOINT ( <i>Calamagrostis canadensis</i> )	1.0	0.0-0.0	100	Organic Thickness:
				Parent Material:
				Soil Type:
				Humus Form

## ij2 shrubby fen (n=53)

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecotope:** ij fen(subhydric/rich)

### General Description

Subhydric conditions often promote the slow advancement of deep rooted willows throughout Alberta, such as velvet-fruited, flat-leaved, smooth, myrtle-leaved and yellow willows. In the Montane, these can be intermixed with bog or dwarf birch, and sedges as the main graminoid species. These areas are commonly wet for significant portions of the year, but may dry periodically allowing wildlife and livestock access. Disturbing these areas commonly leads to the invasion of introduced agronomic species.

### Environmental Variables

Moisture Regime: Hydric (wet) (17), Subhydric (moderately wet) (14), Hygric (moist) (11), Subhygric (moderately moist) (4)

Nutrient Regime: Permesotrophic (rich) (25), Mesotrophic (medium) (14), Submesotrophic (poor) (7)

Elevation (range): 1465.75 (1300-1640) M

Slope (%): level (21), very gentle slope (6), nearly level (5), gentle slope (3)

Aspect: Level (18), Easterly (5), Southerly (4), Westerly (3), Northerly (2)

Topographic Position: Depression (27), Level (8), Lower Slope (3), Toe (3)

### Characteristic Species

#### Shrub

- [ 33.7 ] SALIX SPECIES  
*Salix*
- [ 8.3 ] BOG BIRCH  
*Betula glandulosa*
- [ 0.6 ] DWARF BIRCH  
*Betula pumila*

#### Forb

- [ 1.3 ] ARROW-LEAVED COLTSFOOT  
*Petasites sagittatus*
- [ 0.5 ] SWEET COLTSFOOT  
*Petasites nivalis*

#### Graminoid

- [ 19.1 ] SEDGE SPECIES  
*Carex*

### Soil Variables

Soil Drainage: Very poorly drained (17), Poorly drained (16), Imperfectly drained (7)

Soil Subgroup: REGO GLEYSOL (2), REGO HUMIC GLEYSOL (1), TERRIC FIBRIC MESISOL (1), ORTHIC DARK GRAY CHERNOZEM (1)

Surface Texture: Silty clay (1), Silt (1), Organic (1), Sand (1), Loam (1)

Effective Texture: Silty clay (1)

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (9)

Parent Material: Fluvial (2), Morainal (1), Lacustrine (1), Fen (1), Undifferentiated Organic (1)

Soil Type: Moist/Silty-Loamy (1)

Humus Form

## Msd10 Drummond's willow (n=1)

### (*Salix drummondiana*)

This community type was described next to the Oldman River on a recent river bar that is periodically flooded. Drummonds willow is well adapted to growing in a variety of soil conditions, but it prefers growing on well aerated soils. It is well adapted to growing at higher elevations and is often associated with the subalpine. Drummonds willow communities tend to be long-lived and are often maintained by frequent flooding. If the water table drops and the site dries out it will often undergo succession to a white spruce dominated forest. The dense nature of this community type often limits livestock movement. This community should be considered tertiary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** ij fen(subhydric/rich)

**Ecosite Phase:** ij2 shrubby fen

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Tall Shrub (2 to 5m)</b>				Ecological Status Score: 40
DRUMMOND'S WILLOW ( <i>Salix drummondiana</i> )	60.0	60.0-60.0	100	Moisture Regime: Hygric (moist) (1)
SILVERBERRY ( <i>Elaeagnus commutata</i> )	3.0	3.0-3.0	100	Nutrient Regime: Permesotrophic (rich) (1)
MYRTLE-LEAVED WILLOW ( <i>Salix myrtillifolia</i> )	3.0	3.0-3.0	100	Elevation (range): 0 (0-0) M
<b>Medium Shrub (0.5 to 2 m)</b>				Slope (%): 0 - 0.49 (1)
UNDIFFERENTIATED ROSE ( <i>Rosa</i> )	3.0	3.0-3.0	100	Aspect: Level (1)
WILLOW ( <i>Salix melanopsis</i> )	3.0	3.0-3.0	100	Topographic Position:
<b>Tall Forb (&gt;= 30 cm)</b>				<b>Soil Variables</b>
CANADA THISTLE ( <i>Cirsium arvense</i> )	10.0	10.0-10.0	100	Soil Drainage:
MACCALLA'S ASTER ( <i>Aster maccallae</i> )	3.0	3.0-3.0	100	Soil Subgroup:
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	3.0	3.0-3.0	100	Surface Texture: Sand (1)
<b>Graminoid</b>				Effective Texture:
AWNLESS BROME ( <i>Bromus inermis</i> )	20.0	20.0-20.0	100	Depth to Mottles/Gley:
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	10.0	10.0-10.0	100	Organic Thickness: 0 - 5 cm (1)
FOWL BLUEGRASS ( <i>Poa palustris</i> )	3.0	3.0-3.0	100	Parent Material:
				Soil Type:
				Humus Form

## Msd11 Willow/Sedge (n=9)

(*Salix spp./Carex spp.*)

This community type represents a wet willow shrubland. High cover of wet growing sedges such as water, small bottle, awned and beaked sedges indicate a calcium-rich environment (Beckingham, 1994; MacKinnon et al., 1992). As organic matter accumulates and the site becomes drier, willow and spruce will increase in cover. Often, numerous species of willow occur as a result of the open canopy and the wet moisture regime. Beaked willow does occur on this ecosite, along with other willows that tolerate wet ground conditions such as velvet-fruited, flat-leaved, smooth, myrtle-leaved and yellow willows. Although productive, this community would be considered inaccessible for domestic livestock during the growing season. However, willow communities are important to wild ungulates. For livestock use, this should be considered tertiary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** ij fen(subhydric/rich)

**Ecosite Phase:** ij2 shrubby fen

### Plant Composition

### Canopy Cover (%)

### Environmental Variables

	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 40
WHITE SPRUCE ( <i>Picea glauca</i> )	5.6	0.0-30.0	66	Moisture Regime: Hydric (wet) (5), Subhydric (moderately wet) (3), Hygic (moist) (2)
<b>Tall Shrub (2 to 5m)</b>				Nutrient Regime: Permesotrophic (rich) (5), Mesotrophic (medium) (3)
SALIX SPECIES ( <i>Salix</i> )	59.0	10.0-63.3	100	Elevation (range): 1492 (1300-1623) M
<b>Tall Forb (&gt;= 30 cm)</b>				Slope (%): 0 - 0.49 (3), 0.5 - 2.49 (3), 2.5 - 5.99 (1)
LARGE-LEAVED YELLOW AVENS ( <i>Geum macrophyllum</i> )	1.8	0.0-6.3	44	Aspect: Level (3), Southerly (2), Easterly (1)
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	1.6	0.0-13.7	22	Topographic Position: Depression (7), Level (1), Toe (1)
SMOOTH ASTER ( <i>Aster laevis</i> )	1.6	0.0-10.0	22	
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	1.2	0.0-9.0	56	<b>Soil Variables</b>
YELLOW AVENS ( <i>Geum aleppicum</i> )	1.1	0.0-6.8	22	Soil Drainage: Very poorly drained (6), Imperfectly drained (2), Poorly drained (1)
<b>Low Forb (&lt; 30 cm)</b>				Soil Subgroup:
HORSETAIL SPECIES ( <i>Equisetum</i> )	6.6	0.0-40.0	56	Surface Texture:
ARROW-LEAVED COLTSFOOT ( <i>Petasites sagittatus</i> )	2.4	0.0-8.9	33	Effective Texture:
SWEET COLTSFOOT ( <i>Petasites nivalis</i> )	1.6	0.0-8.7	22	Depth to Mottles/Gley:
<b>Graminoid</b>				Organic Thickness:
SEDGE SPECIES ( <i>Carex</i> )	21.5	10.0-35.3	100	Parent Material:
BLUEJOINT ( <i>Calamagrostis canadensis</i> )	5.4	0.0-24.3	44	Soil Type:
TUFTED HAIR GRASS ( <i>Deschampsia cespitosa</i> )	2.6	0.0-7.9	78	Humus Form
FOWL MANNA GRASS ( <i>Glyceria striata</i> )	1.4	0.0-7.9	22	



## Msd18 Willow-Bog birch/Sedge (n=20)

(*Salix spp.*-*Betula glandulosa*/*Carex spp.*)

This community type is similar to the Willow-Bog birch/Sedge community type of Lane et al (2000), as well as the Willow-Bog birch/Tufted hair grass-Foothills rough fescue [Msd17] community in this guide, although wetter. Sedge dominated sites are generally slightly wetter than those dominated by tufted hair grass, however graceful sedge can occur on drier soil conditions compared to water, awned, beaked and small bottle sedges that occur on wet ecosites. This community type can have a thick cover of bog birch and willow as well as wet soil conditions which may restrict access to forage. This community should be considered tertiary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** ij fen(subhydric/rich)

**Ecosite Phase:** ij2 shrubby fen

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 40 Moisture Regime: Hydric (wet) (11), Subhydric (moderately wet) (8), Hygic (moist) (6), Subhygic (moderately moist) (2) Nutrient Regime: Mesotrophic (medium) (11), Permesotrophic (rich) (10), Submesotrophic (poor) (7) Elevation (range): 1469 (1367-1640) M Slope (%): 0 - 0.49 (14), 2.5 - 5.99 (2), 0.5 - 2.49 (1) Aspect: Level (12), Easterly (2), Southerly (1), Westerly (1) Topographic Position: Depression (18), Level (6), Lower Slope (2), Toe (1)
WHITE SPRUCE ( <i>Picea glauca</i> )	2.0	0.0-15.0	40	
<b>Tall Shrub (2 to 5m)</b>				
SALIX SPECIES ( <i>Salix</i> )	27.1	10.0-86.0	100	
<b>Medium Shrub (0.5 to 2 m)</b>				
BOG BIRCH ( <i>Betula glandulosa</i> )	17.8	3.5-37.3	100	
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	0.7	0.0-5.3	55	
<b>Tall Forb (&gt;= 30 cm)</b>				
SMOOTH ASTER ( <i>Aster laevis</i> )	1.5	0.0-16.0	10	
<b>Low Forb (&lt; 30 cm)</b>				
ARROW-LEAVED COLTSFOOT ( <i>Petasites sagittatus</i> )	1.5	0.0-18.7	35	
<b>Graminoid</b>				
SEDGE SPECIES ( <i>Carex</i> )	19.6	5.0-49.7	100	
WIRE RUSH ( <i>Juncus balticus</i> )	3.5	0.0-25.1	70	
TUFTED HAIR GRASS ( <i>Deschampsia cespitosa</i> )	1.5	0.0-9.3	50	
BLUEJOINT ( <i>Calamagrostis canadensis</i> )	1.4	0.0-22.7	25	
MELIC GRASS ( <i>Melica smithii</i> )	1.0	0.0-11.0	10	
				<b>Soil Variables</b> Soil Drainage: Poorly drained (12), Very poorly drained (8), Imperfectly drained (4) Soil Subgroup: ORTHIC DARK GRAY CHERNOZEM (1) Surface Texture: Silty clay (1), Loam (1) Effective Texture: Silty clay (1) Depth to Mottles/Gley: Organic Thickness: 0 - 5 cm (2) Parent Material: Fluvial (1), Morainal (1) Soil Type: Moist/Silty-Loamy (1) Humus Form

## Msd8 Myrtle leaved willow/Sedge (n=9)

### (*Salix myrtillifolia*/*Carex rostrata*)

This community represents a willow/sedge association that occurs on slightly drier soils than other shrublands in this ecosite phase. Myrtle-leaved willow occurs with numerous species of willow as well as bog birch, and typically with sedges in the undergrowth. These may be considered edaphic climax community since the area is frequently flooded which prevents establishment of trees although it may be found in association with black spruce and black spruce-larch community types. This community type itself would be considered to have limited use for livestock due to the poor access and wet substrate, however, there are often more open communities nearby that are slightly drier and preferred due to their valley bottom locations. This community should be considered tertiary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** ij fen(subhydric/rich)

**Ecosite Phase:** ij2 shrubby fen

#### Plant Composition

#### Canopy Cover (%)

#### Environmental Variables

	Mean	Range	Const.	
<b>Tall Shrub (2 to 5m)</b>				Ecological Status Score: 40
SALIX SPECIES ( <i>Salix</i> )	15.2	5.0-40.0	100	Moisture Regime: Subhydric (moderately wet) (3), Hygric (moist) (2), Subhygric (moderately moist) (1), Hydric (wet) (1)
DWARF BIRCH ( <i>Betula pumila</i> )	1.9	0.0-14.0	22	Nutrient Regime: Permesotrophic (rich) (8)
<b>Medium Shrub (0.5 to 2 m)</b>				Elevation (range): 1422 (1368-1440) M
MYRTLE-LEAVED WILLOW ( <i>Salix myrtillifolia</i> )	25.9	10.0-50.0	100	Slope (%): 2.5 - 5.99 (3), 6 - 9.99 (2), 0 - 0.49 (2), 0.5 - 2.49 (1)
BOG BIRCH ( <i>Betula glandulosa</i> )	7.2	0.0-23.3	56	Aspect: Westerly (2), Northerly (2), Level (1), Easterly (1), Southerly (1)
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	1.6	0.0-11.0	56	Topographic Position: Depression (2), Level (1), Lower Slope (1), Toe (1)
<b>Tall Forb (&gt;= 30 cm)</b>				<b>Soil Variables</b>
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	1.8	0.0-10.5	67	Soil Drainage: Poorly drained (3), Very poorly drained (3), Imperfectly drained (1)
YELLOW AVENS ( <i>Geum aleppicum</i> )	1.5	0.0-10.0	33	Soil Subgroup: REGO GLEYSOL (2), REGO HUMIC GLEYSOL (1)
PURPLE AVENS ( <i>Geum rivale</i> )	1.2	0.0-5.0	44	Surface Texture: Silt (1)
<b>Low Forb (&lt; 30 cm)</b>				Effective Texture:
HORSETAIL SPECIES ( <i>Equisetum</i> )	2.2	0.0-10.0	55	Depth to Mottles/Gley:
<b>Graminoid</b>				Organic Thickness: 0 - 5 cm (4)
SEDGE SPECIES ( <i>Carex</i> )	16.3	7.9-39.0	100	Parent Material: Fluvial (1), Lacustrine (1), Undifferentiated Organic (1)
WIRE RUSH ( <i>Juncus balticus</i> )	8.9	0.0-21.0	89	Soil Type:
TUFTED HAIR GRASS ( <i>Deschampsia cespitosa</i> )	1.6	0.0-9.0	22	Humus Form
BLUEJOINT ( <i>Calamagrostis canadensis</i> )	1.2	0.0-10.0	33	

## Msd8a Myrtle leaved willow/Kentucky bluegrass (n=13)

### (*Salix myrtillifolia*/*Poa pratensis*)

This community represents a Myrtle-leaved willow/Sedge [Msd8] community type that has been disturbed. These communities may dry out enough to be accessible by livestock at some times of the year, and would be preferred sites due to their landscape location. The rich nature of the soils promotes introduced species such as Kentucky bluegrass with any type of soil disturbance. With grazing, typically the disturbance occurs near the upper edges of these communities that dry out first. This community should be considered tertiary range, and care should be used to minimize damage.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** ij fen(subhydric/rich)

**Ecosite Phase:** ij2 shrubby fen

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Tall Shrub (2 to 5m)</b>				Ecological Status Score: 40
MYRTLE-LEAVED WILLOW ( <i>Salix myrtillifolia</i> )	21.6	16.3-33.7	100	Moisture Regime: Subhygric (moderately moist) (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Nutrient Regime: Permesotrophic (rich) (1)
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	7.1	0.0-19.0	92	Elevation (range): 0 (0-0) M
<b>Tall Forb (&gt;= 30 cm)</b>				Slope (%): 0 - 0.49 (1)
GRACEFUL CINQUEFOIL ( <i>Potentilla gracilis</i> )	7.8	0.0-17.0	92	Aspect: Level (1)
VEINY MEADOW RUE ( <i>Thalictrum venulosum</i> )	7.5	0.0-19.3	92	Topographic Position:
BLUE CAMAS ( <i>Camassia quamash</i> )	4.3	0.0-9.5	77	<b>Soil Variables</b>
SMOOTH ASTER ( <i>Aster laevis</i> )	1.2	0.0-4.8	69	Soil Drainage:
<b>Low Forb (&lt; 30 cm)</b>				Soil Subgroup:
SLENDER BLUE BEARDTONGUE ( <i>Penstemon procerus</i> )	5.2	0.0-20.5	92	Surface Texture: Organic (1)
COMMON YARROW ( <i>Achillea millefolium</i> )	3.9	0.0-10.7	92	Effective Texture:
NORTHERN BEDSTRAW ( <i>Galium boreale</i> )	2.9	0.5-5.7	100	Depth to Mottles/Gley:
COMMON DANDELION ( <i>Taraxacum officinale</i> )	2.2	0.0-7.1	92	Organic Thickness: 0 - 5 cm (1)
WILD STRAWBERRY ( <i>Fragaria virginiana</i> )	2.1	0.0-5.2	92	Parent Material:
<b>Graminoid</b>				Soil Type:
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	20.0	10.0-37.3	100	Humus Form
SEDGE SPECIES ( <i>Carex</i> )	9.9	5.4-12.7	100	
TIMOTHY ( <i>Phleum pratense</i> )	6.5	1.5-17.5	100	
WIRE RUSH ( <i>Juncus balticus</i> )	3.7	0.0-30.0	85	
TUFTED HAIR GRASS ( <i>Deschampsia cespitosa</i> )	3.1	0.0-10.7	69	
IDAHO FESCUE ( <i>Festuca idahoensis</i> )	1.5	0.0-10.3	62	
SLENDER WHEAT GRASS ( <i>Agropyron trachycaulum</i> )	1.3	0.0-3.3	85	

## ij3 graminoid fen (n=23)

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** ij fen(subhydric/rich)

### General Description

Sedges predominate subhydric and hydric moisture regimes in the Montane. Some areas close to other subregions may have significant amounts of marsh reed grass. Willows may occur, however are not predominant in this phase. This phase may stay stable for a long period of time due to soil and climate conditions. Although these grassy meadows are very productive, access is limited as well as they are very susceptible to disturbance. Disturbed soils will often lead to the establishment of introduced species.

### Environmental Variables

Moisture Regime: Subhydric (moderately wet) (14), Hydric (wet) (7), Hygric (moist) (3)

Nutrient Regime: Permesotrophic (rich) (14), Mesotrophic (medium) (12), Eutrophic (very rich) (2)

Elevation (range): 1481.8 (940-1739) M

Slope (%): level (25), nearly level (2), gentle slope (1)

Aspect: Level (22), Southerly (2), Easterly (1)

Topographic Position: Depression (12), Level (6)

### Characteristic Species

#### Forb

- [ 2.3 ] ARROW-LEAVED COLTSFOOT  
*Petasites sagittatus*
- [ 0.5 ] PURPLE AVENS  
*Geum rivale*

#### Graminoid

- [ 24.4 ] BLUEJOINT  
*Calamagrostis canadensis*
- [ 16.0 ] SMALL BOTTLE SEDGE  
*Carex utriculata*
- [ 10.5 ] WATER SEDGE  
*Carex aquatilis*
- [ 6.1 ] AWNED SEDGE  
*Carex atherodes*
- [ 1.1 ] WIRE RUSH  
*Juncus balticus*
- [ 0.6 ] COMMON TALL MANNA GRASS  
*Glyceria grandis*

### Soil Variables

Soil Drainage: Poorly drained (11), Very poorly drained (5), Imperfectly drained (3)

Soil Subgroup: REGO GLEYSOL (2), TERRIC FIBRISOL (1)

Surface Texture: Organic (2), Silt loam (2), Silt (1)

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (8)

Parent Material: Fluvial (2), Fen (1)

Soil Type:

Humus Form

## Msb12 Water-Small bottle sedge (n=16)

### (*Carex aquatilis*-*Carex utriculata*)

This community type is found in most subregions of Alberta. Wet conditions and periodic flooding result in the formation of wet sedge meadows composed of pure or mixed species such as awned, small bottle and water sedges. Bog birch and willow will invade into the drier edges of these meadows to form the Willow/Sedge and Willow/Bog birch/Sedge [Msd18, Msd11] community types. This community type is quite productive producing roughly 2000 kg/ha of forage, but the high water table in the spring and summer when these meadows are most palatable limits livestock use. A study in the Yukon found that crude protein on these meadows declined from a high of 10% in May to less than 5% in September (Bailey et al. 1992). As a result, these meadows would be rated as secondary or tertiary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** ij fen(subhydric/rich)

**Ecosite Phase:** ij3 graminoid fen

#### Plant Composition

#### Canopy Cover (%)

#### Environmental Variables

	Mean	Range	Const.	
<b>Medium Shrub (0.5 to 2 m)</b>				Ecological Status Score: 40
SHRUBBY CINQUEFOIL ( <i>Potentilla fruticosa</i> )	1.2	0.0-20.0	13	Moisture Regime: Subhydric (moderately wet) (13), Hydric (wet) (7)
<b>Tall Forb (&gt;= 30 cm)</b>				Nutrient Regime: Permesotrophic (rich) (12), Mesotrophic (medium) (8), Eutrophic (very rich) (2)
SWAMP HORSETAIL ( <i>Equisetum fluviatile</i> )	1.5	0.0-11.5	25	Elevation (range): 1445 (940-1600) M
PURPLE AVENS ( <i>Geum rivale</i> )	1.0	0.0-16.0	13	Slope (%): 0 - 0.49 (20), 0.5 - 2.49 (2), 6 - 9.99 (1)
<b>Low Forb (&lt; 30 cm)</b>				Aspect: Level (19), Easterly (1), Southerly (1)
BUCK-BEAN ( <i>Menyanthes trifoliata</i> )	2.1	0.0-34.0	6	Topographic Position: Depression (8), Level (4)
<b>Graminoid</b>				<b>Soil Variables</b>
SMALL BOTTLE SEDGE ( <i>Carex utriculata</i> )	32.1	0.0-97.5	56	Soil Drainage: Poorly drained (9), Very poorly drained (4)
WATER SEDGE ( <i>Carex aquatilis</i> )	21.1	0.0-70.7	63	Soil Subgroup: REGO GLEYSOL (2), TERRIC FIBRISOL (1)
AWNED SEDGE ( <i>Carex atherodes</i> )	12.3	0.0-97.5	19	Surface Texture: Organic (2), Silt loam (2), Silt (1)
BLUEJOINT ( <i>Calamagrostis canadensis</i> )	5.6	0.0-56.7	50	Effective Texture:
WIRE RUSH ( <i>Juncus balticus</i> )	2.3	0.0-21.9	25	Depth to Mottles/Gley:
TUFTED HAIR GRASS ( <i>Deschampsia cespitosa</i> )	1.8	0.0-21.3	19	Organic Thickness: 0 - 5 cm (8)
				Parent Material: Fluvial (2), Fen (1)
				Soil Type:
				Humus Form

## Msb22 Bog muhly (n=1)

### (*Muhlenbergia glomerata*)

This community type was described in the area west of Bragg Creek. Bog muhly is a moisture loving grass that can be found in bogs, peaty meadows and the shorelines of small sloughs. It often grows with beaked and water sedge and these sites often resemble sedge meadows. These sites are often inaccessible to livestock because of the moist ground conditions. Consequently they should be rated as non-use.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** ij fen(subhydric/rich)

**Ecosite Phase:** ij3 graminoid fen

#### Plant Composition

#### Canopy Cover (%)

#### Environmental Variables

	Canopy Cover (%)			
	Mean	Range	Const.	
<b>Low Forb (&lt; 30 cm)</b>				Ecological Status Score: 40
WESTERN WILLOW ASTER ( <i>Aster hesperius</i> )	1.0	1.0-1.0	100	Moisture Regime: Hydric (wet) (0)
WESTERN DOCK ( <i>Rumex occidentalis</i> )	1.0	1.0-1.0	100	Nutrient Regime: Permesotrophic (rich) (0)
<b>Graminoid</b>				Elevation (range): 1457 (0-0) M
BOG MUHLY ( <i>Muhlenbergia glomerata</i> )	43.0	43.0-43.0	100	Slope (%):
SMALL BOTTLE SEDGE ( <i>Carex utriculata</i> )	33.0	33.0-33.0	100	Aspect:
BLUEJOINT ( <i>Calamagrostis canadensis</i> )	16.0	16.0-16.0	100	Topographic Position:
WATER SEDGE ( <i>Carex aquatilis</i> )	1.0	1.0-1.0	100	<b>Soil Variables</b>
				Soil Drainage: Imperfectly drained (0)
				Soil Subgroup:
				Surface Texture:
				Effective Texture:
				Depth to Mottles/Gley:
				Organic Thickness:
				Parent Material:
				Soil Type:
				Humus Form

## Msb23 Mud sedge (n=1)

### (*Carex limosa*)

This community type was described on a floating bog. In Europe this species is often associated with peatlands and quaking bogs. The dominance of mud sedge in this community type could indicate the acidic nature of this site. The wet soil conditions, instability of the substrate makes this community type unsuitable for use by livestock. This community type should be rated as non-use.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** ij fen(subhydric/rich)

**Ecosite Phase:** ij3 graminoid fen

#### Plant Composition

#### Canopy Cover (%)

#### Environmental Variables

	Mean	Range	Const.	
<b>Medium Shrub (0.5 to 2 m)</b>				Ecological Status Score: 40
BEAKED WILLOW ( <i>Salix bebbiana</i> )	7.0	0.0-0.0	100	Moisture Regime: Hydric (wet) (0)
BOG BIRCH ( <i>Betula glandulosa</i> )	1.0	0.0-0.0	100	Nutrient Regime: Permesotrophic (rich) (0)
<b>Low Forb (&lt; 30 cm)</b>				Elevation (range): 1452 (0-0) M
BUCK-BEAN ( <i>Menyanthes trifoliata</i> )	6.0	0.0-0.0	100	Slope (%):
MARSH CINQUEFOIL ( <i>Potentilla palustris</i> )	4.0	0.0-0.0	100	Aspect:
<b>Graminoid</b>				Topographic Position:
MUD SEDGE ( <i>Carex limosa</i> )	47.0	0.0-0.0	100	<b>Soil Variables</b>
LONG-BRACTED SEDGE ( <i>Carex athrostachya</i> )	11.0	0.0-0.0	100	Soil Drainage: Imperfectly drained (0)
WATER SEDGE ( <i>Carex aquatilis</i> )	3.0	0.0-0.0	100	Soil Subgroup:
				Surface Texture:
				Effective Texture:
				Depth to Mottles/Gley:
				Organic Thickness:
				Parent Material:
				Soil Type:
				Humus Form

## Msb25 Marsh reed grass (Bluejoint) (n=4)

### (*Calamagrostis canadensis*)

Marsh reed grass dominated community types are not common in the Montane and this community type likely represents the transition to the Lower Foothills or Subalpine subregions. This community type occurs on very moist, depressional areas. It will occur on the fringes around marshes or sedge meadows and in the center of willow rings on upland sites. Unlike sedge meadows, these areas are only flooded in the spring and early summer; which allows marsh reed grass to dominate instead of sedges. This community type is productive and livestock usage may occur during the latter part of summer when the area dries out and access improves. Livestock use of this community type will not be extensive and it should be considered tertiary range.

**Natural Subregion:** Montane  
**Ecosection:** Ms Montane South Ecosection

**Ecosite:** ij fen(subhydric/rich)  
**Ecosite Phase:** ij3 graminoid fen

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Overstory Tree</b>				Ecological Status Score: 40
WHITE SPRUCE ( <i>Picea glauca</i> )	1.2	0.0-5.0	25	Moisture Regime: Hygric (moist) (3), Subhydric (moderately wet) (1)
<b>Medium Shrub (0.5 to 2 m)</b>				Nutrient Regime: Mesotrophic (medium) (4), Permesotrophic (rich) (2)
BEAKED WILLOW ( <i>Salix bebbiana</i> )	1.8	0.0-7.3	25	Elevation (range): 1508 (1381-1739) M
<b>Low Shrub (&lt; 0.5m)</b>				Slope (%): 0 - 0.49 (4)
DEWBERRY ( <i>Rubus pubescens</i> )	2.1	0.0-5.8	50	Aspect: Level (2), Southerly (1)
<b>Tall Forb (&gt;= 30 cm)</b>				Topographic Position: Depression (3), Level (2)
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	6.8	0.0-17.0	75	<b>Soil Variables</b>
LARGE-LEAVED YELLOW AVENS ( <i>Geum macrophyllum</i> )	5.6	0.0-14.3	75	Soil Drainage: Imperfectly drained (3), Poorly drained (2), Very poorly drained (1)
COW PARSNIP ( <i>Heracleum lanatum</i> )	3.1	0.0-8.3	50	Soil Subgroup:
<b>Low Forb (&lt; 30 cm)</b>				Surface Texture:
BOG VIOLET ( <i>Viola nephrophylla</i> )	6.1	0.0-24.7	25	Effective Texture:
ARROW-LEAVED COLTSFOOT ( <i>Petasites sagittatus</i> )	4.7	0.0-10.0	50	Depth to Mottles/Gley:
<b>Graminoid</b>				Organic Thickness:
BLUEJOINT ( <i>Calamagrostis canadensis</i> )	43.3	7.9-72.0	100	Parent Material:
SEDGE SPECIES ( <i>Carex</i> )	5.6	0.0-17.5	50	Soil Type:
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	2.2	0.0-8.0	50	Humus Form
COMMON TALL MANNA GRASS ( <i>Glyceria grandis</i> )	1.3	0.0-5.5	25	
TUFTED HAIR GRASS ( <i>Deschampsia cespitosa</i> )	1.2	0.0-5.0	25	



## Msc17 Small bottle sedge-Kentucky bluegrass (n=1)

### (*Carex utriculata*-*Poa pratensis*)

This community type represents a grazing disclimax of the Water-Small bottle sedge [Msb12] community type. Often livestock graze the drier edges of these community types, which may be intermixed with upland species. Soil in this wet/rich environment favours the establishment of Kentucky bluegrass and other grazing tolerant species such as Baltic rush. Although these sites may be productive, conservative stocking is suggested to reduce impact to the wet soils. As a result, these meadows should be rated as secondary or tertiary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** ij fen(subhydric/rich)

**Ecosite Phase:** ij3 graminoid fen

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Medium Shrub (0.5 to 2 m)</b>				Ecological Status Score: 15-27
BEAKED WILLOW ( <i>Salix bebbiana</i> )	2.1	2.1-2.1	100	Moisture Regime:
HOARY WILLOW ( <i>Salix candida</i> )	1.0	1.0-1.0	100	Nutrient Regime:
<b>Tall Forb (&gt;= 30 cm)</b>				Elevation (range): 1547 (1547-1547) M
LARGE-LEAVED YELLOW AVENS ( <i>Geum macrophyllum</i> )	15.5	15.5-15.5	100	Slope (%): 0 - 0.49 (1)
LINDLEY'S ASTER ( <i>Aster ciliolatus</i> )	5.2	5.2-5.2	100	Aspect: Level (1)
WATER-HEMLOCK ( <i>Cicuta maculata</i> )	4.7	4.7-4.7	100	Topographic Position: Depression (1)
CANADA THISTLE ( <i>Cirsium arvense</i> )	1.9	1.9-1.9	100	<b>Soil Variables</b>
NORTHERN GREEN BOG ORCHID ( <i>Habenaria hyperborea</i> )	1.4	1.4-1.4	100	Soil Drainage:
COMMON FIREWEED ( <i>Epilobium angustifolium</i> )	1.0	1.0-1.0	100	Soil Subgroup:
COW PARSNIP ( <i>Heracleum lanatum</i> )	1.0	1.0-1.0	100	Surface Texture:
WILD VETCH ( <i>Vicia americana</i> )	1.0	1.0-1.0	100	Effective Texture:
<b>Low Forb (&lt; 30 cm)</b>				Depth to Mottles/Gley:
COMMON DANDELION ( <i>Taraxacum officinale</i> )	2.9	2.9-2.9	100	Organic Thickness:
COMMON YARROW ( <i>Achillea millefolium</i> )	1.0	1.0-1.0	100	Parent Material:
NORTHERN GRASS-OF-PARNASSUS ( <i>Parnassia palustris</i> )	1.0	1.0-1.0	100	Soil Type:
<b>Graminoid</b>				Humus Form
SMALL BOTTLE SEDGE ( <i>Carex utriculata</i> )	25.5	25.5-25.5	100	
KENTUCKY BLUEGRASS ( <i>Poa pratensis</i> )	13.0	13.0-13.0	100	
WIRE RUSH ( <i>Juncus balticus</i> )	10.7	10.7-10.7	100	
FOOTHILLS ROUGH FESCUE ( <i>Festuca campestris</i> )	7.7	7.7-7.7	100	
SKYLINE BLUEGRASS ( <i>Poa epilis</i> )	3.7	3.7-3.7	100	
TUFTED HAIR GRASS ( <i>Deschampsia cespitosa</i> )	1.0	1.0-1.0	100	
TIMOTHY ( <i>Phleum pratense</i> )	1.0	1.0-1.0	100	

## k marsh(hydric/rich) (n=4)

**Natural Subregion:** Montane

### General Description

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The marsh ecosite is found in level and depressional areas along shorelines of water bodies and in riparian zones. The water is above the rooting zone for at least part of the growing season. These ecosites are dominated by a wide variety of emergent sedges and rushes. This ecosite is not common in the Montane subregion, but can be found on the eastern edge of the Montane South Ecoregion, depressions in the Cypress Hills and wet areas of the Montane North Ecoregion.



### Successional Relationships

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The marsh ecosite characterizes the beginning stages of hydrarch succession. It can be thought of as successional stable with changes in plant community composition being determined largely by disturbance regime.

### Indicator Species

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#### Forb

COMMON CATTAIL  
*Typha latifolia*

#### Graminoid

SEDGE SPECIES  
*Carex*

UNDIFFERENTIATED SCIRPUS  
*Scirpus*

CREEPING SPIKE-RUSH  
*Eleocharis palustris*

**Ecoregion:** Ms Montane South Ecoregion

### Environmental Variables

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Moisture Regime: Subhydric (moderately wet) (3), Hydric (wet) (2)  
Nutrient Regime: Permesotrophic (rich) (3), Eutrophic (very rich) (2)  
Elevation (range): 1393 (1393-1393) M  
Slope (%): level (4), very gentle slope (1)  
Aspect: Level (4), Easterly (1)  
Topographic Position: Toe (1)

### Soil Variables

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Soil Drainage: Poorly drained (1), Very poorly drained (1)  
Soil Subgroup:  
Surface Texture: Organic (2), Sandy loam (1), Silt loam (1)  
Effective Texture:  
Depth to Mottles/Gley:  
Organic Thickness: 0 - 5 cm (4)  
Parent Material:  
Soil Type:  
Humus Form

# k1 marsh (n=4)

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** k marsh(hydric/rich)

## General Description

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This is the wettest phase in the Montane and represents areas that are covered in water for a large portion of the year. Often, these are emergent bands near shores, and occupied by species such as cattails and rushes. Shrubs and trees are limited due to the wet conditions.

## Environmental Variables

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Moisture Regime: Subhydric (moderately wet) (3), Hydric (wet) (2)

Nutrient Regime: Permesotrophic (rich) (3), Eutrophic (very rich) (2)

Elevation (range): 1393 (1393-1393) M

Slope (%): level (4), very gentle slope (1)

Aspect: Level (4), Easterly (1)

Topographic Position: Toe (1)

## Characteristic Species

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### Forb

[ 45.0 ] COMMON CATTAIL\*  
*Typha latifolia*

[ 20.0 ] SWAMP HORSETAIL  
*Equisetum fluviatile*

### Graminoid

[ 40.0 ] UNDIFFERENTIATED SCIRPUS\*  
*Scirpus*

[ 3.0 ] SEDGE SPECIES  
*Carex*

## Soil Variables

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Soil Drainage: Poorly drained (1), Very poorly drained (1)

Soil Subgroup:

Surface Texture: Organic (2), Silt loam (1), Sandy loam (1)

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (4)

Parent Material:

Soil Type:

Humus Form

## Msb19 Bulrush (n=3)

### (*Scirpus acutus/microcarpus*)

This community type occurs along the margins of ponds and lakes (Thompson and Hansen 2002). Great bulrush tends to be found growing in the water. Often the water is up to 2 m deep. The wet conditions and unpalatability of great bulrush limits the use of this community type. This community should be considered tertiary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** k marsh(hydric/rich)

**Ecosite Phase:** k1 marsh

Plant Composition	Canopy Cover (%)			Environmental Variables
	Mean	Range	Const.	
<b>Tall Forb (&gt;= 30 cm)</b>				Ecological Status Score: 40
SWAMP HORSETAIL ( <i>Equisetum fluviatile</i> )	26.6	0.0-80.0	33	Moisture Regime: Subhydric (moderately wet) (3), Hydric (wet) (1)
WILD MINT ( <i>Mentha arvensis</i> )	1.0	0.0-3.0	33	Nutrient Regime: Permesotrophic (rich) (3), Eutrophic (very rich) (1)
CURLED DOCK ( <i>Rumex crispus</i> )	1.0	0.0-3.0	33	Elevation (range): 1393 (1393-1393) M
COMMON HORSETAIL ( <i>Equisetum arvense</i> )	0.1	0.0-0.5	33	Slope (%): 0 - 0.49 (3), 2.5 - 5.99 (1)
<b>Graminoid</b>				Aspect: Level (3), Easterly (1)
SMALL-FRUITED BULRUSH ( <i>Scirpus microcarpus</i> )	59.1	0.0-97.5	67	Topographic Position: Toe (1)
GREAT BULRUSH ( <i>Scirpus acutus</i> )	16.6	0.0-50.0	33	<b>Soil Variables</b>
SMALL BOTTLE SEDGE ( <i>Carex utriculata</i> )	4.5	0.5-10.0	100	Soil Drainage: Poorly drained (1)
ROUGH HAIR GRASS ( <i>Agrostis scabra</i> )	3.3	0.0-10.0	33	Soil Subgroup:
ALPINE FOXTAIL ( <i>Alopecurus occidentalis</i> )	3.3	0.0-10.0	33	Surface Texture: Sandy loam (1), Silt loam (1), Organic (1)
TUFTED HAIR GRASS ( <i>Deschampsia cespitosa</i> )	1.0	0.0-3.0	33	Effective Texture:
				Depth to Mottles/Gley:
				Organic Thickness: 0 - 5 cm (3)
				Parent Material:
				Soil Type:
				Humus Form

## Msb20 Cattail (n=1)

### (*Typha latifolia*)

This community type is associated with standing water. Thompson and Hansen (2002) have found that the saturated or inundated conditions tend to limit species diversity. The wet conditions limit use by domestic livestock and this community type should be considered tertiary range.

**Natural Subregion:** Montane

**Ecosection:** Ms Montane South Ecosection

**Ecosite:** k marsh(hydric/rich)

**Ecosite Phase:** k1 marsh

#### Plant Composition

#### Canopy Cover (%)

#### Environmental Variables

	Mean	Range	Const.
<b>Tall Forb (&gt;= 30 cm)</b>			
COMMON CATTAIL ( <i>Typha latifolia</i> )	90.0	90.0-90.0	100
SWAMP HORSETAIL ( <i>Equisetum fluviatile</i> )	3.0	3.0-3.0	100
<b>Graminoid</b>			
SMALL BOTTLE SEDGE ( <i>Carex utriculata</i> )	10.0	10.0-10.0	100
GREAT BULRUSH ( <i>Scirpus acutus</i> )	1.0	0.5-1.0	100

Ecological Status Score: 40

Moisture Regime: Hydric (wet) (1)

Nutrient Regime: Eutrophic (very rich) (1)

Elevation (range): 0 (0-0) M

Slope (%): 0 - 0.49 (1)

Aspect: Level (1)

Topographic Position:

#### Soil Variables

Soil Drainage: Very poorly drained (1)

Soil Subgroup:

Surface Texture: Organic (1)

Effective Texture:

Depth to Mottles/Gley:

Organic Thickness: 0 - 5 cm (1)

Parent Material:

Soil Type:

Humus Form

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# Appendix 1. Forest Management Interpretations<sup>1</sup>

Forest Management Interpretations are derived from the limitations of the ecological units in the classification system. These have been developed through literature review and expert opinion from public workshops. They present the user with a general outline of limitations that together with the user's knowledge and experience should be applied in a creative manner. Some management interpretations will change dramatically with time, season of year, economic conditions, existing technology, scale of application, and program objectives (Still and Utzig 1982). Under no circumstances should the information in the dataset be construed as a formal recommendation or guideline for resource management, or as a prescription for specific sites.

Six levels were used to rate the ecosites and soil types: low (L), low to medium (L-M), low to high (L-H), medium (M), medium to high (M-H) and high (H).

Table 4. Forest management interpretations for Montane South (Ms) and Montane North (Mn) Ecosections in the Montane Subregion.

ECOSITE_CODE	ECOSECTION	DROUGHT	EXCESS_MOIST	RUTTING	COMPACTION	SOIL_TEMP	COMPETITION	WINDTHROW
a	Ms	H	L	L	L	L	L	L
b	Ms	H	L	L	L	L	L	L
c	Ms	M	L	L	L	L	L	L
d	Ms	L	L	M	M	L	L	L
e	Ms	L	L	M-H	M-H	L	M-H	L
f	Ms	L	M	M-H	M-H	L	M-H	L
h	Ms	L	M	H	H	L	H	M
g	Ms	L	M-H	H	M-H	M-H	H	M
ij	Ms	L	H	H	L	H	L	H
aa	Ms	H	L	NA	NA	L	L	NA
cc	Ms	H	H	H	H	H	H	H
k	Ms	L	H	H	L	NA	NA	NA
a	Mn	H	L	L	L	L	L	L
aa	Mn	H	L	NA	NA	L	L	NA
b	Mn	H	L	L	L	L	L	L
c	Mn	M	L	L	L	L	L	L
cc	Mn	H	H	H	H	H	H	H
d	Mn	L	L	M	M	L	L	L
e	Mn	L	M-H	H	H	M	H	M
f	Mn	L	M	M-H	M-H	L	M-H	L
g	Mn	L	M-H	H	M-H	M-H	H	M
h	Mn	L	M	H	H	L	H	M

<sup>1</sup> Beckingham, J., I.G.W. Corns and J.H. Archibald. 1996. Field guide to ecosites of West-Central Alberta. Special report 9. Canadian Forest Service. Northwest Region. Edmonton, AB

ij	Mn	L	H	H	L	H	L	H
k	Mn	L	H	H	L	NA	NA	NA

The relative meaning of a limitation rating and the variables that were used in the rating process are described below. All limiting factors were rated through an assessment of the variability of important site and soil characteristics associated with each ecosite and soil type.

## Drought Limitations

Droughty conditions are associated with rapidly drained soils that draw water away from the rooting zone for a significant portion of the growing season. Typically, sites that are limited by drought are associated with coarse-textured soils or are situated on steep south-facing slopes where insolation and surface runoff are high. Remedial silviculture efforts such as drought-tolerant species, using stock with small tops and large root systems, and using micro-shelter planting sites can all help alleviate the effects of drought (Strong and Carnell 1995).

Ratings are based on the moisture regime of the ecosites and soil types. A high drought limitation rating indicates severe limitations while low ratings indicate little or no limitations.

## Excess Moisture

Excess soil moisture is a concern because serious site degradation can occur if sites are not properly managed. Operating heavy equipment on wet sites can cause serious rutting, compaction and puddling damage and therefore should be avoided. Winter months are suitable for operating on wet sites as the ground is frozen and snow cover acts as a disturbance buffer.

From a silvicultural perspective, excess moisture is a concern because wet soils require more heat to raise rooting zone temperatures and rooting zone aeration is reduced by saturation.

Ratings are based on the moisture regime of the ecosites and soil types. A high excess moisture rating indicates severe limitations while low ratings indicate little or no limitations.

## Soil Rutting and Compaction Hazard

Machine traffic most often modifies soil quality through compaction, remoulding, puddling and/or soil displacement, which in turn affects several interrelated soil physical properties. The modification that predominates depends on soil wetness, applied stress and number of passes. Soil texture may also be important, especially when soils are at moisture levels close to field capacity.

The risk of causing soil compaction or rutting by forestry operations should be evaluated before beginning operations as both risks are greatly influenced by the amount of water in the soil at the time of disturbance. Risk assessments are based on soil water content and on estimates of the time it takes a wet soil to drain.

The rating system included in this database does not replace the operational assessment but is designed as a planning tool. It can be used as part of the decision process when evaluating whether an area has the potential for supporting operations in the summer months.

Soil modifications affect four physical processes important to an organism's health: water supply and flux, heat flux, soil strength, and gas diffusion. Simply stated, the effects of compaction and rutting are manifested in changed in water infiltration rates, soil heat flux, root penetration, and oxygen supply in the soil. All of these conditions may influence soil quality and ultimately soil productivity.

The rating system is based primarily on moisture regime and related soil drainage with soil texture considered for coarse-textured soils (less than 20% silt and clay). High risk ratings indicate that it is unlikely that summer operations would be possible, medium ratings indicate that operations may be possible in dry periods, while those with low risk ratings are good candidates for summer operations. Current moisture conditions should always be evaluated before initiating operations.

## **Soil Temperature Limitations**

Soil temperature is an important characteristic as it relates to seedling growth and survival. In cold soils, the rate of root development and the ability of plants to uptake water is considerably less than in warm soils. Thus seedlings planted in cold soils are disadvantaged during the critical establishment period. Areas where cold soils are prevalent include depressions, north-facing slopes (300 to 60 degree aspect) greater than 30%, sites located at the base of major slopes and in valleys. Opportunities exist to increase soil temperatures to more than favourable levels using various site preparation methods that create raised microsites and/or exposed mineral soils. Educating tree planters to plant in idealized microsite locations will also help increase the survival rates of seedlings situated in areas where cold soils exist.

Ratings were based on moisture regime, topographic position and surface texture of the ecosites and soil types and on the assumption that organic layers are disturbed during operations. Increase the rating by one level (e.g., medium to high) if organic layers are not disturbed.

## **Vegetation Competition**

Assessing the degree of vegetation competition associated with each ecosite is important as it relates to forestry planning and operations such as choosing an appropriate planting stock, site preparation methods and projected management costs. Research and experience has shown that competition is related to the height and percent cover of shrubs, forbs and grasses and whether a seedling is overtopped by a competitor. Some of the more competitive species include shrubs such as green alder, river alder, willow and bracted honeysuckle, tall prolific forbs such as fireweed and wild sarsaparilla and grasses such as hairy wild rye and most particularly marsh reed grass.

Ratings were based on the moisture regime, nutrient regime, and surface texture of the ecosites and on the assumption that organic layers are disturbed during operations. In general, high ratings were assigned to those ecosites that are moist and rich. Low ratings were assigned to ecosites that are very dry, rapidly drained and/or nutrient poor where dense understorey vegetation is uncommon.

## **Windthrow Hazard**

Several environmental and man-made factors, not particular to an ecosite or soil type, influence the susceptibility of a site to windthrow hazard. These factors include exposure, cutblock layout and topography and should always be considered when assessing the windthrow hazard of a particular site. Shallow root systems evident on sites with thick organic layers or high water tables increases the chance of windthrow while coarse-textured soils can reduce the ability of a root system to anchor trees firmly.

Windthrow hazard ratings for ecosites and soil types were based on organic thickness, presence of water table, tree rooting habit and effective soil texture.

## **Soil Erosion Hazard**

Soil types were rated for surface water erosion hazard. Infiltration capacity and structural stability are regarded as the most important factors in controlling water erosion; therefore, they were central to the evaluation. Numerous soil and site variable affect infiltration capacity and structural stability including the extent and type of vegetation cover, the thickness of the LFH layer, the type of humus form, texture of the surface and C horizons, degree of carbonate cementing, coarse fragment content, slope angle, and length of slope. Climatic factors such as rainfall intensity, duration and seasonal distribution and the rapidity of snow melt affect erosion, but are difficult to relate to a particular ecosite or soil type. Soil erosion hazard decreases as clay or sand content increase, and increases as percent silt increases. As organic matter depth and vegetation increase erosion hazard decreases.

Ratings were based on the moisture regime and surface texture of the soil types and on the assumption that organic layers are disturbed during operations. Reduce the soil hazard rating by one level (e.g. high to medium) if organic layers and/or vegetation are not disturbed.

## Appendix 2. Soil Types

Soil types are taxonomic units used to group soils based on soil moisture regime, effective soil texture, organic matter thickness and solum depth. Soil types can be used independently, in association with the hierarchical classification system (ecosite, ecosite phase and plant community type) or to classify disturbed sites.

Along with moisture regime, organic matter thickness, and solum depth, effective texture is central to the soil type classification system. Effective texture for mineral soils is generally defined as the textural class of the finest-textured horizon that occurs 20 to 60 cm below the mineral soil surface and that is at least 10 cm thick. The 10-cm minimum thickness stipulation avoids misclassifying soils as fine textured when they are predominantly coarse, but have thin, finer-textured depositional bands.

There are 5 major soil types defined by their soil moisture: very dry (SV) (very xeric-xeric-subxeric); dry (SD) (submesic); moist (SM) (mesic-subhygric); wet (SW) (hygric-subhydric-hydric); organic (SR); and shallow (SS). The soil types are further broken down by their texture class, for a total of 17 classes.

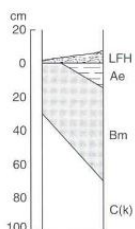
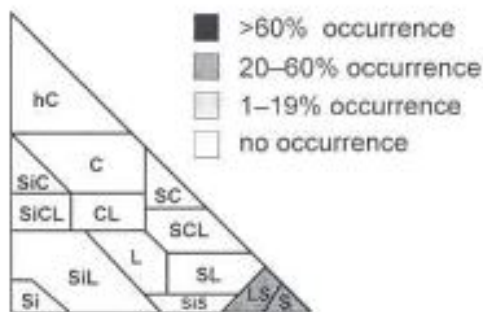
Surficial materials in the Montane are mainly medium textured, weakly calcareous tills. However, these deposits can be quite thin in steeper areas where textures tend to be more variable. In major river valleys, fluvial and glaciofluvial sands and gravels form level to gently undulating terraces on valley bottoms; till and colluvial deposits of variable textures occur on lower slopes. Bedrock exposures occur both in the foothills and in the valleys. Extremely calcareous loessal materials occur at the eastern extension of the Athabasca valley in the Brule Lake area. In the foothills and outlying Montane areas of southern and southwestern Alberta, Orthic Black Chernozems are typical under grasslands with Orthic Dark Gray Chernozems becoming dominant in the wooded areas. On moister northern slopes and higher elevations, Gray Luvisols become significant. Bedrock exposures (nonsoils) also occur. In the valleys, Eutric Brunisols are the dominant soil on fluvial and glaciofluvial deposits. Regosols are typical of both fluvial terraces adjacent to the rivers and side slopes where erosion or slope movement has recently occurred. Valley side soils may also include Luvisols and Dystric Brunisols where slopes are stable enough to allow soil development to occur. Gleysols and Organic soils are typically associated with fens (Natural Regions Committee 2006).

For this guide we have only included soil profiles that were described in the Montane subregion and combined the soil type definitions from the field Ecosite guides of West-Central and Southwestern Alberta (Beckingham et al. 1996, Archibald et al. 1996). The numbers in brackets (8) indicates the number of all plots representing a particular attribute.

# SV1 Very Dry/Sandy (n=13)

## General Description

Very dry coarse sandy, sandy and loamy sand soil. As sampled they were found mostly on glaciofluvial and fluvial deposits



## Comments

SV1 soils are rare in southwestern Alberta. As sampled they were on level glaciofluvial and fluvial deposits, however they could be expected on eolian deposits on a range of slope positions. These soils have rapid internal drainage and low moisture and nutrient holding capacity.

## Environmental Variables

Moisture Regime: Subxeric (9), Xeric (4)

Nutrient Regime: Permesotrophic (rich) (1), Mesotrophic (medium) (5), Submesotrophic (poor) (7)

## Soil Variables

Soil Drainage: Rapidly (3), Well (7), Very Rapid (3)

Soil Subgroup: ORTHIC REGOSOL (5), ORTHIC EUTRIC BRUNISOL (3), ORTHIC HUMIC REGOSOL (1), ORTHIC MELANIC BRUNISOL (1), CUMULIC REGOSOL (1), ELUVIATED DYSTRIC BRUNISOL (1), ELUVIATED EUTRIC BRUNISOL (1)

Surface Texture: Sandy Loam (4), Loamy Sand (3), Sand (3), Loam (2), Silt Loam (1)

Effective Texture: Sand (3), Loamy Sand (4), Loam (1), Sandy Loam (5)

Depth to Mottles/Gley: None (13)

Parent Material: Fluvial (6), Glaciofluvial (2), Morainal (2), Colluvial (1), Rock (4)

## Interpretations

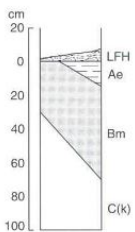
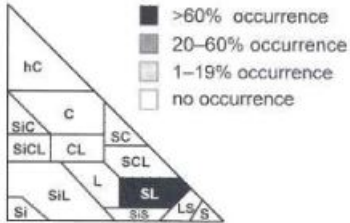
Drought Limitations	H
Excess Moisture	L
Rutting Hazard	L
Compaction Hazard	L
Puddling Hazard	L
Soil Erosion Hazard	L
Frost Heave Hazard	L
Soil Temperature Limitations	L
Windthrow Hazard	L-M



## SV2 Very Dry/Coarse Loamy (n=2)

### General Description

Very dry coarse loamy materials that develop in a variety of parent materials and slope positions. Samples were predominantly found on level glaciofluvial parent material.



### Comments

SV2 are found on any slope position from level to crest. As sampled they were not found on northerly aspects in southern Alberta (Archibald et al. 1996). These soils are only weakly layered with similar textures throughout the profile. SV2 soils were not extensively sampled in West-Central Alberta (Beckingham et al. 1996). In West-Central Alberta SV2 soils are most commonly associated with grassland Ecosite (aa) in the Montane, the bearberry and hairy wildrye ecosites in the Upper and Lower Foothills and Subalpine subregions.

### Environmental Variables

Moisture Regime: Subxeric (1), Xeric (1)

Nutrient Regime: Mesotrophic (medium) (1), Submesotrophic (poor) (1)

### Soil Variables

Soil Drainage: Rapidly drained (1), Well (1)

Soil Subgroup: ELUVIATED EUTRIC BRUNISOL (1), ORTHIC REGOSOL (1)

Surface Texture: Sandy Loam (2)

Effective Texture: Sandy Loam (2)

Depth to Mottles/Gley: None (2)

Parent Material: Glaciofluvial (2), Eolian (1)

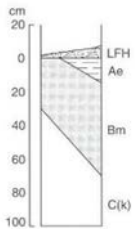
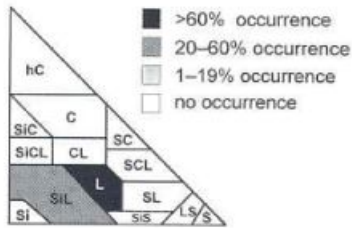
### Interpretations

<b>Drought Limitations</b>	H
<b>Excess Moisture</b>	L
<b>Rutting Hazard</b>	L
<b>Compaction Hazard</b>	L
<b>Puddling Hazard</b>	L
<b>Soil Erosion Hazard</b>	L
<b>Frost Heave Hazard</b>	L
<b>Soil Temperature Limitations</b>	L
<b>Windthrow Hazard</b>	L

# SV3 Very Dry/Silty Loamy (n=11)

## General Description

Very dry silty or loamy materials that develop in a variety of parent materials including colluvial, morainal, fluvial and glaciofluvial.



## Comments

The sampled SV3 soils in the south were found on level fluvial sites to steep upper slopes with colluvial veneers. These soils are only weakly layered with similar textures throughout the profile (Archibald et al. 1996). In the north SV3 soils were not extensively sampled, but were found on level to extremely sloped (46-70%) surfaces, with predominantly southern exposures (Beckingham et al. 1996). The soil type is droughty and is most commonly associated with the grassland (aa) and the bearberry (b) ecosites of the Montane, the bearberry ecosites of the Subalpine, Upper Foothills, and Lower Foothills and the hairy wildrye ecosites in the Upper and Lower Foothills subregions.

## Environmental Variables

Moisture Regime: Subxeric (11)

Nutrient Regime: Mesotrophic (medium) (7), Submesotrophic (poor) (1), Permesotrophic (rich) (2), Eutrophic (very rich) (1)

## Soil Variables

Soil Drainage: Rapidly drained (2), Well (8), Moderately well (1)

Soil Subgroup: ORTHIC EUTRIC BRUNISOL (5), ORTHIC REGOSOL (2), REGO BLACK CHERNOZEM (1), ORTHIC DARK GRAY LUVISOL 91), ELUVIATED EUTRIC BRUNISOL (1), ORTHIC HUMIC REGOSOL (1)

Surface Texture: Sandy Loam (2) Silty Loam (2), Loam (7)

Effective Texture: Silty Loam (5), Loam (5), Clay Loam (1)

Depth to Mottles/Gley: None (11)

Parent Material: Fluvial (1), Morainal (6), Glaciofluvial (3), Colluvial (2), Rock (3), Eolian (2)

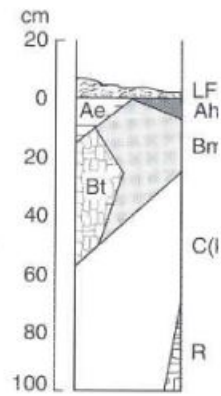
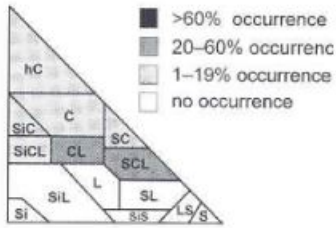
## Interpretations

Drought Limitations	H
Excess Moisture	L
Rutting Hazard	L
Compaction Hazard	L-M
Puddling Hazard	M
Soil Erosion Hazard	H
Frost Heave Hazard	H
Soil Temperature Limitations	L
Windthrow Hazard	L

# SV4 Very Dry/Fine Loamy-Clayey (n=3)

## General Description

Very dry, fine loamy or clays soils that were found developed in all parent materials. In the north these soils developed in morainal parent materials.



## Comments

The SV4 soils were found primarily on south, west and east aspects on upper and midslopes greater than 10% (Archibald et al. 1996). These soils tend to have strong layering in profile, with coarser-textured horizons overlaying a fine-textured B horizon. Sites that were strongly to extremely sloped surfaces are highly susceptible to water erosion.

## Environmental Variables

Moisture Regime: Subxeric (3)  
 Nutrient Regime: Mesotrophic (medium) (1), Submesotrophic (poor) (1), Eutrophic (very rich) (1)

## Soil Variables

Soil Drainage: Rapidly drained (1), Well (2)  
 Soil Subgroup: ORTHIC EUTRIC BRUNISOL (1), BRUNISOLIC GRAY LUVISOL (1), DARK GRAY LUVISOL (1)  
 Surface Texture: Silty Loam (1), Sandy Clay Loam (1), Silty Clay Loam (1)  
 Effective Texture: Sandy Clay Loam (1), Silty Clay (1), Clay (1)  
 Depth to Mottles/Gley: None (3)  
 Parent Material: Morainal (2), Rock (2), Eolian (1)

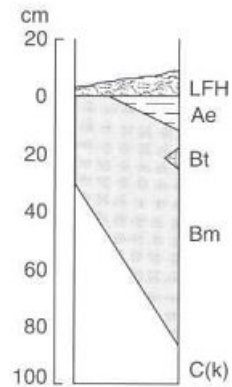
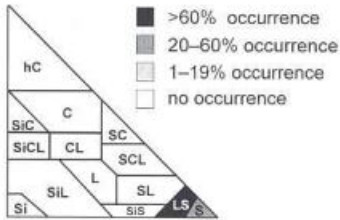
## Interpretations

<b>Drought Limitations</b>	H
<b>Excess Moisture</b>	L
<b>Rutting Hazard</b>	L
<b>Compaction Hazard</b>	L-M
<b>Puddling Hazard</b>	M
<b>Soil Erosion Hazard</b>	H
<b>Frost Heave Hazard</b>	H
<b>Soil Temperature Limitations</b>	L
<b>Windthrow Hazard</b>	L

# SD1 Dry/Sandy (n=0)

## General Description

This soil type has not been described in the Montane subregion. This soil type description is taken from the southern and west-central field guides (Archibald et al. 1996, Beckingham et al. 1996). This soil type is found on dry, sandy soils on fluvial and glaciofluvial deposits in the south and on glaciofluvial and eolian parent materials in the north.



## Comments

This type is rare in the southern subregions. The two samples described in the southern ecosite guide (Archibald et al. 1996) were found on level fluvial or glaciofluvial deposits. In the north these soils are well drained and occur on crest and level upland positions. In both the south and north the dry nature of this soil type is strongly influenced by its coarse texture. Droughty conditions may persist for part of the growing season.

## Environmental Variables

Moisture Regime: Submesic (10)

Nutrient Regime: Mesotrophic (medium) (4), Submesotrophic (poor) (6)

## Soil Variables

Soil Drainage: Rapidly drained (6), Well (4)

Soil Subgroup: EUTRIC BRUNISOL ELUVIATED (2), EUTRIC BRUNISOL ORTHIC (5) ORTHIC REGOSOL (2), ELUVIATED DYSTRIC BRUNISOL (1)

Surface Texture: Sandy Loam (1) Loamy Sand (6), Sand (3)

Effective Texture: Loamy Sand (6), Sand (4)

Depth to Mottles/Gley: None (10)

Parent Material: Eolian (2), Glaciofluvial (6), Fluvial (1), Fluvialeolian (1)

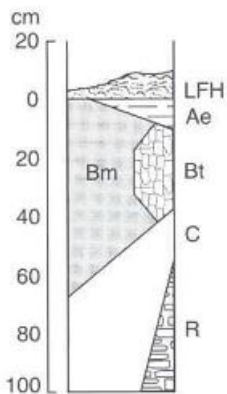
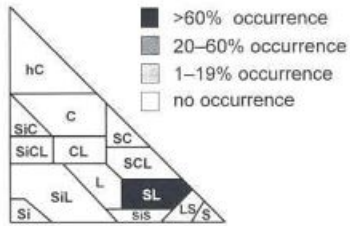
## Interpretations

<b>Drought Limitations</b>	M
<b>Excess Moisture</b>	L
<b>Rutting Hazard</b>	L
<b>Compaction Hazard</b>	L
<b>Puddling Hazard</b>	L
<b>Soil Erosion Hazard</b>	L
<b>Frost Heave Hazard</b>	L
<b>Soil Temperature Limitations</b>	L
<b>Windthrow Hazard</b>	L-M

## SD2 Dry/Coarse Loamy (n=12)

### General Description

Dry, coarse loamy soils that most commonly develop in morainal or level fluvial or glaciofluvial deposits.



### Comments

The SD2 soil type is found on all slope positions and aspects. These soils are weakly layered in profile, with similar textures throughout. SD2 soils in the north are not common (Beckingham et al. 1996).

### Environmental Variables

Moisture Regime: Submesic (12)

Nutrient Regime: Mesotrophic (medium) (9), Submesotrophic (poor) (3)

### Soil Variables

Soil Drainage: Rapidly drained (1), Well (9), Moderately well (2)

Soil Subgroup: ORTHIC EUTRIC BRUNISOL (8), ORTHIC BLACK CHERNOZEM (1), ELUVIATED EUTRIC BRUNISOL (1), ORTHIC MELANIC BRUNISOL (1), ORTHIC REGOSOL (1)

Surface Texture: Sandy Loam (5) Loam (2), Silty Loam (3), Clay Loam (2)

Effective Texture: Sandy Loam (11), Clay Loam (1)

Depth to Mottles/Gley: None (12)

Parent Material: Glaciofluvial (6), Fluvial (1), Morainal (3), Eolian (5), Rock (2)

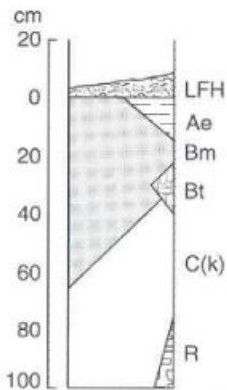
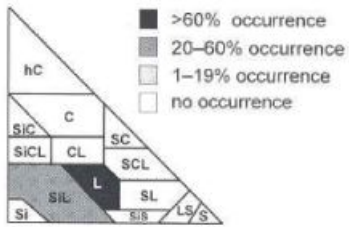
### Interpretations

Drought Limitations	M
Excess Moisture	L
Rutting Hazard	L
Compaction Hazard	L
Puddling Hazard	L
Soil Erosion Hazard	L
Frost Heave Hazard	L
Soil Temperature Limitations	L
Windthrow Hazard	L-M

## SD3 Dry/Silty-Loamy (n=28)

### General Description

Dry, silty loamy soils that most commonly develop in morainal or level fluvial or glaciofluvial deposits.



### Comments

The SD3 soil type is found on all slope positions and aspects. These soils are weakly layered in profile, with similar textures throughout. If slopes are long and straight, the susceptibility of the soils to water erosion is high.

### Environmental Variables

Moisture Regime: Submesic (28)

Nutrient Regime: Mesotrophic (medium) (22), Submesotrophic (poor) (3), Permesotrophic (rich)(3), Eutrophic (very rich) (1)

### Soil Variables

Soil Drainage: Rapidly drained (3), Well (23), Moderately well (3)

Soil Subgroup: ORTHIC EUTRIC BRUNISOL (12), ORTHIC MELANIC BRUNISOL (5), ORTHIC REGOSOL (2), ORTHIC BLACK CHERNOZEM (2), ORTHIC DARK GRAY CHERNOZEM (2), REGO DARK GRAY CHERNOZEM (1), BRUNISOLIC GRAY LUVISOL (1), CUMULIC HUMIC REGOSOL (1), CUMULIC REGOSOL (1)

Surface Texture: Sandy Loam (2) Loam (11), Silty Loam (11), Clay Loam (2), Loamy Sand (2)

Effective Texture: Loam (10), Silty Loam (9), Silt (4), Silty Clay Loam (2), Clay (1), Clay Loam (1), Sandy Clay Loam (1)

Depth to Mottles/Gley: None (28)

Parent Material: Morainal (12), Glaciofluvial (5), Eolian (4), Fluvial (3), Rock (2), Colluvial (2)

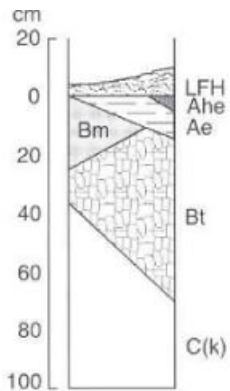
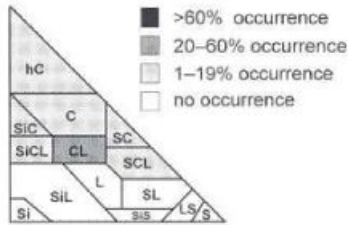
### Interpretations

<b>Drought Limitations</b>	M
<b>Excess Moisture</b>	L
<b>Rutting Hazard</b>	L-M
<b>Compaction Hazard</b>	M
<b>Puddling Hazard</b>	M
<b>Soil Erosion Hazard</b>	M-H
<b>Frost Heave Hazard</b>	M
<b>Soil Temperature Limitations</b>	L
<b>Windthrow Hazard</b>	L

## SD4 Dry/Fine Loamy-Clayey (n=17)

### General Description

Dry, fine loamy to clayey soils that were found developed in predominantly morainal parent materials.



### Comments

The SD4 soil type is a common soil type in the south (Archibald et al. 1996). They are found in all slope positions, parent materials and aspects. These soils tend to be strongly layered in profile, with coarser surface horizons overlaying a fine textured B-horizon. In the north this soil type are generally characterized by moderately coarse to medium textured surface layers overlying a moderate fine to fine-textured Bt horizon (Beckingham et al. 1996).

### Environmental Variables

Moisture Regime: Submesic (17)

Nutrient Regime: Mesotrophic (medium) (9), Submesotrophic (poor) (4), Permesotrophic (rich)(4)

### Soil Variables

Soil Drainage: Well (12), Moderately well (4), Rapidly (1)

Soil Subgroup: ELUVIATED EUTRIC BRUNISOL (4), ORTHIC EUTRIC BRUNISOL (4), ORTHIC DARK GRAY LUVISOL (2), ORTHIC BLACK CHERNOZEM (1), ORTHIC DYSTRIC BRUNISOL (1), BRUNISOLIC GRAY LUVISOL (1), DARK GRAY LUVISOL (1), ORTHIC GRAY LUVISOL (1), ORTHIC HUMIC REGOSOL (1), ORTHIC MELANIC BRUNISOL (1)

Surface Texture: Silty Loam (4), Sandy Clay Loam (4), Silty Clay Loam (2), Clay Loam (2), Loam (2), Silty Clay (1), Sandy Loam (2),

Effective Texture: Clay Loam (5), Silty Clay Loam (4), Silty Clay (3), Clay (2), Sandy Clay Loam (2), Sandy Clay (1)

Depth to Mottles/Gley: None (17)

Parent Material: Colluvial (1), Fluvial (2), Morainal (12), Eolian (1)

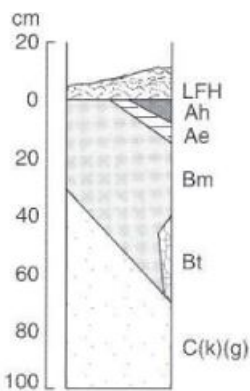
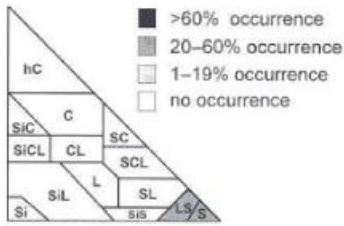
### Interpretations

<b>Drought Limitations</b>	M
<b>Excess Moisture</b>	L
<b>Rutting Hazard</b>	M
<b>Compaction Hazard</b>	M
<b>Puddling Hazard</b>	H
<b>Soil Erosion Hazard</b>	H
<b>Frost Heave Hazard</b>	M
<b>Soil Temperature Limitations</b>	L
<b>Windthrow Hazard</b>	L

# SM1 Moist/Sandy (n=16)

## General Description

Moist sandy and loamy sand soils that develop on a variety of parent materials.



## Comments

The SM1 soils are rare in southern Alberta. As described they were found on level to depressional areas in fluvial parent materials (Archibald et al. 1996). In the north this soil type tends to be located on level to gently sloping topography (Beckingham et al. 1996). The moisture regimes are mesic to subhygric and maybe positively influenced by the presence of fine textured materials at depths of 60cm or more. Faint distinct mottles maybe present in this soil type in the northern ecosection (Beckingham et al. 1996).

## Environmental Variables

Moisture Regime: Mesic (14), Subhygric (2)

Nutrient Regime: Mesotrophic (medium) (10), Submesotrophic (poor) (3), Permesotrophic (rich)(3)

## Soil Variables

Soil Drainage: Well (7), Very rapidly (4), Rapid (4), Imperfectly (1)

Soil Subgroup: ORTHIC REGOSOL (6), ORTHIC EUTRIC BRUNISOL (4), ORTHIC HUMIC REGOSOL (3), ELUVIATED EUTRIC BRUNISOL (1), ORTHIC GLEYSOL (1), CUMULIC REGOSOL (1)

Surface Texture: Loamy Sand (8), Sandy Loam (4), Sand (2), Silt Loam (2)

Effective Texture: Loamy Sand (6), Sand (7), Sandy Loam (1)

Depth to Mottles/Gley: None (15), (26-50)(1)

Parent Material: Fluvial (6) Eolian (6), Glaciofluvial (2), Morainal (1), Colluvial (5)

## Interpretations

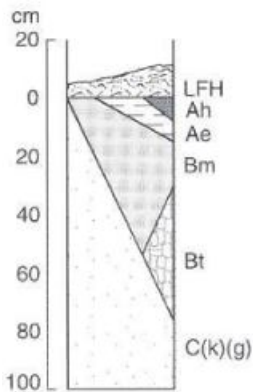
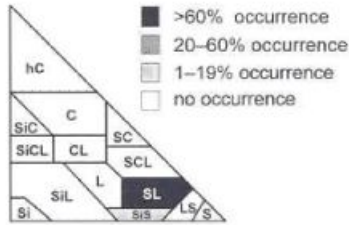
Drought Limitations	L
Excess Moisture	L-M
Rutting Hazard	L
Compaction Hazard	L
Puddling Hazard	L
Soil Erosion Hazard	L
Frost Heave Hazard	L
Soil Temperature Limitations	M
Windthrow Hazard	L-M



## SM2 Moist/Coarse Loamy (n=21)

### General Description

Moist coarse loamy soils that have developed on a variety of parent materials.



### Comments

The SM2 soils typically occur on level to very gently sloping topography (Beckingham et al. 1996). The soils that occur in water-receiving topographic positions and have a subhygric moisture regime typically have higher hazard ratings than those soils in better-drained locations.

### Environmental Variables

Moisture Regime: Mesic (20), Subhygric (1)

Nutrient Regime: Mesotrophic (medium) (16), Permesotrophic (rich)(5)

### Soil Variables

Soil Drainage: Well (13), Moderately well (8)

Soil Subgroup: ORTHIC EUTRIC BRUNISOL (6), ORTHIC REGOSOL (3), ORTHIC HUMIC REGOSOL (2), ORTHIC MELANIC BRUNISOL (2), ORTHIC DARK GRAY CHERNOZEM (2), ORTHIC BLACK CHERNOZEM (1), ORTHIC DARK BROWN CHERNOZEM (1), ORTHIC DYSTRIC BRUNISOL (1), ELUVIATED EUTRIC BRUNISOL (1), BRUNISOLIC GRAY LUVISOL (1), ORTHIC GRAY LUVISOL (1)

Surface Texture: Loam (3), Sandy Loam (9), Silty Loam (7), Loamy Sand (1), Sandy Clay Loam (1)

Effective Texture Sandy Loam (17), Loam (1), Loamy Sand (1), Sandy Clay Loam (1), Silty Clay Loam (1)

Depth to Mottles/Gley: None (20), (51-100)(1)

Parent Material: Fluvial (3), Glaciofluvial (9), Morainal (7), Colluvial (1), Eolian (6)

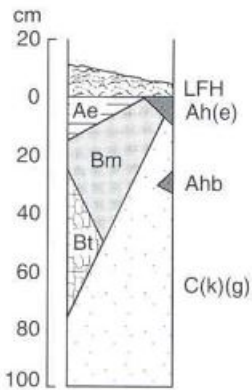
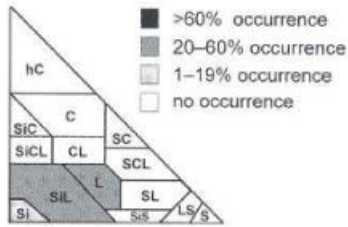
### Interpretations

<b>Drought Limitations</b>	L
<b>Excess Moisture</b>	L-M
<b>Rutting Hazard</b>	L-M
<b>Compaction Hazard</b>	L-M
<b>Puddling Hazard</b>	L
<b>Soil Erosion Hazard</b>	L
<b>Frost Heave Hazard</b>	L-M
<b>Soil Temperature Limitations</b>	L-M
<b>Windthrow Hazard</b>	L

# SM3 Moist/Silty Loamy (n=38)

## General Description

Moist silty loamy soils that can develop on a variety of parent materials, but are most common on morainal and fluvial parent materials.



## Comments

The SM3 soils has a trend toward occurrence on northerly and easterly aspects with moderate slopes in the south (Archibald et al. 1996). In the north this soil type occurs on gently sloped to level topography (Beckingham et al. 1996). Till was the most common parent material but this soil type was prevalent in fluvial deposits on river terraces and floodplain landscapes.

## Environmental Variables

Moisture Regime: Mesic (30), Subhygric (8)

Nutrient Regime: Mesotrophic (medium) (22), Submesotrophic (poor) (2), Permesotrophic (rich)(13), Eutrophic (very rich)

## Soil Variables

Soil Drainage: Well (27), Moderately well (10), Imperfectly (1)

Soil Subgroup: ORTHIC EUTRIC BRUNISOL (12), ORTHIC GRAY LUVISOL (5), ORTHIC BLACK CHERNOZEM (4), ORTHIC DARK GRAY CHERNOZEM (4), ORTHIC HUMIC REGOSOL (3), ORTHIC MELANIC BRUNISOL (2), CUMULIC REGOSOL (2), BRUNISOLIC GRAY LUVISOL (2), ELUVIATED EUTRIC BRUNISOL (1), ORTHIC GLEYSOL (1), GLEYED MELANIC BRUNISOL (1), ORTHIC REGOSOL (1)

Surface Texture: Loam (11), Sandy Loam (3), Silty Loam (18), Silt (1), Clay Loam (2), Sand (1), Silty Clay (1), Silty Clay Loam (1)

Effective Texture: Loam (13), Silt (4), Silty Loam (13), Clay Loam (2), Silty Clay (2), Silty Clay Loam (2), Clay (1), Sandy Loam (1)

Depth to Mottles/Gley: None (36), (26-50)(1), 51-100 (1)

Parent Material: Fluvial (9), Morainal (12), Colluvial (3), Glaciofluvial (10), Eolian (7), Glaciolacustrine (2)

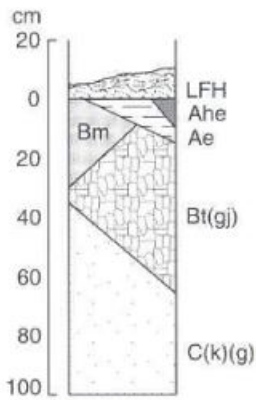
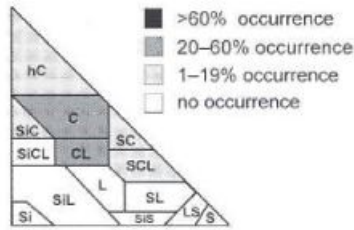
## Interpretations

<b>Drought Limitations</b>	L
<b>Excess Moisture</b>	L-M
<b>Rutting Hazard</b>	M-H
<b>Compaction Hazard</b>	M-H
<b>Puddling Hazard</b>	M-H
<b>Soil Erosion Hazard</b>	M
<b>Frost Heave Hazard</b>	M-H
<b>Soil Temperature Limitations</b>	L-M
<b>Windthrow Hazard</b>	L

# SM4 Moist/Fine Loamy-Clayey (n=33)

## General Description

Moist, fine loamy to clayey sols that most commonly develop in morainal parent materials.



## Comments

SM4 was the most extensively sampled soil type in west-central Alberta (Beckingham et al. 1996). It most commonly occurs in level or gently to moderately sloped landscapes. SM4 soils typically have a medium-textured surface layer overlying a moderately fine to fine-textured Bt horizon. This illuvial horizon (Bt) may temporarily impede soil drainage during high rainfall and spring runoff periods causing saturated soil conditions in the upper horizons. High hazard ratings generally apply to those SM4 soils that have a subhygric moisture regime.

## Environmental Variables

Moisture Regime: Mesic (25), Subhygric (7)

Nutrient Regime: Mesotrophic (medium) (20), Submesotrophic (poor) (1), Permesotrophic (rich)(10), Eutrophic (very rich) (1)

## Soil Variables

Soil Drainage: Well (17), Moderately well (11), Poorly (1), Rapidly (1)

Soil Subgroup: ORTHIC EUTRIC BRUNISOL (6), DARK GRAY LUVISOL (5), ORTHIC BLACK CHERNOZEM (3), ORTHIC DARK GRAY CHERNOZEM (3), BRUNISOLIC GRAY LUVISOL (3), ORTHIC GRAY LUVISOL (2), ORTHIC HUMIC GLEYSOL (2), ORTHIC HUMIC REGOSOL (2), ORTHIC MELANIC BRUNISOL (2), ELUVIATED DYSTRIC BRUNISOL (1), ELUVIATED EUTRIC BRUNISOL (1), ORTHIC GLEYSOL (1), CUMULIC REGOSOL (1), DARK BROWN SOLONETZ (1)

Surface Texture: Loam (13), Loamy Sand (1), Silty Loam (4), Silty Clay Loam (1), Sandy Loam (1), Clay Loam (11), Sandy Clay Loam (1), Sandy Clay (1)

Effective Texture: Sandy Clay Loam (9), Clay Loam (8), Silty Clay Loam (8), Clay (4), Sandy Clay (2), Silty Clay (2)

Depth to Mottles/Gley: None (32), (0-25)(1)

Parent Material: Fluvial (8), Morainal (16), Rock (3), Colluvial (3), Eolian (3), Lacustrine (2), Glaciofluvial (2), Glaciolacustrine (1)

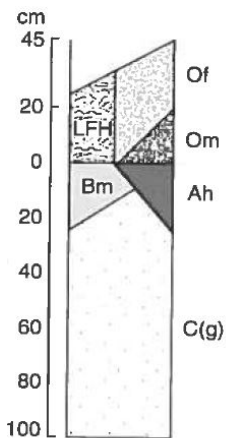
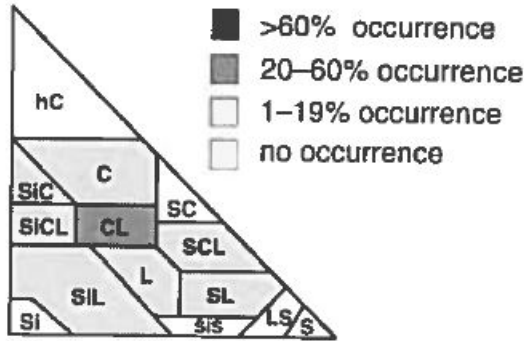
## Interpretations

<b>Drought Limitations</b>	L
<b>Excess Moisture</b>	L-M
<b>Rutting Hazard</b>	M-H
<b>Compaction Hazard</b>	H
<b>Puddling Hazard</b>	M-H
<b>Soil Erosion Hazard</b>	M
<b>Frost Heave Hazard</b>	H
<b>Soil Temperature Limitations</b>	L-M
<b>Windthrow Hazard</b>	L

# SMp Moist/Peaty (n=0)

## General Description

This soil type has currently not been described in the Montane subregion. This soil description is taken from 51 plots described in the Ecosites of West-Central and Southwestern Alberta (Beckingham et al. 1996, Archibald et al. 1996). SMp are moist soils with a duff layer thicker than 20cm. They are found most commonly on fluvial and morainal parent materials. **Note:** the numbers in brackets indicate a rough percentage of the attributes from the described plots.



## Comments

With a thick organic layer and a higher mean moisture regime rating that other moist soil types (SM1-SM4). SMp is considered transitional to the wet peaty soil type SWp. Faint to distinct mottles may be encountered throughout the soil profile. The effects of forestry operations on soil erosion, rutting, compaction and puddling can be minimized if the thick organic layer of the SMp soil type is not excessively disturbed.

## Environmental Variables

Moisture Regime: Mesic (5), Subhygric (5)

Nutrient Regime: Mesotrophic (medium) (5), Eutrophic (very rich) (1), Permesotrophic (rich)(4)

## Soil Variables

Soil Drainage: Well (1), Moderately well (6), Imperfectly (2), Poor (1)

Soil Subgroup: EUTRIC BRUNISOL ELUVIATED (3), EUTRIC BRUNISOL ORTHIC (1), ORTHIC GRAY LUVISOL (1), BRUNISOLIC GRAY LUVISOL (1), ORTHIC LUVIC GLEYSOL (1), ORTHIC GLEYSOL (1), ORTHIC HUMIC GLEYSOL (1), GLEYED GRAY LUVISOL (1)

Surface Texture: Loam (2), Silty Loam (2), Silty Clay Loam (1), Sandy Loam (1), Clay Loam (4)

Effective Texture: Silty Clay (1), Silty Loam (1), Silty Clay Loam (2), Sandy Clay Loam (1), Clay Loam (5)

Depth to Mottles/Gley: None (17), (0-25)(3)

Parent Material: Fluvial (3), Morainal (5), Glaciolacustrine (1), Lacustrine (1)

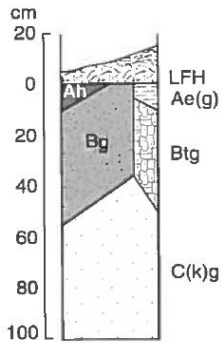
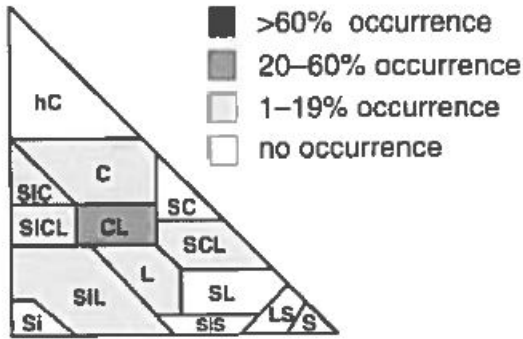
## Interpretations

Drought Limitations	L
Excess Moisture	M
Rutting Hazard	H
Compaction Hazard	H
Puddling Hazard	H
Soil Erosion Hazard	L-M
Frost Heave Hazard	M-H
Soil Temperature Limitations	H
Windthrow Hazard	M-H

# SWm Wet/Mineral (n=3)

## General Description

SWm soils are wet soils with an organic layer thickness of less than 20cm. They are found primarily on fluvial and morainal parent materials



## Comments

SWm are commonly associated with the Labrador tea-subhygric ecosite in the Upper and Lower Foothills subregions and the horsetail ecosite in all subregions. The non-forested meadow and marsh ecological sites also tend to have SWm soils (Beckingham et al. 1996). Level landscapes influenced by fluctuating or permanently high water tables with prominent mottles and/or strong gleying are characteristic of this soil type.

## Environmental Variables

Moisture Regime: Hygric (6)

Nutrient Regime: Permesotrophic (rich)(3)

## Soil Variables

Soil Drainage: Poorly (3)

Soil Subgroup: ORTHIC LUVIC GLEYSOL (1), ORTHIC GLEYSOL (1), ORTHIC HUMIC GLEYSOL (1)

Surface Texture: Clay (1), Silt (1), Silt Loam (1)

Effective Texture : Clay Loam (1), Sandy Clay Loam (1), Silty Clay (1)

Depth to Mottles/Gley: (0-25)(3)

Parent Material: Fluvial (1), Morainal (1), Glaciofluvial (1), Eolian (1)

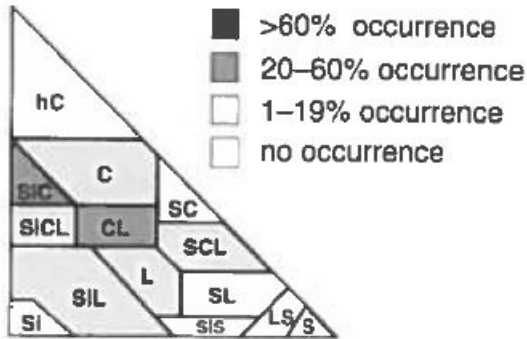
## Interpretations

<b>Drought Limitations</b>	L
<b>Excess Moisture</b>	H
<b>Rutting Hazard</b>	H
<b>Compaction Hazard</b>	H
<b>Puddling Hazard</b>	H
<b>Soil Erosion Hazard</b>	H
<b>Frost Heave Hazard</b>	H
<b>Soil Temperature Limitations</b>	H
<b>Windthrow Hazard</b>	H

# SWp Wet/Peaty (n=5)

## General Description

SWp soils are wet soils with an organic layer thickness of greater than 20cm. They are found primarily on fluvial and lacustrine parent materials



## Environmental Variables

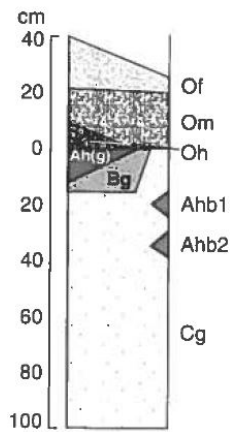
Moisture Regime: Hygric (3), Subhygric (1), Hydric (1)  
 Nutrient Regime: Permesotrophic (rich)(5)

## Soil Variables

Soil Drainage: Imperfectly (3), Poorly (2)  
 Soil Subgroup: ORTHIC LUVIC GLEYSOL (1), ORTHIC GLEYSOL (2), REGO HUMIC GLEYSOL (2)  
 Surface Texture: Fibric (2), Silt (1), Silty Clay Loam (1), Silt Loam (1)  
 Effective Texture : Silty Clay (3), Silt (1), Silt Loam (1)  
 Depth to Mottles/Gley: (26-50)(1)  
 Parent Material: Fluvial (1), Glaciolacustrine (2), Eolian (1)

## Interpretations

<b>Drought Limitations</b>	L
<b>Excess Moisture</b>	H
<b>Rutting Hazard</b>	H
<b>Compaction Hazard</b>	H
<b>Puddling Hazard</b>	H
<b>Soil Erosion Hazard</b>	H
<b>Frost Heave Hazard</b>	H
<b>Soil Temperature Limitations</b>	H
<b>Windthrow Hazard</b>	H



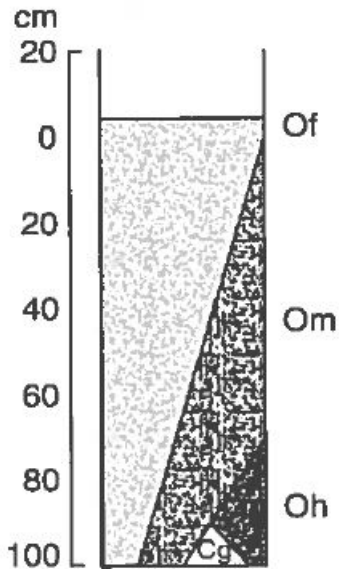
## Comments

SWp soils are predominantly poor to very poorly drained and are found in level, lower slope, depressional, and toe slope positions. Prominent mottles or strong gley are typically encountered in all soil horizons. A water table may be present within the upper 100 cm. Most of the tree roots occur in the thick peaty layers of this soil type, increasing the risk of blowdown.

# SR Organic (n=7)

## General Description

Organic soils are wet with an organic thickness greater than 60cm if the material is fibric or > 40cm if the material is mesic or humic. On sites with mosses covering the surface substrate, microtopography tends to be hummocky.



## Comments

SR soils are typically located on flat or depressional areas in the landscape where regional or local drainage waters accumulate. They exhibit a diverse range of profiles based on organic matter thickness and on the degree of organic matter decomposition. SR soils are strongly associated with unmerchantable lowland ecosites.

## Environmental Variables

Moisture Regime: Subhydic (6), Hydic (1)  
 Nutrient Regime: Mesotrophic (medium) (2), Eutrophic (very rich) (2), Permesotrophic (rich)(3)

## Soil Variables

Soil Drainage: Very poorly (5), Poorly (2)  
 Soil Subgroup: TERRIC FIBRISOL (2), TYPIC FIBRISOL (2), TERRIC HUMISOL (1), CUMULIC MESISOL (1), TYPIC MESISOL (1)  
 Surface Texture: Fibric (7)  
 Effective Texture: Mesic (3), Fibric (3), Humic (1)  
 Depth to Mottles/Gley: not applicable  
 Parent Material: Organic (3), Glaciolacustrine (4), Lacustrine (1), Fen (4)

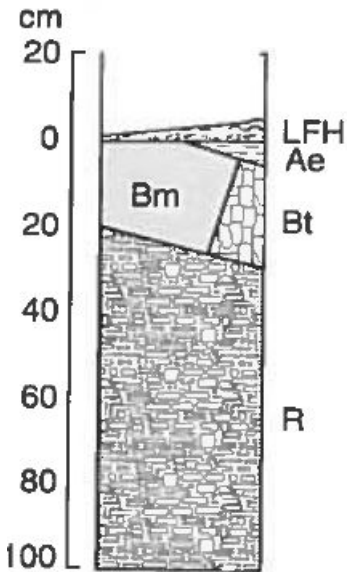
## Interpretations

Drought Limitations	L
Excess Moisture	H
Rutting Hazard	H
Compaction Hazard	L
Puddling Hazard	L
Soil Erosion Hazard	L
Frost Heave Hazard	H
Soil Temperature Limitations	H
Windthrow Hazard	H

## SS Shallow (n=3)

### General Description

Shallow soils with less than or equal to 30 cm of mineral material overlying bedrock. This soil type includes exposed bedrock surfaces.



### Comments

SS soils are usually associated with crests and upper slope positions with dry moisture regimes. Although they may occur on mesic sites on midslope positions where seepage may have some influence. This soil type is most frequent on exposed limber pine community types.

### Environmental Variables

Moisture Regime: Subxeric (2), Submesic (1)

Nutrient Regime: Mesotrophic (medium) (2), Submesotrophic (poor) (1)

### Soil Variables

Soil Drainage: Rapidly drained (3)

Soil Subgroup: ORTHIC REGOSOL (2), REGO DARK BROWN CHERNOZEM (1)

Surface Texture: Loam (1), Silty Clay Loam (1), Sand (1)

Effective Texture: Undifferentiated mineral (1)

Depth to Mottles/Gley: None (3)

Parent Material: Morainal/Rock (2), Residual (1)

### Interpretations

<b>Drought Limitations</b>	M-H
<b>Excess Moisture</b>	L
<b>Rutting Hazard</b>	M
<b>Compaction Hazard</b>	M
<b>Puddling Hazard</b>	M
<b>Soil Erosion Hazard</b>	L-M
<b>Frost Heave Hazard</b>	L
<b>Soil Temperature Limitations</b>	L
<b>Windthrow Hazard</b>	H



## Appendix 3:

# Ecological site descriptions for grass and shrubland plant communities of south and west facing slopes in the Montane subregion



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## Introduction

Ecological site classifications and descriptions provide a consistent framework for stratifying and describing rangelands and their soil, vegetation, and abiotic features; thereby delineating units that share similar capabilities to respond to management activities or disturbance processes. Ecological site descriptions provide land managers the information needed for evaluating suitability of the land for various land-use activities, the capability to respond to various management activities or disturbance processes, and the ability to sustain productivity over the long term.

Ecological Site Descriptions are complementary to the ecological site guides for each natural subregion and provide a summary of the important ecological sites for rangelands within a subregion. Rangeland reference areas are extremely important in the development of Ecological Site Descriptions (ESD) for Alberta rangelands. One of the many objectives of the rangeland reference area program is to assist in determining the characteristics of succession in the presence and absence of disturbance for each ecological site.

### *Ecological Site Description (ESD)*

An Ecological Site Description (ESD) is a summary of the plant communities within the classification hierarchy for an ecological site. It incorporates abiotic and biotic environmental factors such as climate, soils/landform, hydrology, vegetation, and natural disturbance regimes that together define the site. Each ecological site is identified, differentiated, and described based on the relationships between these environmental factors and how they influence plant community composition.

Data from the guide to Ecological Sites of the Montane Subregion (Willoughby et al. 2020) and long-term monitoring data from nine rangeland area sites (Station Creek, North Todd, South Todd, South Castle Slope, Middle Chimney, Highwood Slope, Spring Creek, North Chimney and South Rock Creek) were used to develop this ecological site description and succession diagrams for the dominant grassland communities on south and west facing slopes in the southern ecosection of the Montane subregion.

The reference grasslands on south and west facing slopes in the southern ecosection of the Montane subregion belong to three ecological sites. These sites include **aa-bluebunch wheatgrass** (subxeric/medium), **b-bearberry** (submesic/poor) and **c-buffaloberry/hairy wildrye** (submesic/medium) (Willoughby et al. 2020).

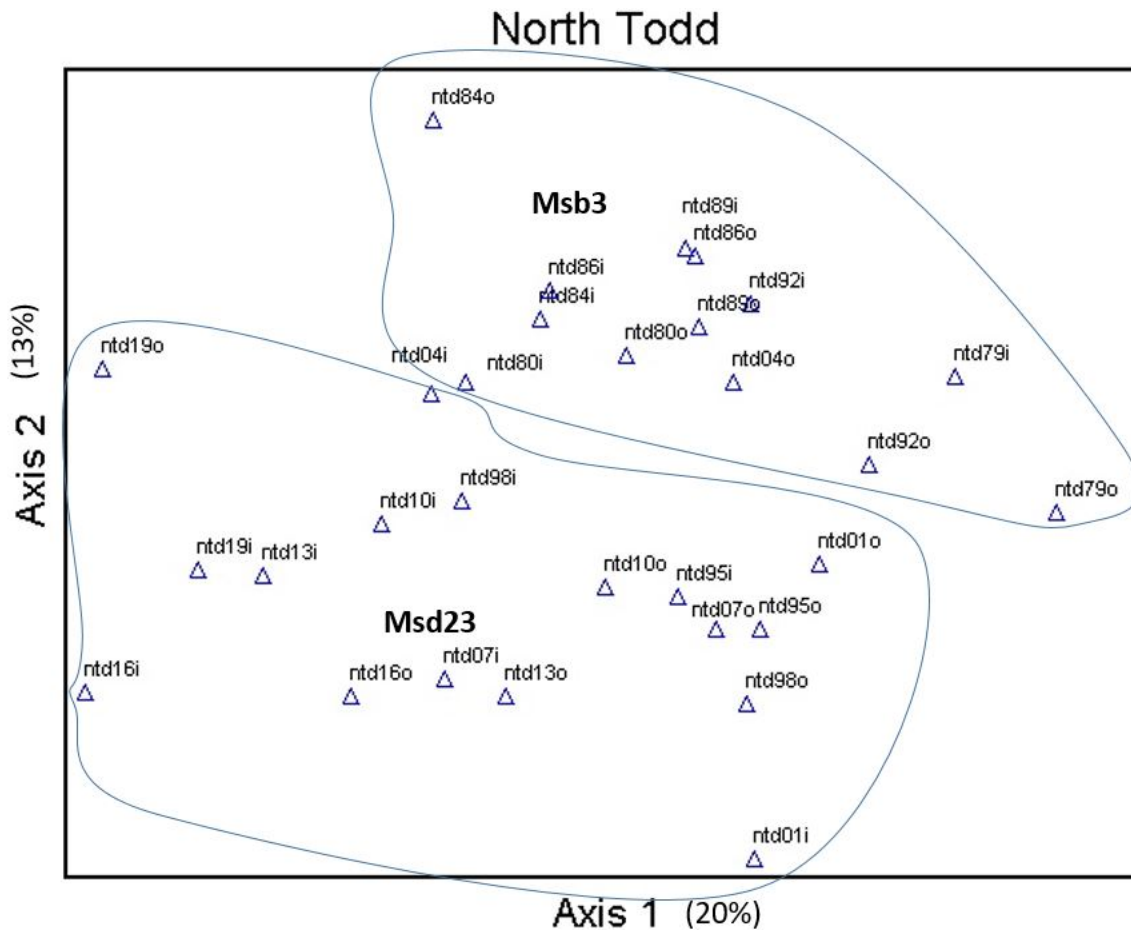
The successional changes in the presence and absence of grazing disturbance will be examined for the grass and shrub plant communities for each of these ecological sites.

## **aa-Bluebunch wheatgrass (subxeric/medium) ecological site (pg 253)**

The grass and shrub phases of the bluebunch wheatgrass ([aa] subxeric/medium) ecological site are located on steep, south and west facing slopes throughout the Montane South, particularly in the Gap and Castle Areas. The soils are poorly developed, nutrient poor and generally have xeric or subxeric moisture regimes. The grassland communities of this area are often dominated by bluebunch wheat grass. Big sagebrush dominated communities are also found in isolated areas in the South Castle in this ecological site.

Outlined in Figures 1 and 2 are the ordinations of the Station Creek and North Todd rangeland reference areas with community types grouped by cluster analysis. Both these sites represent the grass and shrub plant communities for the bluebunch wheatgrass ecological site. The Station Creek reference area site represents both grazed and ungrazed transects that have been recorded since 1958. In contrast the North Todd reference area represents grazed and ungrazed transects that have been recorded since 1979.





**Figure 2.** Ordination of grazed and ungrazed transects with years grouped by cluster analysis for the North Todd rangeland reference area. (eg ntd13i where 13=year (2013), (i=In, o=Out) Msb3=Bluebunch wheatgrass-Sedge, Msd23=Snowberry-Rose/Bluebunch wheatgrass-Rough fescue (Willoughby et al. 2020))

In the ordination of the North Todd reference area the first two axes in the ordination accounted for 20% and 13% of the variation in the species stand table, respectively. There is little difference in species composition between the grazed and ungrazed transects for all years, but there is a trend for an increase in shrub and tree cover on both transects over time. When the site was first established in 1979 grass species tended to dominate the site to form the Bluebunch wheatgrass-Sedge (Msb3) dominated community. However, since 1995 shrub and tree cover (Douglas fir) has increased on both the grazed and ungrazed transects to form the Snowberry-Rose/Bluebunch wheatgrass-Rough fescue (Msd23) dominated community.





**Msd23: Snowberry-Rose/Bluebunch wheatgrass-Rough fescue community type.** This picture was taken on the outside transect at the North Todd reference area and represents plant community Msd23. Under light to little grazing disturbance there has been an increase in tree and shrub cover over 20 years compared to the lightly to moderately grazed Bluebunch wheatgrass-Sedge (Msb3) dominated plant community type.





**Msb3: Bluebunch wheatgrass-Sedge community type.** This picture was taken on the outside transect at the Station Creek reference area and represents plant community Msb3. There is a noticeable decline in shrub and tree cover compared to the lightly to ungrazed Snowberry-Rose/Bluebunch wheatgrass-Rough fescue (Msd23) dominated community type.





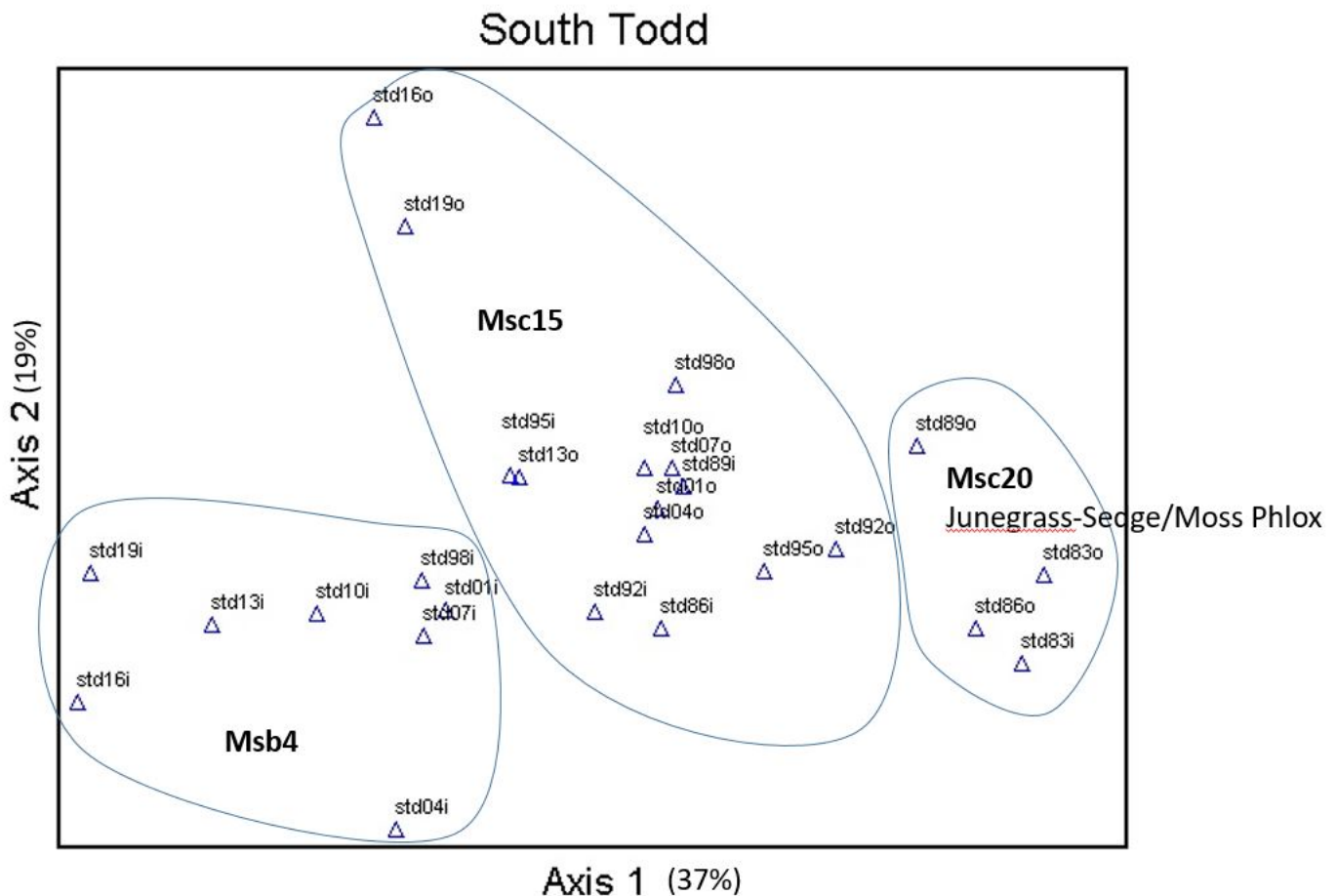
**Msc13: Sedge-Junegrass-Bluebunch wheatgrass/Fringed sage.** Increased grazing pressure on the Bluebunch wheatgrass-Sedge (Msb3) dominated community type will lead to an increase in bare ground, reduced litter, and lower bluebunch wheatgrass cover which is evident in this picture.



## b-Bearberry (submesic/poor) ecological site (pg 261)

The grass and shrub phases within the bearberry ([b] submesic/poor) commonly occur on the hillcrests and upper slope positions of strong south and west facing slopes exposed to sunlight. The soils tend to be shallow Brunisols and weakly developed Chernozems. Regosolic soils may also be common. These slopes generally rapidly shed water, and have high evapotranspiration causing dry grassland conditions. This is indicated by a strong presence of bearberry and/or juniper along with grasses. Rough fescue is the most common grass on these communities, along with Parry oat grass and Idaho fescue.

Outlined in Figures 3,4,5 and 6 are the ordinations of the South Todd, Middle Chimney, Highwood Slope, and South Rock Creek rangeland reference areas with community types grouped by cluster analysis. All of these sites represent the grass and shrub plant communities for the bearberry ecological site and the grassland and shrubland ecological site phases b5 and b7, respectively (Willoughby et al. 2020). The South Todd reference area site represents both grazed and ungrazed transects that have been recorded since 1983. The Middle Chimney Rock reference area represents grazed and ungrazed transects that have been recorded since 1979. In contrast the Highwood Slope and South Rock Creek reference area represents grazed and ungrazed transects that have been recorded since 1953 and 1982, respectively.

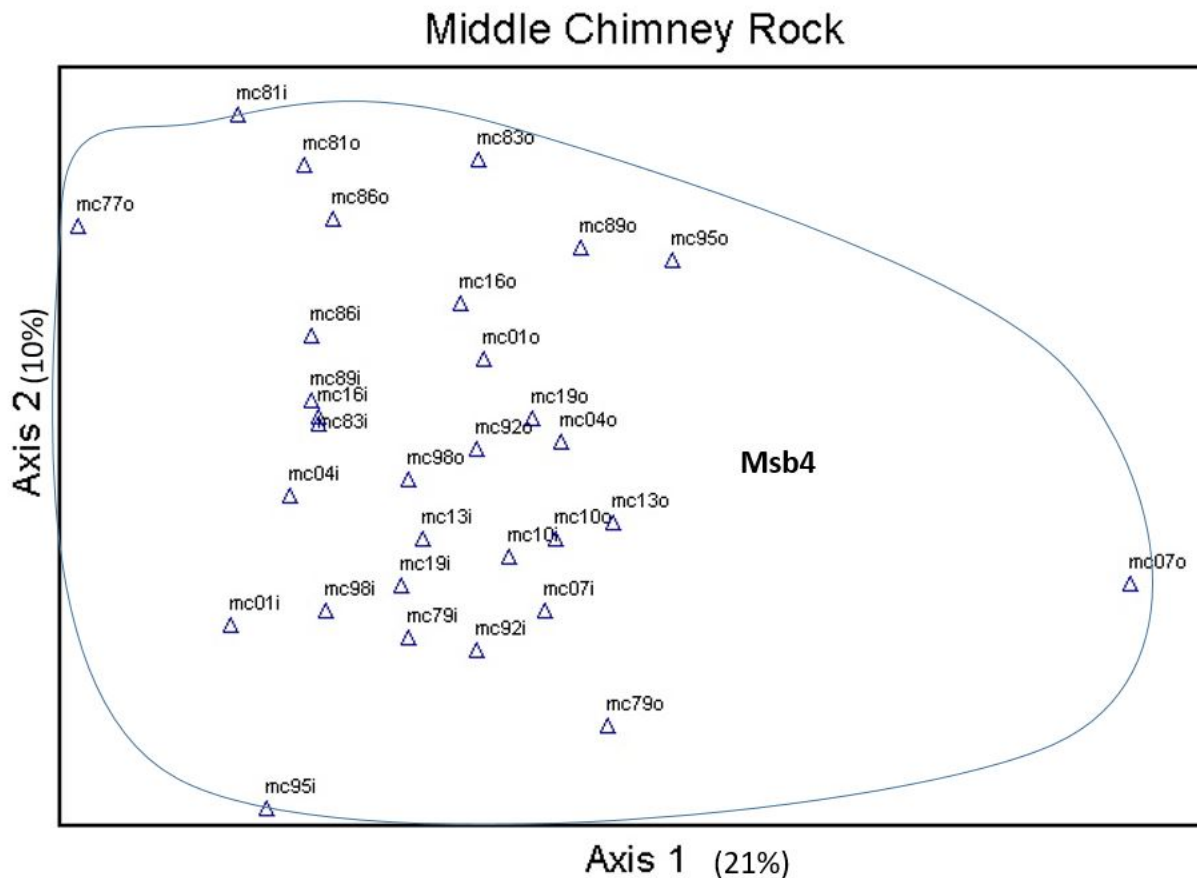


**Figure 3.** Ordination of grazed and ungrazed transects with years grouped by cluster analysis for the South Todd rangeland reference area. (eg std13i where 13=year (2013), (i=In, o=Out) Msb4=Foothills rough fescue/Bearberry-Juniper, Msc15=Bearberry/Little clubmoss/Parry oatgrass-Sedge, Msc20=Junegrass-Sedge/Moss phlox-Fringed sage (Willoughby et al. 2021))

In the ordination of the South Todd reference area the first two axes in the ordination accounted for 37% and 19% of the variation in the species stand table, respectively. When the reference site was first established in 1983 both the grazed and ungrazed transects were dominated by junegrass, sedge and moss phlox plant species to form the Junegrass-Sedge/Moss phlox (Msc20) community type. After 3 years of no grazing

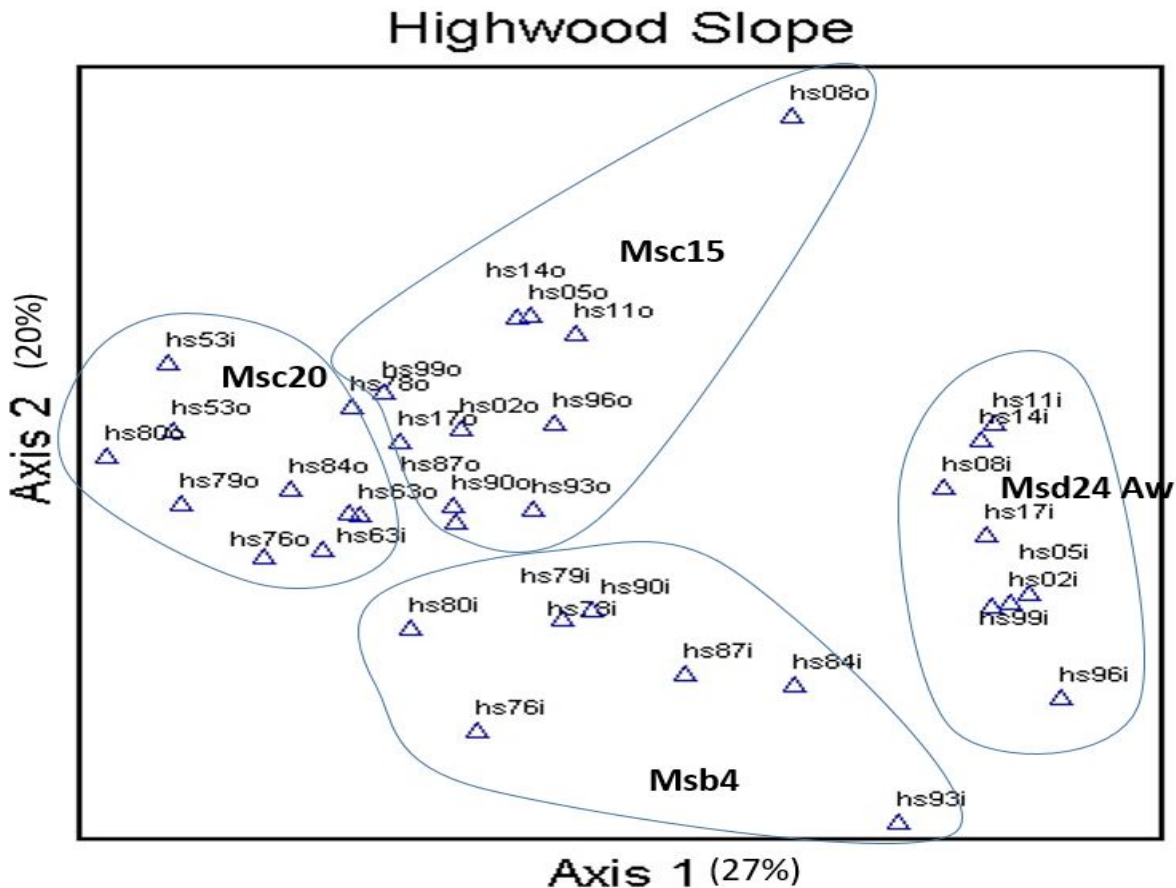


(std86i) there was some recovery of Parry oatgrass and rough fescue to form the Bearberry/Little clubmoss/Parry oatgrass-Sedge (Msc15) community type. However, the grazed outside transect continued to be represented by the junegrass (Msc20) dominated community during the 1980's where 8 of the 10 years had below average precipitation (Willoughby and Alexander 2005). The inside ungrazed transect continued to be dominated by Bearberry/Little clubmoss/Parry oatgrass-Sedge (Msc15) community type until 1995, but since 1998 the inside ungrazed transect has seen an increase in rough fescue, bearberry and juniper cover to form the Foothills rough fescue/Bearberry-Juniper (Msb4) dominated community type. In contrast the grazed transect continues to represent the Bearberry/Little clubmoss/Parry oatgrass-Sedge (Msc15) dominated community type up until the final reading in 2019.



**Figure 4.** Ordination of grazed and ungrazed transects with years grouped by cluster analysis for the Middle Chimney Rock rangeland reference area. (eg mc13i where 13=year (2013), (i=In, o=Out) Msb4=Foothills rough fescue/Bearberry-Juniper(Willoughby et al. 2020)

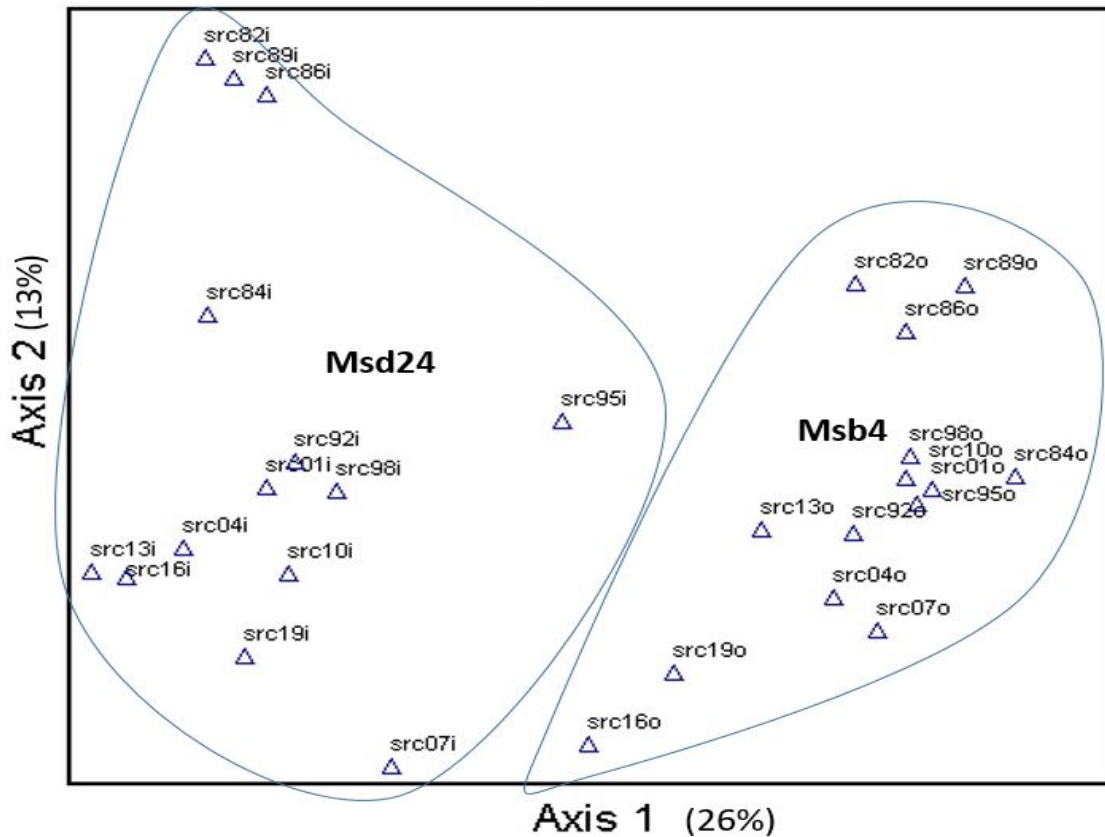
In the ordination of the Middle Chimney Rock reference area the first two axes in the ordination accounted for 21% and 10% of the variation in the species stand table, respectively. There is little difference in species composition between the grazed and ungrazed transects for all years, and the site continues to be dominated by rough fescue, bearberry and juniper on both the grazed and ungrazed transects up until the final year of reading in 2019 and is represented by the Foothills rough fescue/Bearberry-Juniper (Msb4) dominated community type.



**Figure 5.** Ordination of grazed and ungrazed transects with years grouped by cluster analysis for the Highwood Slope rangeland reference area. (eg hs14i where 14=year (2014), (i=In, o=Out) Msb4=Foothills rough fescue/Bearberry-Juniper, Msc20=Junegrass-Sedge/Moss phlox-Fringed sage, Msc15=Bearberry/Little clubmoss/Parry oatgrass-Sedge, Msd24=Saskatoon-Bearberry/Foothills rough fescue(Willoughby et al. 2021)

In the ordination of the Highwood Slope reference area the first two axes in the ordination accounted for 27% and 20% of the variation in the species stand table, respectively. When the reference site was first established in 1953 both the grazed and ungrazed transects were dominated by junegrass, sedge, fringed sage and moss phlox plant species to form the Junegrass-Sedge/Moss phlox-Fringed sage (Msc20) community type. After 26 years of no grazing (hs79i) there was some recovery of rough fescue to form the Foothills rough fescue/Bearberry-Juniper (Msb4) community type. However, the grazed outside transect continued to be represented by the junegrass (Msc20) dominated community to the mid 1980's where 8 of the 10 years had below average precipitation (Willoughby and Alexander 2005). The inside ungrazed transect continued to be dominated by the rough fescue (Msb4) community type until 1993, but since 1996 the inside ungrazed transect has seen an increase in shrub (Saskatoon, snowberry, rose) and tree cover (aspen), to form the Saskatoon-Bearberry/Foothills rough fescue (Msd24) dominated community type. In contrast the grazed transect continues to represent the Bearberry/Little clubmoss/Parry oatgrass-Sedge (Msc15) dominated community type up until the final reading in 2017.

## South Rock Creek



**Figure 6.** Ordination of grazed and ungrazed transects with years grouped by cluster analysis for the South Rock Creek rangeland reference area. (eg src16i where 16=year (2016), (i=In, o=Out) Msb4=Foothills rough fescue/Bearberry-Juniper, Msd24=Saskatoon-Bearberry/Foothills rough fescue (Willoughby et al. 2021))

In the ordination of the South Rock Creek reference area the first two axes in the ordination accounted for 26% and 13% of the variation in the species stand table, respectively. There is little difference in species composition between the grazed and ungrazed transects for all years, but there is a trend for an increase in shrub cover (Saskatoon, shrubby cinquefoil, bearberry) on the ungrazed transect over time. When the site was first established in 1982 bearberry and shrub cover were high (Saskatoon) and overtime have increased to form the Saskatoon-Bearberry/Foothills rough fescue (Msd24) dominated community. However, under continued grazing pressure bearberry and Saskatoon cover are much lower and the site continues to be dominated by grass species to form the Foothills rough fescue/Bearberry-Juniper (Msb4) dominated community type.





**Msb4: Foothills rough fescue/Bearberry-Juniper community type.** This picture was taken on the inside transect at the Middle Chimney Rock reference area and represents plant community Msb4. There is a noticeable decline in shrub and tree cover compared to the lightly to ungrazed Saskatoon-Bearberry/Foothills rough fescue (Msd24) dominated community type.





**Msc15: Bearberry/Little clubmoss/Parry oatgrass-Sedge community type.** Increased grazing pressure on the Foothills rough fescue/Bearberry-Juniper (Msb4) dominated community type will lead to an increase in bare ground, reduced litter, and lower rough fescue cover which is evident in this picture.





**Msd24: Saskatoon-Bearberry/Foothills rough fescue community type.** This picture was taken on the inside transect at the South Rock Creek reference area and represents plant community Msd24. Under light to little grazing disturbance there has been an increase in tree and shrub cover over 20 years compared to the lightly to moderately grazed Foothills rough fescue/Bearberry-Juniper (Msb4) dominated plant community type.





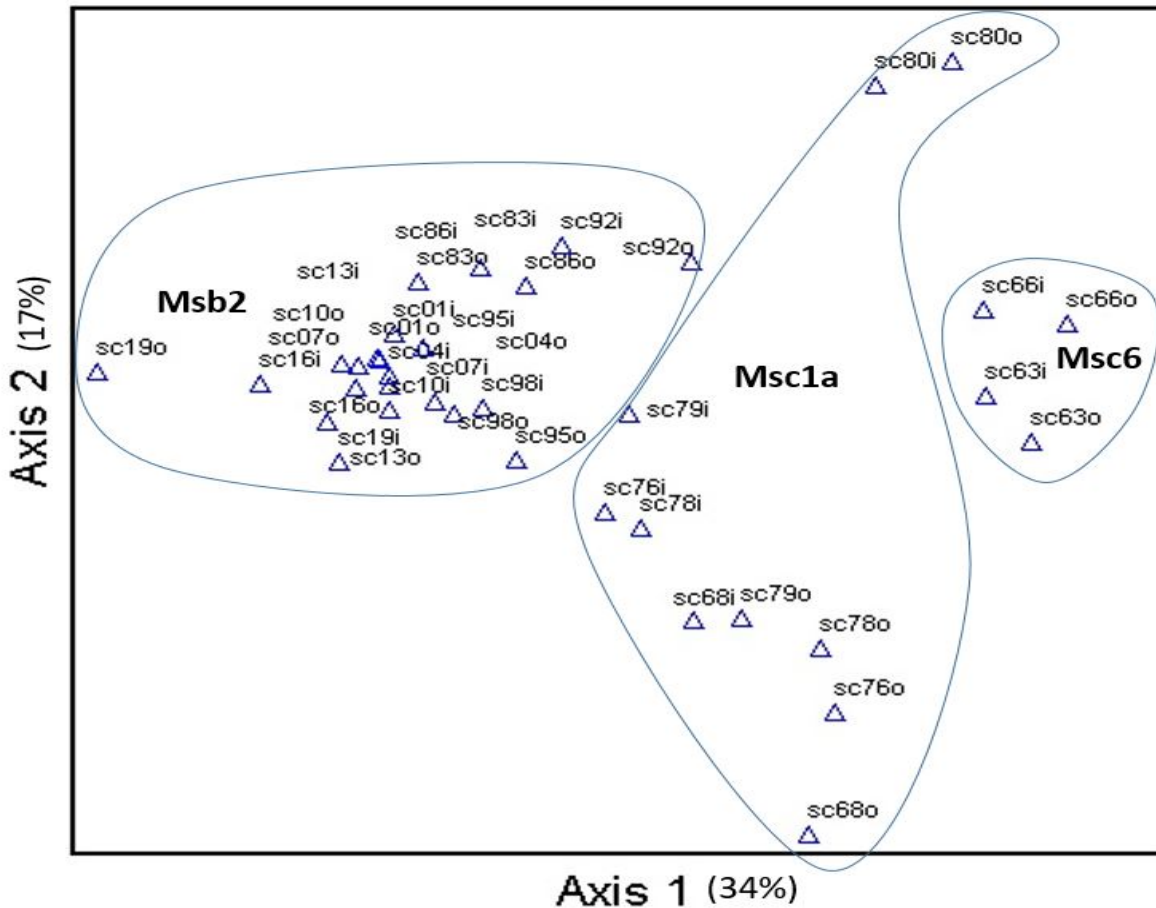
**Msc20: Sedge-Junegrass/Moss phlox-Fringed sage.** Increased grazing pressure and droughty conditions on the Bearberry/Little clubmoss/Parry oatgrass-Sedge (Msc15) dominated community type will lead to an increase in bare ground, reduced litter, and lower rough fescue cover.

### **c-Buffaloberry/Hairy wildrye (submesic/medium) ecological site (pg280)**

The grass and shrub phases in the buffaloberry/hairy wildrye ([c] submesic/medium) ecological site characteristically occur on south and west facing, mid to upper slope positions. Soils are well drained and typically have well developed Melanic Brunisols and Chernozems. Rough fescue is present, however, cover is reduced compared to lower slope sites. Idaho fescue and/or Parry oat grasses typically dominate the reference community types in this ecological site.

Outlined in Figures 7 and 8 are the ordinations of the Spring Creek and North Chimney Rock rangeland reference areas with community types grouped by cluster analysis. All of these sites represent the grass and shrub plant communities for the buffaloberry/hairy wildrye ecological site and the grassland and shrubland ecological site phase c5 and c7, respectively (Willoughby et al. 2020). The Spring Creek reference area site represents both grazed and ungrazed transects that have been recorded since 1963 and the North Chimney Rock reference area represents grazed and ungrazed transects that have been recorded since 1977.

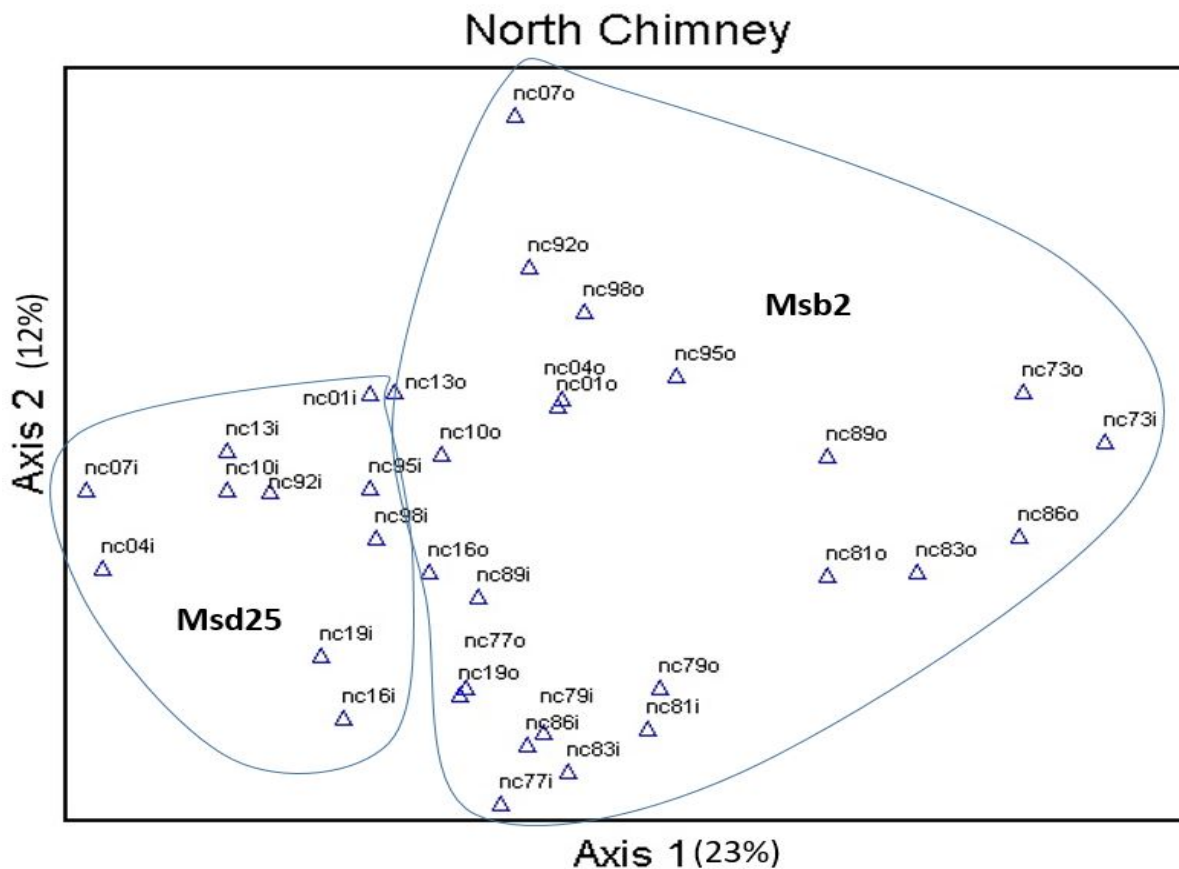
## Spring Creek



**Figure 7.** Ordination of grazed and ungrazed transects with years grouped by cluster analysis for the Spring Creek rangeland reference area. (eg sc13i where 13=year (2013), (i=In, o=Out) Msb2=Parry oatgrass-Foothills rough fescue-Idaho fescue, Msc1a=Sedge-Parry oatgrass-Foothills rough fescue, Msc6=Sedge-Idaho fescue/Little clubmoss (Willoughby et al. 2021))

In the ordination of the South Todd reference area the first two axes in the ordination accounted for 34% and 17% of the variation in the species stand table, respectively. When the reference site was first established in 1963 both the grazed and ungrazed transects were dominated by junegrass, Idaho fescue, sedge and little clubmoss plant species to form the Sedge-Idaho fescue/Little clubmoss (Msc6) community type. After 2 years of no grazing and reduced grazing pressure there was some recovery of Parry oatgrass and rough fescue to form the Sedge-Parry oatgrass-Foothills rough fescue (Msc1a) community type. Continued light grazing and no grazing since 1992 has allowed both the grazed and ungrazed transects to further recover and the site is now dominated by Parry oatgrass, foothills rough fescue and Idaho fescue species to form the Parry oatgrass-Foothills rough fescue-Idaho fescue (Msb2) dominated community type.





**Figure 8.** Ordination of grazed and ungrazed transects with years grouped by cluster analysis for the North Chimney rangeland reference area. (eg nc16i where 16=year (2016), (i=In, o=Out) Msb2=Parry oatgrass-Foothills rough fescue-Idaho fescue, Msd25=Rose/Parry oatgrass-Foothills rough fescue (Willoughby et al. 2021))

In the ordination of the North Chimney reference area the first two axes in the ordination accounted for 23% and 13% of the variation in the species stand table, respectively. There is little difference in species composition between the grazed and ungrazed transects for all years, but there is a trend for an increase in shrub cover (Saskatoon, shrubby cinquefoil, rose) on the ungrazed transect over time. When the site was first established in 1973 the ungrazed transect was dominated by grass species and was represented by the Msb2 community type. This community type continued to represent the ungrazed transect until 1989. Since 1989 shrub cover (rose, snowberry, shrubby cinquefoil) has increased to form the Rose/Parry oatgrass-Foothills rough fescue (Msd25) dominated community. However, under continued grazing pressure since 1973 grass species continue to dominate the outside grazed transect to form the Parry oatgrass-Foothills rough fescue-Idaho fescue (Msb2) dominated community. This community has continued to dominate the outside grazed transect up until the final reading in 2019.



**Msb2: Parry oatgrass-Foothills rough fescue-Idaho fescue community type.** This picture was taken on the inside transect at the Spring Creek reference area and represents plant community Msb2. There is a noticeable decline in shrub and tree cover compared to the lightly to ungrazed Rose/Parry oatgrass-Foothills rough fescue (Msd25) dominated community type and there is a noticeable decline in rough fescue cover compared to the outside grazed transect at Spring Creek.





**Msc1a: Parry oatgrass-Sedge-Foothills rough fescue.** Increased grazing pressure on the Parry oatgrass-Foothills rough fescue-Idaho fescue (Msb2) dominated community type will lead to a decline in rough fescue cover and an increase in sedge cover. Continued heavy grazing will eventually lead to decline in litter cover, an increase in bare ground and the site will become dominated by sedge, junegrass, little clubmoss and fringed sage.





**Msd25: Rose/Parry oatgrass-Foothills rough fescue community type.** This picture was taken on the inside transect at the North Chimney Rock reference area and represents plant community Msd25. Under light to little grazing disturbance there has been an increase in tree and shrub cover over 20 years compared to the lightly to moderately grazed Parry oatgrass-Foothills rough fescue-Idaho fescue (Msb2) dominated plant community type.

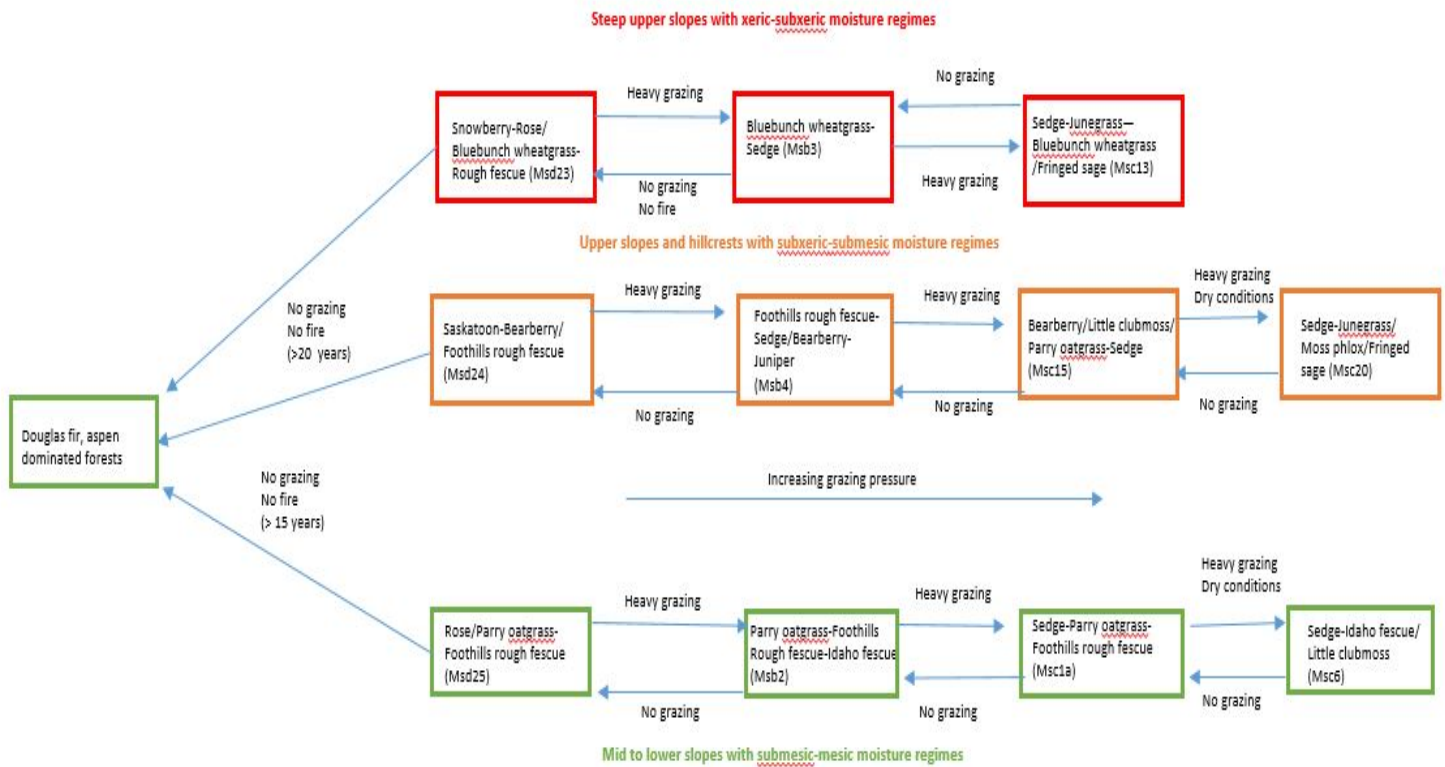
## Discussion

The successional sequences of the various grass and shrub dominated community types on south and west facing slopes in the Montane subregion are outlined in Figure 9. On dry, steep, upper slope positions with xeric to subxeric moisture regimes increased grazing pressure on a Bluebunch wheatgrass-Sedge (Msb3) dominated community type leads to a decline bluebunch wheatgrass grass cover to form the Sedge-Junegrass-Bluebunch wheatgrass/Fringed sage (Msc13) dominated community type. Protection from grazing over 10-15 years on these grazed communities allows bluebunch wheatgrass to recover. However, continued protection from grazing on the Msb3 community type increases moisture conditions from a litter buildup and snow catchment allowing shrubs to encroach to form the Snowberry-Rose/Bluebunch wheatgrass-Foothills rough fescue community type (Msd23).

On upper slope positions and hillcrests, with submesic to subxeric moisture regimes the Foothills rough fescue/Bearberry-Juniper (Msb4) appears to be the reference community type under a light disturbance regime. However, increased grazing pressure on this community leads to a community type that resembles Msc15 and continued heavy grazing and droughty conditions appears to lead to the development of plant community Msc20 (Figure 9).



On more submesic to mesic midslope positions increased grazing pressure on a Parry oatgrass-Foothills rough fescue-Idaho fescue (Msb2) dominated community type leads to a decline in Parry oatgrss and rough fescue cover to form the Sedge-Parry oatgrass-Foothills rough fescue (Msc1a) dominated community type. Continued heavy grazing and droughty conditions leads to a decline in all native grass species and the site becomes dominated by sedge, little clubmoss, moss phlox and fringed sage to form the Sedge-Junegrass/Moss phlox-Fringed sage (Msc6) dominated community type. Continued protection from grazing on the Msb2 community type increases moisture conditions from a litter build up allowing shrubs to encroach to form the Rose/Parry oatgrass-Foothills rough fescue (Msd25) community type. It would appear that continued lack of fire, grazing disturbance and droughty conditions will eventually lead to the encroachment of trees onto these grasslands. The time frame for complete tree encroachment appears to be 20-30+ years.



**Figure 9.** Successional sequences of the grass and shrubland plant communities on south and west facing slopes in the Montane subregion.

Continued understanding of the successional relationships and the ecological diversity of the grass and shrub community types on south and west facing slopes of the southern ecoregion of the Montane subregion will assist in developing management schemes that will ensure that the productivity and diversity of these resources are sustainable.

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