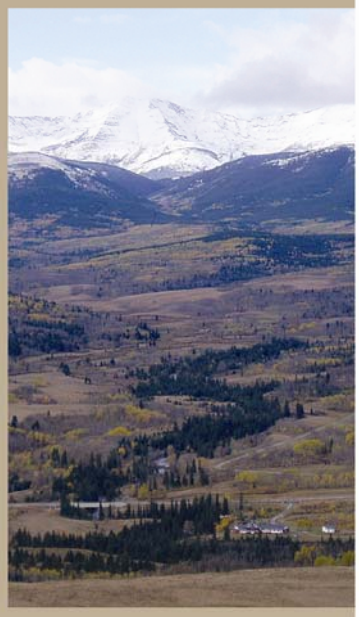
Range Plant Communities and Range Health Assessment Guidelines for the

Foothills Parkland Natural Subregion of Alberta

Foothills Parkland

Range Plant Community Guide

Alberta Government

Pub. No. T/274
ISBN No. 978-1-4601-3606-7 (Printed Edition)
ISBN No. 978-1-4601-3607-4 (On-line Edition)

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http://srd.alberta.ca/LandsForests/GrazingRangeManagement/RangePlantCommunityGuidesStockingRates.asp

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First approximation

Pub. No. T/274

2012

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Acknowledgements

We wish to acknowledge past and current AESRD agrologists working in the Foothills Parkland for the data and knowledge that they have collected or guided collection of. This information is the basis of this plant community guide. We would particularly like to single out John Carscallen, Varge Craig, Brian Olson, and Richard Ehlert for their efforts, insight and leadership with regards to developing the Foothills Parkland guide.

The development of this guide has been made possible through a large and growing body of high quality vegetation plot data collected by the Rocky Mountain Forest Range Association, Rangeland Resource Management Program staff, and a number of rangeland consultants working for the department including Al Robertson and Clare and Kathy Tannas. This guide would not have been possible without this data and the time and care that were taken to ensure its high quality.

Executive Summary

The Foothills Parkland subregion occupies a small discontinuous belt along the eastern edge of the foothills from northeast of Calgary to the north end of the Porcupine Hills and south of Pincher Creek to the U.S. border. At an elevation range from 1025 to 1400m, it is the highest subregion within the Parkland natural region. Adjacent subregions are the Central Parkland and Lower Foothills to the north, the Montane to the south and west, and the Foothills Fescue to the east.

The species diversity in this subregion is high due to the rapid changes in topography and climate going from east to west. This ecological diversity results in a landscape mosaic of different vegetative communities. Three vegetation types are considered representative: foothills rough fescue grasslands, beaked willow shrublands, and aspen groves. Although much of the undisturbed landscape is covered by aspen today, the soils are predominately Chernozemic under all but the wettest shrublands and meadows.

The lands of the Foothills Parkland provide a multitude of ecological goods and services including important watersheds, wildlife habitat, biodiversity, and aesthetics. These lands are also highly valued by society as rangelands for livestock, for their rich subsurface oil, gas and mineral deposits, and for the recreation opportunities they provide. However, despite the importance of the area and the complexity of the interactions of these multiple interests there is little information available for the plant communities that occur within the subregion.

This guide is the first effort to classify and describe rangeland plant communities in the Foothills Parkland. Along with describing the boundaries that make up a plant community, other information provided includes: productivity, livestock carrying capacity, and plant community succession with and without disturbances including grazing. This information can be utilized to help with the management of the multiple uses on this landscape, as well as provide a basis for rangeland health assessments; a measure of the functioning condition of the rangelands.

This guide represents the analysis of 285 plots described in the Foothills Parkland subregion. These plots represent 55 community types. These types are split into:

A. Native grasslands 9 types
B. Disturbed grasslands 6 types
C. Native shrublands 16 types
D. Deciduous 10 types
E. Mixedwood 5 types
F. Conifer 8 types
G. Cutblocks 1 type

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1.0 Introduction

The province of Alberta is covered by a broad spectrum of vegetation regions. These range from the prairie grasslands in the southeast, to windswept alpine meadows and Montane forests in the southwest Rocky Mountains, to forest and wetlands mosaics in the north. These broad vegetation regions have been classified into 6 natural regions and 20 natural subregions for the province (Natural Regions Committee 2006). The natural subregions are defined by grouping areas with similar landscape and climatic features. Each subregion has unique qualities that are valuable to both natural systems and human activities. Naturally vegetated communities within these subregions provide a wide variety of ecological goods and services and natural resource values. These include productive watersheds, rangelands that are used by wildlife and livestock, wood fibre, oil, gas, and mineral resources, aesthetics, and recreational opportunities.

In order to ensure sustainable management of these resources throughout Alberta, the potentials and constraints of the landscape needed to be quantified. Initiatives have been undertaken to develop classification systems within the subregions to further subdivide the landscape into more manageable areas. Examples of these classification systems include "Field guide to Forest ecosystems of West Central Alberta" (Corns and Annas 1986) and "Field Guide to Ecosites of Southwestern Alberta" (Archibald et al. 1996). This Foothills Parkland guide is a continuation of these initiatives.

To create the basis for classification within a subregion, commonalities and patterns across the landscape must first be ascertained in order to group areas with similar vegetation types together. This is accomplished through a hierarchal system, where first the landscape is grouped on similar physical properties, and then further narrowed into common plant communities. Once defined, the characteristics and production potential of the community can be described, and then succession as well as responses to natural and unnatural disturbances can be studied and documented.

Historic livestock grazing management policy on public lands did not allow for the variability in production, successional rebound, and habitat quality between communities. Traditionally, all vegetation within the Foothills Parkland was usually rated at 32 acres / head / year regardless of its community type (Carscallen and Craig 2011, Pers. Comm.). Recent work has shown that productivity and the ability for a community to recover from disturbance can vary significantly depending upon the ecological conditions of the site (Willoughby et al. 2008, Adams et al. 2003).

The purpose of this guide is to create a framework to classify the vegetative community types in the Foothills Parkland natural subregion. The ultimate goal is a classification system that can be used by the field staff to assess carrying capacity of management areas and also to provide baseline communities to evaluate rangeland health on lands within the subregion. The classification hierarchy for this guide is based on the aforementioned Ecosite Field Guides (Corns and Annas 1986, Archibald et al. 1996). However, neither of these guides contains information on the Foothills Parkland, therefore similarities had

to be drawn from the neighbouring Montane subregion. Information in the Foothills Fescue guide was also drawn upon to help complete the community descriptions.

2.0 Physiography, Climate, Soils and Vegetation Relationships of the Foothills Parkland

2.1 Overview

The Parkland natural region in Alberta represents the transition between prairie grasslands in the southeast and the boreal and montane forests in the north and west portions of the province (Natural Regions Committee 2006). The Foothills Parkland natural subregion represents the western and southern portions of this natural region. It occupies a relatively small disconnected area along the eastern edge of the foothills from northwest of Calgary to the north end of the Porcupine Hills (figure 1). There is another small portion in the south near the Alberta – Montana border. It is surrounded by the Montane subregion to the south and west, by the Foothills Fescue to the east and the Central Parkland and Lower Foothills to the north.

The Foothills Parkland subregion is comprised of a rolling and hilly landscape. The geology of the slopes are characterized by non-marine sandstones, mudstones and shales that underlie moderately fine, weakly calcareous till. Ice-contact glaciolacustrine sediments also occur across about 20 percent of the subregion mainly in lower valley positions. (Natural Regions Committee 2006)

The subregion has the highest elevations (1025 m to 1400 m) of all the subregions in the Parkland natural region, which results in cooler summers and shorter growing seasons. However, this area also experiences warmer winters and more precipitation than other Parkland subregions. Yearly precipitation averages over 500mm (391 – 1020) of which a substantial portion occurs in May, June, and July (Natural Regions Committee 2006). The mean annual temperature for the Foothills Parkland is 3 degrees, and growing degree day's average 1158 (924 – 1344) (Natural Regions Committee 2006). All of these values fall between the averages for the Foothills Fescue and Montane subregions. The increase of moisture and cooler temperatures over the predominantly grassland Foothills Fescue decreases moisture stress and begins to favour the growth of woody vegetative species such as willow and aspen. It also is warmer / and less moist than the primarily forested areas in the Montane, indicating a transitional nature of the Foothills Parkland between forests and grasslands.

The shorter cooler summers in the Foothills Parkland are not conducive to intensive agriculture such as annual cropping. Hay or feed crops are the most dominant crop types, but extensive agriculture practices are far more common. Over sixty percent of the subregion is either native rangelands or tame pasture (Natural Regions Committee 2006). Other common land uses for this area are settlement, oil and gas exploration and development, as well as recreational pursuits such as hunting and camping.

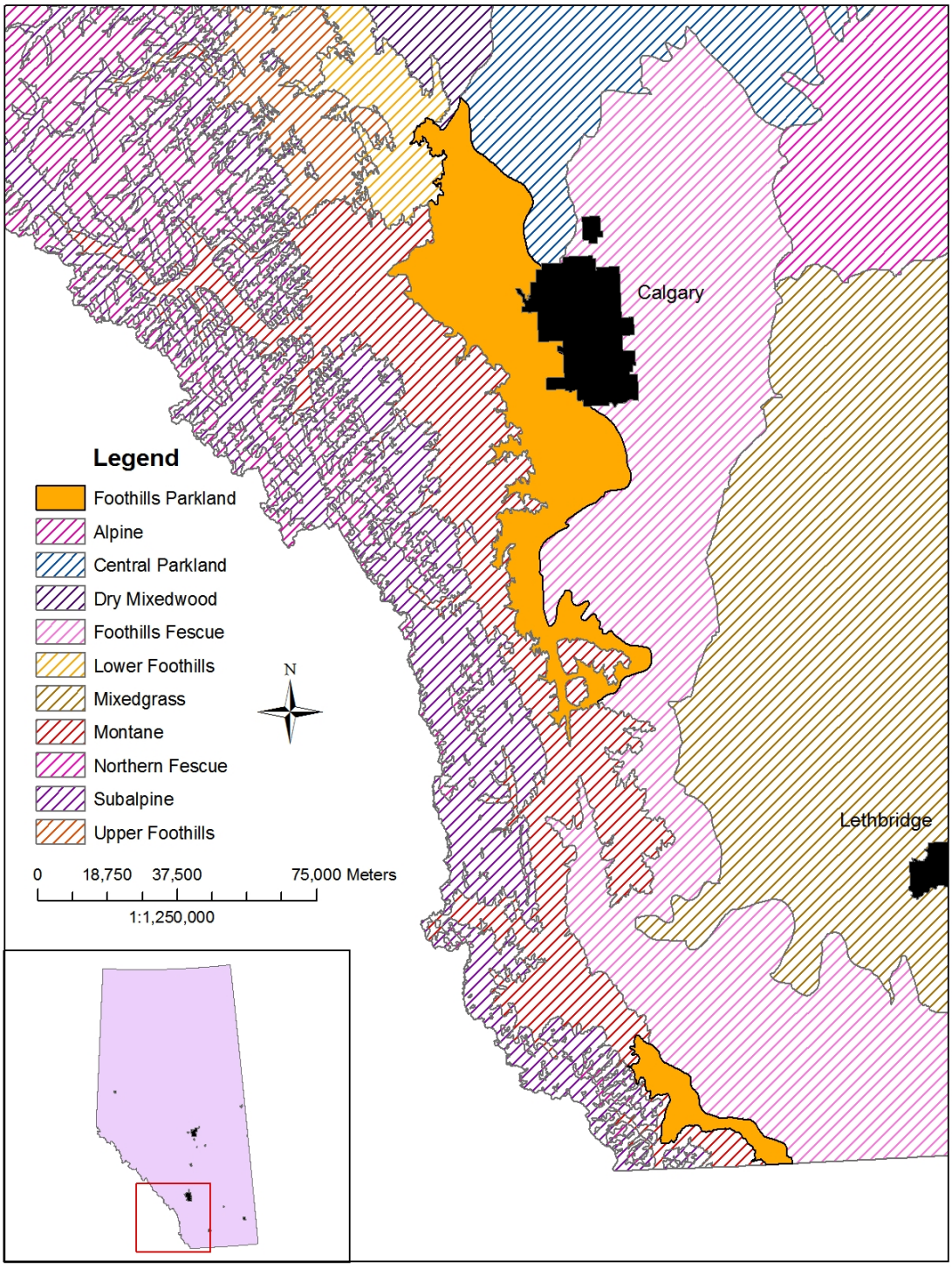


Figure 1. Location of the Foothills Parkland natural subregion in Alberta and its relationship to other subregions.

Native vegetation in the Foothills Parkland is categorized into three major divisions: rough fescue grasslands, willow shrublands and aspen woodlands (Natural Regions Committee 2006). Foothills rough fescue grasslands occur throughout the landscape on a variety of slopes and aspects, although dominate on southerly facing slopes. Soils under these grasslands are typically Deep Orthic Black Chernozems (Natural Regions Committee 2006). Deciduous forests occur on moist northerly and easterly slopes, low lying areas and seepage zones with moderately well drained soils. These forests are usually aspen dominated, but can have balsam poplar when moisture is greater. Lastly, shrublands made up of beaked willow groves occur on the low lying areas and seepage zones where the soils are moderately to imperfectly drained. Soils for both the aspen forests and willow grovelands are typically Orthic Dark Gray Chernozems, unless very wet, where the soils become Gleysols.

2.2 Vegetation Relationships Across the Landscape

There has been considerable research completed in the Aspen (Central) Parkland natural subregion regarding aspen succession and the factors that affect it. Although the following discussion references are specific to the Aspen Parkland, it has been extrapolated to include the Parkland natural region as a whole.

The higher amount of moisture and cooler temperatures of the Parkland natural region is considered more suitable for forest growth than the neighbouring Grassland natural region, although less so than in the neighbouring Rocky Mountain natural region. This creates a landscape that can be suitable for both forests and grassland, but many areas that are marginal for both (Alexander 1995). The basis for how vegetation is distributed on the landscape is driven by microclimatic conditions created by slope, aspect, and slope position (Alexander 1995) and succession becomes a key process that drives an ever changing landscape. Under suitable conditions, grasslands can be encroached onto by neighbouring aspen or willow stands. Once an over-story is established, much slower growing coniferous trees can utilize the shaded conditions. Succession this far advanced is quite rare in the Foothills Parkland because the amount of time necessary for this to occur is longer than any historical disturbance regime.

There are a number of biological and physical factors that influence successional trends. These factors although part of the natural system can either slow or set back the succession process, or even change the successional pathway for a site. These work simultaneously and are interconnected to influence one another. Although there are many others, the three major factors are climatic cycles, fire, and herbivory.

Climatic cycles are large scale temporal changes that affect year to year growing conditions. During wetter than average seasons, the water tables will become closer to ground and seepage areas will expand. Cooler / wetter periods favour the growth of shrubs and trees over grassland species. During drier / warmer seasons, these seepage areas will dry up; lessening the advantage of woody plants, and provide potential for grasslands to expand.

Fire, both natural and man made, is another factor that has had a significant role in influencing the plant community distribution in the Foothills Parkland. There is much evidence that prior to European settlement, fire played a significant role in controlling the amount of woody vegetation on the landscape in the Parkland natural region (Alexander 1995). Aspen trees are considered susceptible to fire; however following a burn that causes mortality of the stems above ground, the aspen root systems sprouts quickly through suckering to regenerate the site. The ability of a root system to successfully produce suckers following a fire depends on the health of the stand and roots prior to fire disturbance and other ecological and environments stresses that may be present (Alexander 1995).

Herbivory is a factor, which coupled along with fire and climatic cycles, has had a major influence on the vegetation in the Foothills Parkland. Prior to European settlement, an estimated 40 to 60 million bison utilized the North American Great Plains (England and DeVos 1968). The herds located in western Canada utilized the fescue grasslands and Aspen Parkland as their fall and winter ranges (Morgan 1980). Herds were much more sedentary in the winter and herds increased in size to utilize the productive forage available on the sheltered grasslands of the Parkland, and the aspen groves for shelter (Morgan 1980). During this time bison browsed aspen shoots, wallowed and trampled on the grasslands, and toppled mature aspen trees by rubbing (Campbell et al. 1994). After the heavy use in the winter, the herds migrated in the spring onto the early growing grasses in the Mixed Grass subregion, allowing the winter range to recover (Morgan 1980). Grassland species recovered more readily than the woody species, thus reducing the forest and shrub cover. Fire was also part of the disturbance regime on the landscape and would have killed trees but promoted aspen suckering. Bison activity however, would have suppressed these new shoots, keeping aspen growth in check and maintaining the important fall and winter grasslands (Campbell et al. 1994).

Since European settlement, eradication of free ranging bison, and a policy of fire exclusion have led to an overall increase of woody species on the landscape in the Parkland natural region (Alexander 1995, Campbell et al. 1994). Soils are a good indicator of this in the Foothills Parkland subregion. Most aspen and willow stands within the Foothills Parkland are over Chernozemic soils (Natural Regions Committee 2006). These soils were developed under grassland vegetation where organic matter was added to the Ah horizon from grass roots. Once under aspen forests, the Ah horizon of these Black Chernozems exhibits some graying as early as 50 years after encroachment (Alexander 1995).

3.0 Rangeland Ecological Classification

3.1 History of Range Plant Community Classification Techniques

The system used in this guide for classifying range plant communities has evolved over the years. Initially a community type approach (Mueggler 1988) to classification was chosen in preference to the habitat type approach (Daubenmire 1952) or ecosystem association approach (Corns and Annas 1986) because of the lack of understanding of the successional sequences of the communities. With Mueggler's (1988) approach,

community types are aggregates of similar plant communities based upon existing floristic characteristics regardless of successional status. However, as range health and proper functioning condition of an ecological range site evolved scientifically a need arose to organize the various plant communities successionally within an ecological site. The ecosystem classification system developed by Corns and Annas (1986) and Beckingham et al. (1996) fit well with the ecological site concept defined for rangelands. Consequently, the ecological classification hierarchy (ecosite, ecosite phase, plant community) was adopted for rangeland classifications. However, slightly different terminology was used in an effort to link this classification system with historic rangeland classification systems. For example, ecosite has been renamed to ecological site. Plant community successional information has been included when available to help determine rangeland health and ecological site description parameters. Figure 2 is a Montane subregion example of how the original classification system has been developed for rangeland classification purposes.

3.2 Current Plant Community Classification Methods

This guide outlines the classification of 285 plots described within the Foothills Parkland Natural Subregion. The procedure for inventory of a plot followed the Range Survey Manual (2007) and uses the MF5 form. For forests, a plot consists of one central 10x10m macroplot to record overstory and shrubs >2.5m, ten 1x1 m microplots to record the canopy cover of shrubs <2.5m, and ten 50x50 cm microplots nested within the 1x1m plots to record the canopy cover of forbs and grass. For grasslands, a plot consists of ten 1x1 m microplots to record shrubs, and ten 20x50 cm microplots nested within these to record forbs and grasses.

The data for each site was analyzed using two multivariate analysis techniques of classification: cluster analysis and ordination.

Cluster analysis was performed in SAS and Euclidean distance was used as the Cluster Distance Measure. Ward's method was used in the Group Linkage Method. Classification in this case is the assignment of samples to classes or groups based on the similarity of vegetative species. A Polythetic Agglomerative approach was used to group the samples. This technique assigns each sample 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 samples (Gauch 1982).

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). DECORANA detrends and rescales the axes thereby reducing the arching and compression of axes problems associated with other ordination techniques (Reciprocal averaging, Principle Components Analysis). Once final groupings were determined on the ordination specific environmental variables were be assigned to the variation outlined on the ordination axes.

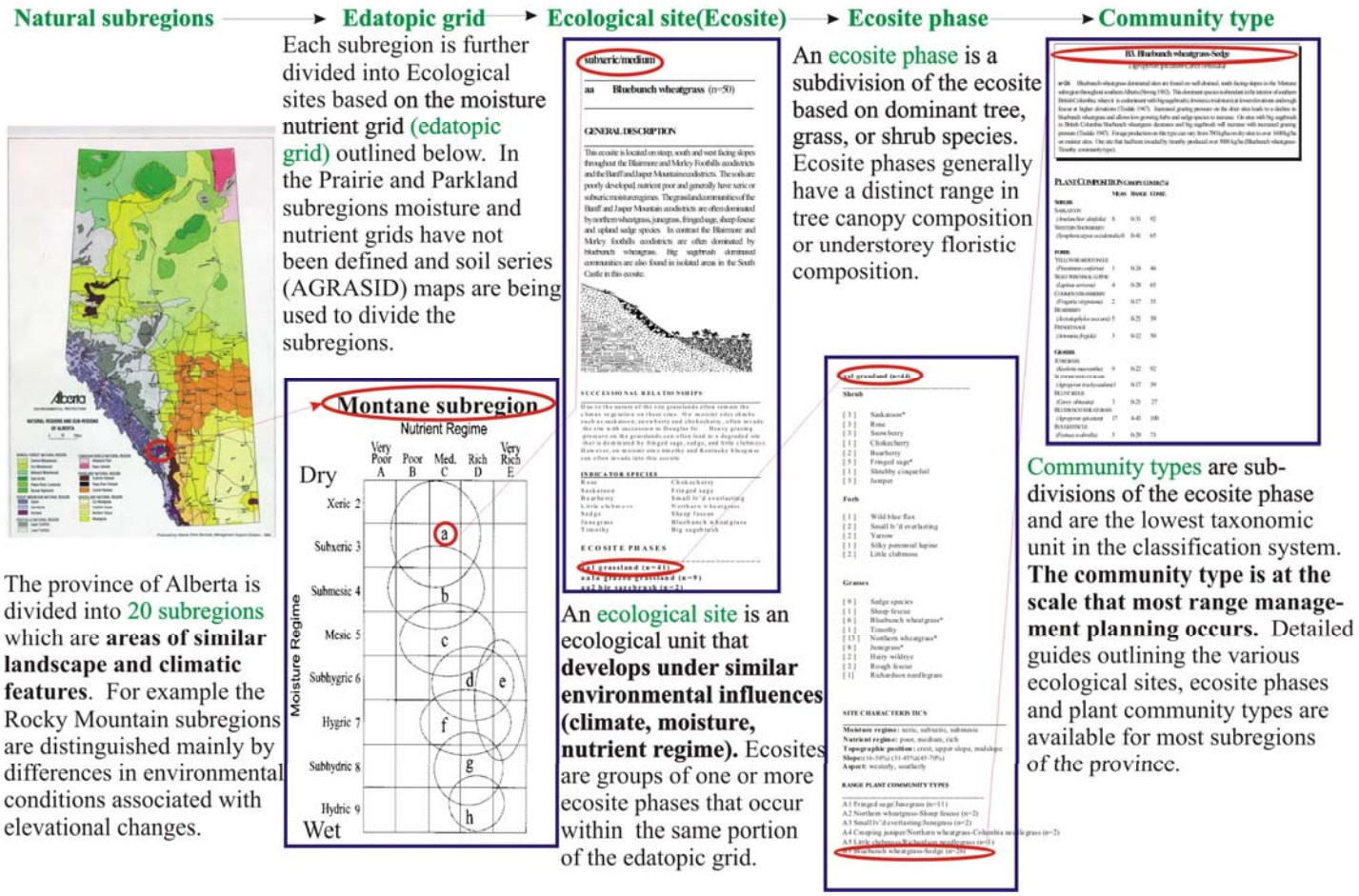


Figure 2. Example of ecological classification hierarchy used in the Alberta

The groupings generated in cluster analysis were overlain on the ordination to determine final groupings. From these plant communities were determined. Plant community plant species descriptions were then generated by averaging plant species composition, range in composition, and percent constancy of occurrence among groups of vegetation inventory plots which were part of a community type. Environmental data was subsequently sorted into the same plant community groupings to create the plant community descriptions outlined in this guide.

3.3 Results from Foothills Parkland Classification

285 plots were analyzed for this guidebook. These plots were first organized by major vegetation type or successional stage, and then analyzed by the methodologies outlined. In total 55 community types have been described within 7 categories.

A. Native grasslands 9 types
B. Disturbed grasslands 6 types
C. Native shrublands 16 types
D. Deciduous types 10 types
E. Mixedwood types 5 types
F. Conifer types 8 types
G. Cutblocks 1 type

- Data for these plant communities were derived from historical data sets from both the Southwest and Prairies data sources. Also, a gap analysis was completed in 2007 to represent common communities brought forward by agrologists that were not yet described.

- Boundary changes to the subregions occurred in 2006 (Natural Regions Committee 2006) that omitted some plots from the Foothills Parkland.

- All vegetation and site information for plant communities were updated according to their corresponding plots. This included: common plant species, canopy cover, environmental conditions, response to grazing, forage production and carrying capacity.

4.0 Using This Guide to Classify a Site

Rangeland classification in Alberta currently uses two ecological classification methods to determine ecological sites and plant communities. In the agricultural settlement area of the province, managers can determine site soil descriptions using AGRASID (Agricultural Region of Alberta Soil Inventory Database) (Brierley et al. 2001). This description and the site's specific environmental and vegetation conditions are used within a hierarchal classification to determine plant community (e.g. subregion, range site, ecological range site, plant community). 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, ecological site, ecosite phase, plant community) (Strong and Thompson 1995).

This guide utilizes the latter system, and is an expansion of the "Ecosites of Southwestern Alberta" guide book (Archibald et al. 1996). The basis of the edatopic grid and the forested community types within this guide are closely related by ecological site and ecosite phase to those found in the in the "Range Plant Community Types and Carrying Capacity for the Montane Subregion" (Willoughby et al. 2008). The grasslands are developed similarly but have influences from the Grassland natural region. The Foothills Fescue subregion shares boundaries with the Foothills Parkland and the plant communities within the "Rangeland Plant Communities and Range Health Assessment Guidelines for the Foothills Fescue Natural Subregion of Alberta" (Adams et al. 2003) may provide helpful insight. It is recommended that the reader has access to all the relevant information in these guides.

The approach for classification in this guide is hierarchal; **to classify a plot to a specific plant community within the Foothills Parkland, first the ecological site and then ecosite phase must be ascertained. Finally a plant community can be chosen from those available for that ecosite phase.**

4.1 Guidelines for Determining Ecological Sites

An ecological site is similar to the concept of range site, but a broader list of environmental characteristics is described. 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". Ecological sites are defined areas of similar climate, moisture and nutrient regimes. The combination of moisture and nutrient regimes can be represented on a grid called the edatopic grid.

The edatopic grid is a two-dimensional table with soil moisture regime on one axis and soil nutrient regime on the other. Soil moisture regime (SMR) is defined as the average amount of soil water available annually for evapotranspiration by vascular plants (Meidinger and Pojar 1991). This moisture regime assumes that precipitation and temperature within a subregion are relatively constant, so the variation in soil moisture is

from the redistribution of precipitation through edaphic factors (Alberta Forestry, Lands and Wildlife 1994). 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 a relative scale that signifies the soil's available nutrient supply to plant growth. The emphasis of these measures is on soil pH and exchangeable cations: Ca, Mg, Na, and K (Alberta Forestry, Lands and Wildlife 1994). 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.

The unique range of a moisture and nutrient combination describes conditions for a particular ecological site within a subregion. For example; a subxeric, poor nutrient regime site is characterized by the [a bearberry (submesic/poor)] ecological site in the Foothills Parkland. These ranges are represented as circles on the edatopic grid and are suggestions for particular boundaries of ecological sites. To recognize that there are transitions from one ecological site to another, the circles are not mutually exclusive. Different ecological sites may share the same location on the grid as one is in transition to another.

There are many physical and biological indicators the can help choose the correct ecological site. For soil moisture determination a combination of environmental factors, soil properties, and indicator species can be used. For nutrients; knowledge of parent materials, soil organic layers, free water, and soil pH are useful (Alberta Forestry, Lands and Wildlife 1994). Ascertaining slope gradient, aspect and slope position can be most useful in placing a site onto the edatopic grid. Slope diagrams are available throughout this guide to provide this information. Also indicator species have been described. Indicator species are species with narrow ecological requirements whose presence or absence provides insight to the available moisture and nutrients[1]. Lastly, AGRASID (Brierley et al. 2001) can be a useful tool. This database provides soils information at a 1:100,000 scale. The entire Foothills Parkland is currently described by AGRASID polygons.

The edatopic grid for the Foothills Parkland is described in figure 3. This grid represents the ecological characteristic groupings of the 285 plots sampled for this report. The current range of ecological site is from submesic / poor to subhygric / rich. As convention dictates, the driest is labelled as 'a' the wettest as 'h'. The most common indicator species that represents that ecological site is also tied to the name (e.g. [a bearberry (submesic/poor)]).

4.2 Guidelines for Determining Ecosite Phases

Ecosite phase is the next level of detail within the hierarchal classification. A phase in an ecological site represents the dominant layer of vegetation that is currently being expressed, and is commonly named as that layer's dominant one to three species. For example spruce or spruce – lodgepole pine - aspen are two ecosite phases in the [b hairy wildrye] ecological site.

[1] Indicator species for each ecological site are listed on the ecological site descriptions pages in Section 5.

Phases within an ecological site generally indicate broad stages of long term succession in the absence of disturbance. For instance, an ecological site may have an early grassland phase, followed by the establishment of aspen. Coniferous trees then grow within aspen phase, producing a mixed wood, and then finally a climax coniferous stage. Phases usually have a distinct range in tree canopy and understory composition that narrows the production and successional pathways of that site.

Phases are typically named by a numerical extension of the ecological site. For example; if there are 5 phases in ecological site 'a', they are listed as 'a1', 'a2'…'a5'. The life form or specie(s) in the dominant layer is also listed (e.g. [a1 bearberry Pl]).

4.3 Guidelines for Determining Plant Community

Plant communities are the final subdivision of the classification hierarchy. Table 1 organizes all the plant communities represented in this guide according within their ecosite phase and ecological site. With the ecosite phase known, the plant community that most closely fits the plot characteristics can then be chosen. Grazing or disturbance can be incorporated by choosing a community in the successional plant community types. All plant communities have suggested ranges for species within a plant community derived from the plot analysis, but should not be considered rigid boundaries. These species lists were developed with special emphasis given to species that are considered indicators of that plant community because of their frequency within the ordinations. Less emphasis was given to a plant species that occurred sporadically through the ordinations, or those considered to have wide ecological boundaries that would not help define the plant community

The relationship of the dominant and co-dominant species should be the primary focus when choosing a plant community within the classification. Plant communities are named in this guide by the two or three species most dominant within their life form. For example, a Foothills rough fescue – Parry oat grass community may have many other subdominant grasses and forbs, but these two species are continually the most dominant. The first species mentioned is the most dominant. In this example, foothills rough fescue is more dominant that Parry oat grass.

Each plant community is also given a code, where the first two letters represent the natural subregion (FP = Foothills Parkland). The next letter is given to represent the major class such as grassland or deciduous, and finally a sequential number.
A. Native grasslands
B. Grazed or modified grasslands
C. Native Shrublands
D. Deciduous forest
E. Mixedwood forest
F. Conifer forest
G. Cleared areas

FPA1 = (FP) Foothills Parkland (A) native grassland (1) sequential number

All ecological sites and ecological site phases reported in this first approximation are summarized by grouping the communities' descriptions together to describe the ecological boundaries. These are all listed in Section 5. The bulk of this guide is community descriptions which include information on the dominant plant species, canopy cover, environmental conditions, response to grazing, forage production and suggested ecologically sustainable stocking rates (ESSRs). These are sorted by the above classes in section 6 through 8.

This is the first approximation of a classification system for the Foothills Parkland, and is by no means a comprehensive list of all plant communities present. In fact this document should be considered as a continual work in progress. Sites that aren't described in this guide should be classified by their most representative ecological site (or phase) and then given a conditional name similar to the conventions here. It is hoped that future analysis will include these community gaps.

4.4 Ecologically Sustainable Stocking Rates

Ecologically sustainable stocking rates (ESSR) values are suggested for each plant community. These values reflect the maximum number of livestock (e.g. animal unit month [AUM][2] per area [e.g. acre / hectare]) that can be supported by the plant community given inherent biophysical constraints and the ecological goal of sustainable health and proper functioning of the plant community (Range Management Branch 2004). When the ESSR is multiplied by the area of a plant community polygon the result is termed its carrying capacity (CC), and is expressed as AUMS. Often the carrying capacity must be adjusted for accessibility and management factors. Accessibility refers to productive areas that are inaccessible to livestock due to natural barriers, or sensitive areas desired to be excluded from grazing. Management factors are reductions to the carrying capacity due to poor livestock distribution, management goals (e.g. multiple use and values, etc.), drought conditions, and other natural phenomena impacting the site (e.g. forage quality, fire, pests, etc.). This adjusted/reduced value is the grazing capacity (GC). Only the Ecologically sustainable stocking rate (ESSR) for carrying capacity values are provided in the plant community guide because the necessary adjustments must be determined by the rangeland resource manager for grazing capacity (GC). (Range Management Branch 2004)

For many guides, suggested ESSR values were determined from a combination of inventories, clipping studies, long-term rangeland reference area data, estimated production, field experience, grazing trials and historical grazing experience (Range Management Branch 2004). To date, there has been little production data collected in the Foothills Parkland. Therefore, suggested carrying capacity values presently in the guide were derived by either knowledge from experienced field staff, long term historical records, or by using a similar sampled plant community in a neighbouring subregion. Further analysis of carrying capacity is planned for frequently occurring plant

[2] An Animal Unit Month is the forage requirement of a 1000lb cow with or without an unweaned calf for a period of one month. Please refer to "Grazing Management Adjustments for Healthy Rangelands" (2008) for further information.

communities in the Foothills Parkland by field assessments. This is performed by production clipping. The recommended stocking rate is then based on 25 percent of the total production for forested types and 25 to 50 percent of total production for grassland types (Range Management Branch 2004).

The ESSR ranges provided are based on total forage production tempered by the forage value of the contributing plant species. For example a plant community with high total production but that is mostly composed of unpalatable or unreachable material will have a high end range value based on less than 25% of total production. The unallocated biomass production (carry over) is needed for the maintenance of ecological functions (e.g. nutrient cycling, viable diverse plant communities, hydrological function, and soil protection, etc.) and plant community services (forage production, habitat maintenance, etc.).

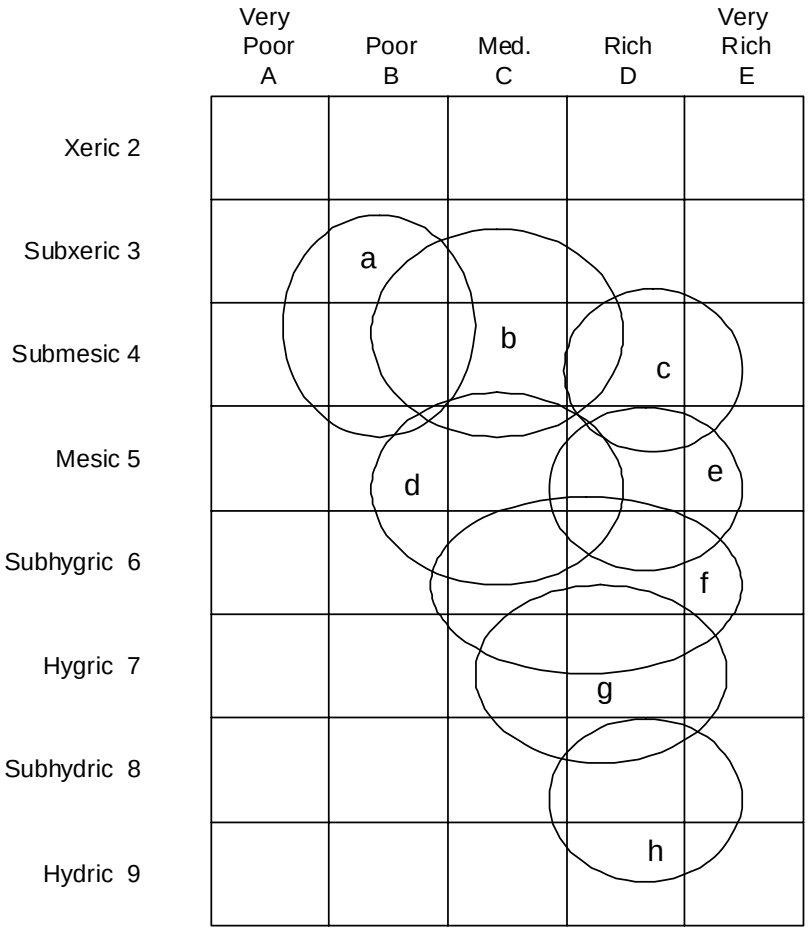
4.5 Range Plant Communities and Rangeland Health

Range health is determined by comparing the functioning of ecological processes on an area (e.g. plant community polygon) of rangeland to a standard (e.g. Reference Plant Community) described within an ecological site (Adams et al. 2009). This guide can be used to help define and further narrow this ecological site and determine the appropriate representative plant community for a rangeland health assessment.

Rangeland health assessments are utilized to make a rapid determination of the ecological status of rangeland. Range health terminology (healthy, healthy with problems, or unhealthy) is used to rank the ability of rangeland 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 rangeland health for various plant communities please refer to "Rangeland Health Assessment for Grassland, Forest and Tame Pasture" (Adams et al. 2009).

Range management objectives tend to favour the later stages of plant succession (late seral to potential natural community (PNC) or good to excellent range condition) (Adams et al. 2009). 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. In contrast, early seral 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. They also have diminished resource values for livestock forage production, wildlife habitat and watershed protection (Adams et al. 2009). Healthy rangelands perform important ecological functions and provide a broader suite of goods and services. In most cases these late seral plant communities are used as reference range plant community (RPC), but sometimes management goals influence the choice of RPC (e.g. range or habitat improvements).

When available, plant community successional information has been included within the guide to help determine rangeland health and the successional relationships on an ecological site. As mentioned in the previous section, this is accomplished by describing a community that has been disturbed and has moved away from the representative plant community. These communities can be used as benchmarks to ascertain how far away from the RPC a site has moved.



- a bearberry (submesic/poor)
- b hairy wild rye (submesic/medium)
- c thick black rough fescue (submesic/rich)
- d pine grass (mesic/medium)
- e snowberry-silverberry (mesic/rich)
- f red osier dogwood (subhygric/rich)
- g horsetail (hygric/rich)
- h fen (subhydric/rich)

Figure 3. Edatopic grid for the Foothills Parkland natural subregion

Table 1. Range plant community table for the Foothills Parkland subregion

Ecological Site	Ecosite Phase	Reference Plant Community	Successional Community Types	Modified Community Types	Harvesting Succession
a bearberry (submesic/poor)	a1 bearberry Pl	FPF1 Pl / Bearberry - Juniper			
	a2 bearberry Aw - Pl	FPE1 Aw - Pl - Sw / Bearberry / Hairy wild rye			
	a3 bearberry grassland thin breaks	FPA3 Bearberry / Foothills rough fescue – Parry oat grass			
b hairy wild rye (submesic/medium)	b1 hairy wild rye Fd	FPF4 Fd/Needle litter			
	b2 hairy wild rye Aw	FPD1 Aw/Rose/Hairy wild rye			
	b3 hairy wild rye Aw-Sw-Pl	FPF3 Sw-Pl-Aw/Hairy wild rye			
		FPE2 Sw-Aw/Hairy wild rye			FPG1 Hairy wild rye/Aw
	b4 hairy wild rye Sw	FPF2 Sw-Pl/Canada buffaloberry			
	b5 grassland	FPA2 Parry oat grass-Foothills rough fescue-Idaho fescue	FPB8 Parry oatgrass – Timothy FPB10 Wheatgrass - Foothills rough fescue	FPB9 Timothy - Kentucky bluegrass	
		FPA4 Foothills rough fescue - western porcupine grass			

Table 1. Range plant community table for the Foothills Parkland subregion (continued)

Ecological Site	Ecosite Phase	Reference Plant Community	Successional Community Types	Modified Community Types	Harvesting Succession
c thick black Foothills rough fescue (submesic/rich)	c1 rough fescue	FPA1 Foothills rough fescue - Parry oat grass - Idaho fescue	FPB1 Kentucky bluegrass - Parry oatgrass FPB3 Foothills rough fescue - Kentucky bluegrass FPB2 Kentucky bluegrass - Foothills rough fescue FPB4 Kentucky bluegrass - Timothy / Common dandelion	FPB5 Timothy FPB7 Creeping red fescue - Kentucky bluegrass FPB6 Smooth (awnless) brome - Kentucky bluegrass	
		FPA13 Foothills rough Fescue - Richardson's needlegrass			
d pine grass (mesic/medium)	d1 pine grass - Aw	FPD2 Aw / Rose / Pine grass			
	d2 pine grass - Sw-Pl-Aw	FPE3 Sw - Pl - Aw / Rose / Pine grass			
	d3 pine grass - Sw	FPF6 Sw/Moss			
e snowberry-silverberry (mesic/rich)	e1 snowberry-silverberry Aw-Pb	FPD4 Aw-Pb/Snowberry-Saskatoon	FPD7 Pb - Aw / Snowberry / Kentucky bluegrass FPD3 Aw / Kentucky bluegrass - Timothy		
		FPD6 Aw - Pb / Marsh reed grass			
		<RPC Not Described>	FPD5 Pb / Silverberry / Kentucky bluegrass		

Table 1. Range plant community table for the Foothills Parkland subregion (continued)

Ecological Site	Ecosite Phase	Reference Plant Community	Successional Community Types	Modified Community Types	Harvesting Succession
e snowberry-silverberry (mesic/rich) (continued)	e2 snowberry-silverberry Sw	<RPC Not Described>	FPF5 Sw / Silverberry		
	e3 shrubland	FPC1 Rose – Snowberry	FPC2 Snowberry - Rose / Kentucky bluegrass		
		<RPC Not Described>	FPC3 Silverberry / Kentucky bluegrass		
		<RPC Not Described>	FPC16 Bebb willow - snowberry / hairy wildrye		
	e4 snowberry-silverberry Sw-Aw	FPE4 Sw - Aw / Rose / Marsh reed grass			
F red osier dogwood (subhygric/rich)	f1 red osier dogwood Sw	FPE5 Sw – Pb / Cow parsnip			
		<RPC Not Described>	FPF7 Sw / Red osier dogwood / Kentucky bluegrass		
	f2 red osier dogwood Pb-Aw	FPD8 Aw / Cow parsnip			
	f3 shrubland	FPC4 Bebb willow - Snowberry - Rose	FPC6 Bebb willow / Cow parsnip / Sedge FPC5 Bebb willow / Kentucky bluegrass FPC15 Bebb willow / cow parsnip / Canada goldenrod		
		<RPC Not Described>	FPC7 Sandbar willow		

Table 1. Range plant community table for the Foothills Parkland subregion (continued)

Ecological Site	Ecosite Phase	Reference Plant Community	Successional Community Types	Modified Community Types	Harvesting Succession
f red osier dogwood (subhygric/rich) (continued)	f3 shrubland (continued)	<RPC Not Described>	FPC8 Water birch - Silverberry / Timothy		
	f4 grassland	<RPC Not Described>	FPA12 Kentucky bluegrass - Wire (Baltic) rush - Tufted hair grass		
g horsetail (hygric/rich)	g1 horsetail Sw	FPF8 Sw / Horsetail			
	g2 horsetail Aw-Pb	FPD9 Pb / Willow / Tall manna grass			
		FPD10 Pb - Aw / Horsetail			
	g3 shrubland	FPC9 Bebb willow / Horsetail / Sedge			
h fen (subhydric/rich)	h1 shrubby fen	FPC10 Basket willow			
		FPC11 Basket willow / Awned (Water) sedge	FPC12 Basket willow / Kentucky bluegrass		
		FPC13 Flat leaved willow / Water (Beaked) sedge			
		FPC14 Yellow willow / Water sedge			
	h2 graminoid fen	FPA5 Northern reed grass			
		<RPC Not Described>	FPA6 Woolly sedge – Kentucky bluegrass		
		FPA7 Sedge meadows	FPA8 Wire rush (Baltic rush)		
		FPA11 Bulrush			

5.0 Ecological Site and Ecosite Phase Descriptions

The following pages are a listing of the ecological site and phase descriptions found in the Foothills Parkland. The data is compiled on a template from the information gathered during plot surveys within the subregion. The 'n' value represents the number of sites of which vegetation information is derived from. The number of sites used for site and soil characteristics may differ than this 'n' value depending on what information was collected during the specific field survey. Measured site and soil characteristics are provided along with the percent frequency (in brackets) the measurement occurred. The frequency values are omitted however if the sites with the characteristic measured is inconsistent or minimal and could lead to misinterpretation. Some characteristics may be blank if the information was not collected.

Important components of the description pages are the indicator species listed on the ecological site description and characteristic species on the ecosite phase description pages. Characteristic species within ecosite phases are summaries of species that commonly have occurred in the plots within the phase. Indicator species are identified due to their narrow ecological requirements that confine them to specific soil moisture / nutrient regimes. These can be very useful in narrowing the ecological site a study area is in. Care must be taken when utilizing these however, especially if near the boundaries of a subregion. For instance, an indicator that may occur on mesic sites in one subregion may represent submesic sites in a neighbouring wetter / cooler subregion. Also, when utilizing indicator species it is important to assess the plant community and site as a whole, and not just by a single species. There may be two species within a study area that represent different ecological sites, or other confounding factors. Studying the clues given by the total plant community characteristics as well as other environmental factors that help identify soil moisture and nutrients are essential to correctly identify an ecological site.

a bearberry (submesic/poor) (n=11)

Natural Subregion: FOOTHILLS PARKLAND

General Description

Dry site conditions resulting from south exposures or coarse textured soils are characteristic of this ecological site. Organic layers are generally thin and soils are relatively poorly developed. The presence of species such as bearberry and juniper indicate the dry site conditions. Limber pine may also be found on this ecological site. Grassland communities on this ecological site are dominated by bearberry and occupy the thin break ecological range site.

Successional Relationships

Lodgepole pine and aspen form pure and mixed stands on this ecological site. In the Montane succession of this ecosite will be to white spruce. In the Foothills Parkland it is not clear if this ecological site will succeed to white spruce because successional rates are very slow.

Indicator Species

common bearberry	hairy wild rye
foothills rough fescue	creeping juniper

Site Characteristics

Moisture Regime: SUBMESIC(100)

Nutrient Regime: SUBMESOTROPHIC(40), MESOTROPHIC(60)

Topographic Poistion: Crest(33), Midslope(17), Upper slope(50)

Slope: 3 - 5(01), 6 - 9(03), 10 - 15(07), 16 - 30(48), 31 - 45(41)

Aspect: Northerly(10), Easterly(14), Southerly(20), Westerly(56)

Soil Characteristics

Organic Thickness:

Humus Form:

Surface Texture:

Effective Texture:

Depth to Mottles/Gley:

Soil Drainage: Rapidly drained(40), Well drained(20), Moderate well drain(40)

Parent Material: C(28), F(14), M(28), P(14), R(14)

Soil Subgroup: O.EB(33), E.EB(17), R.BL(17), O.GL(17), CU.R(17)

a1 bearberry - Pl (n=1)

Natural Subregion: FOOTHILLS PARKLAND

Ecological Site: bearberry (submesic/poor)

Characteristic Species

Tree

[43] lodgepole pine

Shrub

[5] creeping juniper
[5] Canada buffaloberry
[3] common bearberry
[2] prickly rose
[2] shrubby cinquefoil

Forb

[5] alpine hedysarum
[4] heart-leaved arnica
[2] showy aster
[1] woolly gromwell

Grass

[2] foothills rough fescue
[1] sedge species
[1] hairy wild rye

*** Species characteristic of the phase but occuring in <70% for the sample plots with a prominence value <20.**

Site Characteristics

Moisture Regime: SUBMESIC()

Nutrient Regime: SUBMESOTROPHIC()

Topographic Position: Crest(), Upper slope()

Slope: 31 - 45()

Aspect: Westerly()

Soil Characteristics

Organic Thickness: 6 - 15 cm()

Humus Form:

Surface Texture: L()

Effective Texture:

Depth to Mottles/Gley:

Soil Drainage: Well drained()

Parent Material: C(), R()

Soil Subgroup: O.EB()

Soil Type:

Plant Community Types (n)

FPF1 Pl / Bearberry - Juniper (1)

a2 bearberry Aw - Pl (n=6)

Natural Subregion: FOOTHILLS PARKLAND

Ecological Site: bearberry (submesic/poor)

Characteristic Species

Tree

[23] aspen
[17] white spruce
[16] lodgepole pine

Shrub

[12] common bearberry
[6] prickly rose
[1] shrubby cinquefoil
[1] creeping juniper
[1] Canada buffaloberry

Forb

[6] showy aster
[3] wild strawberry
[2] common fireweed
[1] common yarrow
[1] Lindley's aster

Grass

[10] hairy wild rye
[7] pine reed grass
[1] foothills rough fescue

*** Species characteristic of the phase but occuring in <70% for the sample plots with a prominence value <20.**

Site Characteristics

Moisture Regime: SUBMESIC()

Nutrient Regime: SUBMESOTROPHIC(), MESOTROPHIC()

Topographic Position: Midslope(), Upper slope()

Slope: 16 - 30()

Aspect: Northerly(22), Easterly(22), Southerly(22), Westerly(33)

Soil Characteristics

Organic Thickness:

Humus Form:

Surface Texture:

Effective Texture:

Depth to Mottles/Gley:

Soil Drainage: Rapidly drained(50), Well drained(25), Moderate well drain(25)

Parent Material: C(), F(), M()

Soil Subgroup: O.EB(), CU.R()

Soil Type:

Plant Community Types (n)

FPE1 Aw - Pl - Sw / Bearberry / Hairy wild rye (6)

a3 grassland (n=4)

Natural Subregion: FOOTHILLS PARKLAND

Ecological Site: bearberry (submesic/poor)

Characteristic Species

Shrub

[8] creeping juniper
[5] common bearberry
[3] prickly rose
[2] shrubby cinquefoil

Forb

[3] wild bergamot
[2] cream-colored vetchling

Grass

[20] foothills rough fescue
[13] Parry oat grass
[4] Undifferentiated wheat grass
[1] Undifferentiated sedge

*** Species characteristic of the phase but occuring in <70% for the sample plots with a prominence value <20.**

Site Characteristics

Moisture Regime: SUBMESIC()

Nutrient Regime: SUBMESOTROPHIC(), MESOTROPHIC()

Topographic Position: Crest(), Upper slope()

Slope: 3 - 5(03), 6 - 9(09), 10 - 15(20), 16 - 30(45), 31 - 45(23)

Aspect: Northerly(09), Easterly(22), Southerly(37), Westerly(32)

Soil Characteristics

Organic Thickness:

Humus Form:

Surface Texture:

Effective Texture:

Depth to Mottles/Gley:

Soil Drainage: Rapidly drained()

Parent Material: M(), P()

Soil Subgroup: E.EB(), R.BL(), O.GL()

Soil Type:

Plant Community Types (n)

FPA3 Bearberry / Foothills rough fescue - Parry oat grass (4)

b hairy wild rye (submesic/medium) (n=49)

Natural Subregion: FOOTHILLS PARKLAND

General Description

This ecological site is similar to the Montane buffalo berry / hairy wild rye (submesic/medium) ecosite and represents relatively dry conditions for the subregion but not as dry as the previously described bearberry ecological site. Forest stands in this site usually have closed canopies. Understory vegetation is sparse with Canada buffaloberry and hairy wild rye being the most common species. Grasslands in this ecological site often occupy mid to upper slope positions where some moisture is received from upslope. These grassland communities generally occur on thin break and shallow to gravel ecological range sites. The reference grassland communities on these ecological range sites are generally dominated by Parry oat grass, but Idaho fescue may also be abundant especially close to the Montane subregion boundaries.

Successional Relationships

Forested sites are composed of lodgepole pine, Douglas-fir, white spruce or aspen. Succession is toward white spruce and/or Douglas-fir, however succession rates are slow because of the dry nature of the site. Shrub and forb layers may be very sparse depending on canopy closure, particularly in Douglas-fir stands. Without fire disturbance, grasslands can be invaded over time by aspen and Douglas-fir. The time frame for complete tree invasion is estimated at greater than 60 years. As is common with the Montane ecosite, moderate grazing pressure on these sites leads to a decrease in dominant species, such as Parry oat grass. Soft grasses tend to invade readily in this subregion so disturbance including moderate and heavy grazing also increase the probably of Kentucky bluegrass and timothy.

Indicator Species

slender wheat grass	Lindley's aster
Parry oat grass	hairy wild rye
bluebunch fescue	northern bedstraw
June grass	prickly rose
wild vetch	

Site Characteristics

Moisture Regime: SUBMESIC(), MESIC()

Nutrient Regime: SUBMESOTROPHIC(06), MESOTROPHIC(50), PERMESOTROPHIC(44)

Topographic Poistion: Crest(03), Lower slope(01), Midslope(72), Upper slope(24)

Slope: 0 - 0.5(07), 3 - 5(14), 6 - 9(05), 10 - 15(31), 16 - 30(28), 31 - 45(15)

Aspect: Northerly(08), Easterly(46), Southerly(28), Westerly(18)

Soil Characteristics

Organic Thickness: 0 - 5 cm()

Humus Form: HUMIFIBRIMOR(), FIBRIHUMIMOR()

Surface Texture: L(), SCL(), SiL(), SL()

Effective Texture:

Depth to Mottles/Gley: None()

Soil Drainage: Rapidly drained(10), Well drained(70), Moderate well drain(10), Imperfectly drained(10)

Parent Material: C(), F(), FL(), M(), R(), X()

Soil Subgroup: O.EB(), E.EB(), O.GL(), D.GL(), BR.GL(), O.BL(), R.BL(), O.R()

b1 hairy wild rye Fd (n=1)

Natural Subregion: FOOTHILLS PARKLAND

Ecological Site: hairy wild rye (submesic/medium)

Characteristic Species

Tree

[55] Douglas-fir
[22] white spruce
[1] aspen

Shrub

[2] saskatoon
[2] Snowberry (buckbrush)
[1] prickly rose

Forb

[1] showy aster
[1] heart-leaved arnica
[1] wild strawberry
[1] Lindley's aster

Grass

[1] pine reed grass
[1] hairy wild rye

*** Species characteristic of the phase but occuring in <70% for the sample plots with a prominence value <20.**

Site Characteristics

Moisture Regime: SUBMESIC(), MESIC()

Nutrient Regime: MESOTROPHIC(), PERMESOTROPHIC()

Topographic Position: Midslope()

Slope: 16 - 30(), 31 - 45()

Aspect: Easterly(), Southerly()

Soil Characteristics

Organic Thickness: 0 - 5 cm()

Humus Form: HUMIFIBRIMOR()

Surface Texture:

Effective Texture:

Depth to Mottles/Gley: None()

Soil Drainage: Well drained()

Parent Material: C(), M(), R()

Soil Subgroup: O.EB(), E.EB()

Soil Type:

Plant Community Types (n)

FPF4 Fd / Needle litter (1)

b2 hairy wild rye Aw (n=9)

Natural Subregion: FOOTHILLS PARKLAND

Ecological Site: hairy wild rye (submesic/medium)

Characteristic Species

Tree

[42] aspen
[2] white spruce

Shrub

[10] prickly rose
[4] Snowberry (buckbrush)
[1] saskatoon

Forb

[10] wild strawberry
[8] Lindley's aster
[7] common fireweed
[4] common dandelion
[2] cream-colored vetchling

Grass

[10] hairy wild rye
[4] pine reed grass
[2] slender wheat grass

*** Species characteristic of the phase but occuring in <70% for the sample plots with a prominence value <20.**

Site Characteristics

Moisture Regime: MESIC()

Nutrient Regime: PERMESOTROPHIC()

Topographic Position: Midslope(17), Upper slope(83)

Slope: 3 - 5(29), 6 - 9(14), 10 - 15(43), 16 - 30(14)

Aspect: Northerly(12), Easterly(38), Southerly(38), Westerly(12)

Soil Characteristics

Organic Thickness:

Humus Form:

Surface Texture:

Effective Texture:

Depth to Mottles/Gley: None()

Soil Drainage: Well drained(63), Moderate well drain(25), Imperfectly drained(12)

Parent Material: F(), M()

Soil Subgroup: O.BL(), D.GL(), O.R()

Soil Type:

Plant Community Types (n)

FPD1 Aw / Rose / Hairy wild rye (9)

b3 hairy wild rye Aw-Sw-Pl (n=6)

Natural Subregion: FOOTHILLS PARKLAND

Ecological Site: hairy wild rye (submesic/medium)

Characteristic Species

Tree

[27] white spruce
[15] aspen
[3] lodgepole pine

Shrub

[4] Undifferentiated rose
[2] saskatoon
[1] common bearberry

Forb

[2] common fireweed
[1] common yarrow
[1] common dandelion
[1] Lindley's aster
[1] wild strawberry
[1] star-flowered Solomon's-seal

Grass

[5] hairy wild rye

*** Species characteristic of the phase but occuring in <70% for the sample plots with a prominence value <20.**

Site Characteristics

Moisture Regime: MESIC(66), SUBHYGRIC(33)

Nutrient Regime: MESOTROPHIC(66), PERMESOTROPHIC(33)

Topographic Position: Midslope()

Slope: 0 - 0.5(33), 3 - 5(33), 16 - 30(34)

Aspect: Variable()

Soil Characteristics

Organic Thickness: 0 - 5 cm()

Humus Form: FIBRIHUMIMOR()

Surface Texture:

Effective Texture:

Depth to Mottles/Gley: None()

Soil Drainage: Well drained(), Moderate well drain(), Imperfectly drained()

Parent Material: FL(), M(), X()

Soil Subgroup: D.GL(), O.R()

Soil Type:

Plant Community Types (n)

FPE2	Sw - Aw / Hairy wild rye (2)
FPF3	Sw - Pl / Hairy wild rye (1)
FPG1	Hairy wild rye/Aw (3)

b4 hairy wild rye Sw (n=1)

Natural Subregion: FOOTHILLS PARKLAND

Ecological Site: hairy wild rye (submesic/medium)

Characteristic Species

Tree

[55] white spruce
[45] lodgepole pine
[10] aspen

Shrub

[18] twinflower
[8] green alder
[8] Canada buffaloberry
[6] white meadowsweet
[3] prickly rose

Forb

[28] bunchberry
[2] common fireweed
[2] Lindley's aster
[1] cream-colored vetchling

Grass

[5] pine reed grass
[2] sedge species

*** Species characteristic of the phase but occuring in <70% for the sample plots with a prominence value <20.**

Site Characteristics

Moisture Regime: MESIC()

Nutrient Regime: MESOTROPHIC()

Topographic Position: Midslope()

Slope: 10 - 15()

Aspect: Easterly()

Soil Characteristics

Organic Thickness: 0 - 5 cm()

Humus Form:

Surface Texture:

Effective Texture:

Depth to Mottles/Gley: None()

Soil Drainage: Well drained()

Parent Material: M()

Soil Subgroup: BR.GL()

Soil Type:

Plant Community Types (n)

FPF2 Sw-Pl/Canada buffaloberry (1)

b5 grassland (n=32)

Natural Subregion: FOOTHILLS PARKLAND

Ecological Site: hairy wild rye (submesic/medium)

Characteristic Species

Shrub

[3] Undifferentiated rose

Forb

[2] northern bedstraw
[1] silky perennial lupine
[1] common yarrow
[1] wild vetch
[1] prairie sagewort

Grass

[18] foothills rough fescue
[16] Parry oat grass
[7] western porcupine grass
[4] bluebunch fescue
[3] Undifferentiated wheat grass
[2] Undifferentiated sedge
[1] June grass

* **Species characteristic of the phase but occuring in <70% for the sample plots with a prominence value <20.**

Site Characteristics

Moisture Regime: SUBMESIC()

Nutrient Regime: SUBMESOTROPHIC(), MESOTROPHIC(), PERMESOTROPHIC()

Topographic Position: Crest(12), Lower slope(06), Midslope(44), Upper slope(38)

Slope: 0.5 - 2.5(02), 3 - 5(07), 6 - 9(09), 10 - 15(14), 16 - 30(41), 31 - 45(25), 46 - 70(02)

Aspect: Northerly(02), Easterly(16), Southerly(29), Westerly(53)

Soil Characteristics

Organic Thickness:

Humus Form:

Surface Texture: L(), SL()

Effective Texture:

Depth to Mottles/Gley: None()

Soil Drainage: Rapidly drained(58), Well drained(42)

Parent Material: C(), M()

Soil Subgroup: E.EB(), O.BL(), R.BL(), O.GL(), O.R()

Soil Type:

Plant Community Types (n)

FPA2	Parry oat grass - Foothills rough fescue-Idaho fescue (14)
FPB9	Timothy - Kentucky bluegrass (4)
FPB8	Parry oatgrass - Timothy (7)
FPA4	Foothills rough fescue - western porcupine grass (4)
FPB10	Wheatgrass - Foothills rough fescue (3)

c thick black Foothills rough fescue (submesic/rich) (n=178)

Natural Subregion: FOOTHILLS PARKLAND

General Description

This ecological site is typical of south and west facing slopes and mid to lower slope positions throughout the Foothills Parkland subregion. It is usually dominated by grass species because of the edaphic conditions and exposure to westerly winds. These grasslands if undisturbed are dominated by Foothills rough fescue, with Parry oatgrass and Idaho fescue as less dominant grasses. The soils are primarily black chernozems.

Successional Relationships

Due to the site conditions, grasslands often remain the climax vegetation within this ecosite. A number of Foothills rough fescue dominated sites in the Montane subregion have not had their species composition change in over 30 years indicating the climax nature of this ecological site. As moisture increases due to slope and aspect changes, shrubs and trees such as saskatoon, snowberry, chokecherry and aspen often invade. Succession without disturbances such as fire would then potentially lead to an aspen stand, and ultimately to coniferous stands such as Douglas-fir, white spruce or lodgepole pine. Disturbance such as heavy grazing pressure can often lead to a degraded site that is dominated by Kentucky bluegrass, timothy and clover species. Relatively low slope and nutrient rich deep thick black chernozemic soils have attracted cultivation within this ecological site. Many areas are now either cereal crops or seeded to tame pasture.

Indicator Species

cut-leaved anemone	Parry oat grass
foothills rough fescue	bluebunch fescue
sticky purple geranium	three-flowered avens
June grass	woolly gromwell
timothy	Kentucky bluegrass
shrubby cinquefoil	

Site Characteristics

Moisture Regime: SUBXERIC(), SUBMESIC(), MESIC(), SUBHYGRIC()

Nutrient Regime: SUBMESOTROPHIC(), MESOTROPHIC(), PERMESOTROPHIC()

Topographic Poistion: Level(33), Lower slope(15), Midslope(40), Upper slope(08), Depression(04)

Slope: 0 - 0.5(02), 0.5 - 2.5(05), 3 - 5(16), 6 - 9(23), 10 - 15(29), 16 - 30(21), 31 - 45(04)

Aspect: Northerly(11), Easterly(34), Southerly(41), Westerly(14)

Soil Characteristics

Organic Thickness: 0 - 5 cm()

Humus Form:

Surface Texture: CL(), L(), SiC(), SiCL(), SiL(), SL()

Effective Texture:

Depth to Mottles/Gley: None()

Soil Drainage: Rapidly drained(35), Well drained(45), Moderate well drain(16), Poorly drained(04)

Parent Material: C(), FL(), GF(), L(), M()

Soil Subgroup: E.EB(), O.B(), O.GL(), D.GL(), O.BL(), R.BL(), CA.BL(), GL.BL(), O.DG(), R.DG(), O.HG(), CU.R(), O.HR(), GL.HR()

c1 rough fescue (n=178)

Natural Subregion: FOOTHILLS PARKLAND

Ecological Site: thick black Foothills rough fescue (submesic/rich)

Characteristic Species

Shrub

[2] prickly rose
[1] shrubby cinquefoil

Forb

[9] common dandelion
[3] northern bedstraw
[3] wild strawberry
[2] three-flowered avens
[2] wild vetch
[2] common yarrow
[2] silky perennial lupine

Grass

[30] foothills rough fescue*
[20] Kentucky bluegrass
[12] Parry oat grass
[10] timothy
[5] bluebunch fescue
[2] June grass

*** Species characteristic of the phase but occuring in <70% for the sample plots with a prominence value <20.**

Site Characteristics

Moisture Regime: SUBXERIC(), SUBMESIC(), MESIC(), SUBHYGRIC()

Nutrient Regime: SUBMESOTROPHIC(), MESOTROPHIC(), PERMESOTROPHIC()

Topographic Position: Level(33), Lower slope(15), Midslope(40), Upper slope(08), Depression(04)

Slope: 0 - 0.5(02), 0.5 - 2.5(05), 3 - 5(16), 6 - 9(23), 10 - 15(29), 16 - 30(21), 31 - 45(04)

Aspect: Northerly(11), Easterly(34), Southerly(41), Westerly(14)

Soil Characteristics

Organic Thickness: 0 - 5 cm()

Humus Form:

Surface Texture: CL(), L(), SiC(), SiCL(), SiL(), SL()

Effective Texture:

Depth to Mottles/Gley: None()

Soil Drainage: Rapidly drained(35), Well drained(45), Moderate well drain(16), Poorly drained(04)

Parent Material: C(), F(), GF(), L(), M()

Soil Subgroup: E.EB(), O.B(), O.GL(), D.GL(), O.BL(), R.BL(), CA.BL(), GL.BL(), O.DG(), R.DG(), O.HG(), CU.R(), O.HR(), GL.HR()

Soil Type:

Plant Community Types (n)

FPB2	Kentucky bluegrass - Foothills rough fescue (35)
FPA1	Foothills rough fescue - Parry oat grass - Idaho fescue (15)
FPB1	Kentucky bluegrass - Parry oatgrass (15)
FPB6	Smooth (awnless) brome - Kentucky bluegrass (19)
FPB4	Kentucky bluegrass - Timothy / Common dandelion (58)
FPB3	Foothills rough fescue - Kentucky bluegrass (23)
FPB7	Creeping red fescue - Kentucky bluegrass (4)
FPA13	Foothills rough Fescue - Richardson's needlegrass (6)
FPB5	Timothy (3)

d pine grass (mesic/medium) (n=21)

Natural Subregion: FOOTHILLS PARKLAND

General Description

The mesic ecological site for the subregion supports mainly forested plant communities. These stands are dominated by aspen and their understories are often dominated by pine grass and various forbs such as asters, bedstraw and fireweed. These sites generally occur on mid to lower slopes with northerly and easterly aspects.

Successional Relationships

Succession in the absence of disturbance is from aspen communities to coniferous forests of white spruce, lodgepole pine or Douglas-fir, depending on the position of the site in the natural subregion. It is believed that periodic fires in these areas would keep the successional advancement of coniferous forest to a minimum. The effort to control wild fire over the past century has also allowed aspen encroachment to increase in grassland / forest mosaics. Disturbance succession in these forests can be noted by the reduction of preferred shrubs, as well as the introduction of invasive species in the understory. Kentucky bluegrass is a good indicator of past or present disturbance in the forested areas of the Foothills Parkland.

Indicator Species

pine reed grass	common fireweed
wild strawberry	northern bedstraw
prickly rose	

Site Characteristics

Moisture Regime: MESIC(84), SUBHYGRIC(08), HYGRIC(08)

Nutrient Regime: MESOTROPHIC(), PERMESOTROPHIC()

Topographic Poistion: Lower slope(03), Midslope(97)

Slope: 0.5 - 2.5(17), 3 - 5(34), 6 - 9(03), 10 - 15(22), 16 - 30(22), 31 - 45(02)

Aspect: Northerly(65), Easterly(16), Southerly(03), Westerly(16)

Soil Characteristics

Organic Thickness: 0 - 5 cm()

Humus Form:

Surface Texture: CL(), L(), SC(), SCL()

Effective Texture:

Depth to Mottles/Gley: None()

Soil Drainage: Well drained(), Moderate well drain()

Parent Material: C(), M(), P()

Soil Subgroup: O.BL(), O.GL(), D.GL(), BR.GL()

d1 pine grass - Aw (n=18)

Natural Subregion: FOOTHILLS PARKLAND

Ecological Site: pine grass (mesic/medium)

Characteristic Species

Tree

[42] aspen*
[3] balsam poplar

Shrub

[7] prickly rose
[3] white meadowsweet
[1] Snowberry (buckbrush)
[1] saskatoon

Forb

[12] common fireweed
[8] wild strawberry
[7] Lindley's aster
[7] showy aster
[3] cream-colored vetchling
[2] northern bedstraw

Grass

[10] pine reed grass*
[4] hairy wild rye
[1] slender wheat grass

*** Species characteristic of the phase but occuring in <70% for the sample plots with a prominence value <20.**

Site Characteristics

Moisture Regime: MESIC(), SUBHYGRIC(), HYGRIC()

Nutrient Regime: PERMESOTROPHIC()

Topographic Position: Lower slope(09), Midslope(91)

Slope: 3 - 5(03), 6 - 9(08), 10 - 15(42), 16 - 30(42), 31 - 45(05)

Aspect: Northerly(46), Easterly(24), Southerly(08), Westerly(22)

Soil Characteristics

Organic Thickness:

Humus Form:

Surface Texture: CL(), L(), SC(), SCL()

Effective Texture:

Depth to Mottles/Gley: None()

Soil Drainage: Well drained(75), Moderate well drain(25)

Parent Material: C(), M(), P()

Soil Subgroup: O.BL(), O.GL(), D.GL()

Soil Type:

Plant Community Types (n)

FPD2 Aw / Rose / Pine grass (18)

d2 pine grass - Sw-Pl-Aw (n=2)

Natural Subregion: FOOTHILLS PARKLAND

Ecological Site: pine grass (mesic/medium)

Characteristic Species

Tree

[50] white spruce
[35] lodgepole pine
[30] aspen

Shrub

[16] twinflower
[7] prickly rose
[5] low-bush cranberry
[5] white meadowsweet
[3] Canada buffaloberry

Forb

[15] bunchberry
[4] Lindley's aster
[3] common fireweed
[1] wild strawberry

Grass

[10] pine reed grass
[1] hairy wild rye

*** Species characteristic of the phase but occuring in <70% for the sample plots with a prominence value <20.**

Site Characteristics

Moisture Regime: MESIC()

Nutrient Regime: MESOTROPHIC()

Topographic Position: Midslope()

Slope: 3 - 5(50), 10 - 15(25), 16 - 30(25)

Aspect: Northerly(50), Easterly(25), Westerly(25)

Soil Characteristics

Organic Thickness:

Humus Form:

Surface Texture: L(), SCL()

Effective Texture:

Depth to Mottles/Gley: None()

Soil Drainage: Well drained(50), Moderate well drain(50)

Parent Material: M()

Soil Subgroup: D.GL(), BR.GL()

Soil Type:

Plant Community Types (n)

FPE3 Sw - Pl - Aw / Rose / Pine grass (2)

d3 pine grass - Sw (n=1)

Natural Subregion: FOOTHILLS PARKLAND

Ecological Site: pine grass (mesic/medium)

Characteristic Species

Tree

[40] white spruce

Shrub

[6] prickly rose

[1] white meadowsweet

Forb

[11] wild strawberry

[9] Lindley's aster

[4] common pink wintergreen

Grass

[12] bluejoint

[5] pine reed grass

*** Species characteristic of the phase but occuring in <70% for the sample plots with a prominence value <20.**

Site Characteristics

Moisture Regime: MESIC()

Nutrient Regime: MESOTROPHIC(), PERMESOTROPHIC()

Topographic Position: Midslope()

Slope: 0.5 - 2.5(), 3 - 5()

Aspect: Northerly()

Soil Characteristics

Organic Thickness: 0 - 5 cm()

Humus Form:

Surface Texture: L()

Effective Texture:

Depth to Mottles/Gley: None()

Soil Drainage: Moderate well drain()

Parent Material: M()

Soil Subgroup: D.GL()

Soil Type:

Plant Community Types (n)

FPF6 Sw/Moss (1)

e snowberry-silverberry (mesic/rich) (n=68)

Natural Subregion: FOOTHILLS PARKLAND

General Description

Moisture conditions are mesic for this ecological site, however nutrient conditions are slightly 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

Succession in the absence of disturbance is often to white spruce. Shrub and forb layers are well developed on these sites due to the favourable moisture and nutrient status, but as the canopy closes, these too may become sparse. Understory vegetation in successional communities in this ecosite is often dominated by snowberry or silverberry.

Indicator Species

saskatoon	pine reed grass
silverberry	common fireweed
Undifferentiated rose	Snowberry (buckbrush)

Site Characteristics

Moisture Regime: MESIC(), SUBHYGRIC()

Nutrient Regime: MESOTROPHIC(), PERMESOTROPHIC()

Topographic Poistion: Level(), Lower slope(), Midslope(), Upper slope(), Depression()

Slope: 0 - 0.5(02), 0.5 - 2.5(02), 3 - 5(15), 6 - 9(09), 10 - 15(38), 16 - 30(28)

Aspect: Northerly(28), Easterly(32), Southerly(16), Westerly(24)

Soil Characteristics

Organic Thickness:

Humus Form:

Surface Texture: CL(), L(), SCL(), SiC(), SiCL(), SiL(), SL()

Effective Texture:

Depth to Mottles/Gley: None()

Soil Drainage: Rapidly drained(22), Well drained(54), Moderate well drain(24)

Parent Material: C(), F(), GF(), M()

Soil Subgroup: O.EB(), D.GL(), BR.GL(), O.BL(), R.HG(), O.R(), CU.R()

e1 snowberry-silverberry Aw-Pb (n=35)

Natural Subregion: FOOTHILLS PARKLAND

Ecological Site: snowberry-silverberry (mesic/rich)

Characteristic Species

Tree

[27] balsam poplar
[27] aspen
[4] white spruce

Shrub

[8] prickly rose
[5] Snowberry (buckbrush)*
[2] silverberry*

Forb

[9] common fireweed
[6] wild strawberry
[3] wild white geranium
[3] common dandelion
[2] veiny meadow rue
[2] cream-colored vetchling
[2] tall lungwort

Grass

[7] bluejoint
[2] slender wheat grass

*** Species characteristic of the phase but occuring in <70% for the sample plots with a prominence value <20.**

Site Characteristics

Moisture Regime: MESIC(), SUBHYGRIC()

Nutrient Regime: MESOTROPHIC(), PERMESOTROPHIC()

Topographic Position: Level(), Lower slope(), Midslope(), Depression()

Slope: 0.5 - 2.5(04), 3 - 5(17), 6 - 9(08), 10 - 15(38), 16 - 30(25), 31 - 45(08)

Aspect: Northerly(27), Easterly(49), Southerly(13), Westerly(11)

Soil Characteristics

Organic Thickness: 0 - 5 cm(), 6 - 15 cm()

Humus Form:

Surface Texture: L(), SCL(), SiCL(), SiL(), SL()

Effective Texture:

Depth to Mottles/Gley: None()

Soil Drainage: Rapidly drained(23), Well drained(46), Moderate well drain(31)

Parent Material: C(), F(), GF(), M()

Soil Subgroup: O.EB(), O.BL(), D.GL(), BR.GL(), O.R()

Soil Type:

Plant Community Types (n)

FPD3	Aw / Kentucky bluegrass - Timothy (9)
FPD4	Aw - Pb / Snowberry - Rose (8)
FPD5	Pb / Silverberry / Kentucky bluegrass (3)
FPD6	Aw - Pb / Marsh reed grass (13)
FPD7	Pb - Aw / Snowberry / Kentucky bluegrass (2)

e2 snowberry-silverberry Sw (n=1)

Natural Subregion: FOOTHILLS PARKLAND

Ecological Site: snowberry-silverberry (mesic/rich)

Characteristic Species

Tree

[40] white spruce
[10] balsam poplar

Shrub

[20] silverberry*
[3] prickly rose*
[1] Snowberry (buckbrush)*

Forb

[20] alsike clover
[10] wild strawberry
[3] Lindley's aster
[3] common dandelion
[1] common fireweed

Grass

[20] Kentucky bluegrass
[10] timothy
[4] bluejoint
[3] slender wheat grass
[2] pine reed grass
[1] fringed brome

*** Species characteristic of the phase but occuring in <70% for the sample plots with a prominence value <20.**

Site Characteristics

Moisture Regime:

Nutrient Regime:

Topographic Position:

Slope:

Aspect:

Soil Characteristics

Organic Thickness:

Humus Form:

Surface Texture:

Effective Texture:

Depth to Mottles/Gley: None()

Soil Drainage:

Parent Material:

Soil Subgroup:

Soil Type:

Plant Community Types (n)

FPF5 Sw / Silverberry (1)

e3 shrubland (n=21)

Natural Subregion: FOOTHILLS PARKLAND

Ecological Site: snowberry-silverberry (mesic/rich)

Characteristic Species

Shrub

[13] Undifferentiated rose*
[8] Snowberry (buckbrush)*
[1] saskatoon

Forb

[4] wild strawberry
[3] common fireweed
[2] cream-colored vetchling
[1] veiny meadow rue
[1] common yarrow
[1] northern bedstraw

Grass

[11] Kentucky bluegrass
[3] timothy
[2] foothills rough fescue
[2] bluejoint
[1] slender wheat grass

*** Species characteristic of the phase but occuring in <70% for the sample plots with a prominence value <20.**

Site Characteristics

Moisture Regime: MESIC(), SUBHYGRIC()

Nutrient Regime: SUBMESOTROPHIC(), MESOTROPHIC(), PERMESOTROPHIC()

Topographic Position: Lower slope(), Midslope(), Depression()

Slope: 0.5 - 2.5(03), 3 - 5(10), 6 - 9(13), 10 - 15(29), 16 - 30(35), 31 - 45(10)

Aspect: Northerly(24), Easterly(28), Southerly(27), Westerly(21)

Soil Characteristics

Organic Thickness:

Humus Form:

Surface Texture: L(), SCL(), SiC(), SiCL(), SiL(), SL()

Effective Texture:

Depth to Mottles/Gley: None()

Soil Drainage: Rapidly drained(08), Well drained(77), Moderate well drain(15)

Parent Material: C(), F(), GF(), M()

Soil Subgroup: O.BL(), D.GL(), CU.R()

Soil Type:

Plant Community Types (n)

FPC1	Rose - Snowberry (10)
FPC2	Snowberry - Rose / Kentucky bluegrass (7)
FPC3	Silverberry/Kentucky bluegrass (2)
FPC16	Bebb willow - snowberry / hairy wildrye (2)

e4 snowberry-silverberry Sw-Aw (n=11)

Natural Subregion: FOOTHILLS PARKLAND

Ecological Site: snowberry-silverberry (mesic/rich)

Characteristic Species

Tree

[37] white spruce
[26] aspen
[12] balsam poplar

Shrub

[5] prickly rose*
[3] Snowberry (buckbrush)*
[3] white meadowsweet

Forb

[11] common fireweed*
[9] Lindley's aster
[8] wild strawberry
[3] cream-colored vetchling

Grass

[5] pine reed grass
[5] bluejoint
[4] hairy wild rye

*** Species characteristic of the phase but occuring in <70% for the sample plots with a prominence value <20.**

Site Characteristics

Moisture Regime:

Nutrient Regime:

Topographic Position: Level(), Midslope(), Upper slope()

Slope: 0 - 0.5(05), 3 - 5(18), 6 - 9(06), 10 - 15(47), 16 - 30(24)

Aspect: Northerly(33), Easterly(20), Southerly(07), Westerly(40)

Soil Characteristics

Organic Thickness:

Humus Form:

Surface Texture: CL(), L(), SL()

Effective Texture:

Depth to Mottles/Gley: None()

Soil Drainage: Rapidly drained(37), Well drained(38), Moderate well drain(25)

Parent Material: C(), F(), GF(), M()

Soil Subgroup: O.EB(), O.BL(), R.HG(), D.GL(), O.R()

Soil Type:

Plant Community Types (n)

FPE4 Sw - Aw / Rose / Marsh reed grass (11)

f red osier dogwood / cow parsnip (subhygric/rich) (n=55)

Natural Subregion: FOOTHILLS PARKLAND

General Description

This ecological site is considered moisture receiving on the landscape. In spring or after heavy rain, seepage may occur. Water tables typically remain within 1m of the soil surface. The humus layers are generally well developed indicating the better than average nutrient regime. Shrub and forb layers are well developed on these sites due to this favourable moisture and nutrient status.

Successional Relationships

Succession in the absence of disturbance is often from a large shrub (usually willow) community, to an increase in aspen and balsam poplar. On sites where poplar trees gain early domination, young spruce establish and grow slowly under the closed canopy. This means the deciduous stage of early succession can be very long, much longer than the fire return interval. The spruce dominated forests within this ecosite should be quite rare.

Indicator Species

bluejoint	red-osier dogwood
tufted hair grass	cow parsnip
beaked willow	

Site Characteristics

Moisture Regime:

Nutrient Regime:

Topographic Poistion: Level(), Lower slope(), Midslope(), Toe(), Depression()

Slope: 0 - 0.5(06), 0.5 - 2.5(08), 3 - 5(23), 6 - 9(08), 10 - 15(40), 16 - 30(15)

Aspect: Northerly(37), Easterly(47), Southerly(08), Westerly(08)

Soil Characteristics

Organic Thickness:

Humus Form:

Surface Texture: CL(), L(), SCL(), SiCL(), SiL(), SL()

Effective Texture:

Depth to Mottles/Gley:

Soil Drainage: Well drained(), Moderate well drain(), Imperfectly drained(), Poorly drained(), Very poorly drained()

Parent Material: F(), GF(), L(), M(), O()

Soil Subgroup: O.EB(), E.EB(), O.GL(), D.GL(), T.F(), O.BL(), GL.BL(), O.HG(), R.HG(), R.G()

f1 red osier dogwood Sw (n=3)

Natural Subregion: FOOTHILLS PARKLAND

Ecological Site: red osier dogwood / cow parsnip (subhygric/rich)

Characteristic Species

Tree

[42] white spruce*
[18] balsam poplar
[5] aspen

Shrub

[7] beaked willow
[3] prickly rose
[3] red-osier dogwood*

Forb

[8] Lindley's aster
[5] cow parsnip
[4] common horsetail
[4] common fireweed

Grass

[15] bluejoint
[3] sedge species
[1] slender wheat grass

*** Species characteristic of the phase but occuring in <70% for the sample plots with a prominence value <20.**

Site Characteristics

Moisture Regime:

Nutrient Regime:

Topographic Position: Lower slope(), Midslope()

Slope: 3 - 5(50), 10 - 15(50)

Aspect: Northerly(), Easterly()

Soil Characteristics

Organic Thickness:

Humus Form:

Surface Texture: L(), SCL()

Effective Texture:

Depth to Mottles/Gley:

Soil Drainage: Well drained(50), Moderate well drain(50)

Parent Material: F(), M()

Soil Subgroup: D.GL()

Soil Type:

Plant Community Types (n)

FPE5	Sw - Pb / Cow parsnip (2)
FPF7	Sw / Red osier dogwood / Kentucky bluegrass (1)

f2 red osier dogwood Pb-Aw (n=11)

Natural Subregion: FOOTHILLS PARKLAND

Ecological Site: red osier dogwood / cow parsnip (subhygric/rich)

Characteristic Species

Tree

[32] aspen
[9] balsam poplar
[3] white spruce

Shrub

[2] Undifferentiated rose
[1] beaked willow

Forb

[21] cow parsnip*
[12] common fireweed
[4] showy aster
[3] western Canada violet
[2] cream-colored vetchling
[2] veiny meadow rue

Grass

[14] bluejoint
[1] common tall manna grass

*** Species characteristic of the phase but occuring in <70% for the sample plots with a prominence value <20.**

Site Characteristics

Moisture Regime:

Nutrient Regime:

Topographic Position: Midslope()

Slope: 3 - 5(28), 10 - 15(58), 16 - 30(14)

Aspect: Northerly(30), Easterly(60), Southerly(10)

Soil Characteristics

Organic Thickness:

Humus Form:

Surface Texture: CL(), L(), SCL(), SL()

Effective Texture:

Depth to Mottles/Gley:

Soil Drainage: Well drained(67), Moderate well drain(33)

Parent Material: GF(), M()

Soil Subgroup: O.EB(), O.BL(), D.GL()

Soil Type:

Plant Community Types (n)

FPD8 Aw / Cow parsnip (11)

f3 shrubland (n=32)

Natural Subregion: FOOTHILLS PARKLAND

Ecological Site: red osier dogwood / cow parsnip (subhygric/rich)

Characteristic Species

Shrub

[25] beaked willow*
[4] Undifferentiated rose

Forb

[4] common dandelion
[3] wild white geranium
[3] wild strawberry
[3] common fireweed
[1] common yarrow
[1] wild vetch

Grass

[11] Kentucky bluegrass
[6] timothy
[6] Undifferentiated sedge
[4] bluejoint

*** Species characteristic of the phase but occuring in <70% for the sample plots with a prominence value <20.**

Site Characteristics

Moisture Regime:

Nutrient Regime:

Topographic Position: Level(), Lower slope(), Midslope(), Depression()

Slope: 0.5 - 2.5(08), 3 - 5(13), 6 - 9(30), 10 - 15(27), 16 - 30(20), 31 - 45(02)

Aspect: Northerly(33), Easterly(31), Southerly(13), Westerly(23)

Soil Characteristics

Organic Thickness:

Humus Form:

Surface Texture: CL(), L(), SCL(), SiCL(), SiL(), SL()

Effective Texture:

Depth to Mottles/Gley:

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

Parent Material: F(), L(), M(), O()

Soil Subgroup: O.GL(), D.GL(), T.F(), O.BL(), GL.BL(), O.HG(), R.HG(), R.G()

Soil Type:

Plant Community Types (n)

FPC4	Bebb willow - Snowberry - Rose (11)
FPC5	Bebb willow / Kentucky bluegrass (12)
FPC6	Bebb willow / Cow parsnip / Sedge (5)
FPC7	Sandbar willow (1)
FPC8	Water birch - Silverberry / Timothy (1)
FPC15	Bebb willow / Cow parsnip / Canada goldenrod (2)

f4 grassland (n=9)

Natural Subregion: FOOTHILLS PARKLAND

Ecological Site: red osier dogwood / cow parsnip (subhygric/rich)

Characteristic Species

Shrub

[2] basket willow

Forb

[10] common dandelion

Grass

[28] Kentucky bluegrass
[19] wire rush
[12] tufted hair grass
[7] sedge species
[5] timothy

*** Species characteristic of the phase but occuring in <70% for the sample plots with a prominence value <20.**

Site Characteristics

Moisture Regime:

Nutrient Regime:

Topographic Position:

Slope: 0 - 0.5(), 0.5 - 2.5(), 10 - 15(), 16 - 30()

Aspect: Variable()

Soil Characteristics

Organic Thickness: 0 - 5 cm(), 6 - 15 cm()

Humus Form: MOR()

Surface Texture: CL(), SiL()

Effective Texture: CL(), SiCL(), SiL()

Depth to Mottles/Gley: 101 -()

Soil Drainage: Well drained(), Moderate well drain()

Parent Material: F(), GF()

Soil Subgroup: O.EB(), E.EB(), O.GL()

Soil Type:

Plant Community Types (n)

FPA12 Kentucky bluegrass - Wire (Baltic) rush - Tufted hair grass (9)

g horsetail (hygric/rich) (n=7)

Natural Subregion: FOOTHILLS PARKLAND

General Description

This ecological site represents some of the wettest and nutrient - rich forests within the subregion. Nutrient levels are high resulting in high diversity in shrub and forb layers. Seepage and high water tables can be expected.

Successional Relationships

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

Indicator Species

bluejoint	Undifferentiated sedge
common horsetail	balsam poplar
Undifferentiated willow	

Site Characteristics

Moisture Regime:

Nutrient Regime:

Topographic Poistion: Level(), Lower slope(), Midslope()

Slope: 0 - 0.5(17), 0.5 - 2.5(17), 3 - 5(33), 10 - 15(17), 31 - 45(16)

Aspect: Northerly(25), Westerly(75)

Soil Characteristics

Organic Thickness:

Humus Form:

Surface Texture: L(), SiCL(), SL()

Effective Texture:

Depth to Mottles/Gley:

Soil Drainage: Well drained()

Parent Material: GF(), L(), M()

Soil Subgroup: O.BL()

g1 horsetail Sw (n=2)

Natural Subregion: FOOTHILLS PARKLAND

Ecological Site: horsetail (hygric/rich)

Characteristic Species

Tree

[65] white spruce
[8] aspen

Shrub

[3] prickly rose
[2] bracted honeysuckle

Forb

[60] common horsetail
[5] bunchberry
[2] cow parsnip

Grass

[5] sedge species
[5] bluejoint

*** Species characteristic of the phase but occuring in <70% for the sample plots with a prominence value <20.**

Site Characteristics

Moisture Regime:

Nutrient Regime:

Topographic Position:

Slope:

Aspect:

Soil Characteristics

Organic Thickness:

Humus Form:

Surface Texture:

Effective Texture:

Depth to Mottles/Gley:

Soil Drainage:

Parent Material:

Soil Subgroup:

Soil Type:

Plant Community Types (n)

FPF8 Sw / Horsetail (2)

g2 horsetail Aw-Pb (n=4)

Natural Subregion: FOOTHILLS PARKLAND

Ecological Site: horsetail (hygric/rich)

Characteristic Species

Tree

[50] balsam poplar
[40] aspen
[10] white spruce

Shrub

[8] Snowberry (buckbrush)
[4] red-osier dogwood

Forb

[9] common horsetail
[5] wild strawberry
[4] tall lungwort

Grass

[14] bluejoint
[3] sedge species

*** Species characteristic of the phase but occuring in <70% for the sample plots with a prominence value <20.**

Site Characteristics

Moisture Regime:

Nutrient Regime:

Topographic Position: Level(), Lower slope(), Midslope()

Slope: 0 - 0.5(17), 0.5 - 2.5(17), 3 - 5(33), 10 - 15(17), 31 - 45(16)

Aspect: Northerly(75), Easterly(25)

Soil Characteristics

Organic Thickness:

Humus Form:

Surface Texture: L(), SCL(), SL()

Effective Texture:

Depth to Mottles/Gley:

Soil Drainage: Well drained(100)

Parent Material: GF(), L(), M()

Soil Subgroup: O.BL()

Soil Type:

Plant Community Types (n)

FPD9	Pb / Willow / Tall manna grass (1)
FPD10	Pb - Aw / Horsetail (3)

g3 shrubland (n=1)

Natural Subregion: FOOTHILLS PARKLAND

Ecological Site: horsetail (hygric/rich)

Characteristic Species

Tree

[1] white spruce

Shrub

[50] beaked willow
[3] bog birch
[3] flat-leaved willow

Forb

[40] common horsetail
[10] smooth aster
[3] large-leaved yellow avens
[3] tall lungwort

Grass

[20] awned sedge
[10] bluejoint

*** Species characteristic of the phase but occuring in <70% for the sample plots with a prominence value <20.**

Site Characteristics

Moisture Regime:

Nutrient Regime:

Topographic Position:

Slope:

Aspect:

Soil Characteristics

Organic Thickness:

Humus Form:

Surface Texture:

Effective Texture:

Depth to Mottles/Gley:

Soil Drainage:

Parent Material:

Soil Subgroup:

Soil Type:

Plant Community Types (n)

FPC9 Bebb willow / Horsetail / Sedge (1)

h fen (subhydric/rich) (n=26)

Natural Subregion: FOOTHILLS PARKLAND

General Description

The fen ecological site is generally characterized by flowing oxygenated water and alkaline, nutrient-rich conditions. It occupies level, depressional and lower slope positions where impeded drainage or high water tables enhance accumulation of organic matter consisting of sedges, golden moss, tufted moss and brown moss. Dwarf birch or willows form the canopy of the shrubby phase and sedges dominate the ground caover of the graminoid phase.

Successional Relationships

Species composition and successional direction is dictated by changes in hydrologic regime. As with other wetlands, fens have slow successional rates. Recovery from disturbance will also be slow.

Indicator Species

water sedge	awned sedge
beaked sedge	common horsetail
basket willow	

Site Characteristics

Moisture Regime:

Nutrient Regime:

Topographic Poistion: Level(), Depression()

Slope: 0 - 0.5(), 3 - 5()

Aspect: Variable()

Soil Characteristics

Organic Thickness:

Humus Form:

Surface Texture: SCL(), SiCL(), SL()

Effective Texture:

Depth to Mottles/Gley: Not Applicable()

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

Parent Material: F(), L(), M(), O()

Soil Subgroup: O.HG(), R.G(), TY.F(), GL.HR()

h1 shrubby fen (n=13)

Natural Subregion: FOOTHILLS PARKLAND

Ecological Site: fen (subhydric/rich)

Characteristic Species

Shrub

[26] basket willow*

[18] Undifferentiated willow

Forb

[1] wild mint

Grass

[33] Undifferentiated sedge*

[7] bluejoint

[3] tufted hair grass

*** Species characteristic of the phase but occuring in <70% for the sample plots with a prominence value <20.**

Site Characteristics

Moisture Regime:

Nutrient Regime:

Topographic Position: Level(), Depression()

Slope: 0 - 0.5(34), 3 - 5(66)

Aspect: Level(29), Easterly(43), Southerly(28)

Soil Characteristics

Organic Thickness:

Humus Form:

Surface Texture: SCL(), SiCL(), SL()

Effective Texture:

Depth to Mottles/Gley: Not Applicable()

Soil Drainage: Poorly drained(50), Very poorly drained(50)

Parent Material: F(), L(), M(), O()

Soil Subgroup: O.HG(), R.G(), TY.F(), GL.HR()

Soil Type:

Plant Community Types (n)

FPC10	Basket willow (1)
FPC11	Basket willow / Awned (Water) sedge (4)
FPC12	Basket willow / Kentucky bluegrass (2)
FPC13	Flat leaved willow / Water (Beaked) sedge (3)
FPC14	Yellow willow / Water sedge (3)

h2 graminoid fen (n=13)

Natural Subregion: FOOTHILLS PARKLAND

Ecological Site: fen (subhydric/rich)

Characteristic Species

Forb

[2] water smartweed

Grass

[28] beaked sedge*
[20] awned sedge*
[13] great bulrush
[9] water sedge*
[7] woolly sedge*

*** Species characteristic of the phase but occuring in <70% for the sample plots with a prominence value <20.**

Site Characteristics

Moisture Regime:

Nutrient Regime:

Topographic Position:

Slope:

Aspect:

Soil Characteristics

Organic Thickness:

Humus Form:

Surface Texture:

Effective Texture:

Depth to Mottles/Gley:

Soil Drainage:

Parent Material:

Soil Subgroup:

Soil Type:

Plant Community Types (n)

FPA8	Wire rush (Baltic rush) (1)
FPA5	Northern reed grass (1)
FPA6	Woolly sedge - Kentucky bluegrass (1)
FPA7	Sedge meadows (8)
FPA11	Bulrush (2)

Foothills Parkland Grasslands

6.0 Foothills Parkland Grasslands

Three vegetation types are considered to represent the vegetation on the rolling to hilly topography of the Foothills Parkland. These are foothills fescue grasslands, willow shrublands, and aspen forests (Natural Regions Committee 2006). Grasslands occur throughout the landscape on a variety of slopes and aspects, but dominate on southerly facing slopes. Soils under these grasslands are predominately Deep Orthic Black Chernozems. As slopes get steeper and closer to hilltops and crests however, the soils become shallower and less nutrient rich.

Floristically, grassland vegetation in the Foothills Parkland is similar to both the Foothills Fescue subregion (Adams et al. 2003) and the grassland types in the Montane subregion (Willoughby et al. 2008). Foothills rough fescue is the dominant grassland species on submesic to subhygric / rich grasslands. The reference grassland plant community is the Foothills rough fescue - Parry oat grass - Idaho fescue (FPA1) community. This community occurs on lower to mid – slope positions on Orthic Black Chernozems. Production and leading species are similar in this community throughout the subregion; however there are some vegetation differences that occur due to changes in latitude. For instance, Idaho fescue is common in the southern portions of the subregion, where Parry oat grass dominates as a secondary species in the central and northern portions. Moving up slope from this community into the shallower, less rich soils, foothills rough fescue decreases and secondary grasses like Parry oat grass become more dominant. Near the crests of hills, the cover of all grass species lessen, soil exposure increases, and shrubs suited to these dry nutrient poor sites such as juniper and bearberry occur.

The foothills rough fescue community is a fairly stable climax community. In the Montane, Willoughby (1992) described foothills rough fescue sites whose species composition had not changed for over 30 years. Biophysical factors can affect these grasslands over time however. Climatic cycles such as extended cooler / wetter periods can promote shrub and deciduous tree growth onto grasslands soils. Once established, these species can affect their microclimate and lead to further advantageous growth and conversion of the grassland to forest or shrubland. Periodic fires can reduce the encroachment of trees and shrubs, and allow grasslands to regain their competitive advantage. If fires are infrequent however, and trees and shrubs establish themselves, soil properties can actually change and significantly set back the Chernozemic grasslands (Alexander 1995).

Grazing, along with the above factors, is thought to help maintain grasses in their climax state and reduce encroachment. Grazing along with fire reduces shrub and tree encroachment especially within the marginal areas of the Foothills Parkland that are conducive to both tree and grass communities. In fact the suppression of fire and the elimination of the large herds of free ranging bison have been cited as the reason for an increase in woody plant species within the Parkland natural region since European settlement (Alexander 1995).

Proper Range management strives to protect and enhance the soil and vegetation complex while maintaining or improving the output of consumable products along with a wide range of other values and natural functions (Adams et al. 2003). To accomplish this managers strive to maintain communities at or near the potential natural community or reference plant communities described in this guide. As stated above, grazing is a fundamental factor that maintains grasslands in the Parkland natural region. However, overgrazing can lead to the degradation of rangeland and its ability to maintain sustainable production and other key ecological functions. Overgrazing can be described as a regime where range plants are grazed too intensely, too frequently, or at the wrong time (Range Management Branch 2010). Overgrazing on the grasslands in the Foothills Parkland leads to a reduction of foothills rough fescue cover, and commonly to the establishment of non native invaders such as Kentucky bluegrass, timothy, and smooth brome. Also reducing plant cover increases potential for soil erosion, and decreases the sites ability to capture moisture (Adams et al. 2003).

The successional pathway from disturbance has been developed for the Foothills rough fescue - Parry oat grass - Idaho fescue (FPA1) community. Particularly for moist sites, light to moderate disturbance may lead to a Foothills rough fescue - Kentucky bluegrass (FPB3). Moderate to heavy disturbance often through grazing reduces the foothills rough fescue coverage and creates either Kentucky bluegrass - Parry oat grass (FPB1) or Kentucky bluegrass - Foothills rough fescue (FPB2) communities depending on where the particular site falls within the 'c' ecological site on the edatopic grid (e.g. submesic / rich = FPB1, mesic / rich = FPB2). If disturbance is continually heavy, all native species are reduced and the community shifts to a Kentucky bluegrass - Timothy / Common dandelion (FPB4) community. Once this last shift has occurred the ability for the site to rebound to its original state is compromised. Willoughby and Alexander (2007) found in the Montane that communities that have reached this state, once excluded from grazing, stabilize with the invaders becoming dominant. These communities are then considered modified. Examples of modified communities in the Foothills Parkland are the Timothy (FPB5) and Smooth (awnless) brome - Kentucky bluegrass (FPB6) communities.

Wetter grassland types in the Foothills Parkland are less prevalent on the landscape but do occur. Seepage areas are common on lower slope positions through the subregion, but are usually covered in willow (Natural Regions Committee 2006). Open meadows and wetlands are less common in the higher elevations of the Parkland, and are generally found in the eastern portion of this subregion and are transitional to the Foothills Fescue. There are a number of community types that are characteristic of moist, poorly drained, nutrient rich sites. These include sedge meadows, tufted hairgrass - Baltic rush and bulrush meadows. Thompson and Hansen (2002, 2003) have described a number of graminoid wetland dominated communities. The types that have instances within the Foothills Parkland have been included in this guide. These types include water, beaked, woolly and awned sedge, creeping spike rush and bulrush dominated meadows.

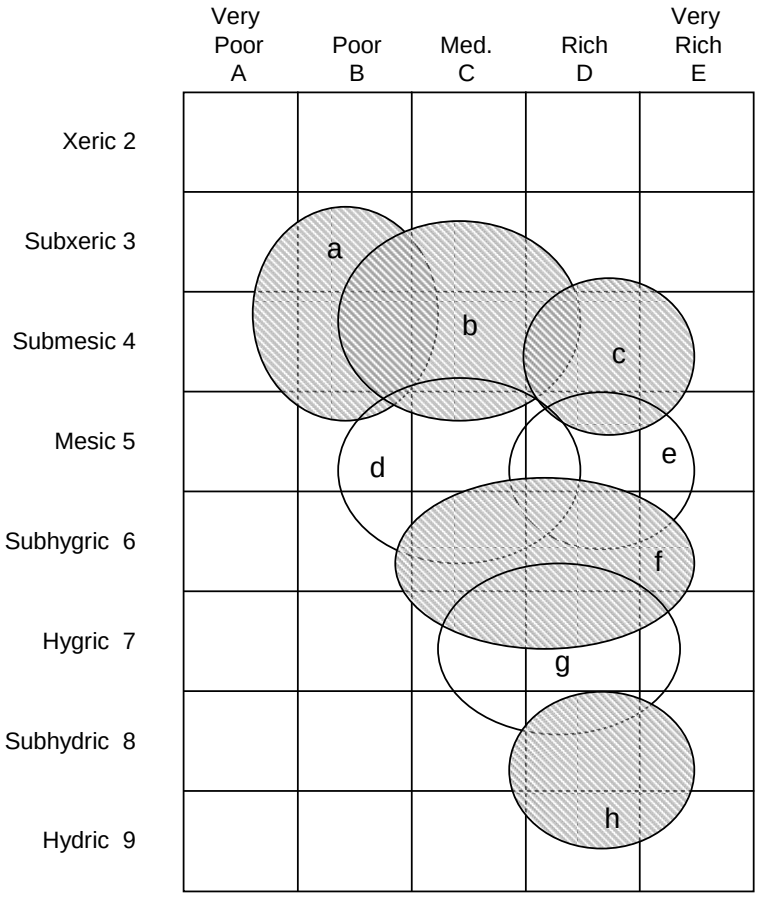


Figure 4. Grassland ecological sites on the Foothills Parkland edatopic grid.

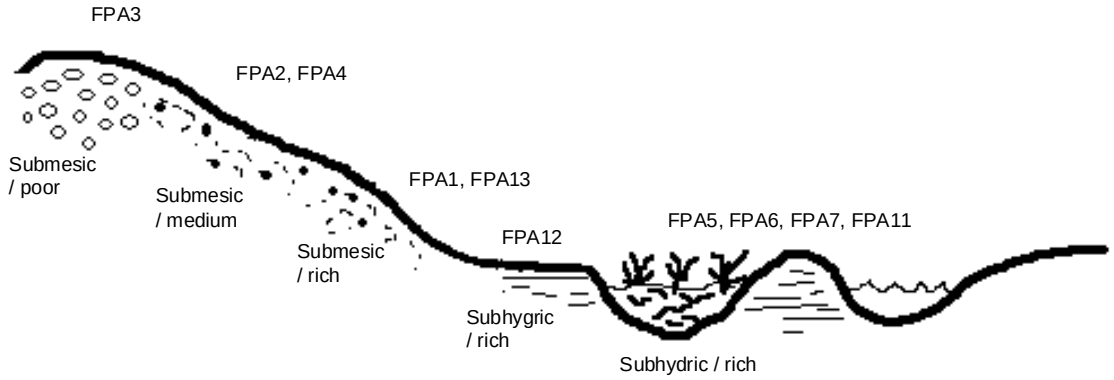


Figure 5. Slope position of grassland plant communities in the Foothills Parkland

Table 2. Foothills Parkland Grassland Communities

Ecological Site	Ecosite Phase	Reference Plant Community	Successional Community Types	Modified Community Types	Harvesting Succession
a bearberry (submesic/poor)	a3 grassland thin breaks	FPA3 Bearberry / Foothills rough fescue - Parry oat grass			
b hairy wild rye (submesic/medium)	b5 grassland	FPA2 Parry oat grass-Foothills rough fescue-Idaho fescue	FPB8 Parry oatgrass – Timothy FPB10 Wheatgrass - Foothills rough fescue	FPB9 Timothy - Kentucky bluegrass	
		FPA4 Foothills rough fescue - western porcupine grass			
c thick black Foothills rough fescue (submesic/rich)	c1 rough fescue	FPA1 Foothills rough fescue - Parry oat grass - Idaho fescue	FPB1 Kentucky bluegrass - Parry oatgras FPB3 Foothills rough fescue - Kentucky bluegrass FPB2 Kentucky bluegrass - Foothills rough fescue FPB4 Kentucky bluegrass - Timothy / Common dandelion	FPB5 Timothy FPB7 Creeping red fescue - Kentucky bluegrass FPB6 Smooth (awnless) brome - Kentucky bluegrass	
		FPA13 Foothills rough Fescue - Richardson's needlegrass			
f red osier dogwood (subhygric/rich)	f4 grassland	<RPC Not Described>	FPA12 Kentucky bluegrass - Wire (Baltic) rush - Tufted hair grass		

Table 2. Foothills Parkland Grassland Communities (continued)

Ecological Site	Ecosite Phase	Reference Plant Community	Successional Community Types	Modified Community Types	Harvesting Succession
h fen (subhydric/rich)	h2 graminoid fen	FPA5 Northern reed grass			
		<RPC Not Described>	FPA6 Woolly sedge - Kentucky bluegrass		
		FPA7 Sedge meadows	FPA8 Wire rush (Baltic rush)		
		FPA11 Bulrush			

FPA1. Foothills rough fescue - Parry oat grass - Idaho fescue

(Festuca campesteris - Danthonia parryi - Festuca idahoensis)

n=15 This community is the modal climax grassland community type on thick to thin Black Chernozemic soils in the Foothills Parkland subregion. This community is very similar to its counterpart in the Montane subregion. Willoughby (1992), described a Foothills rough fescue dominated site in the Montane where the species composition had not changed in over 30 years, indicating the climax nature of this community type. Moss and Campbell (1947) found that Foothills rough fescue grows almost to the exclusion of other plants in the absence of disturbance. They also found Parry oatgrass and Idaho fescue increased and rough fescue declined with increased grazing pressure. These findings are also found within the plots studied for this guide where this community is replaced by the Kentucky bluegrass - Parry oat grass (FPB1) successional community with moderate to heavy grazing. A slight difference from the Montane studies is that invasive soft grass or agronomic species such as Kentucky bluegrass and timothy seem to become a part of this community much more readily, even on drier sites. Successional sites with more moisture are either directly dominated or codominated by Kentucky bluegrass or other invasive agronomic species. (Foothills rough fescue - Kentucky bluegrass (FPB3) or Kentucky bluegrass - Foothills rough fescue (FPB2)). Long term or heavy disturbance will reduce all native species and change the site to a Kentucky bluegrass - Timothy / Dandelion (FPB4) community.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: c thick black Foothills rough fescue (submesic/rich)

Ecosite Phase: c1 rough fescue

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Shrub			
PRICKLY ROSE *(Rosa acicularis)*	2	0-6	50
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	2	1-3	100
Forb			
COMMON YARROW *(Achillea millefolium)*	1	0-2	80
CUT-LEAVED ANEMONE *(Anemone multifida)*	2	1-4	100
NORTHERN BEDSTRAW *(Galium boreale)*	2	1-2	100
SILKY PERENNIAL LUPINE *(Lupinus sericeus)*	2	0-7	50
WILD BERGAMOT *(Monarda fistulosa)*	5	0-18	30
WILD STRAWBERRY *(Fragaria virginiana)*	1	0-2	50
Grass			
BLUEBUNCH FESCUE *(Festuca idahoensis)*	5	1-11	100
COLUMBIA NEEDLE GRASS *(Stipa columbiana)*	2	0-6	50
FOOTHILLS ROUGH FESCUE *(Festuca campestris)*	38	13-60	100
JUNE GRASS *(Koeleria macrantha)*	2	0-5	50
PARRY OAT GRASS *(Danthonia parryi)*	12	0-25	80
SEDGE SPECIES *(Carex spp.)*	1	0-4	60

Environmental Variables

Moisture Regime: SUBMESIC(), MESIC()

Nutrient Regime: SUBMESOTROPHIC(), MESOTROPHIC(), PERMESOTROPHIC()

Elevation (range): 1396(1227-1680) M

Slope: 3 - 5(03), 6 - 9(06), 10 - 15(25), 16 - 30(44), 31 - 45(19), 46 - 70(03)

Aspect: Northerly(06), Easterly(18), Southerly(27), Westerly(49)

Soil Drainage: Rapidly drained(70), Well drained(23), Moderate well drain(07)

Soil Subgroup: O.EB, O.BL, R.DG, O.GL

Soil Series: BVA, DVG, GST, HFD

Soil Correlation: SCA 8

Range Site Category: Lo

Ecological Status Score: 40

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=0

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

0.58 (0.62-0.51) HA/AUM or *0.70 (0.65-0.79) AUM/AC*

FPA2. Parry oat grass - Foothills rough fescue-Idaho fescue

(Danthonia parryi - Festuca campesteris-Festuca Idahoensis)

n=14 This community type is found upslope from the Foothills rough fescue - Parry oat grass -Idaho fescue (FPA1) community type. Rough fescue tends to decrease in composition where slopes increase, soils thin, and thin breaks occur. Parry oat grass or Idaho fescue commonly becomes the dominant species. Idaho fescue is more prevalent in the southern portion of the subregion, but decreases moving north where Parry oat grass dominates. With disturbance pressure the Parry oat grass and Idaho fescue will decline and timothy may invade into this community. Further up slope on top of thin breaks, crests, and knolls, the community transitions into a Bearberry / Foothills rough fescue - Parry oat grass (FPA3) community where juniper and bearberry cover increases, as well as bare soil.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: b hairy wild rye (submesic/medium)

Ecosite Phase: b5 grassland

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Shrub			
PRICKLY ROSE *(Rosa acicularis)*	4	0-15	50
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	1	0-3	75
Forb			
COMMON YARROW *(Achillea millefolium)*	1	0-3	100
CUT-LEAVED ANEMONE *(Anemone multifida)*	2	0-7	50
NORTHERN BEDSTRAW *(Galium boreale)*	4	1-6	100
PRAIRIE SAGEWORT *(Artemisia ludoviciana)*	1	0-1	75
SILKY PERENNIAL LUPINE *(Lupinus sericeus)*	2	0-4	75
THREE-FLOWERED AVENS *(Geum triflorum)*	1	0-2	50
WILD VETCH *(Vicia americana)*	2	1-3	100
Grass			
BLUEBUNCH FESCUE *(Festuca idahoensis)*	7	0-14	50
BLUNT SEDGE *(Carex obtusata)*	3	0-6	50
FOOTHILLS ROUGH FESCUE *(Festuca campestris)*	11	3-21	100
JUNE GRASS *(Koeleria macrantha)*	1	0-2	75
PARRY OAT GRASS *(Danthonia parryi)*	33	21-36	100
SLENDER WHEAT GRASS *(Agropyron trachycaulum)*	2	0-5	75

Environmental Variables

Moisture Regime: SUBMESIC()

Nutrient Regime: SUBMESOTROPHIC(25), MESOTROPHIC(50), PERMESOTROPHIC(25)

Elevation (range): 1349(1264-1400) M

Slope: 3 - 5(08), 6 - 9(09), 10 - 15(22), 16 - 30(48), 31 - 45(13)

Aspect: Easterly(08), Southerly(29), Westerly(63)

Soil Drainage: Rapidly drained(59), Well drained(41)

Soil Subgroup: O.BL, R.BL, O.GL, O.R

Soil Series: BVA, HFD, BDY

Soil Correlation: SCA 8

Range Site Category: TB

Ecological Status Score: 40

Soil Exposure	**Mean**	**Min**	**Max**
%:			
Comment:			

Forage Production (kg/ha) n=0

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

1.01 (1.62-0.67) HA/AUM or *0.40 (0.25-0.60) AUM/AC*

FPA3. Bearberry / Foothills rough fescue - Parry oat grass

(Arctostaphhylos uva-ursi / Festuca campestris - Danthonia parryi)

n=4 This community type represents the very dry thin break or limy range sites and is found on upper slopes, crests and knolls throughout the Foothills Parkland Subregion. It is closely related to the Foothills rough fescue - sedge / bearberry community in the Montane (Willoughby et al. 2008). Shallow, rapidly drained soils are characteristic of this plant community type. If within the transitional zone to the Montane region this particular site can also have small components of limber pine growing. Forage production on this site is generally low because of the dry site conditions and high soil exposure.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: a bearberry (submesic/poor)

Ecosite Phase: a3 grassland

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Shrub			
COMMON BEARBERRY *(Arctostaphylos uva-ursi)*	5	0-13	75
CREEPING JUNIPER *(Juniperus horizontalis)*	8	0-18	50
PRICKLY ROSE *(Rosa acicularis)*	3	0-8	75
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	2	0-3	75
Forb			
CREAM-COLORED VETCHLING *(Lathyrus ochroleucus)*	2	0-5	50
WILD BERGAMOT *(Monarda fistulosa)*	3	0-7	50
WILD VETCH *(Vicia americana)*	1	0-2	75
Grass			
BLUEBUNCH FESCUE *(Festuca idahoensis)*	4	0-9	75
FOOTHILLS ROUGH FESCUE *(Festuca campestris)*	20	9-32	100
JUNE GRASS *(Koeleria macrantha)*	2	0-4	50
PARRY OAT GRASS *(Danthonia parryi)*	13	9-16	100
UNDIFFERENTIATED SEDGE *(Carex)*	1	0-2	50
UNDIFFERENTIATED WHEAT GRASS *(Agropyron)*	4	0-16	25

Environmental Variables

Moisture Regime: SUBMESIC()

Nutrient Regime: SUBMESOTROPHIC(), MESOTROPHIC()

Elevation (range): 1428(1263-1570) M

Slope: 3 - 5(02), 6 - 9(09), 10 - 15(20), 16 - 30(46), 31 - 45(23)

Aspect: Northerly(09), Easterly(22), Southerly(37), Westerly(32)

Soil Drainage: Rapidly drained(100)

Soil Subgroup: E.EB, R.BL, O.GL

Soil Series:

Soil Correlation:

Range Site Category: TB, Li

Ecological Status Score: 40

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=0

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

1.62 (8.10-1.01) HA/AUM or *0.25 (0.05-0.40) AUM/AC*

FPA4. Foothills rough fescue - western porcupine grass

(Festuca campestris - Stipa curtiseta)

n=4 This community falls within the Foothills Parkland Subregion close to the borders of the Foothills fescue and Mixedgrass subregions within the Grassland natural region. These communities occur on thin break steeper slope positions and limy terraces usually with south aspects that are dry enough to support Western porcupine grass. This community is not overly common, and represents the transition from a drier subregion to one with more moisture. Similar species associations occur in the Cypress Hills, where the Mixedgrass subregion quickly transitions to the Montane. (Adams et al. 2005)

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: b hairy wild rye (submesic/medium)

Ecosite Phase: b5 grassland

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Shrub			
PRICKLY ROSE *(Rosa acicularis)*	1	0-1	100
Forb			
LOW GOLDENROD *(Solidago missouriensis)*	1	0-2	50
PASTURE SAGEWORT *(Artemisia frigida)*	1	0-2	50
SILKY PERENNIAL LUPINE *(Lupinus sericeus)*	2	0-8	25
THREE-FLOWERED AVENS *(Geum triflorum)*	6	0-16	50
WOOLLY GROMWELL *(Lithospermum ruderale)*	1	0-2	75
Grass			
BLUEBUNCH FESCUE *(Festuca idahoensis)*	1	0-2	75
FOOTHILLS ROUGH FESCUE *(Festuca campestris)*	24	8-36	100
JUNE GRASS *(Koeleria macrantha)*	1	0-4	75
RICHARDSON NEEDLE GRASS *(Stipa richardsonii)*	2	0-4	75
UNDIFFERENTIATED SEDGE *(Carex)*	3	2-5	100
WESTERN PORCUPINE GRASS *(Stipa curtiseta)*	13	8-16	100

Environmental Variables

Moisture Regime:

Nutrient Regime:

Elevation (range): (-) M

Slope:

Aspect:

Soil Drainage:

Soil Subgroup:

Soil Series:

Soil Correlation:

Range Site Category: TB, Li

Ecological Status Score: 40

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

1.01 (1.16-0.81) HA/AUM or *0.40 (0.35-0.50) AUM/AC*

FPA5. Northern reed grass

(Calamagrostis inexpansa)

n=1 This community type is not common in Alberta and has only been described in 3 sites in the Dry Mixedwood and 1 in the Foothills Parkland subregion (Thompson and Hansen 2003). This type occurs in wet meadows, basins and slightly saline depressions and is often associated with lentic riparian areas. This community is characterized by an abundance of northern reedgrass with somewhat saline tolerant species like foxtail barley, baltic rush and fowl bluegrass. Increased disturbance will lead to a plant community dominated by foxtail barley and baltic rush. Although rated fair in forage production and considered palatable when young the wet conditions limit the use of this plant community.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: h fen (subhydric/rich)

Ecosite Phase: h2 graminoid fen

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Forb			
WATER SMARTWEED *(Polygonum amphibium)*	1		100
Grass			
NORTHERN REED GRASS *(Calamagrostis inexpansa)*	70		100
WIRE RUSH *(Juncus balticus)*	30		100
WOOLLY SEDGE *(Carex lanuginosa)*	20		100

Environmental Variables

Moisture Regime:

Nutrient Regime:

Elevation (range): (-) M

Slope:

Aspect:

Soil Drainage:

Soil Subgroup:

Soil Series:

Soil Correlation:

Range Site Category: Lo, Sb

Ecological Status Score: 40

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

0.54 (0.74-0.51) HA/AUM or *0.75 (0.55-0.79) AUM/AC*

FPA6. Woolly sedge - Kentucky bluegrass

(Carex lanuginosa)

n=1 This community type was described in the Grassland Natural region by Thompson and Hansen (2002). It occurs on slightly alkaline sites with deep organic soils and associated with riparian areas. As indicated by the single plot describing this community, moderate disturbance will increase the cover of wire (Baltic) rush and severe disturbance may lower the water table and increase the cover of Kentucky bluegrass. This community is considered a temporary wetland and may be flooded into July and August. In these cases livestock will generally not use it until it dries out.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: h fen (subhydric/rich)

Ecosite Phase: h2 graminoid fen

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Forb			
COMMON DANDELION *(Taraxacum officinale)*	3		100
COMMON HORSETAIL *(Equisetum arvense)*	1		100
GRACEFUL CINQUEFOIL *(Potentilla gracilis)*	3		100
Grass			
KENTUCKY BLUEGRASS *(Poa pratensis)*	20		100
TIMOTHY *(Phleum pratense)*	10		100
WOOLLY SEDGE *(Carex lanuginosa)*	70		100

Environmental Variables

Moisture Regime:

Nutrient Regime:

Elevation (range): (-) M

Slope:

Aspect:

Soil Drainage:

Soil Subgroup:

Soil Series:

Soil Correlation:

Range Site Category: Sb, WL

Ecological Status Score: 20 - 15

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

0.40 (0.51-0.27) HA/AUM or *1.01 (0.79-1.50) AUM/AC*

FPA7. Sedge meadows

(Carex atherodes, C. rostrata, C. aquatilis)

n=8 This riparian associated 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 dominated community types. Thompson and Hansen (2002) described this community on the eastern edges of the Montane subregion. It was found in lentic situations around depressional wetlands, sloughs, and potholes. Willoughby (2001) has found these sedge species to be very palatable to livestock in the Upper Foothills subregion. Wetter conditions however limit accessibility particularly during the early to mid grazing season. On dry years or into the fall they can be extensively utilized by livestock, however forage quality declines. 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). If used by livestock when soils are saturated, soil disturbance problems such as pugging will often occur.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: h fen (subhydric/rich)

Ecosite Phase: h2 graminoid fen

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Shrub			
SALIX SPECIES *(Salix spp.)*	1	0-1	25
Forb			
MARSH HEDGE-NETTLE *(Stachys palustris)*	1	0-3	25
WATER SMARTWEED *(Polygonum amphibium)*	3	0-20	13
WILD MINT *(Mentha arvensis)*	1	0-3	25
Grass			
AWNED SEDGE *(Carex atherodes)*	37	0-98	40
BEAKED SEDGE *(Carex rostrata)*	44	0-98	75
CREEPING SPIKE-RUSH *(Eleocharis palustris)*	1	0-10	13
WATER SEDGE *(Carex aquatilis)*	15	0-90	50
WIRE RUSH *(Juncus balticus)*	1	0-3	25

Environmental Variables

Moisture Regime:

Nutrient Regime:

Elevation (range): 1257(1257-1257) M

Slope:

Aspect:

Soil Drainage:

Soil Subgroup:

Soil Series:

Soil Correlation:

Range Site Category:

Ecological Status Score: 40

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

0.40 (0.51-0.27) HA/AUM or *1.01 (0.79-1.50) AUM/AC*

FPA8. Wire rush (Baltic rush)

(Juncus balticus)

n=1 This community type is a grazing disclimax of the sedge dominated communities. Thompson and Hansen (2002) described this community in the Grassland natural region. It occurs over a wide range of environmental conditions, usually near seaps, in meadows, and on alluvial terraces. Wire (Baltic) rush is generally unpalatable to livestock and will increase with an increase in grazing pressure on these wet sites. The increased use may also dry the site out somewhat and species such as Kentucky bluegrass will invade. Along with the species shifts, soil disturbance problems such as pugging may occur.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: h fen (subhydric/rich)

Ecosite Phase: h2 graminoid fen

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Forb			
GRACEFUL CINQUEFOIL *(Potentilla gracilis)*	1		100
SMOOTH ASTER *(Aster laevis)*	1		100
WATER SMARTWEED *(Polygonum amphibium)*	1		100
Grass			
KENTUCKY BLUEGRASS *(Poa pratensis)*	20		100
WIRE RUSH *(Juncus balticus)*	90		100

Environmental Variables

Moisture Regime:

Nutrient Regime:

Elevation (range): (-) M

Slope:

Aspect:

Soil Drainage:

Soil Subgroup:

Soil Series:

Soil Correlation:

Range Site Category: WL, Ov, Sb, SL

Ecological Status Score: 20 - 15

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

1.01 (1.35-0.67) HA/AUM or *0.40 (0.30-0.60) AUM/AC*

Range in stocking rate due to the presence absence of palatable species.

FPA11. Bulrush

(Scirpus acutus)

n=2 This wetland community type is associated with standing water. It is an emergent community found in pond and lake margins in water up to 2 m deep (Thompson and Hansen (2003). Typically this is one of the last bands of vegetation before open water. This community is limited for livestock use due a lack of palatable forage as well as the deep water it resides.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: h fen (subhydric/rich)

Ecosite Phase: h2 graminoid fen

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Forb			
COMMON HORSETAIL *(Equisetum arvense)*	5	1-10	100
WILD MINT *(Mentha arvensis)*	2	0-3	50
Grass			
BEAKED SEDGE *(Carex rostrata)*	7	3-10	100
GREAT BULRUSH *(Scirpus acutus)*	85	80-90	100

Environmental Variables

Moisture Regime:

Nutrient Regime:

Elevation (range): (-) M

Slope:

Aspect:

Soil Drainage:

Soil Subgroup:

Soil Series:

Soil Correlation:

Range Site Category: WL

Ecological Status Score: 40

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

0.00 (0.00-0.81) HA/AUM or 0.00 (0.00 - 0.5) AUM/AC

FPA12. Kentucky bluegrass - Wire (Baltic) rush - Tufted hair grass

(Poa pratensis - Juncus Balticus - Deschampsia cespitosa)

n=9 This is a mid seral community found on the boundaries of the Foothills Parkland and Foothills Fescue natural subregions. Tufted hair grass grows in moist subirrigated or overflow range sites. Due to lack of plots in the Foothills Parkland, a reference community for this disclimax community has not yet been described. Adams et al. (2003) however describes a community in the Foothills Fescue natural subregion that suggests if undisturbed, tufted hair grass, and sedges would predominate (FFC2). Thompson and Hansen (2003) suggest that left undisturbed, tufted hair grass will dominate over other herbaceous species. Moderate to heavy grazing however lowers its reproductive advantage by reducing its seed head.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: f red osier dogwood / cow parsnip (subhygric/rich)

Ecosite Phase: f4 grassland

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Shrub			
BASKET WILLOW *(Salix petiolaris)*	2	0-13	22
FALSE MOUNTAIN WILLOW *(Salix pseudomonticola)*	1	0-6	33
Forb			
COMMON DANDELION *(Taraxacum officinale)*	10	1-39	100
COMMON YARROW *(Achillea millefolium)*	1	0-5	78
NORTHERN BEDSTRAW *(Galium boreale)*	1	0-2	67
WILD VETCH *(Vicia americana)*	1	0-3	100
Grass			
FOOTHILLS ROUGH FESCUE *(Festuca campestris)*	3	0-13	33
KENTUCKY BLUEGRASS *(Poa pratensis)*	28	10-51	100
TIMOTHY *(Phleum pratense)*	8	0-16	89
TUFTED HAIR GRASS *(Deschampsia cespitosa)*	12	5-20	100
UNDIFFERENTIATED SEDGE *(Carex)*	7	0-23	67
WIRE RUSH *(Juncus balticus)*	19	0-43	89

Environmental Variables

Moisture Regime:

Nutrient Regime:

Elevation (range): 1336(-) M

Slope: 0.5 - 2.5(18), 3 - 5(64), 6 - 9(09), 10 - 15(09)

Aspect: Northerly(25), Easterly(25), Southerly(25), Westerly(25)

Soil Drainage: Rapidly drained(11), Well drained(67), Imperfectly drained(11), Poorly drained(11)

Soil Subgroup: O.BL, O.DG

Soil Series: BVA, DVG

Soil Correlation: SCA 8

Range Site Category: Sb, Ov

Ecological Status Score: 20 - 15

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

0.54 (0.81-0.40) HA/AUM or *0.75 (0.50-1.01) AUM/AC*

FPA13. Foothills rough Fescue - Richardson's needlegrass

(Festuca campestris - Stipa Richardsonii)

n=6 This community commonly occurs in the transition between the Foothills Fescue and Foothills Parkland natural subregions. It can occur on a wide range of slopes and aspects with good soil development and appears to be a transitional community between the lower slope position Foothills rough fescue - Parry oat grass - Idaho fescue (FPA1) and the much drier Foothills rough fescue - Western porcupine grass community type (FPA4). With increased disturbance pressure, Foothills rough fescue will decrease in abundance, and species such as Richardson's needle grass, Parry oat grass, Idaho fescue, invader species, and numerous forb species will increase. Litter may be an important factor in maintaining production on these slopes (Adams et al. 2003).

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: c thick black Foothills rough fescue (submesic/rich)

Ecosite Phase: c1 rough fescue

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Shrub			
PRICKLY ROSE *(Rosa acicularis)*	1	0-1	100
Forb			
COMMON YARROW *(Achillea millefolium)*	1	0-2	80
LOW GOLDENROD *(Solidago missouriensis)*	2	0-6	80
THREE-FLOWERED AVENS *(Geum triflorum)*	6	0-18	80
WILD WHITE GERANIUM *(Geranium richardsonii)*	3	0-7	80
Grass			
PARRY OAT GRASS *(Danthonia parryi)*	1	0-4	40
RICHARDSON NEEDLE GRASS *(Stipa richardsonii)*	12	9-16	100
ROUGH FESCUE *(Festuca scabrella)*	35	31-38	100
UNDIFFERENTIATED SEDGE *(Carex)*	4	2-5	100
WESTERN PORCUPINE GRASS *(Stipa curtiseta)*	2	0-4	80

Environmental Variables

Moisture Regime:

Nutrient Regime:

Elevation (range): (-) M

Slope: 3 - 5()

Aspect: Easterly()

Soil Drainage: Well drained()

Soil Subgroup: O.BL

Soil Series: MSB, SPR, BDY

Soil Correlation: SCA 8

Range Site Category: Lo

Ecological Status Score: 40

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

0.67 (1.01-0.58) HA/AUM or *0.60 (0.40-0.70) AUM/AC*

FPB1. Kentucky bluegrass - Parry oatgrass

(Poa pratensis - Danthonia parryi)

n=15 This community type is most commonly found on lower and toe slope positions and represents the drier phase of the Foothills rough fescue - Parry oat grass - Idaho fescue (FPA1) plant community that has been moderately to heavily disturbed for a number of years. The decrease in abundance of foothills rough fescue makes this community similar to a Parry oat grass - Rough fescue - Idaho fescue (FPA2) community type that occupies mid to upper slope positions. The limited cover of rough fescue suggests this community is slightly drier than a Foothills Rough fescue - Kentucky bluegrass (FPB3) community and could represent a transition between water shedding and water receiving at the lower slope position for the FPA1 community. This relationship is similar in the Montane grasslands, but in the Foothills Parkland, non-native invaders seem to more readily advance into even the drier communities. Heavy grazing of this community may either further increase the amount of invader species or decrease the amount of cover altogether depending on the amount of moisture that is available. If disturbance pressure is reduced or eliminated, the site will likely recover back to the original community (Foothills rough fescue - Parry oat grass - Idaho fescue (FPA1)), but may have a small component of Kentucky bluegrass (Foothills rough Fescue - Kentucky bluegrass (FPB3)).

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: c thick black Foothills rough fescue (submesic/rich)

Ecosite Phase: c1 rough fescue

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Shrub			
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	4	0-15	80
UNDIFFERENTIATED ROSE *(Rosa)*	1	0-3	60
Forb			
COMMON DANDELION *(Taraxacum officinale)*	2	0-5	80
COMMON YARROW *(Achillea millefolium)*	2	1-3	100
CUT-LEAVED ANEMONE *(Anemone multifida)*	3	1-8	100
NORTHERN BEDSTRAW *(Galium boreale)*	4	1-11	100
SILKY PERENNIAL LUPINE *(Lupinus sericeus)*	5	0-17	60
STICKY PURPLE GERANIUM *(Geranium viscosissimum)*	3	1-3	100
THREE-FLOWERED AVENS *(Geum triflorum)*	3	0-5	80
WILD VETCH *(Vicia americana)*	1	0-2	80
WOOLLY GROMWELL *(Lithospermum ruderale)*	1	0-1	80
YELLOW FALSE DANDELION *(Agoseris glauca)*	2	0-8	100
Grass			
JUNE GRASS *(Koeleria macrantha)*	3	0-10	90
KENTUCKY BLUEGRASS *(Poa pratensis)*	23	2-51	100
PARRY OAT GRASS *(Danthonia parryi)*	15	11-26	100
ROUGH FESCUE *(Festuca scabrella)*	9	0-16	90
SLENDER WHEAT GRASS *(Agropyron trachycaulum)*	3	0-9	90
TIMOTHY *(Phleum pratense)*	6	0-26	80

Environmental Variables

Moisture Regime: SUBXERIC(), SUBMESIC()

Nutrient Regime: MESOTROPHIC(), PERMESOTROPHIC()

Elevation (range): 1374(1290-1495) M

Slope: 3 - 5(07), 10 - 15(31), 16 - 30(62)

Aspect: Northerly(14), Easterly(10), Southerly(34), Westerly(42)

Soil Drainage: Rapidly drained(30), Well drained(60), Imperfectly drained(10)

Soil Subgroup:

Soil Series:

Soil Correlation: SCA 8

Range Site Category: Lo

Ecological Status Score: 27 - 20

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=0

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

0.67 (1.01-0.54) HA/AUM or *0.60 (0.40-0.75) AUM/AC*

FPB2. Kentucky bluegrass - Foothills rough fescue

(Poa pratensis - Festuca campestris)

n=35 This plant community commonly occurs on Orthic Black Loamy soils, on level to moderate slopes on all aspects, but most commonly southerly and westerly. It represents a direct disturbance (grazing) disclimax community of the Foothills rough fescue - Parry oatgrass - Idaho fescue community type. Long-term heavy disturbance pressure leads to a decline in Foothills rough fescue. With the availability of moisture, Kentucky bluegrass or other invasive agronomics readily increase between the fescue plants. Continued heavy disturbance (grazing) pressure eventually leads to a decline in all native species and the plant community will resemble a Kentucky bluegrass - Timothy / Common dandelion (FPB4) type. Similar to these successional community types in the Montane, the forage productivity of this community type on average moisture years is equivalent to or better than a lightly grazed Foothills rough fescue - Parry oat grass - Idaho fescue (FPA1) community. However, Foothills rough fescue is a much more desirable forage species because its productivity is less affected by drought and maintains its nutrient content into the dormant season. In contrast, Kentucky bluegrass productivity is highly influenced by fluctuations in moisture and loses much of its palatability and nutrient content once it has gone dormant.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: c thick black Foothills rough fescue (submesic/rich)

Ecosite Phase: c1 rough fescue

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Shrub			
PRICKLY ROSE *(Rosa acicularis)*	4	0-9	71
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	3	0-7	100
Forb			
COMMON DANDELION *(Taraxacum officinale)*	3	0-7	86
COMMON YARROW *(Achillea millefolium)*	2	1-4	100
CREAM-COLORED VETCHLING *(Lathyrus ochroleucus)*	2	0-4	86
NORTHERN BEDSTRAW *(Galium boreale)*	5	1-6	100
STAR-FLOWERED SOLOMON'S-SEAL *(Smilacina stellata)*	3	0-4	86
VEINY MEADOW RUE *(Thalictrum venulosum)*	4	0-9	86
WILD BERGAMOT *(Monarda fistulosa)*	2	0-5	86
WILD VETCH *(Vicia americana)*	2	0-3	86
YELLOW FALSE DANDELION *(Agoseris glauca)*	4	0-11	86
Grass			
FOOTHILLS ROUGH FESCUE *(Festuca campestris)*	5	0-20	71
JUNE GRASS *(Koeleria macrantha)*	2	0-10	71
KENTUCKY BLUEGRASS *(Poa pratensis)*	22	16-37	100
PARRY OAT GRASS *(Danthonia parryi)*	4	0-7	71
TIMOTHY *(Phleum pratense)*	5	0-10	71

Environmental Variables

Moisture Regime: SUBXERIC(), SUBMESIC(), MESIC()

Nutrient Regime: SUBMESOTROPHIC(), MESOTROPHIC(), PERMESOTROPHIC()

Elevation (range): 1413(1315-1677) M

Slope: 0 - 0.5(05), 0.5 - 2.5(10), 3 - 5(18), 6 - 9(29), 10 - 15(31), 16 - 30(07)

Aspect: Northerly(10), Easterly(36), Southerly(33), Westerly(21)

Soil Drainage: Rapidly drained(45), Well drained(39), Moderate well drain(16)

Soil Subgroup: O.B, O.BL, R.BL, CA.BL, O.DG, O.GL

Soil Series: DVG, FMT, HFD, MAB

Soil Correlation: SCA 8

Range Site Category: Lo

Ecological Status Score: 20 - 15

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=0

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

0.62 (1.01-0.54) HA/AUM or *0.65 (0.40-0.75) AUM/AC*

FPB3. Foothills rough fescue - Kentucky bluegrass

(Festuca campestris - Poa pratensis)

n=23 This plant community commonly occurs on Orthic Black Loamy soils, on level to strong slopes on all aspects but more commonly westerly and southerly. It represents a late seral Foothills rough fescue - Parry oat grass - Idaho fescue (FPA1) community type. It may represent previously heavily disturbed grasslands that are now recovering, but may also occur on a site with high enough moisture levels that Kentucky bluegrass has invaded in small components with minimal to no grazing disturbance. In similar communities in the Montane, protection or a reduction in stocking level at the point where Kentucky bluegrass has become a significant component of the community allows rough fescue to recover, but Kentucky bluegrass also remains as a subdominant component of the community. Willoughby (1996), found that some rangeland reference area sites that were protected from grazing before Kentucky bluegrass became established recovered to Rough fescue -Idaho fescue - Parry oat grass in 20-30 years. In contrast sites that had significant Kentucky bluegrass invasion recovered to a Rough fescue - Kentucky bluegrass dominated community over the same time period. It appears that both the unidirectional climax range condition model (Wroe et al. 1988) and the state and threshold model (Westoby et al. 1989) apply to the succession sequences of the foothills rough fescue grasslands of southwestern Alberta. This makes it extremely difficult to assess range health on these sites (Willoughby and Alexander 2000). A suggestion is to allow for a small component (in the range of 5%) of timothy or Kentucky bluegrass into the Foothills rough fescue - Parry oat grass - Idaho fescue (FPA1) community before declaring this one.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: c thick black Foothills rough fescue (submesic/rich)

Ecosite Phase: c1 rough fescue

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Shrub			
PRICKLY ROSE *(Rosa acicularis)*	3	0-17	50
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	2	0-9	50
Forb			
COMMON DANDELION *(Taraxacum officinale)*	1	0-4	68
CREAM-COLORED VETCHLING *(Lathyrus ochroleucus)*	1	0-2	64
SMOOTH ASTER *(Aster laevis)*	1	0-3	46
THREE-FLOWERED AVENS *(Geum triflorum)*	2	0-15	50
Grass			
BLUEBUNCH FESCUE *(Festuca idahoensis)*	4	0-14	86
FOOTHILLS ROUGH FESCUE *(Festuca campestris)*	23	10-35	100
KENTUCKY BLUEGRASS *(Poa pratensis)*	10	0-20	96
PARRY OAT GRASS *(Danthonia parryi)*	7	0-15	100
SLENDER WHEAT GRASS *(Agropyron trachycaulum)*	1	0-7	68
TIMOTHY *(Phleum pratense)*	9	0-30	96

Environmental Variables

Moisture Regime: SUBMESIC(), MESIC()

Nutrient Regime: MESOTROPHIC(), PERMESOTROPHIC()

Elevation (range): 1043(1280-1555) M

Slope: 6 - 9(03), 10 - 15(20), 16 - 30(35), 31 - 45(21), 46 - 70(21)

Aspect: Northerly(05), Easterly(28), Southerly(28), Westerly(39)

Soil Drainage: Rapidly drained(81), Well drained(05), Moderate well drain(14)

Soil Subgroup: O.B, O.BL, O.DG, O.GL

Soil Series:

Soil Correlation: SCA 8

Range Site Category: Lo, Ov

Ecological Status Score: 27

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=0

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

0.58 (0.81-0.51) HA/AUM or *0.70 (0.50-0.79) AUM/AC*

FPB4. Kentucky bluegrass - Timothy / Common dandelion

(Poa pratensis - Phleum pratense / Taraxacum officinale)

n=58 This community type appears to once have been a Foothills rough fescue- Parry oatgrass - Idaho fescue (FPA1) community type on thick Black Orthic Chernozmic soils. Prolonged heavy disturbance (grazing) has shifted the community to one dominated by Kentucky bluegrass, timothy and dandelion. The climax range condition model (Wroe et al. 1988) suggests that vegetation development will be directional, predictable and revert to the original vegetation when protected from grazing. Local exclosure research in the neighbouring Montane subregion however indicates that vegetation dynamics on these sites more closely follows the state and threshold model (Westoby et al. 1989) when non-native invaders such as timothy or Kentucky bluegrass dominate the site. Rather than move back to the RPC, these communities will stabilize with invader species still present (Willoughby and Alexander 2007). It appears that on sites with more moisture, if these invaders become dominant, there will be little recovery even after long periods of no disturbance. Drier sites however may still have potential for recovery. Although the range of this community indicates that it can be a native community, it is usually rated as modified when assessing rangeland health (Adams et al. 2009) due to the extensive non native species.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: c thick black Foothills rough fescue (submesic/rich)

Ecosite Phase: c1 rough fescue

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Shrub			
PRICKLY ROSE *(Rosa acicularis)*	2	0-20	57
Forb			
CANADA THISTLE *(Cirsium arvense)*	3	0-17	50
COMMON DANDELION *(Taraxacum officinale)*	10	0-54	83
COMMON YARROW *(Achillea millefolium)*	3	0-10	90
NORTHERN BEDSTRAW *(Galium boreale)*	4	0-27	90
WILD STRAWBERRY *(Fragaria virginiana)*	4	0-18	70
WILD VETCH *(Vicia americana)*	2	0-9	70
Grass			
AWNLESS BROME *(Bromus inermis)*	1	0-17	53
BLUEBUNCH FESCUE *(Festuca idahoensis)*	1	0-8	33
CREEPING RED FESCUE *(Festuca rubra)*	4	0-35	33
FOOTHILLS ROUGH FESCUE *(Festuca campestris)*	2	0-15	37
KENTUCKY BLUEGRASS *(Poa pratensis)*	33	3-87	100
TIMOTHY *(Phleum pratense)*	22	1-52	100

Environmental Variables

Moisture Regime: MESIC(), SUBHYGRIC()

Nutrient Regime: MESOTROPHIC(), PERMESOTROPHIC()

Elevation (range): 1310(1212-1406) M

Slope: 0 - 0.5(03), 0.5 - 2.5(10), 3 - 5(17), 6 - 9(26), 10 - 15(23), 16 - 30(17), 31 - 45(04)

Aspect: Northerly(16), Easterly(32), Southerly(30), Westerly(21)

Soil Drainage: Rapidly drained(16), Well drained(58), Moderate well drain(13), Imperfectly drained(02), Poorly drained(11)

Soil Subgroup: O.GL, D.GL, O.BL, CA.BL, GL.BL, O.DG, O.HG, O.HR, GL.HR

Soil Series: BPE, BVA, DVG, DVGaa, FMT, HFD, HFDaa, POT, SPR, BDY

Soil Correlation: SCA 8

Range Site Category: Lo, Ov

Ecological Status Score: Native 15 or Modified 15 - 8

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=0

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

0.74 (1.01-0.51) HA/AUM or *0.55 (0.40-0.79) AUM/AC*

Range in stocking rate due to potentially high variablity in productive palatable species.

FPB5. Timothy

(Phleum pratense)

n=3 These sites were probably once Foothills rough fescue - Parry oatgrass - Idaho fescue communities on Thick Black Orthic Chernozemic soils. There are two pathways that may have created the present plant community. These sites may have once been either cultivated and seeded in the past, but are presently not being managed intensively as tame pasture. Another pathway is that historic prolonged extreme grazing pressure led to a decline in all native species, creating a Kentucky bluegrass - timothy / common dandelion (FPB4) community. A change in management then reduced the pressure and allowed timothy to re-assert vigour and seed production to dominate the site. This corresponds to the state and threshold model (Westoby et al. 1989) that suggests that if disturbance pressure is lessened, these communities may stabilize, but significant portions of timothy will never recede. This community is usually rated modified for range health assessments (Adams et al. 2009) however the species ranges suggest it may score in the native category on some sites.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: c thick black Foothills rough fescue (submesic/rich)

Ecosite Phase: c1 rough fescue

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Shrub			
COMMON WILD ROSE *(Rosa woodsii)*	2	0-4	67
Forb			
COMMON DANDELION *(Taraxacum officinale)*	2	1-3	100
COMMON YARROW *(Achillea millefolium)*	1	1-2	100
FIELD MOUSE-EAR CHICKWEED *(Cerastium arvense)*	1	0-1	100
GRACEFUL CINQUEFOIL *(Potentilla gracilis)*	2	1-4	100
NORTHERN BEDSTRAW *(Galium boreale)*	1	0-1	100
WILD VETCH *(Vicia americana)*	1	0-1	100
YELLOW FALSE DANDELION *(Agoseris glauca)*	1	0-1	100
Grass			
BLUEBUNCH FESCUE *(Festuca idahoensis)*	1	0-2	67
KENTUCKY BLUEGRASS *(Poa pratensis)*	7	2-9	100
PARRY OAT GRASS *(Danthonia parryi)*	11	0-20	67
ROUGH FESCUE *(Festuca scabrella)*	1	0-2	67
TIMOTHY *(Phleum pratense)*	50	33-72	100

Environmental Variables

Moisture Regime:

Nutrient Regime:

Elevation (range): 1348(1237-1578) M

Slope: 3 - 5(02), 6 - 9(29), 10 - 15(41), 16 - 30(28)

Aspect: Northerly(15), Easterly(35), Southerly(44), Westerly(06)

Soil Drainage: Well drained(100)

Soil Subgroup: O.B, O.BL

Soil Series: FMT, MAB

Soil Correlation: SCA 8

Range Site Category: Lo, Ov

Ecological Status Score: Modified 15 or Native 15

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=0

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

0.58 (0.81-0.51) HA/AUM or *0.70 (0.50-0.79) AUM/AC*

Ranges denote potential for less production in drought conditions

FPB6. Smooth (awnless) brome - Kentucky bluegrass

(Bromus inermis - Poa pratensis)

n=19 These sites were probably once Foothills rough fescue - Parry oat grass - Idaho fescue communities on Thick Black Orthic Chernozemic Soils. Cultivation, extreme disturbance (grazing) pressure, and the introduction of smooth brome either through seeding or feeding practices have led to a decline in all native species and dominance of smooth brome. Due to the aggressive rhizomatous nature of smooth brome, this community will probably never return to its RPC, but maintain itself as a modified community with components of smooth brome and Kentucky bluegrass. Exclosures in the Montane that have had smooth brome introduced into them have become almost completely dominated by the species even though there has been no other disturbance. This community will usually be rated as modified in the range health guide (Adams et al. 2009).

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: c thick black Foothills rough fescue (submesic/rich)

Ecosite Phase: c1 rough fescue

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Shrub			
PRICKLY ROSE *(Rosa acicularis)*	1	0-15	22
Forb			
ALFALFA *(Medicago sativa)*	3	0-31	29
COMMON DANDELION *(Taraxacum officinale)*	18	0-57	93
COMMON YARROW *(Achillea millefolium)*	2	0-7	64
NORTHERN BEDSTRAW *(Galium boreale)*	3	0-13	50
SMOOTH ASTER *(Aster laevis)*	1	0-3	36
VEINY MEADOW RUE *(Thalictrum venulosum)*	1	0-9	43
WHITE CLOVER *(Trifolium repens)*	1	0-9	21
WILD VETCH *(Vicia americana)*	2	0-16	71
Grass			
AWNLESS BROME *(Bromus inermis)*	25	2-54	100
KENTUCKY BLUEGRASS *(Poa pratensis)*	33	10-62	100
ORCHARD GRASS *(Dactylis glomerata)*	3	0-23	21
TIMOTHY *(Phleum pratense)*	7	0-28	71

Environmental Variables

Moisture Regime:

Nutrient Regime:

Elevation (range): 1325(1245-1446) M

Slope: 0 - 0.5(02), 0.5 - 2.5(08), 3 - 5(24), 6 - 9(34), 10 - 15(24), 16 - 30(08)

Aspect: Level(04), Northerly(14), Easterly(32), Southerly(34), Westerly(16)

Soil Drainage: Rapidly drained(11), Well drained(72), Moderate well drain(17)

Soil Subgroup: O.BL, CA.BL, O.GL, D.GL, CU.R

Soil Series: DVG

Soil Correlation: SCA 8

Range Site Category: Lo, Ov

Ecological Status Score: Modified 15 - 8

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=0

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

0.62 (0.81-0.51) HA/AUM or *0.65 (0.50-0.79) AUM/AC*

FPB7. Creeping red fescue - Kentucky bluegrass

(Festuca rubra - Poa pratensis)

n=4 This community is intended to be an example of a grassland that has been modified during reclamation after industrial disturbances or a range improvement seeded to creeping red fescue. Seed used in reclamation has influenced the plant association such that creeping red fescue and Kentucky bluegrass now dominate the site. Although they provide good initial ground cover, the aggressive nature of these species has enabled them to move off of the original site and invade surrounding rangelands. Historically agronomic species like creeping red fescue were used in reclamation with little thought given to compatibility with surrounding native vegetation. It is now recognized that allowing for natural recovery or seeding native species that promote the recovery of the original community structure and function are preferred in reclamation strategies (Gerling et al. 1996). These sites are usually rated as modified in the range health guidelines (Adams et al. 2009). A note for industrial developments: The stocking rate for this community is based upon being on Thick Black Orthic Chernozemic grassland soils. Industrial developments can occur on these soils, but also many other soils and ecosites within this guide. It is recommended to still use this community as a catch all but closely scrutinize the stocking rate values to reflect poorer production.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: c thick black Foothills rough fescue (submesic/rich)

Ecosite Phase: c1 rough fescue

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Shrub			
COMMON WILD ROSE *(Rosa woodsii)*	10	0-15	75
Forb			
COMMON DANDELION *(Taraxacum officinale)*	5	1-7	100
COMMON YARROW *(Achillea millefolium)*	2	0-4	100
CREAM-COLORED VETCHLING *(Lathyrus ochroleucus)*	3	0-5	100
NORTHERN BEDSTRAW *(Galium boreale)*	1	0-3	100
WILD STRAWBERRY *(Fragaria virginiana)*	6	1-11	100
WILD VETCH *(Vicia americana)*	2	0-3	100
Grass			
AWNLESS BROME *(Bromus inermis)*	2	0-3	75
CREEPING RED FESCUE *(Festuca rubra)*	38	33-50	100
KENTUCKY BLUEGRASS *(Poa pratensis)*	18	3-57	100
SLENDER WHEAT GRASS *(Agropyron trachycaulum)*	4	0-11	75
TIMOTHY *(Phleum pratense)*	12	2-18	100
UNDIFFERENTIATED SEDGE *(Carex)*	2	0-3	75

Environmental Variables

Moisture Regime:

Nutrient Regime:

Elevation (range): (-) M

Slope: 3 - 5(80), 6 - 9(20)

Aspect: Variable()

Soil Drainage: Well drained(25), Moderate well drain(75)

Soil Subgroup: O.BL

Soil Series: BVA, DVG, HFD

Soil Correlation: SCA 8

Range Site Category: Variable

Ecological Status Score: Modified 15 - 8

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

0.74 (4.05-0.54) HA/AUM or *0.55 (0.10-0.75) AUM/AC*

Low range of ESSR reflects seeding on non-grassland soils

FPB8. Parry oatgrass - Timothy

(Danthonia Parryii - Phleum pratense)

n=7 This community is a disclimax representation of a Parry oat grass - Foothills rough fescue community type. It occurs on thin breaks or strong mid to upper slopes that are well or rapidly drained. As with its RPC, the most common native grass is still Parry oat grass, although the presence of timothy and other increasers indicates disturbance. Continued heavy disturbance will further reduce Parry oat grass and increase bare soil and the presence of timothy.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: b hairy wild rye (submesic/medium)

Ecosite Phase: b5 grassland

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Shrub			
COMMON WILD ROSE *(Rosa woodsii)*	2	0-7	57
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	2	0-7	43
Forb			
GOLDEN BEAN *(Thermopsis rhombifolia)*	1	0-2	71
THREE-FLOWERED AVENS *(Geum triflorum)*	1	0-3	71
Grass			
BLUEBUNCH FESCUE *(Festuca idahoensis)*	7	3-14	100
FOOTHILLS ROUGH FESCUE *(Festuca campestris)*	9	5-20	100
KENTUCKY BLUEGRASS *(Poa pratensis)*	6	0-17	100
PARRY OAT GRASS *(Danthonia parryi)*	23	13-33	100
SLENDER WHEAT GRASS *(Agropyron trachycaulum)*	4	0-8	86
TIMOTHY *(Phleum pratense)*	15	1-30	100

Environmental Variables

Moisture Regime:

Nutrient Regime:

Elevation (range): (-) M

Slope: 3 - 5(09), 6 - 9(09), 16 - 30(46), 31 - 45(27), 46 - 70(09)

Aspect: Easterly(07), Southerly(36), Westerly(57)

Soil Drainage: Rapidly drained(60), Well drained(40)

Soil Subgroup: O.BL, O.GL, O.R

Soil Series:

Soil Correlation:

Range Site Category:

Ecological Status Score: 20

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=0

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

1.01 (1.16-0.67) HA/AUM or *0.40 (0.35-0.60) AUM/AC*

FPB9. Timothy - Kentucky bluegrass

(Phleum pratense - Poa Pratensis)

n=4 This plant community represents heavily disturbed mid to upper slope, terrace and crest hilltop positions. It commonly occurs on or near thin breaks on shallow loamy swales. It differs from the Kentucky bluegrass - Timothy / Common Dandelion (FPB4) community mainly due to slope position. The reference plant community is likely either a dry Foothills rough fescue - Parry oat grass - Idaho fescue (FPA1) or a Parry oat grass - Foothills rough fescue- Idaho fescue (FPA2) community type, but high disturbance has allowed the significant establishment of timothy as well as a diversity of forbs. The State and Threshold model (Westoby et al. 1989) suggests that these communities may stabilize with significant portions of timothy never receding, but local information from the Montane suggests that drier sites have a greater potential to recover to resemble their reference plant community than ones with more moisture (Willoughby and Alexander 2007).

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: b hairy wild rye (submesic/medium)

Ecosite Phase: b5 grassland

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Shrub			
COMMON WILD ROSE *(Rosa woodsii)*	4	0-8	75
Forb			
COMMON DANDELION *(Taraxacum officinale)*	2	0-6	75
COMMON FIREWEED *(Epilobium angustifolium)*	1	0-2	75
COMMON YARROW *(Achillea millefolium)*	1	0-1	100
FIELD MOUSE-EAR CHICKWEED *(Cerastium arvense)*	1	0-1	100
NORTHERN BEDSTRAW *(Galium boreale)*	1	0-1	100
PRAIRIE SAGEWORT *(Artemisia ludoviciana)*	1	0-1	75
STICKY PURPLE GERANIUM *(Geranium viscosissimum)*	2	1-3	100
WILD STRAWBERRY *(Fragaria virginiana)*	1	0-1	100
Grass			
BLUEBUNCH FESCUE *(Festuca idahoensis)*	2	0-3	75
FOOTHILLS ROUGH FESCUE *(Festuca campestris)*	3	0-8	75
KENTUCKY BLUEGRASS *(Poa pratensis)*	7	1-13	100
PARRY OAT GRASS *(Danthonia parryi)*	5	0-14	75
SLENDER WHEAT GRASS *(Agropyron trachycaulum)*	3	0-5	75
TIMOTHY *(Phleum pratense)*	58	49-71	100
UNDIFFERENTIATED SEDGE *(Carex)*	2	1-2	100

Environmental Variables

Moisture Regime:

Nutrient Regime:

Elevation (range): (-) M

Slope: 0.5 - 2.5(25), 31 - 45(75)

Aspect: Northerly(12), Easterly(50), Southerly(25), Westerly(13)

Soil Drainage: Rapidly drained(25), Well drained(75)

Soil Subgroup: O.BL, O.R

Soil Series:

Soil Correlation: SCA 8

Range Site Category: Lo

Ecological Status Score: 15

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=0

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

0.81 (1.01-0.67) HA/AUM or *0.50 (0.40-0.60) AUM/AC*

FPB10. Wheatgrass - Foothills rough fescue

(Agropyron spp. - Festuca campestris)

n=3 This plant community generally occurs on loamy to thin break sites in hilly terrain. It tends to be drier than Foothills rough fescue - Parry oat grass - Idaho fescue (FPA1) or Parry oat grass - Foothills rough fescue - Idaho fescue (FPA2) communities as it is often on steep slopes where winter Chinook winds commonly expose this grassland type. It is considered transitional to the Grassland Natural Region where a similar community occurs in the Foothills Fescue Subregion (FFA27). Here, exposed slopes express drier conditions and promote the growth of wheat grasses. Increased grazing pressure will further increase the abundance of the wheat grasses on these sites (Adams et al. 2003).

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: b hairy wild rye (submesic/medium)

Ecosite Phase: b5 grassland

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Shrub			
PRICKLY ROSE *(Rosa acicularis)*	2	0-3	67
SNOWBERRY (BUCKBRUSH) *(Symphoricarpos occidentalis)*	3	0-11	33
Forb			
CREAM-COLORED VETCHLING *(Lathyrus ochroleucus)*	1	0-1	67
PASTURE SAGEWORT *(Artemisia frigida)*	2	0-4	67
WILD VETCH *(Vicia americana)*	1	0-2	67
Grass			
BLUEBUNCH FESCUE *(Festuca idahoensis)*	4	1-8	100
FOOTHILLS ROUGH FESCUE *(Festuca campestris)*	13	9-21	100
NORTHERN WHEAT GRASS *(Agropyron dasystachyum)*	13	8-16	100
PARRY OAT GRASS *(Danthonia parryi)*	9	2-14	100
SUN-LOVING SEDGE *(Carex pensylvanica)*	4	3-5	100

Environmental Variables

Moisture Regime: SUBMESIC()

Nutrient Regime: MESOTROPHIC()

Elevation (range): (-) M

Slope: 6 - 9(16), 10 - 15(17), 16 - 30(33), 31 - 45(33)

Aspect: Easterly(), Westerly()

Soil Drainage: Rapidly drained(100)

Soil Subgroup:

Soil Series:

Soil Correlation:

Range Site Category: TB, Steep Lo

Ecological Status Score: 15

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

1.35 (2.02-1.01) HA/AUM or *0.30 (0.20-0.40) AUM/AC*

Foothills Parkland Shrublands

7.0 Foothills Parkland Shrublands

Three vegetation types are considered to represent the vegetation on the rolling to hilly topography of the Foothills Parkland. These are foothills fescue grasslands, willow shrublands, and aspen forests (Natural Regions Committee 2006). Shrubland communities occur in valley bottoms, depressional areas, and on moist upland seepage areas. These commonly occur on moderately to imperfectly drained sites on fine textured glaciolacustrine parent materials. These soils are often classed as moist Chernozems except in the wettest, most poorly drained sites that change to Orthic Gleysols (Natural Regions Committee 2006).

Willow is the most common woody species in these shrublands. Bebb willow in particular is the most common willow. It prefers better drained sites and is often associated with the scattered willow grove lands that are typical of the Foothills Parkland. A frequent community type for Bebb willow is the Bebb willow – Snowberry – Rose (FPC4). It occurs on subhygric / rich upland ecological sites where snow and other moisture tend to accumulate. As these communities mature in the absence of disturbance, white spruce will slowly establish, and potentially change to a forest type (Jaques and Corbin 1981). Historically, climatic fluctuations, grazing, and fire have negated this succession. Although snowberry and rose are common shrubs under the willow in the plots analyzed for this guide, others have suggested that species such as red osier dogwood should be more common (Thompson and Hansen 2003). It has been suggested that historic fire and grazing disturbance has reduced these shrubs on these sites.

Further upland in swales and snow catchment areas willow cover declines and rose, snowberry, and saskatoon increase. These areas are transitional from grassland to forest, and without disturbance may undergo succession to forested communities. Silverberry can also occur on upland sites that have some overland flow that provides additional moisture (Thompson and Hansen 2002). Silverberry prefers well-drained, coarse-textured soils and can form thickets in moist seepage areas and also within the riparian zones of streams and rivers.

Lowland shrublands are found in marshy or boggy sites and are often considered the edaphic climax communities on these sites since the wet cool soil conditions often prevent any further succession to forest. These appear along wetlands and riparian areas of streams and rivers. The extent and type of shrub cover is highly dependent on the proximity of the water table. Colonization by willow and other shrubs begins on the drier edges of sedge meadows and streams. Flat leaved or yellow willow is commonly found adjacent to open water or sedge wetlands. These species will then give way to basket willow as the water level decreases, and finally to Bebb willow. 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. Water sedge indicates a calcium rich environment often in stagnant water (Beckingham 1994; MacKinnon et. al. 1992). Beaked sedge indicates nitrogen rich conditions with flowing water (Beckingham

1994). Marsh reed grass, tufted hair grass and some drier sedges occur as the site dries out.

Three biophysical factors that influence shrub ecology in the Parkland are climatic shifts, fire, and grazing. Extended cooler / wetter periods can increase the moisture and raise the water table in low lying areas. This promotes an increase in shrub growth into marginal areas. Conversely, drier periods will reduce the water table and increase the prevalence of dead and decadent shrubs. Historically, fire was both a natural and anthropogenic disturbance in western Canada (Morgan 1980). The wet conditions in the centers of these low lying shrub communities decreases the severity of fire effects, however marginal areas will burn readily, especially during drier climatic periods. Grazing has also been an important part of shrub ecology. Prior to European settlement large herds of migrating bison would utilize these woody communities for their high productivity, browse, shade, and shelter from storms (Alexander 1995). The occupation of these herds would have set back the shrublands, allowing faster recovering grassland species to establish.

Today, grazing is still considered a factor that helps maintain the balance of the shrublands, aspen forest, and grasslands of the Foothills Parkland. In fact exclusion of fires and elimination of the large herds of free ranging bison has been cited as the reason for an increase in woody plant species within the Parkland natural region since European settlement (Alexander 1995). However, overgrazing or excessive disturbance can lead to the degradation of rangeland and its abilities of sustainable production and provision of key ecological functions. Overgrazing can be described as a regime where range plants are grazed too intensely, too frequently, or at the wrong time (Range Management Branch 2010). Overgrazing on shrublands in the Foothills Parkland leads to reduced vigour in the shrubs and the replacement of some shrubs with those less palatable. Commonly, overgrazing has the effect of drying a site out, and increasing soil exposure (Thompson and Hansen 2003). When this happens, Kentucky bluegrass and timothy often invade the understory and become the dominant grass.

Successional pathway of shrublands in the Foothills Parkland is not completely clear due primarily from the lack of plots collected for this guide. In cases so far, a common effect is the site will decrease in shrub cover, dry out, and the understory will become dominated with Kentucky bluegrass. For instance, the Bebb willow – Snowberry – Rose (FPC4) community will move to a Bebb willow / Kentucky bluegrass (FPC5) community whose understory is primarily Kentucky bluegrass, timothy, and dandelion. The same transition occurs from the Basket willow / Awned (water) sedge (FPC11) to the Basket willow / Kentucky bluegrass (FPC12) community.

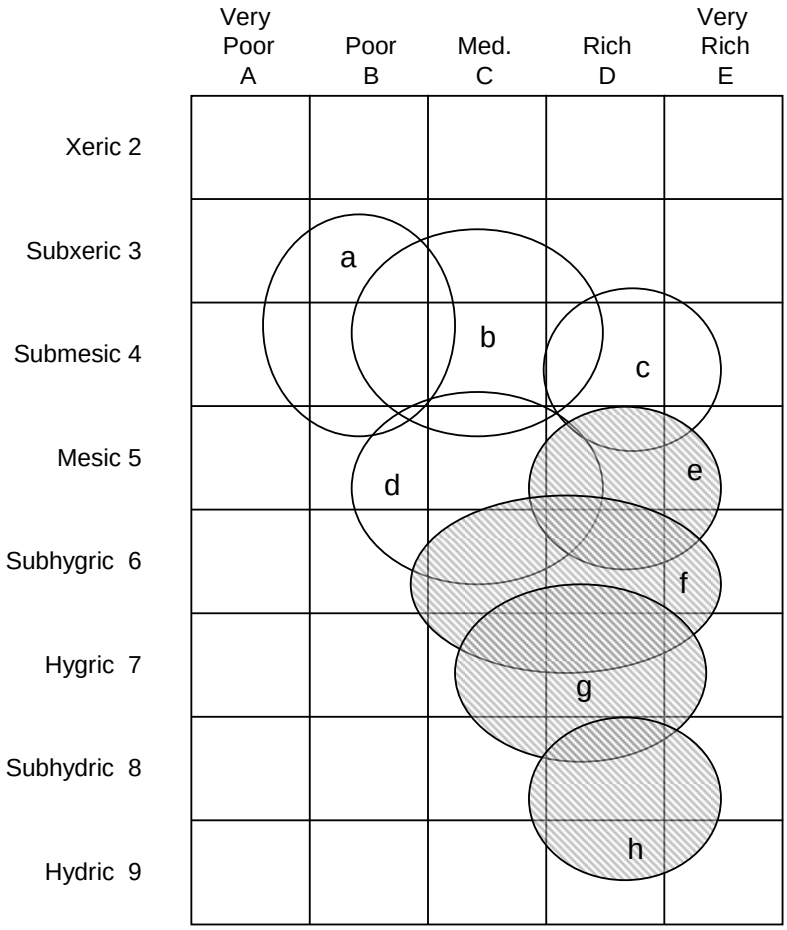


Figure 6. Shrubland ecological sites on the Foothills Parkland edatopic grid.

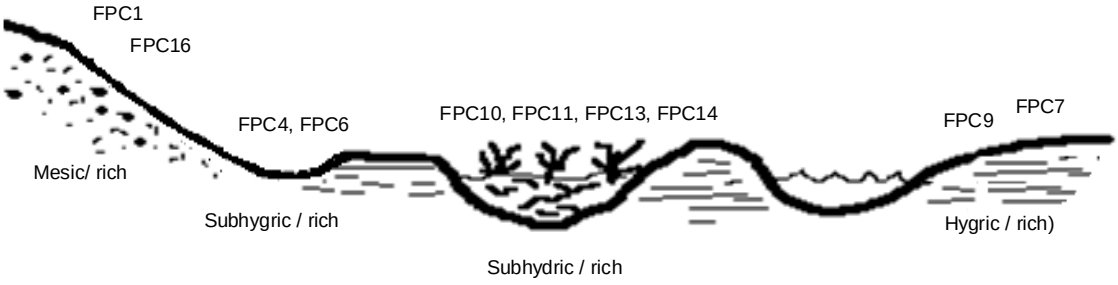


Figure 7. Slope position of shrubland plant communities in the Foothills Parkland.

Table 3. Foothills Parkland Shrubland Communities

Ecological Site	Ecosite Phase	Reference Plant Community	Successional Community Types	Modified Community Types	Harvesting Succession
e snowberry-silverberry (mesic/rich)	e3 shrubland	FPC1 Rose - Snowberry	FPC2 Snowberry - Rose / Kentucky bluegrass		
		<RPC Not Described>	FPC3 Silverberry/Kentucky bluegrass		
		<RPC Not Described>	FPC16 Bebb willow - snowberry / hairy wildrye		
f red osier dogwood (subhygric/rich)	f3 shrubland	FPC4 Bebb willow - Snowberry – Rose	FPC6 Bebb willow / Cow parsnip / Sedge FPC5 Bebb willow / Kentucky bluegrass FPC15 Bebb willow / cow parsnip / Canada goldenrod		
		<RPC Not Described>	FPC7 Sandbar willow		
		<RPC Not Described>	FPC8 Water birch - Silverberry / Timothy		
g horsetail (hygric/rich)	g3 shrubland	FPC9 Bebb willow / Horsetail / Sedge			
h fen (subhydric/rich)	h1 shrubby fen	FPC10 Basket willow			
		FPC11 Basket willow / Awned (Water) sedge	FPC12 Basket willow / Kentucky bluegrass		
		FPC13 Flat leaved willow / Water (Beaked) sedge			
		FPC14 Yellow willow / Water sedge			

FPC1. Rose - Snowberry

(Rosa acicularis - Symphoricarpos spp.)

n=10 This community type represents the transition between grasslands and forested dominated community types. It commonly occurs in swales along hillsides, snow accumulation areas or other locations with a slightly higher moisture content that favours the growth of shrub species. It is commonly dominated by shrubs such as rose, saskatoon, chokecherry, silverberry, buckbrush and / or snowberry. In the absence of disturbance (such as fire) this community will undergo succession to an aspen, pine and spruce dominated community type. Native grasses associated with this community are commonly sedges or marsh reed grass, but disturbance can lead to a dominance of Kentucky bluegrass and timothy. With the low lying shrubs, this community should be assessed with the grassland range health form.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: e snowberry-silverberry (mesic/rich)

Ecosite Phase: e3 shrubland

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Tree			
WHITE SPRUCE *(Picea glauca)*	1	0-10	18
Shrub			
COMMON BEARBERRY *(Arctostaphylos uva-ursi)*	2	0-14	20
PRICKLY ROSE *(Rosa acicularis)*	13	5-29	100
SASKATOON *(Amelanchier alnifolia)*	1	0-4	55
SILVERBERRY *(Elaeagnus commutata)*	1	0-7	18
SNOWBERRY (BUCKBRUSH) *(Symphoricarpos occidentalis)*	7	0-22	83
Forb			
CREAM-COLORED VETCHLING *(Lathyrus ochroleucus)*	2	0-3	73
LINDLEY'S ASTER *(Aster ciliolatus)*	3	0-9	55
WILD BERGAMOT *(Monarda fistulosa)*	5	0-25	64
WILD STRAWBERRY *(Fragaria virginiana)*	4	0-11	82
WILD VETCH *(Vicia americana)*	2	0-4	91
Grass			
BLUEJOINT *(Calamagrostis canadensis)*	4	0-15	46
ROUGH FESCUE *(Festuca scabrella)*	2	0-7	55
SLENDER WHEAT GRASS *(Agropyron trachycaulum)*	2	0-10	73
UNDIFFERENTIATED SEDGE *(Carex)*	3	0-12	55

Environmental Variables

Moisture Regime: MESIC(), SUBHYGRIC()

Nutrient Regime: SUBMESOTROPHIC(), MESOTROPHIC(), PERMESOTROPHIC()

Elevation (range): 1210(-) M

Slope: 0.5 - 2.5(09), 3 - 5(09), 6 - 9(10), 10 - 15(27), 16 - 30(36), 31 - 45(09)

Aspect: Northerly(25), Easterly(25), Southerly(33), Westerly(17)

Soil Drainage: Rapidly drained(11), Well drained(78), Moderate well drain(11)

Soil Subgroup: O.BL, D.GL, CU.R

Soil Series:

Soil Correlation: SCA 8

Range Site Category: Lo, TB

Ecological Status Score: 40 - 27

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=0

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

1.35 (2.02-0.90) HA/AUM or *0.30 (0.20-0.45) AUM/AC*

FPC2. Snowberry - Rose / Kentucky bluegrass

(Symphoricarpos spp. - Rosa acicularis/Poa pratensis)

n=7 This community type represents a mid seral grazing disclimax of the Rose - Snowberry (FPC1) community described as the reference community for this ecosite phase. Grazing reduces the native grasses and opens up the shrub canopy allowing disturbance species such as Kentucky bluegrass and timothy to invade (Thompson and Hansen 2002). This community can have a very diverse forb component and is usually a small component of the landscape, occupying moisture receiving swales, snow accumulation areas, or moist aspects. The reference community (FPC1) represents the transition between grasslands and forest and generally produce higher amounts of productive palatable forages than neighbouring locations. As such, it is commonly used by livestock. This community should be rated with the grassland range health assessment.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: e snowberry-silverberry (mesic/rich)

Ecosite Phase: e3 shrubland

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Shrub			
SNOWBERRY (BUCKBRUSH) *(Symphoricarpos occidentalis)*	12	0-50	71
UNDIFFERENTIATED ROSE *(Rosa)*	12	1-22	100
WILD RED RASPBERRY *(Rubus idaeus)*	3	0-13	29
Forb			
COMMON DANDELION *(Taraxacum officinale)*	3	0-8	57
COMMON FIREWEED *(Epilobium angustifolium)*	1	0-2	71
COMMON YARROW *(Achillea millefolium)*	1	0-3	86
VEINY MEADOW RUE *(Thalictrum venulosum)*	2	1-5	100
WILD STRAWBERRY *(Fragaria virginiana)*	3	1-10	100
WILD VETCH *(Vicia americana)*	1	0-2	71
WILD WHITE GERANIUM *(Geranium richardsonii)*	2	0-10	43
Grass			
KENTUCKY BLUEGRASS *(Poa pratensis)*	20	4-30	100
PARRY OAT GRASS *(Danthonia parryi)*	3	0-17	43
ROUGH FESCUE *(Festuca scabrella)*	3	0-11	43
TIMOTHY *(Phleum pratense)*	5	1-17	100
UNDIFFERENTIATED SEDGE *(Carex)*	2	0-2	100

Environmental Variables

Moisture Regime: MESIC(), SUBHYGRIC()

Nutrient Regime: MESOTROPHIC(), PERMESOTROPHIC()

Elevation (range): 1330(1256-1426) M

Slope: 3 - 5(11), 6 - 9(17), 10 - 15(33), 16 - 30(33), 31 - 45(06)

Aspect: Northerly(25), Easterly(30), Southerly(25), Westerly(20)

Soil Drainage: Well drained(75), Moderate well drain(25)

Soil Subgroup: O.BL, D.GL, CU.R

Soil Series:

Soil Correlation: SCA 8

Range Site Category: Lo, TB

Ecological Status Score: 20 - 15

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=0

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

1.35 (2.02-0.90) HA/AUM or *0.30 (0.20-0.45) AUM/AC*

FPC3. Silverberry/Kentucky bluegrass

(Elaeagnus commutata/Poa pratensis)

n=2 Due to a lack of plots in the Foothills parkland, a reference community for the Silverberry shrubland has not yet been defined. According to plots described by Thompson and Hansen (2003), a variety of grass species can occur. Silverberry dominated plant communities occur on alluvial floodplain terraces, in V-shaped ravines and swale-like depressions where overland flow provides additional moisture (Thompson and Hansen 2002). Sites where silverberry is very dense forage production is low, however in more open stands livestock use can be extensive which often leads to the invasion of brome, Kentucky bluegrass, timothy and dandelion. In the absence of disturbances such as fire, silverberry dominated communities can undergo succession to aspen or balsam poplar and eventually white spruce. This community should be rated with the grassland range health assessment.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: e snowberry-silverberry (mesic/rich)

Ecosite Phase: e3 shrubland

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Shrub			
PRICKLY ROSE *(Rosa acicularis)*	20	10-30	100
SILVERBERRY *(Elaeagnus commutata)*	50	40-60	100
SNOWBERRY (BUCKBRUSH) *(Symphoricarpos occidentalis)*	5	0-10	50
Forb			
COMMON DANDELION *(Taraxacum officinale)*	5	1-10	100
COMMON YARROW *(Achillea millefolium)*	5	1-10	100
GRACEFUL CINQUEFOIL *(Potentilla gracilis)*	2	1-3	100
WHITE CLOVER *(Trifolium repens)*	12	3-20	100
WILD STRAWBERRY *(Fragaria virginiana)*	5	1-10	100
Grass			
AWNLESS BROME *(Bromus inermis)*	5	0-10	50
CREEPING RED FESCUE *(Festuca rubra)*	5	0-10	50
KENTUCKY BLUEGRASS *(Poa pratensis)*	30	20-40	100
TIMOTHY *(Phleum pratense)*	2	0-3	50

Environmental Variables

Moisture Regime:

Nutrient Regime:

Elevation (range): 1106(951-1261) M

Slope: 16 - 30(), 31 - 45()

Aspect: Westerly()

Soil Drainage:

Soil Subgroup:

Soil Series:

Soil Correlation:

Range Site Category: Lo, SwG

Ecological Status Score: 20 - 15

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

1.35 (2.02-1.16) HA/AUM or *0.30 (0.20-0.35) AUM/AC*

FPC4. Bebb willow - Snowberry - Rose

(Salix bebbiana - Symphoricarpos spp. - Rosa acicularis)

n=11 This community is typical of the willow grovelands scattered throughout Foothills Parkland subregion. It tends to grow on areas where moisture accumulates either by snow or drainage from surrounding areas. Jaques and Corbin (1981) described a similar community in the western part of the subregion that was dominated by Scouler's and Bebb's willow and found on north and easterly slopes with thick humus layers. Indications were this community type would eventually succeed to white spruce in the absence of disturbance. Thompson and Hansen (2003) described a Bebb's willow / Red osier dogwood climax community in the Parkland natural region of Alberta. The plots in this guide used to describe this community however have only a small cover of red osier dogwood. It is possible that the historic fire regime and grazing pressure throughout this subregion by both livestock and wildlife favours the growth of snowberry and rose over red osier dogwood. Thompson and Hansen (2003) also had a small component of cow parsnip in the community described. Although the 11 plots described here did not have any, field observations suggest that cow parsnip can make up as much as 15% of the understory (Carscallen 2011, Pers. Comm.). This community should be rated with the forest range health assessment due to the presence of tall shrubs.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: f red osier dogwood / cow parsnip (subhygric/rich)

Ecosite Phase: f3 shrubland

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Tree			
WHITE SPRUCE *(Picea glauca)*	2	0-5	55
Shrub			
BEAKED WILLOW *(Salix bebbiana)*	22	3-40	100
BOG BIRCH *(Betula glandulosa)*	4	0-12	47
PRICKLY ROSE *(Rosa acicularis)*	4	0-13	55
RED-OSIER DOGWOOD *(Cornus stolonifera)*	1	0-13	10
SNOWBERRY (BUCKBRUSH) *(Symphoricarpos occidentalis)*	6	0-13	36
Forb			
COMMON FIREWEED *(Epilobium angustifolium)*	3	0-10	73
LINDLEY'S ASTER *(Aster ciliolatus)*	4	0-9	82
WILD STRAWBERRY *(Fragaria virginiana)*	3	0-8	91
WILD WHITE GERANIUM *(Geranium richardsonii)*	1	0-13	10
Grass			
BLUEJOINT *(Calamagrostis canadensis)*	8	0-35	73
UNDIFFERENTIATED SEDGE *(Carex)*	12	0-20	83

Environmental Variables

Moisture Regime:

Nutrient Regime:

Elevation (range): 1210(-) M

Slope: 0.5 - 2.5(45), 3 - 5(44), 10 - 15(11)

Aspect: Northerly(17), Easterly(22), Southerly(33), Westerly(28)

Soil Drainage: Very rapidly drained(11), Well drained(11), Imperfectly drained(11), Poorly drained(44), Very poorly drained(22)

Soil Subgroup: O.BL, O.HG, R.HG, R.G, T.F

Soil Series:

Soil Correlation: SCA 8

Range Site Category: Lo, Sb, Ov

Ecological Status Score: 25

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=0

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

1.01 (2.02-0.54) HA/AUM or *0.40 (0.20-0.75) AUM/AC*

FPC5. Bebb willow / Kentucky bluegrass

(Salix bebbiana / Poa pratensis)

n=12 This community type represents the grazing disclimax of the Bebb's willow - Snowberry - Rose (FPC4) community type. Continued heavy grazing pressure can dry out and open up the overstory vegetation (Thompson and Hansen 2003). This exposes the soil and allows Kentucky bluegrass, timothy and dandelion to invade. This community type can be productive because of the favourable moisture and nutrient regime. This community should be rated with the forest range health assessment.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: f red osier dogwood / cow parsnip (subhygric/rich)

Ecosite Phase: f3 shrubland

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Shrub			
BASKET WILLOW *(Salix petiolaris)*	3	0-20	17
BEAKED WILLOW *(Salix bebbiana)*	33	12-60	100
PRICKLY ROSE *(Rosa acicularis)*	3	0-10	58
SNOWBERRY (BUCKBRUSH) *(Symphoricarpos occidentalis)*	3	0-20	58
Forb			
COMMON DANDELION *(Taraxacum officinale)*	6	0-21	82
COMMON YARROW *(Achillea millefolium)*	2	0-5	83
SMOOTH ASTER *(Aster laevis)*	3	0-10	75
WILD STRAWBERRY *(Fragaria virginiana)*	3	0-8	83
WILD VETCH *(Vicia americana)*	2	0-5	83
WILD WHITE GERANIUM *(Geranium richardsonii)*	2	0-15	50
Grass			
KENTUCKY BLUEGRASS *(Poa pratensis)*	26	2-77	100
TIMOTHY *(Phleum pratense)*	13	0-29	92
UNDIFFERENTIATED SEDGE *(Carex)*	7	0-20	75

Environmental Variables

Moisture Regime:

Nutrient Regime:

Elevation (range): 1315(1251-1397) M

Slope: 0.5 - 2.5(03), 3 - 5(13), 6 - 9(50), 10 - 15(18), 16 - 30(13), 31 - 45(03)

Aspect: Northerly(32), Easterly(35), Southerly(10), Westerly(23)

Soil Drainage: Well drained(50), Imperfectly drained(50)

Soil Subgroup: O.BL, GL.BL, O.GL

Soil Series:

Soil Correlation: SCA 8

Range Site Category: Lo, Sb, Ov

Ecological Status Score: 10 - 5

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=0

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

1.16 (2.02-0.81) HA/AUM or *0.35 (0.20-0.50) AUM/AC*

FPC6. Bebb willow / Cow parsnip / Sedge

(Salix bebbiana / Heracleum lanatum / Carex spp.)

n=5 This community type is another disclimax community to the Bebb willow - Snowberry - Rose (FPC4) community, potentially between the FPC4 and the Bebb willow / Kentucky bluegrass (FPC5) community in succession. It may represent sites that are slightly more moist and nutrient rich indicated by the growth of cow parsnip. The understory of this community is palatable to livestock and extensive utilization will cause further decline of the native species and the advancement of non native such as Kentucky bluegrass and timothy. The forest health range assessment should be used when rating this site.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: f red osier dogwood / cow parsnip (subhygric/rich)

Ecosite Phase: f3 shrubland

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Shrub			
BEAKED WILLOW *(Salix bebbiana)*	29	15-60	100
COMMON WILD ROSE *(Rosa woodsii)*	7	0-17	80
RED-OSIER DOGWOOD *(Cornus stolonifera)*	2	0-7	40
SNOWBERRY (BUCKBRUSH) *(Symphoricarpos occidentalis)*	7	3-15	100
WILD RED RASPBERRY *(Rubus idaeus)*	4	0-7	80
Forb			
COMMON DANDELION *(Taraxacum officinale)*	4	0-10	80
COMMON FIREWEED *(Epilobium angustifolium)*	10	0-41	80
COMMON PINK WINTERGREEN *(Pyrola asarifolia)*	2	0-6	80
COW PARSNIP *(Heracleum lanatum)*	14	5-31	100
VEINY MEADOW RUE *(Thalictrum venulosum)*	2	1-4	100
WILD STRAWBERRY *(Fragaria virginiana)*	4	1-5	100
WILD VETCH *(Vicia americana)*	1	1-2	100
WILD WHITE GERANIUM *(Geranium richardsonii)*	3	1-7	100
Grass			
BLUEJOINT *(Calamagrostis canadensis)*	4	0-10	60
KENTUCKY BLUEGRASS *(Poa pratensis)*	4	0-9	60
SLENDER WHEAT GRASS *(Agropyron trachycaulum)*	4	0-17	60
TIMOTHY *(Phleum pratense)*	2	0-6	60
UNDIFFERENTIATED SEDGE *(Carex)*	3	1-7	100

Environmental Variables

Moisture Regime:

Nutrient Regime:

Elevation (range): 1397(1299-1531) M

Slope: 6 - 9(11), 10 - 15(47), 16 - 30(42)

Aspect: Northerly(43), Easterly(32), Southerly(04), Variable(21)

Soil Drainage: Well drained()

Soil Subgroup: O.BL, D.GL

Soil Series: DVG, HFD

Soil Correlation: SCA 8

Range Site Category: Ov, Sb, Lo

Ecological Status Score: 15 - 10

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=0

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

1.01 (1.62-0.62) HA/AUM or *0.40 (0.25-0.65) AUM/AC*

FPC7. Sandbar willow

(Salix exigua)

n=1 This community type occurs on moist alluvial deposits which are adjacent to streams and rivers. It can occur in the Foothills Parkland, but is considered a short term early successional plant community following a major flood disturbance. It can persist for some time if the site is subject to frequent flooding. However in the absence of disturbance and a more consistent moisture regime, it may eventually undergo succession to a balsam poplar or yellow willow dominated community type (Thompson and Hansen 2003). Typically there is little understory vegetation found in this community type as the sandbar willow's dense stands inhibit livestock access. The plot described here however has had some disturbance indicated by the Kentucky bluegrass, timothy, and dandelion in the understory. This community should be rated with the forest range health.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: f red osier dogwood / cow parsnip (subhygric/rich)

Ecosite Phase: f3 shrubland

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Tree			
NARROW-LEAF COTTONWOOD *(Populus angustifolia)*	1		100
Shrub			
SANDBAR WILLOW *(Salix exigua)*	80		100
Forb			
COMMON DANDELION *(Taraxacum officinale)*	1		100
WESTERN WILLOW ASTER *(Aster hesperius)*	1		100
Grass			
KENTUCKY BLUEGRASS *(Poa pratensis)*	3		100
TIMOTHY *(Phleum pratense)*	3		100

Environmental Variables

Moisture Regime:

Nutrient Regime:

Elevation (range): 1200(1200-1200) M

Slope:

Aspect:

Soil Drainage:

Soil Subgroup:

Soil Series:

Soil Correlation:

Range Site Category: SwG, Ri

Ecological Status Score: 15 - 10

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

8.10 (0.00-2.70) HA/AUM or *0.05 (-0.15) AUM/AC*

FPC8. Water birch - Silverberry / Timothy

(Betula occidentalis - Silverberry / Phleum pratense)

n=1 This community type is found on alluvial terraces, streambanks, abandoned channels on river floodplains and moist areas around springs and seeps (Thompson and Hansen 2002). It is more common in the southern part of the Foothills Parkland subregion near Waterton Lakes National Park. It could be considered on the wetter boundaries of this ecosite. Livestock generally do not prefer this community type because of the dense nature of the shrub layer, but heavy grazing pressure can reduce the native vegetation including the shrub cover and allow Kentucky bluegrass, smooth brome or timothy to invade as it has in the single plot described here. This community should be rated with the forest range health assessment.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: f red osier dogwood / cow parsnip (subhygric/rich)

Ecosite Phase: f3 shrubland

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Shrub			
BEAKED WILLOW *(Salix bebbiana)*	1		100
RED-OSIER DOGWOOD *(Cornus stolonifera)*	1		100
SILVERBERRY *(Elaeagnus commutata)*	20		100
WATER BIRCH *(Betula occidentalis)*	30		100
Forb			
CANADA GOLDENROD *(Solidago canadensis)*	3		100
COMMON DANDELION *(Taraxacum officinale)*	10		100
WILD STRAWBERRY *(Fragaria virginiana)*	3		100
Grass			
SLENDER WHEAT GRASS *(Agropyron trachycaulum)*	3		100
TIMOTHY *(Phleum pratense)*	10		100
UNDIFFERENTIATED SEDGE *(Carex)*	3		100

Environmental Variables

Moisture Regime:

Nutrient Regime:

Elevation (range): (-) M

Slope:

Aspect:

Soil Drainage:

Soil Subgroup:

Soil Series:

Soil Correlation:

Range Site Category: Sb, SwG, Ri

Ecological Status Score: 15 - 10

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

1.62 (4.05-1.35) HA/AUM or *0.25 (0.10-0.30) AUM/AC*

FPC9. Bebb willow / Horsetail / Sedge

(Salix bebbiana / Equisetum arvense / Carex atherodes)

n=1 This community type is among the wettest and most nutrient rich Bebb willow dominated community types within the Foothills Parkland subregion. Seepage and high water tables can be expected. Balsam poplar and aspen tend to establish easily and without disturbance succession will ultimately be to a white spruce climax community (Thompson and Hansen 2002). This however is a very slow progression and not common in the Foothills Parkland due to the past occurrences of the natural fire regime and other disturbance factors in the subregion. Livestock pressure can damage the soil profile due to the wet conditions. Heavy grazing pressure will often cause hummocks, pugging, and other erosion features, reduce available soil moisture and lead to invasion by Kentucky bluegrass. This community should be rated with the forest range health assessment.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: g horsetail (hygric/rich)

Ecosite Phase: g3 shrubland

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Tree			
WHITE SPRUCE *(Picea glauca)*	1		100
Shrub			
BEAKED WILLOW *(Salix bebbiana)*	50		100
BOG BIRCH *(Betula glandulosa)*	3		100
FLAT-LEAVED WILLOW *(Salix planifolia)*	3		100
Forb			
COMMON HORSETAIL *(Equisetum arvense)*	40		100
LARGE-LEAVED YELLOW AVENS *(Geum macrophyllum)*	3		100
SMOOTH ASTER *(Aster laevis)*	3		100
Grass			
AWNED SEDGE *(Carex atherodes)*	20		100
BLUEJOINT *(Calamagrostis canadensis)*	10		100

Environmental Variables

Moisture Regime:

Nutrient Regime:

Elevation (range): (-) M

Slope:

Aspect:

Soil Drainage:

Soil Subgroup:

Soil Series:

Soil Correlation:

Range Site Category: Sb, Ov, Ri

Ecological Status Score: 25

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

8.10 (0.00-2.02) HA/AUM or *0.05 (-0.20) AUM/AC*

FPC10. Basket willow

(Salix petiolaris)

n=1 Basket willow occurs around sloughs, depressional wetlands and wet meadows, usually in a narrow riparian band (Thompson and Hansen 2002). This particular community occupies slightly drier sites than the Basket willow / Awned sedge (FPC11) community type. In the absence of disturbance these stands become very dense and are almost completely dominated by basket willow. This dense cover and wet conditions tends to restrict livestock movement. This community should be rated using the forest range health assessment.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: h fen (subhydric/rich)

Ecosite Phase: h1 shrubby fen

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Shrub			
BASKET WILLOW *(Salix petiolaris)*	98		100
BEAKED WILLOW *(Salix bebbiana)*	3		100
Forb			
WESTERN DOCK *(Rumex occidentalis)*	1		100
Grass			
AWNED SEDGE *(Carex atherodes)*	3		100
BEAKED SEDGE *(Carex rostrata)*	1		100

Environmental Variables

Moisture Regime:

Nutrient Regime:

Elevation (range): (-) M

Slope:

Aspect:

Soil Drainage:

Soil Subgroup:

Soil Series:

Soil Correlation:

Range Site Category: Sb, Ri

Ecological Status Score: 25

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

4.05 (8.10-1.35) HA/AUM or *0.10 (0.05-0.30) AUM/AC*

FPC11. Basket willow / Awned (Water) sedge

(Salix petiolaris / Carex atherodes, C.aquatilis)

n=4 Basket willow occurs around sloughs, depressional wetlands and wet meadows, usually in a narrow band (Thompson and Hansen 2002). The soils of this community tend to be drier than the Flat leaved willow dominated community types, but are wetter than the Bebb willow dominated communities. This community is slightly moister than the Basket willow community type also described in this ecosite phase as indicated by the substantial amounts of sedges. 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 will allow Kentucky bluegrass and timothy to invade to form the Basket willow / Kentucky bluegrass (FPC12) community type. Soil disturbance can also become a problem with hummocks and pugging. This community should be rated with the forest range health assessment.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: h fen (subhydric/rich)

Ecosite Phase: h1 shrubby fen

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Tree			
WHITE SPRUCE *(Picea glauca)*	1	0-2	75
Shrub			
BASKET WILLOW *(Salix petiolaris)*	30	12-50	100
BOG BIRCH *(Betula glandulosa)*	7	0-16	50
FLAT-LEAVED WILLOW *(Salix planifolia)*	3	0-10	25
Forb			
LINDLEY'S ASTER *(Aster ciliolatus)*	1	0-1	50
VEINY MEADOW RUE *(Thalictrum venulosum)*	1	0-1	50
Grass			
AWNED SEDGE *(Carex atherodes)*	15	0-40	50
TUFTED HAIR GRASS *(Deschampsia cespitosa)*	3	0-5	75
WATER SEDGE *(Carex aquatilis)*	24	13-76	50

Environmental Variables

Moisture Regime:

Nutrient Regime:

Elevation (range): (-) M

Slope: 3 - 5(100)

Aspect: Easterly(50), Southerly(50)

Soil Drainage: Poorly drained(100)

Soil Subgroup:

Soil Series:

Soil Correlation: SCA 8, SCA 16

Range Site Category: Sb, Ri

Ecological Status Score: 25

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

1.16 (2.70-0.81) HA/AUM or *0.35 (0.15-0.50) AUM/AC*

FPC12. Basket willow / Kentucky bluegrass

(Salix petiolaris / Poa pratensis)

n=2 This community type represents a grazing disclimax of the Basket willow / Awned sedge (FPC11) community. Basket willow is not particularly palatable to livestock, but heavy grazing of the understory will open the site up, dry it out, and allow Kentucky bluegrass and timothy to invade. Once established these introduced species are very palatable to livestock and this community type can become extensively utilized. Soil erosion can become a problem with hummocks and pugging. This community should be rated with the forest range health assessment.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: h fen (subhydric/rich)

Ecosite Phase: h1 shrubby fen

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Shrub			
BASKET WILLOW *(Salix petiolaris)*	60	60-60	100
BEAKED WILLOW *(Salix bebbiana)*	2	0-3	50
Forb			
COW PARSNIP *(Heracleum lanatum)*	2	0-3	50
GRACEFUL CINQUEFOIL *(Potentilla gracilis)*	7	3-10	100
VEINY MEADOW RUE *(Thalictrum venulosum)*	5	0-10	50
WILD STRAWBERRY *(Fragaria virginiana)*	2	0-3	50
Grass			
KENTUCKY BLUEGRASS *(Poa pratensis)*	20	10-30	100
TIMOTHY *(Phleum pratense)*	7	3-10	100
WOOLLY SEDGE *(Carex lanuginosa)*	5	0-10	50

Environmental Variables

Moisture Regime:

Nutrient Regime:

Elevation (range): 1341(-) M

Slope:

Aspect:

Soil Drainage:

Soil Subgroup:

Soil Series:

Soil Correlation:

Range Site Category: Lo, Sb, Ri

Ecological Status Score: 15 - 10

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=0

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

1.16 (2.70-0.90) HA/AUM or *0.35 (0.15-0.45) AUM/AC*

FPC13. Flat leaved willow / Water (Beaked) sedge

(Salix planifolia / Carex aquatilis, C. rostrata)

n=3 This community is one of the willow dominated communities described in the Foothills Parkland subregion. Flat leaved willow prefers areas where the water table is shallow, and is found associated with meadow adjacent to lakes, streams and springs, as well as broad valley bottoms and wet slopes. Thompson and Hansen (2002) described this community in the grassland natural region. It was found that although production is moderate, continually wet soils limit use until late summer or fall. Grazing during periods where the soils are saturated leads to damaged plants and soils. Continued over-use will increase the presence of Baltic rush and Kentucky bluegrass. This community should be rated with the forest range health assessment.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: h fen (subhydric/rich)

Ecosite Phase: h1 shrubby fen

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Tree			
WHITE SPRUCE *(Picea glauca)*	1	0-2	67
Shrub			
BOG BIRCH *(Betula glandulosa)*	4	0-12	33
FLAT-LEAVED WILLOW *(Salix planifolia)*	46	16-80	100
VELVET-FRUITED WILLOW *(Salix maccalliana)*	7	0-20	33
Forb			
COMMON HORSETAIL *(Equisetum arvense)*	4	0-10	67
LARGE-LEAVED YELLOW AVENS *(Geum macrophyllum)*	2	0-3	67
Grass			
AWNED SEDGE *(Carex atherodes)*	1	0-3	33
BEAKED SEDGE *(Carex rostrata)*	13	0-30	67
BLUEJOINT *(Calamagrostis canadensis)*	7	0-20	67
WATER SEDGE *(Carex aquatilis)*	19	0-59	33

Environmental Variables

Moisture Regime:

Nutrient Regime:

Elevation (range): (-) M

Slope: 0 - 0.5(100)

Aspect: Level(100)

Soil Drainage: Very poorly drained(100)

Soil Subgroup: TY.F

Soil Series:

Soil Correlation: SCA 8

Range Site Category: Ri, WL

Ecological Status Score: 25

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

1.35 (2.02-0.81) HA/AUM or *0.30 (0.20-0.50) AUM/AC*

FPC14. Yellow willow / Water sedge

(Salix lutea / Carex aquatilis)

n=3 According to Thompson and Hansen (2002), this community is typically found as a narrow band parallel to the channel on the lower floodplain terraces of major rivers in the region. It is more common in the southern and eastern part of the subregion. Moving further north, yellow willow is often replaced by the flat leaved willow. Heavy grazing will often lead to soil erosion problems, a decrease in yellow willow coverage, and an increase in Kentucky bluegrass. Continued heavy grazing will often eliminate yellow willow entirely from the stand. This community should be rated using the forest range health assessment.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: h fen (subhydric/rich)

Ecosite Phase: h1 shrubby fen

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Tree			
BALSAM POPLAR *(Populus balsamifera)*	2	0-5	67
Shrub			
BASKET WILLOW *(Salix petiolaris)*	2	0-5	33
BEAKED WILLOW *(Salix bebbiana)*	3	0-5	67
YELLOW WILLOW *(Salix lutea)*	13	7-18	100
Forb			
WESTERN CANADA VIOLET *(Viola canadensis)*	1	0-1	67
WESTERN DOCK *(Rumex occidentalis)*	2	0-4	33
WESTERN WILLOW ASTER *(Aster hesperius)*	1	0-3	67
Grass			
BLUEJOINT *(Calamagrostis canadensis)*	17	0-29	67
TUFTED HAIR GRASS *(Deschampsia cespitosa)*	8	1-16	100
WATER SEDGE *(Carex aquatilis)*	19	0-32	67
WIRE RUSH *(Juncus balticus)*	3	0-7	67

Environmental Variables

Moisture Regime:

Nutrient Regime:

Elevation (range): (-) M

Slope:

Aspect:

Soil Drainage:

Soil Subgroup: O.HG, R.G

Soil Series:

Soil Correlation: SCA 8

Range Site Category: WL, Ri

Ecological Status Score: 25

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

1.16 (1.62-0.81) HA/AUM or *0.35 (0.25-0.50) AUM/AC*

FPC15. Bebb willow / Cow parsnip / Canada goldenrod

(Salix bebbiana / Heracleum lanatum / Solidago Canadensis)

n=2 This plant community represents further disturbance of a Bebb willow / cow parsnip / sedge (FPC6) community. These nutrient rich shrublands can be very attractive to livestock due to their highly productive and palatable species such as cow parsnip. Over utilization of these sites will promote the invasion of Kentucky bluegrass, timothy, and a diversity of lesser palatable forbs such as Canada goldenrod or fireweed. This community should be assessed with the forest range health form.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: f red osier dogwood / cow parsnip (subhygric/rich)

Ecosite Phase: f3 shrubland

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Shrub			
BEAKED WILLOW *(Salix bebbiana)*	17	11-23	100
SASKATOON *(Amelanchier alnifolia)*	1	0-2	100
Forb			
CANADA GOLDENROD *(Solidago canadensis)*	40	9-69	100
COMMON FIREWEED *(Epilobium angustifolium)*	2	0-2	50
COW PARSNIP *(Heracleum lanatum)*	9	2-15	100
WILD WHITE GERANIUM *(Geranium richardsonii)*	10	3-16	100
Grass			
BLUEJOINT *(Calamagrostis canadensis)*	3	0-5	50
FRINGED BROME *(Bromus ciliatus)*	3	2-3	100
KENTUCKY BLUEGRASS *(Poa pratensis)*	3	0-5	50
SLENDER WHEAT GRASS *(Agropyron trachycaulum)*	1	0-1	100
TIMOTHY *(Phleum pratense)*	5	0-10	50

Environmental Variables

Moisture Regime:

Nutrient Regime:

Elevation (range): (-) M

Slope:

Aspect:

Soil Drainage:

Soil Subgroup:

Soil Series:

Soil Correlation:

Range Site Category: Ov, Sb, Lo

Ecological Status Score: 15 - 10

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

1.01 (1.62-0.62) HA/AUM or *0.40 (0.25-0.65) AUM/AC*

FPC16. Bebb willow - snowberry / hairy wildrye

(Salix bebbiana - Symphoricarpos occidentalis / Elymus innovatus)

n=2 This is an uncommon community similar to the Bebb willow - Snowberry - Rose (FPC4) community type but is considered a transition to a drier ecosite. It is usually found on hilltops and represents a grassland that has been invaded by willow due to the absence of disturbance. This is indicated by the presence of hairy wild rye as well as other grassland species such as rough fescue, Parry oat grass and shrubby cinqufoil. As with its counterpart in the wetter ecosite, continued heavy grazing will increase the abundance of snowberry and rose, and could eventually lead to an understory dominated by Kentucky bluegrass and timothy. This community should be rated with the forest range health assessment.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: e snowberry-silverberry (mesic/rich)

Ecosite Phase: e3 shrubland

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Shrub			
BEAKED WILLOW *(Salix bebbiana)*	38	35-40	100
PRICKLY ROSE *(Rosa acicularis)*	4	0-7	50
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	2	0-2	100
SNOWBERRY (BUCKBRUSH) *(Symphoricarpos occidentalis)*	3	1-5	100
Forb			
COMMON FIREWEED *(Epilobium angustifolium)*	11	5-16	100
CREAM-COLORED VETCHLING *(Lathyrus ochroleucus)*	2	1-2	100
SHOWY ASTER *(Aster conspicuus)*	6	3-8	100
WILD STRAWBERRY *(Fragaria virginiana)*	2	2-2	100
Grass			
BLUEJOINT *(Calamagrostis canadensis)*	4	0-9	50
FOOTHILLS ROUGH FESCUE *(Festuca campestris)*	1	0-1	50
HAIRY WILD RYE *(Elymus innovatus)*	18	9-29	100
KENTUCKY BLUEGRASS *(Poa pratensis)*	2	1-2	100
PARRY OAT GRASS *(Danthonia parryi)*	1	0-1	50

Environmental Variables

Moisture Regime:

Nutrient Regime:

Elevation (range): (-) M

Slope:

Aspect:

Soil Drainage:

Soil Subgroup:

Soil Series:

Soil Correlation:

Range Site Category: Sb, Ov

Ecological Status Score: 20 - 15

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

1.35 (2.70-1.01) HA/AUM or *0.30 (0.15-0.40) AUM/AC*

Foothills Parkland Forests

8.0 Foothills Parkland Forests

Three vegetation types are considered to represent the vegetation on the rolling to hilly topography of the Foothills Parkland. These are foothills fescue grasslands, willow shrublands, and aspen forests (Natural Regions Committee 2006). Aspen forests are the characteristic tree species for the Foothills Parkland and occur on mesic north facing slopes, seepage zones, and low areas. Soils are generally well to imperfectly drained Black or Dark Gray Chernozems (Natural Regions Committee 2006).

Closed-canopied trembling aspen stands represent the primary forest vegetation for uplands since they often occur on mesic sites (Strong 1992). In contrast, closed-canopied balsam poplar stands tend to occur on more poorly drained sites with more moisture (Strong 1992). White spruce represents the potential climax species for both aspen and balsam poplar dominated stands (Strong 1992) although it is considered a very slow progression in comparison to the establishment of aspen. Common understory species include cow parsnip, Canada buffaloberry, bearberry, snowberry, rose, silverberry, hairy wild rye, pine grass, horsetail and white meadowsweet. These species tend to define the ecological sites and ecosite phases.

Aspen ecology in the Parkland natural region, particularly in the Central Parkland subregion has been studied extensively. This information can be extrapolated to include the Foothills Parkland. Historical documentation implies that grasslands were much more extensive in the Parkland and aspen only occupied areas with greatest soil moisture prior to European settlement (Alexander 1995). It has been suggested that the absence of fire in recent times has allowed the eastward and southward advance of aspen into the grasslands (Bailey and Wroe 1974). Fire alone, may not reduce aspen. Aspen is considered susceptible to fire, but does not burn readily (Debyle and Winokur 1985). Although the stems may die, low intensity fire actually increases sucker growth. It requires more intense and frequent fires to significantly reduce aspen suckers (Quintilio et al. 1991). There are many additional factors such as climatic variations, insect infestations, and grazing that along with fire contribute to the distribution of aspen on the landscape.

Mean annual temperature, growing season, and precipitation values for the Foothills Parkland are between the Grassland and Rocky Mountain natural regions (Natural Regions Committee 2006). In this transition, mean climatic conditions are at the low range of the precipitation to potential evapotranspiration ratio that is suitable for forest growth (Alexander 1995). This along with the variable topography creates a landscape that is intermittent to forest growth and susceptible to long term climatic variation. Cooler / wetter periods may increase locations favourable to aspen growth, whereas these areas would decline in warmer / drier periods. For example, after nearly 100 years of advancement the drought conditions in the late 1980's and early 90's stressed trees in the Aspen Parkland especially where they had encroached onto the marginal areas (Alexander 1995).

Along with the drought in the 1980's and 90's, a tent caterpillar infestation occurred between 1980 and 1991 in the Central Parkland. The forest tent caterpillar is a defoliator of trembling aspen. With high infestations, complete defoliation can happen, and consecutive years of infestation can cause substantial mortality (Alexander 1995). This infestation coupled with the drought resulted in reduction of forest canopy cover to 20-90% of a healthy aspen forest (Alexander 1995). In this documented case, multiple environmental stresses had a significant impact on aspen stands.

Grazing is another factor that has been influential on the distribution of aspen in the Foothills Parkland landscape. Historically, bison utilized the Parkland particularly in their fall and winter migrations (Morgan 1980). Huge herds utilized these aspen stands for grazing, browsing, and shelter. Prior to the removal of these free ranging bison, documentation suggests that aspen only existed in groves that were most suitable for their growth (Alexander 1995). Most rangelands in the Foothills Parkland today are grazed by domestic livestock. Similar to bison, domestic livestock utilize aspen groves for their productivity and shelter. Grazing along with periodic fire disturbances are considered primary factors that help maintain the balance of the shrublands, aspen forest, and grasslands of the Foothills Parkland. In fact suppression of fires and elimination of the large herds of free ranging bison has been cited as the reason for an increase in woody plant species within the Parkland natural region since European settlement (Alexander 1995).

Range management strives to maintain this balance of the ecosystem by protecting and enhancing the soil and vegetation complex while maintaining or improving the output of consumable products and the wide range of other values and natural functions rangelands provide (Adams et al. 2003). Proper timing of grazing and rest to allow for recovery is essential for these communities to function properly. Continual overgrazing within aspen stands can have negative ecological impacts. Often, the multiple layers of herbaceous species are replaced by shorter, less palatable, and sometimes non – native species (Debyle and Winokur 1985). Much browsing can occur, reducing the young aspen and palatable shrubs. Also, excessive use can increase soil exposure, compaction, and erosion (Adams et al. 2009). Aspen communities in the Foothills Parkland that are moderately to heavily grazed commonly have understories that change to snowberry, rose, Kentucky bluegrass, and timothy.

Forests in this guide are divided into deciduous (D), mixedwood (E), coniferous (F) and harvested (G) types. As mentioned, deciduous trembling aspen forests are the typical forest in the Foothills Parkland. Balsam poplar becomes more predominate in subirrigated to overflow range sites with subhyrgic to hygric moisture regimes.

Mixedwood forests occur where coniferous trees, usually white spruce, establishes in the understory of the deciduous forests. The establishment of coniferous trees in the deciduous forests of the Foothills Parkland is very gradual, and disturbances such as fire and grazing have historically set back this process. A forest is considered mixedwood in this guidebook if the overstory tree strata has 20% or greater of a differing coniferous or deciduous type.

Although not typical for the Foothills Parkland, coniferous forests are encountered more frequently on the western edge of the Foothills Parkland in the transition to the Montane subregion. Douglas-fir and lodgepole pine dominated plant communities may occur on mid and upper slopes. Douglas-fir and lodgepole pine are the climax species on steep, south-facing, shallow rocky soils, and very coarse-textured outwash in valley bottoms in the Montane (Strong 1992). White spruce forests may also occur on cooler, lower north facing slopes with more moisture.

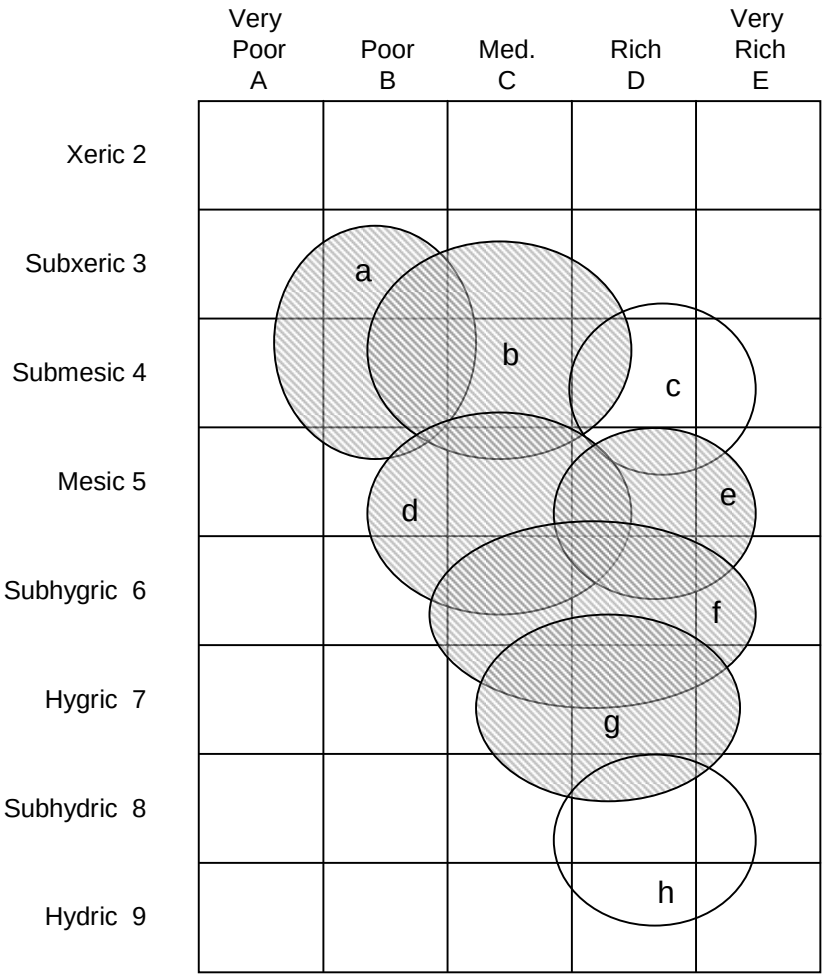


Figure 8. Forested ecological sites on the Foothills Parkland edatopic grid.

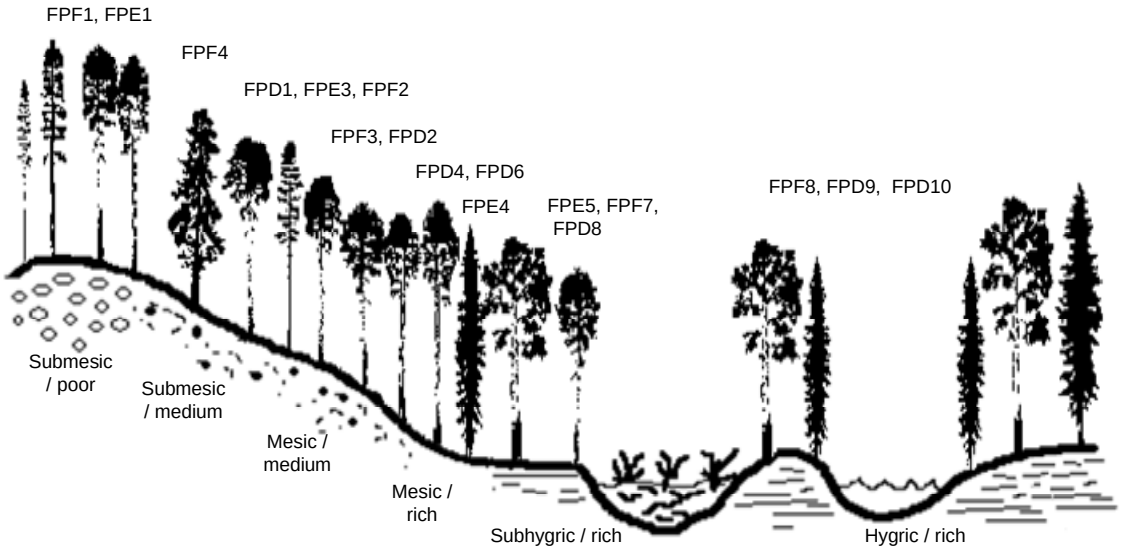


Figure 9. Slope position of forested plant communities in the Foothills Parkland.

Table 4. Foothills Parkland Forested Communities

Ecological Site	Ecosite Phase	Reference Plant Community	Successional Community Types	Modified Community Types	Harvesting Succession
a bearberry (submesic/poor)	a1 bearberry - Pl	FPF1 Pl / Bearberry - Juniper			
	a2 bearberry Aw - Pl	FPE1 Aw - Pl - Sw / Bearberry / Hairy wild rye			
b hairy wild rye (submesic/medium)	b1 hairy wild rye Fd	FPF4 Fd/Needle litter			
	b2 hairy wild rye Aw	FPD1 Aw/Rose/Hairy wild rye			
	b3 hairy wild rye Aw-Sw-Pl	FPF3 Sw-Pl-Aw/Hairy wild rye			
		FPE2 Sw-Aw/Hairy wild rye			FPG1 Hairy wild rye/Aw
	b4 hairy wild rye Sw	FPF2 Sw-Pl/Canada buffaloberry			
d pine grass (mesic/medium)	d1 pine grass – Aw	FPD2 Aw / Rose / Pine grass			
	d2 pine grass – Sw-Pl-Aw	FPE3 Sw - Pl - Aw / Rose / Pine grass			
	d3 pine grass – Sw	FPF6 Sw/Moss			
e snowberry-silverberry (mesic/rich)	e1 snowberry-silverberry Aw-Pb	FPD4 Aw – Pb / Snowberry - Saskatoon	FPD7 Pb - Aw / Snowberry / Kentucky bluegrass FPD3 Aw / Kentucky bluegrass - Timothy		
		FPD6 Aw - Pb / Marsh reed grass			
		<RPC Not Described>	FPD5 Pb / Silverberry / Kentucky bluegrass		

Table 4. Foothills Parkland Forested Communities (continued)

Ecological Site	Ecosite Phase	Reference Plant Community	Successional Community Types	Modified Community Types	Harvesting Succession
e snowberry-silverberry (mesic/rich) (continued)	e2 snowberry-silverberry Sw	<RPC Not Described>	FPF5 Sw / Silverberry		
	e4 snowberry-silverberry Sw-Aw	FPE4 Sw - Aw / Rose / Marsh reed grass			
f red osier dogwood (subhygric/rich)	f1 red osier dogwood Sw	FPE5 Sw - Pb / Cow parsnip			
		<RPC Not Described>	FPF7 Sw / Red osier dogwood / Kentucky bluegrass		
	f2 red osier dogwood Pb-Aw	FPD8 Aw / Cow parsnip			
g horsetail (hygric/rich)	g1 horsetail Sw	FPF8 Sw / Horsetail			
	g2 horsetail Aw-Pb	FPD9 Pb / Willow / Tall manna grass			
		FPD10 Pb - Aw / Horsetail			

FPD1. Aw / Rose / Hairy wild rye

(Populus tremuloides / Rosa acicularis / Elymus innovatus)

n=9 This community type is similar to the Aw / Rose / Hairy wild rye community that occurs on submesic slopes in the Montane. It usually occurs on mid slope, top slope and crest positions and is a product of aspen encroachment onto grasslands in the absence of fire. This community occurs most often on southerly and easterly aspects. Further succession is quite slow and will likely be to a lodgepole pine, Douglas-fir, or white spruce dominated community.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: b hairy wild rye (submesic/medium)

Ecosite Phase: b2 hairy wild rye Aw

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Tree			
ASPEN *(Populus tremuloides)*	43	25-60	100
WHITE SPRUCE *(Picea glauca)*	2	0-5	44
Shrub			
PRICKLY ROSE *(Rosa acicularis)*	10	3-16	100
SASKATOON *(Amelanchier alnifolia)*	1	0-3	44
SNOWBERRY (BUCKBRUSH) *(Symphoricarpos occidentalis)*	4	0-16	78
Forb			
COMMON DANDELION *(Taraxacum officinale)*	4	1-6	100
COMMON FIREWEED *(Epilobium angustifolium)*	7	0-16	79
CREAM-COLORED VETCHLING *(Lathyrus ochroleucus)*	2	0-5	89
LINDLEY'S ASTER *(Aster ciliolatus)*	8	3-13	100
WILD STRAWBERRY *(Fragaria virginiana)*	10	0-19	89
Grass			
HAIRY WILD RYE *(Elymus innovatus)*	10	1-22	100
PINE REED GRASS *(Calamagrostis rubescens)*	4	0-12	67
SLENDER WHEAT GRASS *(Agropyron trachycaulum)*	2	1-8	100

Environmental Variables

Moisture Regime: MESIC()

Nutrient Regime: PERMESOTROPHIC()

Elevation (range): 1400(-) M

Slope: 3 - 5(28), 6 - 9(14), 10 - 15(43), 16 - 30(14)

Aspect: Northerly(12), Easterly(38), Southerly(38), Westerly(12)

Soil Drainage: Well drained(63), Moderate well drain(25), Imperfectly drained(12)

Soil Subgroup: O.BL, D.GL, O.R

Soil Series:

Soil Correlation:

Range Site Category:

Ecological Status Score: 25

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=0

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

2.02 (2.70-1.35) HA/AUM or *0.20 (0.15-0.30) AUM/AC*

FPD2. Aw / Rose / Pine grass

(Populus tremuloides / Rosa acicularis / Calamagrostis rubescens)

n=18 This community is similar to the Aspen / Rose / Pine grass community in the Montane (Willoughby et al. 2008). It is dominated by an aspen overstory, an understory of pine grass, and represents an earlier successional stage to a coniferous forest community. The forage productivity of this community type is moderate. Pine grass becomes dormant quickly during the season and less palatable to livestock. If it is grazed early it can be utilized as a forage source. Care must be taken when grazing as pine grass, understory forbs and preferred shrubs. These species recover slowly which may allow non native species and non preferred shrubs such as Kentucky bluegrass and buckbrush to invade.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: d pine grass (mesic/medium)

Ecosite Phase: d1 pine grass - Aw

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Tree			
ASPEN *(Populus tremuloides)*	40	20-65	100
BALSAM POPLAR *(Populus balsamifera)*	3	0-20	22
Shrub			
PRICKLY ROSE *(Rosa acicularis)*	7	0-22	94
SASKATOON *(Amelanchier alnifolia)*	1	0-10	39
WHITE MEADOWSWEET *(Spiraea betulifolia)*	3	0-16	28
Forb			
COMMON FIREWEED *(Epilobium angustifolium)*	12	1-26	100
CREAM-COLORED VETCHLING *(Lathyrus ochroleucus)*	3	1-9	100
LINDLEY'S ASTER *(Aster ciliolatus)*	7	0-18	83
NORTHERN BEDSTRAW *(Galium boreale)*	2	1-11	100
SHOWY ASTER *(Aster conspicuus)*	7	0-23	83
WILD STRAWBERRY *(Fragaria virginiana)*	8	1-20	100
Grass			
HAIRY WILD RYE *(Elymus innovatus)*	3	0-14	72
PINE REED GRASS *(Calamagrostis rubescens)*	10	0-23	89
SLENDER WHEAT GRASS *(Agropyron trachycaulum)*	1	0-6	61

Environmental Variables

Moisture Regime: MESIC(), SUBHYGRIC(), HYGRIC()

Nutrient Regime: PERMESOTROPHIC()

Elevation (range): 1360(-) M

Slope: 3 - 5(03), 6 - 9(08), 10 - 15(42), 16 - 30(42), 31 - 45(05)

Aspect: Northerly(46), Easterly(24), Southerly(08), Westerly(22)

Soil Drainage: Well drained(75), Moderate well drain(25)

Soil Subgroup: O.BL, O.GL, D.GL

Soil Series: DVGaa, LTC, MSB, BEV

Soil Correlation: SCA 8

Range Site Category:

Ecological Status Score: 25

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=0

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

1.62 (2.02-1.16) HA/AUM or *0.25 (0.20-0.35) AUM/AC*

FPD3. Aw / Kentucky bluegrass - Timothy

(Populus tremuloides / Poa pratensis - Phleum pratense)

n=9 This community represents the outcome of prolonged heavy disturbance of a deciduous forested community within this ecosite. It is generally thought to be the continued successional regression of a Aw - Pb / Snowberry - Saskatoon (FPD4) with heavy disturbance but the sparse shrub layer of either preferred or non - preferred shrubs suggests this community could also be the outcome of a heavily disturbed Aw - Pb / Marsh reed grass (FPD6) community. Although not present in the canopy coverage summarized here, balsam poplar can grow within this ecosite and could potentially be part of this plant community. Often these disturbed communities occur on the edges of stands where grasslands or meadows meet the forest. This interface is a common loafing and grazing area for cattle. Usually, the entire forest stand is not over grazed and a native community will begin to dominate once away from the edge and into the forest.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: e snowberry-silverberry (mesic/rich)

Ecosite Phase: e1 snowberry-silverberry Aw-Pb

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Tree			
ASPEN *(Populus tremuloides)*	43	15-80	100
Shrub			
PRICKLY ROSE *(Rosa acicularis)*	4	0-20	56
SNOWBERRY (BUCKBRUSH) *(Symphoricarpos occidentalis)*	2	0-6	56
WILD RED RASPBERRY *(Rubus idaeus)*	2	0-10	33
Forb			
COMMON DANDELION *(Taraxacum officinale)*	5	0-20	67
LINDLEY'S ASTER *(Aster ciliolatus)*	4	0-10	56
NORTHERN BEDSTRAW *(Galium boreale)*	2	0-3	89
VEINY MEADOW RUE *(Thalictrum venulosum)*	1	0-6	78
WILD STRAWBERRY *(Fragaria virginiana)*	3	1-7	100
WILD WHITE GERANIUM *(Geranium richardsonii)*	2	0-7	56
Grass			
BLUEJOINT *(Calamagrostis canadensis)*	3	0-18	33
KENTUCKY BLUEGRASS *(Poa pratensis)*	11	0-30	56
PINE REED GRASS *(Calamagrostis rubescens)*	2	0-10	33
TIMOTHY *(Phleum pratense)*	18	1-40	100

Environmental Variables

Moisture Regime: MESIC(), SUBHYGRIC()

Nutrient Regime: MESOTROPHIC(), PERMESOTROPHIC()

Elevation (range): 1384(1314-1495) M

Slope: 3 - 5(20), 10 - 15(60)

Aspect: Northerly(22), Easterly(44), Southerly(33)

Soil Drainage: Well drained()

Soil Subgroup: D.GL

Soil Series: BPE, BDY

Soil Correlation: SCA 8

Range Site Category:

Ecological Status Score: 10 - 5

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=0

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

1.16 (2.02-0.90) HA/AUM or *0.35 (0.20-0.45) AUM/AC*

FPD4. Aw - Pb / Snowberry - Rose

(Populus tremuloides - P. balsamifera / Symphoricarpos spp. - Rosa spp.)

n=8 This community represents a mesic / rich site that has become advanced successionally from a Rose - snowberry shrub (FPC1) or a Bebb willow - snowberry - rose (FPC4) community to a deciduous community with an aspen and balsam poplar overstory. As with most shrubland and forested communities in the Foothills Parkland, disturbance leads to a reduced shrub component and an introduction of non-native invaders such as Kentucky bluegrass and timothy.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: e snowberry-silverberry (mesic/rich)

Ecosite Phase: e1 snowberry-silverberry Aw-Pb

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Tree			
ASPEN *(Populus tremuloides)*	38	25-45	100
BALSAM POPLAR *(Populus balsamifera)*	24	0-55	75
Shrub			
PRICKLY ROSE *(Rosa acicularis)*	10	1-23	100
SASKATOON *(Amelanchier alnifolia)*	2	0-3	75
SNOWBERRY (BUCKBRUSH) *(Symphoricarpos occidentalis)*	10	0-22	88
WHITE MEADOWSWEET *(Spiraea betulifolia)*	3	0-15	50
Forb			
COMMON FIREWEED *(Epilobium angustifolium)*	6	0-14	88
CREAM-COLORED VETCHLING *(Lathyrus ochroleucus)*	2	0-5	88
LINDLEY'S ASTER *(Aster ciliolatus)*	6	0-16	75
WESTERN CANADA VIOLET *(Viola canadensis)*	2	0-6	63
WILD STRAWBERRY *(Fragaria virginiana)*	7	1-11	100
Grass			
BLUEJOINT *(Calamagrostis canadensis)*	4	0-6	75
PINE REED GRASS *(Calamagrostis rubescens)*	2	0-5	63

Environmental Variables

Moisture Regime: MESIC(), SUBHYGRIC()

Nutrient Regime: MESOTROPHIC(), PERMESOTROPHIC()

Elevation (range): 1450(1371-1560) M

Slope: 3 - 5(38), 6 - 9(12), 10 - 15(25), 16 - 30(25)

Aspect: Northerly(25), Easterly(38), Southerly(25), Westerly(12)

Soil Drainage: Rapidly drained(14), Well drained(43), Moderate well drain(29), Poorly drained(14)

Soil Subgroup: CA.DB, O.BL, O.DG, HU.LG, D.GL

Soil Series: DVG, HFD, POT, BDY

Soil Correlation: SCA 8

Range Site Category:

Ecological Status Score: 25

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

2.02 (2.70-1.62) HA/AUM or *0.20 (0.15-0.25) AUM/AC*

FPD5. Pb / Silverberry / Kentucky bluegrass

(Populus balsamifera / Elaeagnus commutata / Poa pratensis)

n=3 Due to a lack of plots, only a disturbed form for this plant community is described. It can be inferred that without disturbance, brome, timothy, and Kentucky bluegrass would be reduced and marsh reed grass or pine grass would be more prevalent similar to an Aw - Pb / Marsh reed grass (FPD6) or Aw - Pb / Snowberry - Rose (FPD4) communities with the exception of the presence of silverberry. Silverberry dominated plant communities occur on alluvial floodplain terraces, in V shaped ravines and swale-like depressions where overland flow provide additional moisture (Thompson and Hansen 2002). As these areas can be productive and provide shade, they become preferred locations for livestock, and disturbance is common. Successionally, the growth of trees suggests these communities are more developed than the shrubland communities within this ecosite.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: e snowberry-silverberry (mesic/rich)

Ecosite Phase: e1 snowberry-silverberry Aw-Pb

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Tree			
BALSAM POPLAR *(Populus balsamifera)*	43	10-80	100
WHITE SPRUCE *(Picea glauca)*	1	0-3	33
Shrub			
PRICKLY ROSE *(Rosa acicularis)*	8	0-20	67
SASKATOON *(Amelanchier alnifolia)*	1	0-3	33
SILVERBERRY *(Elaeagnus commutata)*	17	10-30	100
SNOWBERRY *(Symphoricarpos albus)*	3	0-10	67
Forb			
CANADA GOLDENROD *(Solidago canadensis)*	4	0-10	67
COMMON DANDELION *(Taraxacum officinale)*	11	3-20	100
CREAM-COLORED VETCHLING *(Lathyrus ochroleucus)*	1	0-3	67
WHITE CLOVER *(Trifolium repens)*	7	0-20	67
WILD STRAWBERRY *(Fragaria virginiana)*	2	0-6	67
Grass			
AWNLESS BROME *(Bromus inermis)*	3	0-10	33
KENTUCKY BLUEGRASS *(Poa pratensis)*	10	10-10	100
TIMOTHY *(Phleum pratense)*	8	3-20	100

Environmental Variables

Moisture Regime:

Nutrient Regime:

Elevation (range): 1372(-) M

Slope:

Aspect:

Soil Drainage:

Soil Subgroup:

Soil Series:

Soil Correlation:

Range Site Category:

Ecological Status Score: 10 - 5

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

1.16 (2.70-1.01) HA/AUM or *0.35 (0.15-0.40) AUM/AC*

FPD6. Aw - Pb / Marsh reed grass

(Populus tremuloides - P. balsamifera / Calamagrostis canadensis)

n=13 This community type was described on lower slope positions where some nutrient rich seepage occurs during the growing season. It is generally found north of the Porcupine Hills in areas that have north and easterly aspects. Unlike other communities in this ecosite, this community type has a low shrub cover and extensive cover of grass which makes it attractive to livestock. Although intermediate steps have not yet been defined, heavy utilization can transition this community to an Aw / Kentucky bluegrass - Timothy (FPD3) community.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: e snowberry-silverberry (mesic/rich)

Ecosite Phase: e1 snowberry-silverberry Aw-Pb

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Tree			
ASPEN *(Populus tremuloides)*	27	0-50	69
BALSAM POPLAR *(Populus balsamifera)*	23	0-50	69
WHITE SPRUCE *(Picea glauca)*	5	0-10	69
Shrub			
BEAKED WILLOW *(Salix bebbiana)*	4	0-20	46
PRICKLY ROSE *(Rosa acicularis)*	5	0-14	77
Forb			
COMMON FIREWEED *(Epilobium angustifolium)*	15	6-23	100
CREAM-COLORED VETCHLING *(Lathyrus ochroleucus)*	2	0-7	85
SHOWY ASTER *(Aster conspicuus)*	6	0-17	85
VEINY MEADOW RUE *(Thalictrum venulosum)*	3	0-8	92
WILD STRAWBERRY *(Fragaria virginiana)*	7	0-20	92
WILD WHITE GERANIUM *(Geranium richardsonii)*	4	0-7	85
Grass			
BLUEJOINT *(Calamagrostis canadensis)*	11	0-25	92
HAIRY WILD RYE *(Elymus innovatus)*	2	0-9	46
PINE REED GRASS *(Calamagrostis rubescens)*	2	0-15	38
SLENDER WHEAT GRASS *(Agropyron trachycaulum)*	2	0-7	77

Environmental Variables

Moisture Regime:

Nutrient Regime:

Elevation (range): 1404(1325-1473) M

Slope: 3 - 5(11), 6 - 9(16), 10 - 15(42), 16 - 30(21), 31 - 45(10)

Aspect: Northerly(20), Easterly(52), Southerly(20), Westerly(08)

Soil Drainage: Rapidly drained(22), Well drained(77), Moderate well drain(33)

Soil Subgroup: O.EB, O.BL, D.GL, BR.GL

Soil Series: BPE, FRK, LTC, MSB

Soil Correlation: SCA 8

Range Site Category:

Ecological Status Score: 25

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=0

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

1.01 (1.62-0.90) HA/AUM or *0.40 (0.25-0.45) AUM/AC*

FPD7. Pb - Aw / Snowberry / Kentucky bluegrass

(Populus balsamifera - P. tremuloides / Symphoricarpos albus / Poa pratensis)

n=2 This community type is very similar to the previously described Aw - Pb / Snowberry - Rose (FPD4) community, but has been grazed by livestock. Willoughby (1995) found that aspen stands that have been heavily grazed for prolonged periods have a low cover of preferred shrubs, forbs and grass species and a higher cover of Kentucky bluegrass, timothy, clover and dandelion. This community has these indications, but it also is comprised of some native shrubs and forbs that may indicate that rest may allow recovery of the native species. These sites are productive and often occur on the edges of the forested stands where grasslands and meadows meet the aspen. These become common loafing and grazing areas for cattle. Usually, a native understory will dominate once away from the forest edge and further into the forest.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: e snowberry-silverberry (mesic/rich)

Ecosite Phase: e1 snowberry-silverberry Aw-Pb

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Tree			
ASPEN *(Populus tremuloides)*	5	0-10	50
BALSAM POPLAR *(Populus balsamifera)*	35	30-40	100
WHITE SPRUCE *(Picea glauca)*	5	0-10	50
Shrub			
PRICKLY ROSE *(Rosa acicularis)*	16	8-23	100
SASKATOON *(Amelanchier alnifolia)*	2	0-3	50
SILVERBERRY *(Elaeagnus commutata)*	7	5-7	100
SNOWBERRY *(Symphoricarpos albus)*	8	8-8	100
Forb			
COMMON DANDELION *(Taraxacum officinale)*	6	1-11	100
CREAM-COLORED VETCHLING *(Lathyrus ochroleucus)*	1	0-2	50
LINDLEY'S ASTER *(Aster ciliolatus)*	5	3-6	100
TALL LUNGWORT *(Mertensia paniculata)*	2	1-3	100
WILD STRAWBERRY *(Fragaria virginiana)*	1	1-2	100
Grass			
AWNLESS BROME *(Bromus inermis)*	1	1-1	100
KENTUCKY BLUEGRASS *(Poa pratensis)*	25	16-33	100
TIMOTHY *(Phleum pratense)*	1	0-3	50

Environmental Variables

Moisture Regime: MESIC(), SUBHYGRIC()

Nutrient Regime: MESOTROPHIC(), PERMESOTROPHIC()

Elevation (range): 1372(-) M

Slope: 0.5 - 2.5()

Aspect: Northerly(), Easterly()

Soil Drainage: Well drained()

Soil Subgroup: O.R

Soil Series: ZUN

Soil Correlation: SCA 8

Range Site Category:

Ecological Status Score: 10 - 5

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

1.62 (2.02-1.01) HA/AUM or *0.25 (0.20-0.40) AUM/AC*

FPD8. Aw / Cow parsnip

(Populus tremuloides / Heracleum lanatum)

n=11 Nutrient rich seepage occurs at some point in the growing season favouring the growth of cow parsnip. This community is a successional step between Bebb willow / Cow parsnip / Sedge (FPC6) and Sw - Pb / Cow parsnip (FPE5) communities. The understory is still productive like the Bebb willow community, and cow parsnip is palatable to livestock and is often extensively utilized. Moderate to heavy grazing can reduce both the cow parsnip and the native grasses, and lead to the invasion of Kentucky bluegrass and timothy.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: f red osier dogwood / cow parsnip (subhygric/rich)

Ecosite Phase: f2 red osier dogwood Pb-Aw

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Tree			
ASPEN *(Populus tremuloides)*	35	30-40	100
BALSAM POPLAR *(Populus balsamifera)*	6	0-40	45
WHITE SPRUCE *(Picea glauca)*	2	0-10	45
Shrub			
BEAKED WILLOW *(Salix bebbiana)*	1	0-10	18
PRICKLY ROSE *(Rosa acicularis)*	2	0-7	45
SASKATOON *(Amelanchier alnifolia)*	1	0-1	18
SNOWBERRY (BUCKBRUSH) *(Symphoricarpos occidentalis)*	1	0-5	36
WHITE MEADOWSWEET *(Spiraea betulifolia)*	1	0-13	27
WILD RED RASPBERRY *(Rubus idaeus)*	1	0-4	45
Forb			
COMMON FIREWEED *(Epilobium angustifolium)*	13	4-23	100
COW PARSNIP *(Heracleum lanatum)*	22	6-57	100
SHOWY ASTER *(Aster conspicuus)*	5	0-14	73
TALL LARKSPUR *(Delphinium glaucum)*	5	0-17	82
VEINY MEADOW RUE *(Thalictrum venulosum)*	2	0-4	91
WILD WHITE GERANIUM *(Geranium richardsonii)*	4	1-14	100
Grass			
BLUEJOINT *(Calamagrostis canadensis)*	15	2-31	100
PINE REED GRASS *(Calamagrostis rubescens)*	2	0-11	36
SLENDER WHEAT GRASS *(Agropyron trachycaulum)*	1	0-3	64

Environmental Variables

Moisture Regime:

Nutrient Regime:

Elevation (range): (-) M

Slope: 3 - 5(16), 10 - 15(67), 16 - 30(17)

Aspect: Northerly(22), Easterly(67), Southerly(11)

Soil Drainage: Well drained()

Soil Subgroup: O.EB, O.BL, D.GL

Soil Series:

Soil Correlation: SCA 8

Range Site Category:

Ecological Status Score: 25

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

1.01 (2.02-0.81) HA/AUM or *0.40 (0.20-0.50) AUM/AC*

FPD9. Pb / Willow / Tall manna grass

(Populus balsamifera / Salix bebbiana / Glyceria grandis)

n=1 This community type was described adjacent to a meandering stream. Tall manna grass is well adapted to growing on the margins of sloughs, marshes and low meadows where the ground is saturated for most of the growing season. This community type is very productive because of the moist nutrient rich conditions, but wet conditions may limit access. If heavy grazing does occur, the site will potentially dry out and lead to non-natives such as Kentucky bluegrass and timothy to establish. Also, soil disturbance problems such as pugging are likely to occur.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: g horsetail (hygric/rich)

Ecosite Phase: g2 horsetail Aw-Pb

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Tree			
BALSAM POPLAR *(Populus balsamifera)*	40		100
WHITE SPRUCE *(Picea glauca)*	15		100
Shrub			
BEAKED WILLOW *(Salix bebbiana)*	5		100
PRICKLY ROSE *(Rosa acicularis)*	2		100
Forb			
BISHOP'S-CAP *(Mitella nuda)*	6		100
BUNCHBERRY *(Cornus canadensis)*	9		100
COMMON HORSETAIL *(Equisetum arvense)*	9		100
COW PARSNIP *(Heracleum lanatum)*	4		100
LARGE-LEAVED YELLOW AVENS *(Geum macrophyllum)*	4		100
Grass			
COMMON TALL MANNA GRASS *(Glyceria grandis)*	13		100
UNDIFFERENTIATED SEDGE *(Carex)*	9		100

Environmental Variables

Moisture Regime:

Nutrient Regime:

Elevation (range): (-) M

Slope: 3 - 5()

Aspect: Northerly()

Soil Drainage: Well drained(), Moderate well drain()

Soil Subgroup: D.GL

Soil Series:

Soil Correlation:

Range Site Category:

Ecological Status Score: 25

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

1.62 (2.02-1.01) HA/AUM or *0.25 (0.20-0.40) AUM/AC*

FPD10. Pb - Aw / Horsetail

(Populus balsamifera - P.tremuloides / Equisetum arvense)

n=3 This community type is among the wettest and most nutrient rich forests within the Foothills Parkland subregion. Seepage and high water tables can be expected. Balsam poplar and aspen are considered pioneer species for this ecosite and tend to establish easily. Without disturbance, succession will lead to a white spruce climax community. This however will be a very slow progression and not common in the Foothills Parkland due to the natural fire regime and other disturbance factors in the subregion. This community can provide moderate levels of spring and summer forage, but livestock pressure can damage the soil profile due to the wet conditions. Heavy grazing and trampling will often lead to invasive understory stands such as Kentucky bluegrass, timothy, and smooth brome.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: g horsetail (hygric/rich)

Ecosite Phase: g2 horsetail Aw-Pb

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Tree			
ASPEN *(Populus tremuloides)*	40	40-40	100
BALSAM POPLAR *(Populus balsamifera)*	50	50-50	100
WHITE SPRUCE *(Picea glauca)*	10	10-10	100
Shrub			
PRICKLY ROSE *(Rosa acicularis)*	13	10-20	100
RED-OSIER DOGWOOD *(Cornus stolonifera)*	4	1-5	100
SNOWBERRY (BUCKBRUSH) *(Symphoricarpos occidentalis)*	8	5-9	100
Forb			
BISHOP'S-CAP *(Mitella nuda)*	5	1-10	100
COMMON HORSETAIL *(Equisetum arvense)*	9	8-11	100
LINDLEY'S ASTER *(Aster ciliolatus)*	3	1-6	100
TALL LUNGWORT *(Mertensia paniculata)*	4	1-6	100
WILD STRAWBERRY *(Fragaria virginiana)*	5	2-7	100
Grass			
BLUEJOINT *(Calamagrostis canadensis)*	14	7-23	100
UNDIFFERENTIATED SEDGE *(Carex)*	3	1-4	100

Environmental Variables

Moisture Regime:

Nutrient Regime:

Elevation (range): (-) M

Slope: 0 - 0.5(17), 0.5 - 2.5(17), 3 - 5(33), 10 - 15(17), 31 - 45(16)

Aspect: Northerly(75), Westerly(25)

Soil Drainage: Well drained(100)

Soil Subgroup: O.BL

Soil Series:

Soil Correlation: SCA 8

Range Site Category:

Ecological Status Score: 25

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=0

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

1.62 (2.70-1.01) HA/AUM or *0.25 (0.15-0.40) AUM/AC*

FPE1. Aw - Pl - Sw / Bearberry / Hairy wild rye

(Populus tremuloides - Pinus contorta - Picea glauca / Arctostaphylos uva-ursi / Elymus innovatus)

n=6 This community represents a dry aspen dominated community type that is undergoing succession to lodgepole pine and white spruce. It may have once been a grassland that has been encroached by trees. It occupies dry upper slope positions with south exposures and coarse textured soils. Forage production on these sites will be low because of the dry site conditions and livestock will not commonly utilize these steep upper slope positions.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: a bearberry (submesic/poor)

Ecosite Phase: a2 bearberry Aw - Pl

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Tree			
ASPEN *(Populus tremuloides)*	23	10-40	100
LODGEPOLE PINE *(Pinus contorta)*	16	0-25	83
WHITE SPRUCE *(Picea glauca)*	17	10-25	100
Shrub			
COMMON BEARBERRY *(Arctostaphylos uva-ursi)*	12	5-20	100
GROUND JUNIPER *(Juniperus communis)*	1	0-5	33
PRICKLY ROSE *(Rosa acicularis)*	6	4-12	100
WHITE MEADOWSWEET *(Spiraea betulifolia)*	6	0-15	83
Forb			
LINDLEY'S ASTER *(Aster ciliolatus)*	2	1-2	100
SHOWY ASTER *(Aster conspicuus)*	6	0-17	83
WILD STRAWBERRY *(Fragaria virginiana)*	3	1-6	100
Grass			
FOOTHILLS ROUGH FESCUE *(Festuca campestris)*	1	0-3	50
HAIRY WILD RYE *(Elymus innovatus)*	10	5-18	100
PINE REED GRASS *(Calamagrostis rubescens)*	7	0-14	83

Environmental Variables

Moisture Regime: SUBMESIC()

Nutrient Regime: SUBMESOTROPHIC(), MESOTROPHIC()

Elevation (range): 1300(-) M

Slope: 16 - 30(100)

Aspect: Northerly(22), Easterly(22), Southerly(22), Westerly(33)

Soil Drainage: Rapidly drained(50), Well drained(25), Moderate well drain(25)

Soil Subgroup: O.EB, CU.R

Soil Series:

Soil Correlation:

Range Site Category:

Ecological Status Score: 25

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=0

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

4.05 (8.10-2.02) HA/AUM or *0.10 (0.05-0.20) AUM/AC*

FPE2. Sw - Aw / Hairy wild rye

(Picea glauca - Populus tremuloides / Elymus innovatus)

n=2 This community occurs on submesic, well drained slopes. It is very similar to the Aw / Rose / Hairy wildrye (FPD1) community type, but is more advanced in succession to a conifer dominated community. The plots used to describe this community include white spruce in the overstory, but could be replaced by Douglas-fir. The forage productivity for this community is slightly less than the community dominated by aspen.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: b hairy wild rye (submesic/medium)

Ecosite Phase: b3 hairy wild rye Aw-Sw-Pl

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Tree			
ASPEN *(Populus tremuloides)*	28	25-30	100
WHITE SPRUCE *(Picea glauca)*	29	20-35	100
Shrub			
PRICKLY ROSE *(Rosa acicularis)*	4	0-7	50
SASKATOON *(Amelanchier alnifolia)*	1	1-1	100
SNOWBERRY *(Symphoricarpos albus)*	1	0-2	50
Forb			
COMMON FIREWEED *(Epilobium angustifolium)*	3	1-5	100
CREAM-COLORED VETCHLING *(Lathyrus ochroleucus)*	1	1-1	100
LINDLEY'S ASTER *(Aster ciliolatus)*	2	1-2	100
WILD STRAWBERRY *(Fragaria virginiana)*	1	1-1	100
Grass			
HAIRY WILD RYE *(Elymus innovatus)*	6	2-10	100
SLENDER WHEAT GRASS *(Agropyron trachycaulum)*	4	0-7	50

Environmental Variables

Moisture Regime: MESIC(), SUBHYGRIC()

Nutrient Regime: MESOTROPHIC(), PERMESOTROPHIC()

Elevation (range): 1371(-) M

Slope: 6 - 9(50), 16 - 30(50)

Aspect: Easterly(50), Southerly(50)

Soil Drainage: Well drained(50), Imperfectly drained(50)

Soil Subgroup: D.GL

Soil Series:

Soil Correlation:

Range Site Category:

Ecological Status Score: 25

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

2.70 (4.05-2.02) HA/AUM or *0.15 (0.10-0.20) AUM/AC*

FPE3. Sw - Pl - Aw / Rose / Pine grass

(Picea glauca - Pinus contorta - Populus tremuloides / Rosa acicularis / Calamagrostis rubescens)

n=2 This community type has a codominant overstory of aspen and coniferous trees such as white spruce and lodgepole pine. It represents an intermediary successional stage between an aspen dominated stand and a coniferous stand. A mixedwood stand generally consists of over 20% of each forested type. These communities are described because the understory is slightly different in composition and less productive than an aspen stand, yet more diverse and productive than a coniferous forest in the same ecosite. As with the Aspen / Rose / Pine grass (FPD2) community the forage productivity is moderate, but care must be taken when grazing. Understory vegetation recovers slowly to disturbance which may allow non native species such as Kentucky bluegrass to invade.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: d pine grass (mesic/medium)

Ecosite Phase: d2 pine grass - Sw-Pl-Aw

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Tree			
ASPEN *(Populus tremuloides)*	30	25-35	100
LODGEPOLE PINE *(Pinus contorta)*	35	25-45	100
WHITE SPRUCE *(Picea glauca)*	50	50-50	100
Shrub			
DWARF BILBERRY *(Vaccinium caespitosum)*	12	1-21	100
GROUND JUNIPER *(Juniperus communis)*	3	3-3	100
PRICKLY ROSE *(Rosa acicularis)*	7	5-8	100
TWINFLOWER *(Linnaea borealis)*	16	15-16	100
WHITE MEADOWSWEET *(Spiraea betulifolia)*	5	3-6	100
Forb			
BUNCHBERRY *(Cornus canadensis)*	15	6-22	100
COMMON FIREWEED *(Epilobium angustifolium)*	3	1-4	100
COMMON PINK WINTERGREEN *(Pyrola asarifolia)*	3	1-4	100
Grass			
HAIRY WILD RYE *(Elymus innovatus)*	1	0-2	50
PINE REED GRASS *(Calamagrostis rubescens)*	10	8-11	100

Environmental Variables

Moisture Regime: MESIC()

Nutrient Regime: MESOTROPHIC()

Elevation (range): 1260(-) M

Slope: 3 - 5(50), 10 - 15(25), 16 - 30(25)

Aspect: Northerly(50), Easterly(25), Westerly(25)

Soil Drainage: Well drained(50), Moderate well drain(50)

Soil Subgroup: D.GL, BR.GL

Soil Series:

Soil Correlation:

Range Site Category:

Ecological Status Score: 25

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

4.05 (8.10-2.02) HA/AUM or *0.10 (0.05-0.20) AUM/AC*

FPE4. Sw - Aw / Rose / Marsh reed grass

(Picea glauca - Populus tremuloides / Rosa acicularis / Calamagrostis canadensis)

n=11 This community is similar to the Aw - Pb / Marsh reed grass (FPD6) community that was described on moist lower slope positions throughout the northern portion of the Porcupine Hills, however is successionaly more advanced. Continued succession in the absence of disturbance will be to a white spruce forest. The forage productivity of this community type is moderate, with the majority of production from marsh reed grass. This grass does not recover quickly from heavy grazing. Moderate to heavy use of this community would likely allow for the introduction of non native species such as Kentucky bluegrass and timothy.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: e snowberry-silverberry (mesic/rich)

Ecosite Phase: e4 snowberry-silverberry Sw-Aw

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Tree			
ASPEN *(Populus tremuloides)*	26	0-40	91
WHITE SPRUCE *(Picea glauca)*	37	20-50	100
Shrub			
PRICKLY ROSE *(Rosa acicularis)*	5	0-17	91
SNOWBERRY (BUCKBRUSH) *(Symphoricarpos occidentalis)*	3	0-10	73
Forb			
COMMON FIREWEED *(Epilobium angustifolium)*	11	0-22	91
CREAM-COLORED VETCHLING *(Lathyrus ochroleucus)*	3	1-6	100
LINDLEY'S ASTER *(Aster ciliolatus)*	9	0-13	91
WILD STRAWBERRY *(Fragaria virginiana)*	8	3-21	100
Grass			
BLUEJOINT *(Calamagrostis canadensis)*	5	1-16	100
HAIRY WILD RYE *(Elymus innovatus)*	4	0-10	64
PINE REED GRASS *(Calamagrostis rubescens)*	5	0-15	64

Environmental Variables

Moisture Regime:

Nutrient Regime:

Elevation (range): 1333(1301-1377) M

Slope: 0 - 0.5(05), 3 - 5(18), 6 - 9(06), 10 - 15(47), 16 - 30(24)

Aspect: Northerly(33), Easterly(20), Southerly(07), Westerly(40)

Soil Drainage: Rapidly drained(37), Well drained(38), Moderate well drain(25)

Soil Subgroup: O.EB, O.BL, R.HG, D.GL, O.R

Soil Series:

Soil Correlation: SCA 8

Range Site Category:

Ecological Status Score: 25

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=0

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

2.02 (4.05-1.62) HA/AUM or *0.20 (0.10-0.25) AUM/AC*

FPE5. Sw - Pb / Cow parsnip

(Picea glauca - Populus balsamifera / Heracleum lanatum)

n=2 Archibald et al. (1996) described a similar Pb / Thimbleberry dominated community on moist lower slope positions where seepage or overflows occur in the spring and after heavy rainfalls in the Montane subregion. It is thought that thimbleberry and cow parsnip reside in the same soil moisture nutrient regime. This community is successionally more advanced than the Aw / Cow parsnip (FPD8) community type, as indicated by the white spruce. Climax succession would likely be to a white spruce community. Likely the northerly aspects allowed this community to escape the historic fires that occurred throughout the area. The high canopy cover of trees and shrubs limits the amount of light reaching the forest floor and therefore there is only a moderate amount of forage available for domestic livestock.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: f red osier dogwood / cow parsnip (subhygric/rich)

Ecosite Phase: f1 red osier dogwood Sw

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Tree			
ASPEN *(Populus tremuloides)*	8	0-15	50
BALSAM POPLAR *(Populus balsamifera)*	28	20-35	100
WHITE SPRUCE *(Picea glauca)*	33	30-35	100
Shrub			
PRICKLY ROSE *(Rosa acicularis)*	2	1-3	100
Forb			
COMMON FIREWEED *(Epilobium angustifolium)*	7	4-9	100
COMMON HORSETAIL *(Equisetum arvense)*	5	2-7	100
COW PARSNIP *(Heracleum lanatum)*	8	6-9	100
LINDLEY'S ASTER *(Aster ciliolatus)*	10	6-13	100
WESTERN CANADA VIOLET *(Viola canadensis)*	10	8-11	100
WILD STRAWBERRY *(Fragaria virginiana)*	2	1-3	100
Grass			
BLUEJOINT *(Calamagrostis canadensis)*	22	13-31	100

Environmental Variables

Moisture Regime:

Nutrient Regime:

Elevation (range): 1339(1314-1364) M

Slope: 3 - 5(50), 10 - 15(50)

Aspect: Northerly(50), Easterly(50)

Soil Drainage: Well drained(50), Moderate well drain(50)

Soil Subgroup: D.GL

Soil Series:

Soil Correlation:

Range Site Category:

Ecological Status Score: 25

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

2.02 (8.10-1.62) HA/AUM or *0.20 (0.05-0.25) AUM/AC*

FPF1. Pl / Bearberry - Juniper

(Pinus contorta / Arctostaphylos uva-ursi - Juniperus spp.)

n=1 This climax forest community type is one of the driest in the Foothills Parkland subregion. It is similar in composition to the Montane Pl / bearberry - Juniper community (Willoughby et al. 2008). Dry site conditions from south exposures and coarse-textured soils are characteristic of this community type (Archibald et al. 1996). This community type may represent a transition into the Montane subregion, or encroachment of coniferous trees onto grassland. The dry site conditions limit the amount of forage this site can produce and the steep slope limits access to livestock.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: a bearberry (submesic/poor)

Ecosite Phase: a1 bearberry - Pl

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Tree			
LIMBER PINE *(Pinus flexilis)*	5		100
LODGEPOLE PINE *(Pinus contorta)*	43		100
Shrub			
CANADA BUFFALOBERRY *(Shepherdia canadensis)*	5		100
COMMON BEARBERRY *(Arctostaphylos uva-ursi)*	3		100
GROUND JUNIPER *(Juniperus communis)*	6		100
PRICKLY ROSE *(Rosa acicularis)*	2		100
SHRUBBY CINQUEFOIL *(Potentilla fruticosa)*	2		100
Forb			
ALPINE HEDYSARUM *(Hedysarum alpinum)*	5		100
HEART-LEAVED ARNICA *(Arnica cordifolia)*	4		100
NODDING ONION *(Allium cernuum)*	2		100
SHOWY ASTER *(Aster conspicuus)*	2		100
Grass			
FOOTHILLS ROUGH FESCUE *(Festuca campestris)*	2		100
UNDIFFERENTIATED SEDGE *(Carex)*	1		100

Environmental Variables

Moisture Regime: SUBMESIC()

Nutrient Regime: SUBMESOTROPHIC()

Elevation (range): 1660(1660-1660) M

Slope: 31 - 45()

Aspect: Westerly()

Soil Drainage: Well drained()

Soil Subgroup: O.EB

Soil Series:

Soil Correlation:

Range Site Category:

Ecological Status Score: 25

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=0

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

0.00 (0.00-8.10) HA/AUM or 0.00 (0.00-0.05) AUM/AC

FPF2. Sw-Pl/Canada buffaloberry

(Picea glauca-Pinus contorta/Shepherdia canadensis)

n=1 This community type occurs on submesic to mesic, well drained slopes. It represents a maturing forest that will succeed to a spruce dominated stand. The closed canopy of this community limits sunlight beneath and only sparse understory vegetation occurs. Therefore it has only limited forage for domestic livestock.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: b hairy wild rye (submesic/medium)

Ecosite Phase: b4 hairy wild rye Sw

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Tree			
ASPEN *(Populus tremuloides)*	10		100
LODGEPOLE PINE *(Pinus contorta)*	45		100
WHITE SPRUCE *(Picea glauca)*	55		100
Shrub			
CANADA BUFFALOBERRY *(Shepherdia canadensis)*	8		100
GREEN ALDER *(Alnus crispa)*	8		100
PRICKLY ROSE *(Rosa acicularis)*	3		100
TWINFLOWER *(Linnaea borealis)*	18		100
WHITE MEADOWSWEET *(Spiraea betulifolia)*	6		100
Forb			
BUNCHBERRY *(Cornus canadensis)*	28		100
COMMON FIREWEED *(Epilobium angustifolium)*	2		100
SHOWY ASTER *(Aster conspicuus)*	2		100
Grass			
PINE REED GRASS *(Calamagrostis rubescens)*	5		100
UNDIFFERENTIATED SEDGE *(Carex)*	2		100

Environmental Variables

Moisture Regime: MESIC()

Nutrient Regime: MESOTROPHIC()

Elevation (range): (-) M

Slope: 10 - 15()

Aspect: Easterly()

Soil Drainage: Well drained()

Soil Subgroup: BR.GL

Soil Series:

Soil Correlation:

Range Site Category:

Ecological Status Score: 25

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

8.10 (0.00-4.05) HA/AUM or *0.05 (-0.10) AUM/AC*

FPF3. Sw - Pl / Hairy wild rye

(Picea glauca - Pinus contorta / Elymus innovatus)

n=1 This community type represents sites that are slightly later in succession that the Sw - Aw / Hairy wild rye (FPE2) community also described in this ecosite phase. It is commonly located along the transition area of the Montane subregion. It has a high cover of coniferous tree species and a sparse understory. Consequently, there is little forage available for domestic livestock.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: b hairy wild rye (submesic/medium)

Ecosite Phase: b3 hairy wild rye Aw-Sw-Pl

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Tree			
ASPEN *(Populus tremuloides)*	10		100
LODGEPOLE PINE *(Pinus contorta)*	10		100
WHITE SPRUCE *(Picea glauca)*	40		100
Shrub			
PRICKLY ROSE *(Rosa acicularis)*	5		100
SASKATOON *(Amelanchier alnifolia)*	5		100
SILVERBERRY *(Elaeagnus commutata)*	5		100
Forb			
ALPINE HEDYSARUM *(Hedysarum alpinum)*	2		100
COMMON DANDELION *(Taraxacum officinale)*	2		100
CREAM-COLORED VETCHLING *(Lathyrus ochroleucus)*	1		100
VEINY MEADOW RUE *(Thalictrum venulosum)*	2		100
WILD STRAWBERRY *(Fragaria virginiana)*	1		100
Grass			
HAIRY WILD RYE *(Elymus innovatus)*	2		100

Environmental Variables

Moisture Regime: MESIC()

Nutrient Regime: MESOTROPHIC()

Elevation (range): 1400(-) M

Slope: 10 - 15()

Aspect: Variable()

Soil Drainage: Moderate well drain()

Soil Subgroup: O.R

Soil Series:

Soil Correlation:

Range Site Category:

Ecological Status Score: 25

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

0.00 (0.00-8.10) HA/AUM or 0.00 (0.00-0.05) AUM/AC

FPF4. Fd / Needle litter

(Pseudotsuga menziesii)

n=1 This community type represents a mature Douglas-fir forest and is generally found in the western portion of the subregion in transition to the Montane subregion. 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.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: b hairy wild rye (submesic/medium)

Ecosite Phase: b1 hairy wild rye Fd

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Tree			
DOUGLAS-FIR *(Pseudotsuga menziesii)*	55		100
WHITE SPRUCE *(Picea glauca)*	3		100
Shrub			
PRICKLY ROSE *(Rosa acicularis)*	1		100
SASKATOON *(Amelanchier alnifolia)*	2		100
Forb			
HEART-LEAVED ARNICA *(Arnica cordifolia)*	1		100
LINDLEY'S ASTER *(Aster ciliolatus)*	1		100
RED AND WHITE BANEBERRY *(Actaea rubra)*	1		100
STAR-FLOWERED SOLOMON'S-SEAL *(Smilacina stellata)*	1		100
VEINY MEADOW RUE *(Thalictrum venulosum)*	1		100
Grass			
PINE REED GRASS *(Calamagrostis rubescens)*	1		50

Environmental Variables

Moisture Regime: SUBMESIC(), MESIC()

Nutrient Regime: MESOTROPHIC(), PERMESOTROPHIC()

Elevation (range): 1541(1502-1580) M

Slope: 16 - 30(50), 31 - 45(50)

Aspect: Easterly(50), Southerly(50)

Soil Drainage: Well drained()

Soil Subgroup: O.EB, E.EB

Soil Series:

Soil Correlation:

Range Site Category:

Ecological Status Score: 25

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

0.00 (0.00-8.10) HA/AUM or 0.00 (0.00-0.05) AUM/AC

FPF5. Sw / Silverberry

(Picea glauca / Elaeagnus commutata)

n=1 This community type was described by Thompson and Hansen (2002) adjacent to Three Point Creek in Kananaskis country on the western edge of the Foothills Parkland subregion. The site was gravelly and well-drained. Silverberry is well adapted to growing on these gravelly river bars and is often found in association with yellow mountain avens in the early successional stages. Succession occurs by balsam poplar first establishing and eventually white spruce to form this community type. This particular site was heavily impacted by recreational use and invaded by Kentucky bluegrass. Unfortunately, there are no plots within the Foothills Parkland that adequately describes the reference plant community for this seral community. This may be due to these communities being not overly productive, easily disturbed, and in locations preferred by livestock.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: e snowberry-silverberry (mesic/rich)

Ecosite Phase: e2 snowberry-silverberry Sw

Plant Composition	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Tree			
BALSAM POPLAR *(Populus balsamifera)*	10		100
WHITE SPRUCE *(Picea glauca)*	40		100
Shrub			
PRICKLY ROSE *(Rosa acicularis)*	3		100
SILVERBERRY *(Elaeagnus commutata)*	20		100
SNOWBERRY (BUCKBRUSH) *(Symphoricarpos occidentalis)*	1		100
YELLOW MOUNTAIN AVENS *(Dryas drummondii)*	3		100
Forb			
REFLEXED LOCOWEED *(Oxytropis deflexa)*	10		100
WHITE CLOVER *(Trifolium repens)*	20		100
WILD STRAWBERRY *(Fragaria virginiana)*	10		100
WILD VETCH *(Vicia americana)*	1		100
Grass			
KENTUCKY BLUEGRASS *(Poa pratensis)*	20		100
TIMOTHY *(Phleum pratense)*	10		100

Environmental Variables

Moisture Regime:

Nutrient Regime:

Elevation (range): 1372(1372-1372) M

Slope:

Aspect:

Soil Drainage:

Soil Subgroup:

Soil Series:

Soil Correlation:

Range Site Category:

Ecological Status Score: 10 - 5

Soil Exposure	Mean	Min	Max
%:			

Comment:

Forage Production (kg/ha) n=

	Mean	Min	Max
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

4.05 (0.00-2.70) HA/AUM or 0.10 (0.00-0.15) AUM/AC

FPF6. Sw/Moss

(Picea glauca/Moss spp.)

n=1 This community type represents a coniferous forest that has succeeded to its climax community. This community was described on northerly aspects, which probably escaped fire and disturbance allowing succession to occur. The understory has minimal production and mosses and coniferous needles are common understory components (mosses, lichens, and needle cover are not included in the Foothills Parkland plant composition tables).

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: d pine grass (mesic/medium)

Ecosite Phase: d3 pine grass - Sw

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Tree			
WHITE SPRUCE *(Picea glauca)*	40		100
Shrub			
PRICKLY ROSE *(Rosa acicularis)*	6		100
WHITE MEADOWSWEET *(Spiraea betulifolia)*	1		100
Forb			
COMMON PINK WINTERGREEN *(Pyrola asarifolia)*	4		100
LINDLEY'S ASTER *(Aster ciliolatus)*	9		100
WILD STRAWBERRY *(Fragaria virginiana)*	11		100
Grass			
BLUEJOINT *(Calamagrostis canadensis)*	12		100
PINE REED GRASS *(Calamagrostis rubescens)*	5		100

Environmental Variables

Moisture Regime: MESIC()

Nutrient Regime: MESOTROPHIC()

Elevation (range): 1370(1310-1431) M

Slope: 0.5 - 2.5(50), 3 - 5(50)

Aspect: Northerly()

Soil Drainage: Moderate well drain()

Soil Subgroup: D.GL

Soil Series: LTC

Soil Correlation:

Range Site Category:

Ecological Status Score: 25

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=0

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

0.00 (0.00-8.10) HA/AUM or 0.00 (0.00-0.05) AUM/AC

FPF7. Sw / Red osier dogwood / Kentucky bluegrass

(Picea glauca / Cornus stolonifera / Poa pratensis)

n=1 This community type was described by Thompson and Hansen (2002) adjacent to the Highwood River west of Longview. The site represents an old channel in the river that has undergone succession from a sedge dominated community to one with a spruce overstory. As these depressions fill in with organic matter they are often over grown with willow and eventually white spruce. Although the grasses of the single plot described are non native, the presence of red osier dogwood indicates the climax nature of the community type. This particular site is considered a recovering site that was once utilized heavily and now is only lightly grazed. Increased livestock grazing will cause willow and red osier dogwood to decline and the understory will often open up, dry out, and become dominated by Kentucky bluegrass, timothy and other invasive species.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: f red osier dogwood / cow parsnip (subhygric/rich)

Ecosite Phase: f1 red osier dogwood Sw

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Tree			
WHITE SPRUCE *(Picea glauca)*	60		100
Shrub			
BEAKED WILLOW *(Salix bebbiana)*	10		100
RED-OSIER DOGWOOD *(Cornus stolonifera)*	10		100
WILD RED RASPBERRY *(Rubus idaeus)*	10		100
Forb			
COMMON HORSETAIL *(Equisetum arvense)*	3		100
HEMP-NETTLE *(Galeopsis tetrahit)*	20		100
LINDLEY'S ASTER *(Aster ciliolatus)*	3		100
Grass			
FOWL MANNA GRASS *(Glyceria striata)*	3		100
KENTUCKY BLUEGRASS *(Poa pratensis)*	3		100
QUACK GRASS *(Agropyron repens)*	10		100
SHORT-AWNED SEDGE *(Carex microglochin)*	1		100

Environmental Variables

Moisture Regime:

Nutrient Regime:

Elevation (range): (-) M

Slope:

Aspect:

Soil Drainage:

Soil Subgroup:

Soil Series:

Soil Correlation:

Range Site Category:

Ecological Status Score: 10 - 5

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

0.00 (0.00-8.10) HA/AUM or *(-0.05) AUM/AC*

FPF8. Sw / Horsetail

(Picea glauca / Equisetum arvense)

n=2 This community type represents the wettest and most nutrient - rich forests in the Foothills Parkland subregion. It is usually associated with moist areas along the edges of streams and rivers, and low lying areas with poor drainage. Seepage and high water tables can be expected. The high nutrient levels result in a diversity of species, although cover can be quite low. Mosses and horsetails are common (mosses and lichens are not included in the Foothill Parkland plant composition tables). Livestock use within these communities is expected to be minimal; however, their presence can be damaging from hooves churning the wet soils (Thompson and Hansen 2003).

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: g horsetail (hygric/rich)

Ecosite Phase: g1 horsetail Sw

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Tree			
BALSAM POPLAR *(Populus balsamifera)*	2	1-3	100
WHITE SPRUCE *(Picea glauca)*	65	40-90	100
Shrub			
BEAKED WILLOW *(Salix bebbiana)*	2	1-3	100
PRICKLY ROSE *(Rosa acicularis)*	3	3-3	100
Forb			
BUNCHBERRY *(Cornus canadensis)*	5	1-10	100
COMMON HORSETAIL *(Equisetum arvense)*	60	30-90	100
COW PARSNIP *(Heracleum lanatum)*	2	1-3	100
Grass			
BLUEJOINT *(Calamagrostis canadensis)*	5	0-10	50
TWO-SEEDED SEDGE *(Carex disperma)*	5	0-10	50

Environmental Variables

Moisture Regime:

Nutrient Regime:

Elevation (range): (-) M

Slope:

Aspect:

Soil Drainage:

Soil Subgroup:

Soil Series:

Soil Correlation:

Range Site Category:

Ecological Status Score: 25

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

0.00 (0.00-16.20) HA/AUM or 0.00 (0.00-0.025) AUM/AC

FPG1. Hairy wild rye/Aw

(Elymus innovatus/Populus tremuloides)

n=3 This community type represents aspen or conifer dominated sites that have been cleared or harvested within the 'b' ecological site. It is included with the mixed wood ecosite phase but can represent cutblocks in any forested phase within this ecosite. These cleared areas 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 coniferous stands in the years directly after harvest. However, the under story forage species have evolved under a forest canopy and do not recover quickly from over grazing. This community can be subject to potential erosion issues and invasion of non natives if not managed appropriately. Also, this flush in production is only temporary and dramatically reduces within a few years after harvest as the cutblock regenerates back into forest succession.

Natural Subregion: FOOTHILLS PARKLAND

Ecosite: b hairy wild rye (submesic/medium)

Ecosite Phase: b3 hairy wild rye Aw-Sw-Pl

Plant Composition

	Canopy Cover (%)		
	Mean	**Range**	**Const.**
Tree			
ASPEN *(Populus tremuloides)*	28	20-35	100
WHITE SPRUCE *(Picea glauca)*	5	0-15	33
Shrub			
PRICKLY ROSE *(Rosa acicularis)*	2	1-3	100
WILD RED RASPBERRY *(Rubus idaeus)*	3	0-7	33
Forb			
LINDLEY'S ASTER *(Aster ciliolatus)*	8	0-21	67
NORTHERN BEDSTRAW *(Galium boreale)*	8	3-13	100
WILD STRAWBERRY *(Fragaria virginiana)*	9	4-12	100
Grass			
BLUEJOINT *(Calamagrostis canadensis)*	11	0-22	67
HAIRY WILD RYE *(Elymus innovatus)*	35	18-42	100

Environmental Variables

Moisture Regime: MESIC()

Nutrient Regime: MESOTROPHIC()

Elevation (range): 1220(-) M

Slope: 3 - 5()

Aspect: Variable()

Soil Drainage: Well drained()

Soil Subgroup:

Soil Series:

Soil Correlation:

Range Site Category:

Ecological Status Score: 25

Soil Exposure

	Mean	**Min**	**Max**
%:			

Comment:

Forage Production (kg/ha) n=

	Mean	**Min**	**Max**
Forb			
Grass			
Shrub			
Tree			
Total	0	0	0

Ecologically Sustainable Stocking Rate

1.62 (2.70-1.35) HA/AUM or *0.25 (0.15-0.30) AUM/AC*

The ESSR values are given for a recent harvest. Production will drop to forest values within a few years after harvest.

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