

Relationship Between Vital Attributes of Ktunaxa Plants and Natural Disturbance
Regimes in Southeastern British Columbia

by

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ABSTRACT

The purpose of the study was to examine the relationship between plant resources of the Ktunaxa people and the natural disturbance regimes in southeastern British Columbia and how reduced fire frequency may have affected the plant resources. The main objectives were to determine the vital attributes or fire survival strategy for each Ktunaxa plant; validate Rowe's hypothesis on the relationships between different species groups (set of vital attributes) and fire cycle length for southeastern British Columbia; and predict which Ktunaxa plants would most likely be affected by reduced fire frequency. The proportions of species groups, based on the Ktunaxa plants and their assigned vital attributes, were determined for 13 Biogeoclimatic (BEC) subzone/variants, ranging from low elevation ponderosa pine to subalpine ecosystems. I used a one-way nested ANOVA to test the relationships between species groups and fire cycle length. The data for southeastern British Columbia tended to be consistent with Rowe's hypothesis. Examples are presented of Ktunaxa plants most likely to be affected by reduced frequency of fire: plants that can resprout from underground parts; plants that produce wind-carried seed; and shade intolerant plants that store seed in the soil.

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INTRODUCTION

This study had its beginnings with the Ktunaxa people of British Columbia. Their resolve to negotiate a treaty with the Government of Canada and the Province of British Columbia provided the impetus for many initiatives, including those related to a better understanding of the land and resources within their traditional territory. This study's contribution to their efforts was an examination of the relationship between Ktunaxa plant resources and the natural disturbance regimes of 13 ecological units in southeastern British Columbia.

A disturbance is any relatively discrete event in time that disrupts ecosystem, community, or population structure and changes resources, substrate availability, or the physical environment (Pickett and White 1985:7)

Fire is one of the predominant natural disturbance agents in many ecosystems. Frequency, predictability, extent, magnitude, synergism, and timing of the disturbance agent form many of the characteristics of a disturbance regime (Pickett and White 1985). Within a landscape the "natural" disturbance regime may be augmented or extended by humans setting fires (Lewis 1982; Pyne 1982; 1995). Aboriginal peoples traditionally set fires in order to extend the growing season of plants, to maintain site conditions that encouraged the growth of important food and medicinal plants, and to enhance forage species that attracted game for hunting (Barrett 1981; Lewis 1985).

Landscape burning was practiced by the Ktunaxa (Barrett 1981) and by many aboriginal groups in the Pacific Northwest and other parts of North America (Norton 1979; Lewis 1982; Pyne 1982; Boyd 1986; Blackburn and Anderson 1993; Turner 1991; Gottesfeld 1994; Boyd 1999). Turner's (1991) review of aboriginal

landscape burning in British Columbia, Canada, and adjacent areas reported that periodic burning enhanced at least 17 identified culturally important plant species. Eleven of the species were shrubby fruiting species, and six were herbaceous species with edible underground parts ("root vegetables") (Turner 1991). Productivity and frequency of root and berry plants may have decreased recently due to lack of burning (Turner 1991). As timber became a more valued resource to British Columbia, burning became less acceptable. The B.C. Forest Service established a fire suppression policy in the 1930s that effectively made aboriginal landscape burning illegal (Gottesfeld 1994).

The Ktunaxa First Peoples

The Ktunaxa Nation is also known as the Kutenai or Kootenay (Turner 1991). Their homeland is in southeastern British Columbia and northern parts of Montana and Idaho. Based on archaeological evidence, the Ktunaxa have occupied their territory for more than 11,000 years (W. Choquette¹, pers comm.). The Ktunaxa were grouped in two major divisions: the Lower Kootenay resided in the Kootenay Lake and lower Kootenay River area and the Upper Kootenay occupied the upper Kootenay and Columbia River areas (M. Keefer², pers comm.). Each spoke their own dialect of the Ktunaxa language, an isolate of the linguistic groups in North America. European settlement in the late 1800s was followed by the establishment of the reserve system, which led to the creation of the present permanent communities or Indian Bands in Canada (Tennant 1990).

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² Ethnobotanist, Ktunaxa/Kinbasket Tribal Council, Cranbrook, B.C.

There are now seven Bands in Ktunaxa Traditional Territory – five in southeastern British Columbia and two in the United States. The communities in British Columbia are Columbia Lake – Windermere; Lower Kootenay – Creston; Shuswap – Invermere; St. Mary's – Cranbrook; and Tobacco Plains – Grasmere. The communities in the United States are the Kootenai Tribe of Idaho – Bonner's Ferry, Idaho; and the Confederated Salish and Kootenai Tribe – Elmo, Montana (Anonymous 1998).

The Ktunaxa year was based on periods of intensive and focused subsistence activities. The following is a description of the seasonal activities of the Ktunaxa people in preparation for the winter months:

Throughout the spring, summer, and fall months, the women gathered roots and berries for drying and storing to be utilized as food and medicine. The men hunted for larger animals such as deer, elk, moose, and mountain goat which were used for food, tools, clothing, and shelter materials... Fishing was also an annual activity... Fowl, such as duck, geese, partridge, and grouse were snared for immediate use in most cases. The favoured areas for food gatherings were northerly to Revelstoke and Golden including the Columbia Valley; east of the Rockies, to the Plains region for buffalo; south into Montana, Idaho, and the eastern part of Washington state for roots and plants and as far west as the Arrow Lakes for fish and fowl (Kutenai Language Task Force 1989:29-31).

The Ktunaxa required an intimate knowledge and understanding of their botanical resources for subsistence. Knowledge about which plants were used, their habitats, when they were ready for gathering, and how they were processed, was passed down through an oral tradition from one generation to the next. There are few published references on the plant knowledge of the Ktunaxa people in British Columbia. Hart (1976) documented the use of plants by the Ktunaxa and Salish peoples in Montana. Turner's (1997; 1998) work on aboriginal plant use and knowledge of food plants and plants in technology makes reference to specific

aboriginal groups in British Columbia, including the Ktunaxa. Publications produced by the Ktunaxa people are scarce, usually due to concerns about protecting intellectual property rights. However, a recent ethnobotany handbook approved by the Ktunaxa/Kinbasket Tribal Council provides general information for 25 culturally important plants, including their Ktunaxa names (Keefer and McCoy 1999).

Disturbance regimes in Ktunaxa Traditional Territory

Within the Ktunaxa Traditional Territory, lower and mid-elevation ponderosa pine (*Pinus ponderosa*) and Douglas-fir (*Pseudotsuga menziesii*) ecosystems in British Columbia and Montana have a natural disturbance regime of frequent surface fires (Dorey 1979; Agee 1993). Lightning started many of these fires, but ignitions by aboriginal people substantially increased fire occurrence in lower elevation forests in and near the major valleys of western Montana (Barrett 1980; Barrett and Arno 1982; Gruell 1985). Fire history and stand reconstruction work completed for Lewis Ridge and Isadore Canyon in the southern Rocky Mountain Trench reported average fire intervals of 19 years and 14 years, respectively. There were no fires, human or lightning-ignited, found in the fire scar data after 1896 for both areas (Gray et al. 1999).

Some of the effects of fire suppression in interior Douglas-fir and ponderosa pine ecosystems include increased stand densities, stagnant tree growth, insect and disease outbreaks, increased fuel loadings and wildfire hazard, a decline in understory herb and shrub cover, and a shift in trees species composition towards more shade tolerant species (Agee 1994). Domestic livestock grazing in the East Kootenay region since the 1850s, along with horses first brought in by the Ktunaxa

in the 1700s, were also contributing factors to the changes in these once fire-maintained ecosystems.

Fire disturbance is usually infrequent in subalpine ecosystems (Agee 1993). Stands of Engelmann spruce (*Picea engelmannii*), subalpine fir (*Abies lasiocarpa*), and lodgepole pine (*Pinus contorta*) historically experienced high-intensity crown fires or severe surface fires with cycles between 50-200 years in the major mountain ranges in the Pacific Northwest (Heinselman 1981; Agee 1993). Past burning in some subalpine communities converted potentially forested sites into huckleberry (*Vaccinium* spp.) brushfields (Agee 1993). Aboriginal peoples used these fields extensively for berry-picking during the summer months (Minore et al. 1979). Studies have been conducted using different methods, including burning, for maintaining black huckleberry (*Vaccinium membranaceum*) fields (Minore et al. 1979).

Changes to natural disturbance regimes may have consequences for Ktunaxa plant resources, such as reduced productivity and abundance of certain plant species. If the plants are early seral species, they may require disturbance to maintain their presence in the ecosystems. Each plant species has life characteristics that provide clues about their response to disturbance. The Ktunaxa plant resources occur over a range of ecosystems and natural disturbance regimes. I used three frameworks to examine how fire exclusion may affect Ktunaxa plant resources: vital attributes theory, Biogeoclimatic Ecosystem Classification (BEC) system, and natural disturbance regimes of the broad ecological units. The descriptions of each framework are followed by an explanation of how they are linked together.

Vital Attributes theory

The vital attributes theory has been used to predict major shifts in plant species composition and dominance in communities subject to recurrent disturbance such as fire (Noble and Slatyer 1977; 1980; Cattelino et al. 1979; Hobbs et al. 1984; Roberts and Betz 1999). A small number of life history characteristics termed 'vital attributes' are vital to the role of the species in a vegetation replacement sequence (Noble and Slatyer 1977; 1980):

1. Persistence by seeds or vegetative regeneration (e.g., seed storage in mineral soil, vegetative resprouting from rhizomes).
2. Conditions for establishment (e.g., shade intolerant, prior establishment of other plant species).
3. Critical life history stages (e.g., age of sexual maturity or first production of propagules by vegetative reproducers, longevity, and propagule longevity).

The mechanisms for each vital attribute are described in Table 1.

Combinations of the mechanisms for the first two vital attributes (method of persistence and conditions for establishment) define a species type (Noble and Slatyer 1980). Rowe (1983) modified the vital attributes scheme by grouping species types into five categories of species groups, each representing a mode of persistence for plants in the context of fire: endurers, resisters, evaders, invaders, and avoiders. Endurers (VI or VT species types) are resprouting species, shade-intolerant or tolerant, with shallow or deep-buried perennating buds. Resisters (WI or WT species types) are shade-intolerant or tolerant species that can survive low-severity fire as adults, but juveniles are usually vulnerable. Evaders are species with relatively long-lived seeds that are stored in the soil (SI and ST species types) or canopy (CI species type) and are usually heat germinated. Invaders (DI species

Table 1. Vital attributes scheme (Source: after Cattelino et al. 1979)

Persistence by seeds and vegetative regeneration

D species	widely dispersed seeds from surrounding undisturbed areas
S species	seeds with long viability and stored in the soil
C species	seeds with short viability and stored in fruits or cones in the canopy
V species	vegetative regrowth from surviving part of the individual
W species	able to resist fire in the adult stage, but juveniles are vulnerable

Conditions for establishment

T species	able to establish at any time with adults of the same species and of other species occurring at the site and can tolerate competition
I species	able to establish only immediately after a disturbance when competition is usually reduced
R species	unable to establish immediately after a disturbance, but become established once mature individuals of the same or another species are present

Life History (critical events)

p	replenishment of enough propagules to survive another disturbance
m	the time when the individual has reached maturity and is able to contribute propagules for the species to persist through another disturbance
l	senescence and loss of the species from the community
e	loss of propagules from the site so that the species is extinct

type) are species that establish early and rapidly by wind-dispersed seed. Avoiders (DT and DR species types) are shade tolerant species that slowly re-occupy burned sites, and have no particular mechanism to survive fire, but tend to occupy unburned sites, e.g., wet microsites. Rowe (1983) put forward a hypothesis as to how these species groups are adapted to fire cycle length in boreal ecosystems (Table 2). He proposed that each of the broad categories of fire cycle length (short, intermediate, and long) favoured certain species groups, but that the invader and shade tolerant sprouter (endurer²) species groups would be found across all fire cycle lengths (Rowe 1983).

Ecological framework

The Biogeoclimatic Ecosystem Classification (BEC) system has provided an ecological framework for many aspects of resource management in British Columbia (Pojar et al. 1987; MacKinnon et al. 1992; Mah et al. 1996). The BEC system is a hierarchical scheme with three levels of integration: local, regional, and chronological. The classification incorporates primarily climate, soils, and vegetation data. The regional level's basic unit, the Biogeoclimatic subzone, is geographically delineated by a distinct climax or near climax plant association on zonal sites under the influence of the same regional climate (Meidinger and Pojar 1991). Zonal sites are generally characterized by deep, loamy soils, and occupy midslope positions with mesic moisture regimes (Braumandl and Curran 1992). Each subzone has a characteristic sequence of related ecosystems influenced by the soil and topographic conditions on sites wetter or drier than the zonal condition. These sequences are described in the site series classification (local level) and are mainly defined according to soil moisture and nutrient regimes (Pojar et al. 1987).

Table 2. Survival strategies of coniferous forest species in environments with varying fire cycles (Source: adapted from Rowe 1983).

Short Fire Cycle	Intermediate Fire Cycle	Short, Intermediate or Long Fire Cycle	Very Long Fire Cycle
Endurer1 (VI* species)	Resister (WI species)	Invader (DI species)	Avoider (DT species)
Evader1 (SI species)	Evader1,2 (ST and SI species)	Endurer2 (VT species)	Avoider (DR species)
	Evader2 (CI species)		
Dry \longrightarrow <i>Moisture Gradient</i> \longrightarrow Moist			

*Letter symbols as in Table 1.

Ecological sampling in the Nelson Forest Region was conducted in forest stands older than 80 years by the B.C. Ministry of Forests in the mid-1970s to early 1980s for classification of regional climatic subzone boundaries and their associated site units (Braumandl and Curran 1992). Sampling criteria included homogeneity, successional status, and size of the stand (Luttmerding et al. 1990). Subjective sampling for the above criteria introduces potential bias into the data collected, but during the development of the classification system there was no sampling frame available and access, time and cost were considerations. Minimum sample plot size was 400 m². On each plot, vegetation data were collected according to standard procedures (Luttmerding et al. 1990). All plant species were listed by strata, using three tree layers, two shrub layers, a herb layer, and a bryophyte and lichen layer, with an estimate of percent cover of each species (Luttmerding et al. 1990). The most recent field guide for the Nelson Forest Region (Braumandl and Curran 1992) includes descriptions and management interpretations for local or site units within each Biogeoclimatic unit in the Ktunaxa Traditional Territory.

The zonal BEC plots were of interest to this study because although the data were collected with a classification purpose, they provide vegetation data from ecosystems that have been undisturbed by fire for a period of at least 80 years to address the question: how have Ktunaxa plants been affected by reduced disturbance.

Natural Disturbance Types

The Natural Disturbance Type (NDT) describes the severity and frequency of disturbance experienced by ecosystems in British Columbia. Biogeoclimatic units were assigned to a numbered NDT based on available disturbance periodicity data

and best estimates of their historic fire cycles and severities to assist in landscape planning decisions (BC Ministry of Forests and BC Environment 1995). The five NDTs were based on a mean event interval that applies to all natural disturbances (e.g., wildfire, wind, insect outbreaks). In this study, the event intervals are used solely to apply to wildfire.

The Biogeoclimatic units in the Ktunaxa Traditional Territory are categorized as NDT1, NDT2, NDT3, and NDT4 ecosystems (Table 3) (BC Ministry of Forests and BC Environment 1995). NDT2 and NDT1 are described as forest ecosystems with infrequent or rare stand-initiating events. Historically, the mean fire return interval for those Biogeoclimatic subzone/variants in the Interior Cedar – Hemlock (ICH) and Engelmann Spruce – Subalpine Fir (ESSF) zones was about 200 years. NDT3 are forest ecosystems with frequent stand-initiating events. Historically, the mean fire return interval for disturbances for those Biogeoclimatic subzone/variants in the ESSF, ICH, and Montane Spruce (MS) zones was about 150 years. NDT4 are forest ecosystems with frequent stand-maintaining fires. Historically, the surface fire return interval for the Ponderosa Pine (PP) and Interior Douglas-fir (IDF) subzone/variants ranged from 4 to 50 years. Stand-initiating fires occurred at intervals of 150-250 years or more in the IDF zone (BC Ministry of Forests and BC Environment 1995).

The frameworks are hierarchical, with the lowest level being the vegetation plot data from the 13 Biogeoclimatic units, the vital attributes (species groups) of the plants in the next level, and the highest level being Natural Disturbance Types. The Natural Disturbance Type (NDT) framework provided the historic mean fire return intervals for each Biogeoclimatic unit.

Table 3. Natural Disturbance Types (NDT) and Biogeoclimatic units in the Ktunaxa Traditional Territory (Source: BC Ministry of Forests and BC Environment 1995)

NDT4 – ecosystems with frequent stand-maintaining fires (short fire cycle)	
Ponderosa Pine dry hot Kootenay variant	PPdh2
Interior Cedar-Hemlock very dry warm subzone	ICHxw
Interior Douglas-fir dry mild Kootenay variant	IDFdm2
NDT3 – ecosystems with frequent stand-initiating events (intermediate fire cycle)	
Montane Spruce dry cool subzone	MSdk
Interior Cedar-Hemlock moist cool Kootenay variant	ICHmk1
Interior Cedar-Hemlock dry warm subzone	ICHdw
Engelmann Spruce - Subalpine Fir dry cool subzone	ESSFdk
NDT2 – ecosystems with infrequent stand-initiating events (long fire cycle)	
Engelmann Spruce - Subalpine Fir wet mild subzone	ESSFwm
Engelmann Spruce - Subalpine Fir wet cold Columbia variant	ESSFwc1
Engelmann Spruce - Subalpine Fir wet cold Selkirk variant	ESSFwc4
Interior Cedar-Hemlock moist warm Golden variant	ICHmw1
Interior Cedar-Hemlock moist warm Columbia-Shuswap variant	ICHmw2
Interior Cedar-Hemlock wet cool Wells Gray variant*	ICHwk1

* unit is NDT1 – ecosystems with rare stand-initiating events (long fire cycle) and grouped with NDT2 for this study.

The purpose of this study was to examine the relationship between Ktunaxa plant resources and the natural disturbance regimes of the ecosystems in which they occur after a period of reduced fire disturbance. The objectives of the study were to:

- 1) determine the vital attributes for Ktunaxa plants;
- 2) determine whether or not Rowe's (1983) hypothesized relationships between plants with different vital attributes and fire frequency, were valid for the Ktunaxa plants in the East Kootenays; and
- 3) predict which Ktunaxa plant resources, based on their vital attributes, would be most affected by reduced frequency of fire.

There are some practical and inter-disciplinary contributions from this research. There are few studies that provide vital attributes of understory plant species for southeastern British Columbia. The first approximation of vital attributes and associated data for Ktunaxa plants will be of value to the Ktunaxa and other resource managers developing conservation strategies for plant resources. Although there have been studies conducted that used mechanistic and ecosystems concepts to investigate natural disturbance regimes, the plants investigated in this study came from bridging with Ktunaxa traditional ecological knowledge.

METHODS

Study area

The Traditional Territory of the Ktunaxa Nation is located in British Columbia, Washington, Idaho and Montana (Figure 1). The approximate boundaries of the Canadian territory extend above the international border, east to the Continental Divide, north to Kinbasket Lake and west of the Arrow Lakes. Its main physiographic features include the Rocky Mountain Trench, the Rocky Mountains, the Kootenay and Columbia River systems, and portions of the Columbia Mountains in the Southern Interior Mountains Ecoregion (Demarchi 1995). The study area was the portion of the Traditional Territory bounded by the international border, east to the Continental Divide, north to Golden, and west to Creston. Thirteen Biogeoclimatic units within the Ponderosa Pine (PP), Interior Douglas-fir (IDF), Interior Cedar – Hemlock (ICH), Montane Spruce (MS), and Engelmann Spruce – Subalpine Fir (ESSF) ecological zones are described within the study area (Figure 2) (Meidinger and Pojar 1991). General descriptions of the zones are provided and followed by detailed information for each Biogeoclimatic unit (Table 4) (Meidinger and Pojar 1991; Braumandl and Curran 1992).

The Ponderosa Pine (PP) zone is the driest and warmest of the five forested zones. It occurs on the valley bottom and/or lower sides of the southern Rocky Mountain Trench. Elevations range from 335 to 900 m. *Pinus ponderosa* (ponderosa pine) as indicated by the name of the zone is the dominant tree species. Stands are open and park-like with an understory usually dominated by *Elymus spicatus* (bluebunch wheatgrass). Dominant soils are Dark Brown Chernozems and

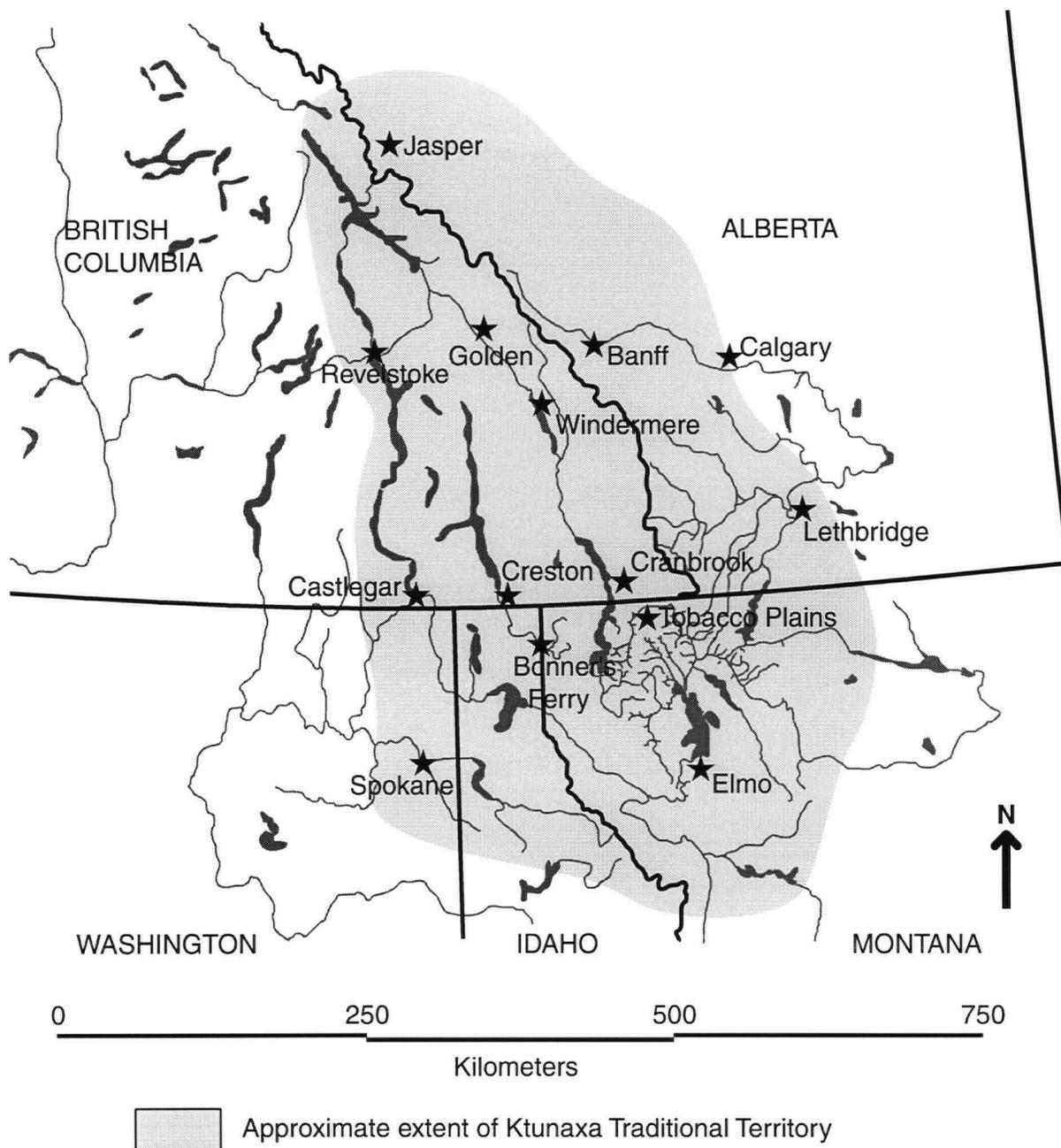


Figure 1. Map of the Ktunaxa Traditional Territory.
 Source: After Ktunaxa Treaty Council (1995).

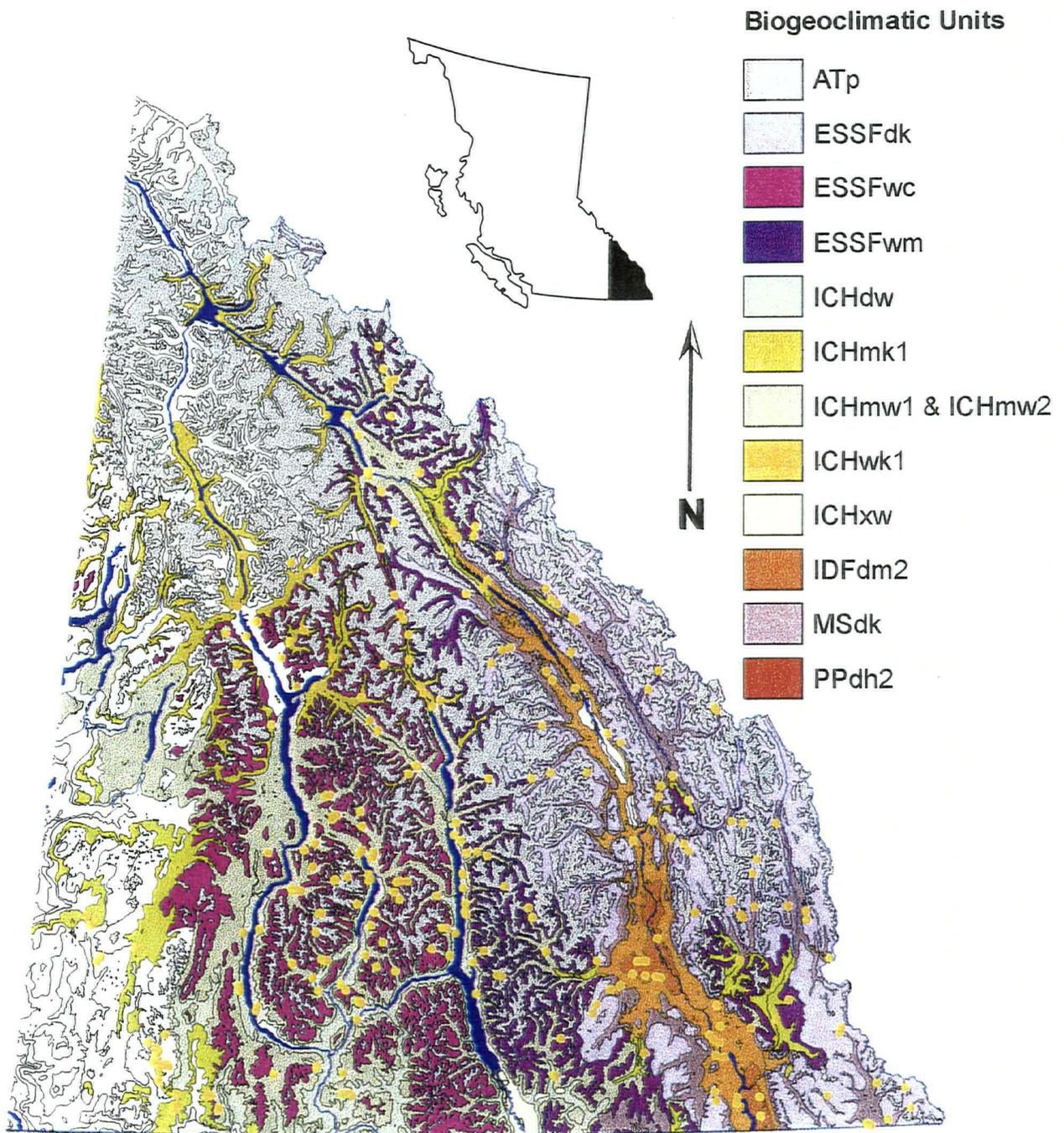


Figure 2. Map of 13 Biogeoclimatic units in the Ktunaxa Traditional Territory.

Locations of 277 of 355 plots are indicated by yellow symbols.

Source: Eng and Mah 1995.

Note: separate mapping was not available for ESSFwc1 and ESSFwc4.

ATp = Alpine Tundra/Parkland; ESSFdk = Engelmann Spruce – Subalpine Fir dry cool subzone; ESSFwc = Engelmann Spruce – Subalpine Fir wet cold subzone; ESSFwm = Engelmann Spruce – Subalpine Fir wet mild subzone; ICHdw = Interior-Cedar Hemlock dry warm subzone; ICHmk1 = Interior Cedar-Hemlock moist cool subzone, Kootenay variant; ICHmw1 = Interior Cedar-Hemlock moist warm subzone, Golden variant; ICHmw2 = Interior Cedar-Hemlock moist warm subzone, Columbia-Shuswap variant; ICHwk1 = Interior Cedar-Hemlock wet cool subzone, Wells Gray variant; ICHxw = Interior Cedar-Hemlock very dry warm subzone; IDFdm2 = Interior Douglas-fir dry mild subzone, Kootenay variant; MSdk = Montane Spruce dry cool subzone; PPdh2 = Ponderosa Pine dry hot subzone, Kootenay variant

Table 4. Descriptions of climate, elevation, location, soils, and zonal vegetation for 13 Biogeoclimatic subzone/variants in Ktunaxa Traditional Territory (Source: Braumandl and Curran, 1992)

PPdh2 Kootenay dry hot Ponderosa Pine variant

- Very hot, dry summers; mild winters with very light snowfall.
- 700-950 m Rocky Mountain Trench between Skookumchuck Creek and the St. Mary River and between Baynes Lake and Tobacco Plains.
- Soils derived from deep sediments of glacial and recent origin: morainal soils with loamy or silty surface textures; glaciofluvial soils with sandy surface texture; fluvial and glaciolacustrine soils on lowest slope positions.
- Open stands of *Pseudotsuga menziesii* (Douglas-fir) and *Pinus ponderosa* (ponderosa pine) with an understory of predominantly *Elymus spicatus* (bluebunch wheatgrass). Common species are *Amelanchier alnifolia* (saskatoon), *Rosa woodsii* (prairie rose), and *Antennaria microphylla* (rosy pussytoes).

IDFdm2 Kootenay dry mild Interior Douglas-fir variant

- Hot, very dry summers; cool winters with very light snowfall.
- 800-1200 m (south aspect) 800-1100 m (north aspect) Valley bottoms and lower slopes of the Rocky Mountain Trench south of the Blaeberry River, and valley bottoms of major tributary valleys such as the Spillamacheen, Kootenay, Finlay, St. Mary, and Wigwam.
- In the Rocky Mountain Trench, this variant is underlain by deep, recent sediments. Morainal soils with loamy or silty surface textures occur on lower to upper slopes; glaciofluvial soils with loamy to clayey textures.
- Climax stands of *Pseudotsuga menziesii* (Douglas-fir); however, mixed seral stands of Douglas-fir, *Larix occidentalis* (western larch, and *Pinus contorta* (lodgepole pine) are more common. The understory is dominated by *Calamagrostis rubescens* (pinegrass) and a high cover of shrubs (*Spiraea betulifolia* (birch-leaved spirea), *Juniperus communis* (common juniper), *Shepherdia canadensis* (soopolallie), *Amelanchier alnifolia* (saskatoon), and *Symphoricarpos albus* (common snowberry)).

Table 4. (..Continued)

ICHxw Very dry warm Interior Cedar – Hemlock subzone

- Very hot, dry summers and very mild winters with very light snowfall
- 450-1100 m (south aspect) Limited occurrence in B.C. and occurs more extensively in northeast Washington and northern Idaho. Present from mid slope to valley floors in the Pend d'Oreille Valley and on western and southern exposures and valley floors from Boswell to Kitchener (east of Creston).
- Glaciofluvial soils with sandy to silty textures occur on lower and level slope positions. Morainal soils with loamy, sandy, or clayey textures cover lower to upper slope positions.
- Closed canopy stands of *Pseudotsuga menziesii* (Douglas-fir) and *Pinus ponderosa* (ponderosa pine), with sporadic regeneration of *Thuja plicata* (western redcedar), *Tsuga heterophylla* (western hemlock), and *Abies grandis* (grand fir). The shrub layer includes *Symphoricarpos albus* (common snowberry), *Holodiscus discolor* (ocean-spray), *Philadelphus lewisii* (mock-orange), *Amelanchier alnifolia* (saskatoon), *Corylus cornuta* (hazelnut), and *Rosa gymnocarpa* (baldhip rose). *Disporum* sp. (fairybells) and *Linnaea borealis* (twinflower) are the dominant herbs.

ICHdw Dry warm Interior Cedar – Hemlock subzone

- Very hot, moist summers; very mild winters with light snowfall.
- 450-1200 m (south aspect) 450-1000 m (north aspect) Southern Monashee, Selkirk, and Purcell Mountains; restricted to valley bottoms and lower slopes of the Upper Granby river; Christina Lake; Lower Arrow Lake; north to Fauquier; Columbia River, Slocan Valley, north to New Denver; Kootenay Valley, north to Kaslo; Goat River and southern Moyie River below the ICHmw2.
- Morainal soils with loamy to silty surface textures occur on lower to upper slopes. Glaciofluvial soils with sandy or loamy textures are found in proximity to morainal soils. Loess cappings overlay glaciofluvial and other soils near Arrow and Kootenay Lakes.

Table 4. (..Continued)

- Stands of *Thuja plicata* (western redcedar) and *Tsuga heterophylla* (western hemlock). Mixed seral stands of *Pseudotsuga menziesii* (Douglas-fir), *Betula papyrifera* (paper birch), *Larix occidentalis* (western larch), and *Pinus monticola* (western white pine) are much more common. Shrubs include *Paxistima myrsinites* (falsebox), *Acer glabrum* (Douglas maple), *Vaccinium membranaceum* (black huckleberry), and *Rosa gymnocarpa* (baldhip rose). Common herbs include *Linnaea borealis* (twinflower), *Chimaphila umbellata* (prince's pine), *Clintonia uniflora* (queen's cup), and *Aralia nudicaulis* (wild sarsaparilla).

ICHmw1 Golden moist warm Interior Cedar – Hemlock variant

- No climate data, however, ICHmw1 is likely wetter than the ICHmk1; drier than the ICHwk1; and warmer and drier than the ESSFwm
- 750-1550 m (south aspect) 750-1500 m (north aspect) Mid to lower elevations in the Rocky Mountains from the Kickinghorse to the Sullivan river, and northern Selkirk Mountains from Parson to Gold River.
- Morainal soils with silty to clayey surface textures occur on all slope positions; glaciofluvial soils with silty or sandy surface textures are found on toe slopes; glaciolacustrine soils with loamy or clayey textures and fluvial soils with loamy textures occur on level slopes.
- Climax zonal sites have stands of *Tsuga heterophylla* (western hemlock) and *Thuja plicata* (western redcedar). Seral stands of *Picea glauca x engelmannii* (hybrid white spruce), *Abies lasiocarpa* (subalpine fir), and *Pseudotsuga menziesii* (Douglas-fir) are more common. Western hemlock and western redcedar are subdominants in seral stands. Common shrubs include *Paxistima myrsinites* (falsebox), *Menziesia ferruginea* (false azalea), and *Taxus brevifolia* (western yew). A sparse herb layer includes *Clintonia uniflora* (queen's cup) and *Cornus canadensis* (bunchberry). *Pleurozium schreberi* (red-stemmed feathermoss) and *Ptilium crista-castrensis* (knight's plume moss) are prevalent.

Table 4. (..Continued)

ICHmw2 Columbia-Shuswap moist warm Interior Cedar – Hemlock variant

- Hot, moist summers; very mild winters with light snowfall.
- 500-1450 m (south aspect) 500-1400 m (north aspect) Southern Monashee, Selkirk, and Purcell mountains; valley bottoms and mid to lower slopes of Upper Arrow Lake, Trout Lake, Lardeau River, and upper St. Mary River valleys; mid-slope positions above the ICHdw in the upper Granby, Lower Arrow Lake, Columbia River, Slocan Valley, Kootenay Valley, Goat River, and southern Moyie River.
- Morainal soils with loamy or silty surface textures occur on lower to upper slopes. Glaciofluvial soils with loamy, silty, or sandy soils are found in proximity to morainal soils. Some soils are covered by silty loess deposits in the southern part of the variant. Fluvial soils with loamy, silty, or sandy textures are found on lower and level slopes. On steep, upper slopes, colluvial soils with sandy, loamy, or silty textures occur.
- Climax zonal sites have stands of *Tsuga heterophylla* (western hemlock) and *Thuja plicata* (western redcedar). Mixed stands of *Pseudotsuga menziesii* (Douglas-fir), *Larix occidentalis* (western larch), *Picea glauca x engelmannii* (hybrid white spruce), western hemlock and western redcedar are more common. *Paxistima myrsinites* (falsebox) and *Vaccinium membranaceum* (black huckleberry) are common shrubs. The herb layer consists of *Linnaea borealis* (twinflower), *Chimaphila umbellata* (prince's pine), *Clintonia uniflora* (queen's cup), and *Tiarella trifoliata* var. *unifoliata* (one-leaved foamflower). *Pleurozium schreberi* (red-stemmed feathermoss), *Rhytidiopsis robusta* (pipecleaner moss), and *Hylocomium splendens* (step moss) are prevalent.

ICHmk1 Kootenay moist cool Interior Cedar – Hemlock variant

- Warm, wet summers; cool winters with moderate snowfall.
- 800-1550 m (south aspect) 750-1500 m (north aspect) Valley bottoms or areas of moderate relief between ICHmw1, ICHmw2, or ICHdw and subzones of the Dry Climatic Region. The ICHmk1 occurs in the Rocky Mountains along the Lower Bull, Lower Elk River, Upper Kootenay, Beaverfoot, and Kickinghorse rivers; in the Rocky Mountain Trench between the Spillamacheen and Blaeberry rivers; in the southern Purcell Mountains along the St. Mary, Moyie, and Yahk rivers; and in the southern Monashee Mountains within the Kettle and Granby River drainages.

Table 4. (..Continued)

- Morainal soils with loamy, silty or sandy surface textures occur on all slope positions. Glaciofluvial soils with loamy or sandy textures are found on lower to upper slopes in proximity to morainal soils. Soils often have a capping of fine silty loess. Fluvial soils with silty, sandy or loamy textures occur on lower and level slopes. Steep, upper slopes have colluvial deposits with loamy or sandy textures. Calcareous soils are common in the Rocky Mountain Trench and adjacent areas.
- Climax zonal sites have stands of *Thuja plicata* (western redcedar), *Picea glauca x engelmannii* (hybrid white spruce), and *Abies lasiocarpa* (subalpine fir). Seral stands of *Pinus contorta* (lodgepole pine), *Pseudotsuga menziesii* (Douglas-fir), and *Larix occidentalis* (western larch) are common. *Paxistima myrsinites* (falsebox), *Vaccinium membranaceum* (black huckleberry), and *Lonicera utahensis* (Utah honeysuckle) are common shrubs. *Linnaea borealis* (twinflower), *Cornus canadensis* (bunchberry), *Clintonia uniflora* (queen's cup), and *Chimaphila umbellata* (prince's pine) are common in the herb layer. *Pleurozium schreberi* (red-stemmed feathermoss) is very common.

ICHwk1 Wells Gray wet cool Interior Cedar – Hemlock variant

- Warm, wet summers; cool winters with moderate snowfall.
- 400-1400 m (south aspect) 400-1350 m (north aspect) Within the Nelson Forest Region, the ICHwk1 is found from valley bottoms to mid slopes in the upper Duncan, Incomapleux, Akolkolex, Illecillewaet, and Gold rivers and upper Pingston Creek, along the Revelstoke Reservoir north to the Goldstream River and the Kinbasket Lake, north of Smith Creek.
- Morainal soils with loamy or silty surface textures occur on all slope positions. Glaciofluvial soils with sandy or silty textures are found in proximity to morainal soils. Fluvial soils with variable textures occur on lower or level slopes. Colluvial soils with silty or loamy textures occur on mid slope to crest positions.
- Climax zonal sites have *Tsuga heterophylla* (western hemlock) and *Thuja plicata* (western redcedar) stands. *Picea glauca x engelmannii* (hybrid white spruce) is the most common seral species. Small amounts of *Paxistima myrsinites* (falsebox) and *Vaccinium ovalifolium* (oval-leaved blueberry) are commonly found. *Gymnocarpium dryopteris* (oak fern), *Tiarella trifoliata* var. *unifoliata* (one-leaved foamflower) and *Clintonia uniflora* (queen's cup) are common herbs. The moss layer is well developed and includes *Pleurozium schreberi* (red-stemmed feathermoss), *Rhytidiopsis robusta* (pipecleaner moss) and *Hylocomium splendens* (step moss).

Table 4. (..Continued)

MSdk Dry cool Montane Spruce subzone

- Warm, dry summers; cold winters with light snowfall. Snowpacks are generally shallow and of moderate duration.
- 1200-1650 m (S) 1100-1550 m (N) Mid slopes in the Rocky Mountain Trench south of the Spillamacheen River; valley bottoms and lower slopes of valleys on the eastern flanks of the Purcell Mountains south of the Spillamacheen River; and valley bottoms and lower slopes in the Rocky Mountains south of the Kickinghorse River.
- Fluvial soils with silty, loamy, or clayey surface textures occur on lower to level slopes. Morainal and glaciofluvial soils with loamy or silty textures occur on mid-slope to level valley bottoms. Upper and steep slopes are covered by colluvial soils with silty or loamy textures. Lacustrine soils with silty or clayey textures occur on level slopes in valley bottoms. Loess cappings of silty texture are common. Soils with shallow calcareous horizons are common.
- Climax zonal sites have stands of *Picea glauca x engelmannii* (hybrid white spruce) and *Abies lasiocarpa* (subalpine fir) with minor amounts of *Pseudotsuga menziesii* (Douglas-fir). Seral stands of *Pinus contorta* (lodgepole pine) are common. *Menziesia ferruginea* (false azalea), *Lonicera utahensis* (Utah honeysuckle), and *Shepherdia canadensis* (soopolallie) are common shrubs. *Vaccinium scoparium* (grouseberry), *Linnaea borealis* (twinline), *Calamagrostis rubescens* (pinegrass), and *Arnica cordifolia* (heart-leaved arnica) are common herbs.

ESSFdk Dry cool Engelmann Spruce - Subalpine Fir subzone

- Cool, moist summers; very cold winters with heavy snowfall.
- 1650-2100 m (south aspect) 1550-2100 m (north aspect) Upper slopes in the eastern Purcell Mountains south of the Spillamacheen River and in the Rocky Mountains south of the Kickinghorse River.
- Morainal soils with silty or loamy surface textures occur on mid to lower slopes. Fluvial and glaciofluvial soils with silty, sandy or clayey textures are found on lower and level slope positions. Colluvial soils with sandy or loamy textures and high coarse fragment contents occur on steep, upper slopes. Calcareous subsoil horizons are common.

Table 4. (..Continued)

- Climax zonal sites have stands of *Abies lasiocarpa* (subalpine fir) and *Picea engelmannii* (Engelmann spruce). The dominant shrub is *Menziesia ferruginea* (false azalea) with lesser amounts of *Vaccinium membranaceum* (black huckleberry) and *Ribes lacustre* (black gooseberry). *Vaccinium scoparium* (grouseberry), *Vaccinium myrtillus* (low bilberry), *Arnica* sp. (arnicas), *Thalictrum occidentale* (western meadowrue) and *Tiarella trifoliata* var. *unifoliata* (one-leaved foamflower) are common herbs.

ESSFwm Wet mild Engelmann Spruce - Subalpine Fir subzone

- No climate data. The ESSFwm is likely warmer and more continental than the ESSFwc2; wetter than the ESSFdk; and colder and wetter than the ICHmw1.
- 1600-1950 m (south aspect) 1500-1950 m (north aspect) Upper slopes in the western Purcell Mountains and in the Rocky Mountains from the Cummins River to the Beaverfoot River, and adjacent to the Lower Elk River.
- Glaciofluvial soils with loamy or silty surface textures occur on mid to lower slopes. Fluvial soils with loamy or silty surface textures are located on lower and level slope positions. Colluvial soils with loamy or silty textures are located on the steeper areas of middle to upper slopes. Some morainal soils with silty or loamy surface textures occur on lower to middle slopes. Calcareous subsoils frequently occur in this subzone.
- Zonal sites have stands of *Abies lasiocarpa* (subalpine fir) and *Picea engelmannii* (Engelmann spruce). The shrub layer consists of *Menziesia ferruginea* (false azalea), *Vaccinium membranaceum* (black huckleberry), *Rhododendron albiflorum* (white-flowered rhododendron), and *Lonicera utahensis* (Utah honeysuckle). *Gymnocarpium dryopteris* (oak fern), *Arnica latifolia* (mountain arnica), and *Tiarella trifoliata* var. *unifoliata* (one-sided foamflower) are common herbs.

Table 4. (..Continued)

ESSFwc1 Columbia wet cold Engelmann Spruce - Subalpine Fir variant

- No climate data. The ESSFwc1 is likely colder and wetter, with more snow than the ICH; warmer and drier, with less snow than the ESSFwm, ESSFwc4, and ESSFvc1; warmer and wetter, with more snow than the ESSFdc1.
- 1450-1650 m (south aspect) 1400-1600 m (north aspect) Upper slopes in the Monashee and Selkirk mountains south of Revelstoke.
- Morainal soils with loamy to silty surface textures occur on lower to upper slopes. These soils often have restricting layers below the surface. Fluvial soils with silty or loamy surface textures occur on lower to level slopes. Colluvial soils with silty textures are found on upper slopes. Glaciofluvial soils with variable textures are found on toe and lower slope positions. Seepage is common on mid to lower slopes.
- Climax zonal sites have *Picea engelmannii* (Engelmann spruce) and *Abies lasiocarpa* (subalpine fir) stands. *Thuja plicata* (western redcedar) and *Tsuga heterophylla* (western hemlock) are often present in the understory or as intermediate trees. *Rhododendron albiflorum* (white-flowered rhododendron), *Vaccinium membranaceum* (black huckleberry), and *Lonicera utahensis* (Utah honeysuckle) are the most common shrubs. Herbs include *Rubus pedatus* (five-leaved bramble), *Clintonia uniflora* (queen's cup), *Gymnocarpium dryopteris* (oak fern), and *Tiarella trifoliata* var. *unifoliata* (one-leaved foamflower). *Pleurozium schreberi* (red-stemmed feathermoss) is abundant.

ESSFwc4 Selkirk wet cold Engelmann Spruce - Subalpine Fir variant

- No climate data. The ESSFwc4 is likely colder and wetter, with more snow than the ICH and the ESSFwc1; drier, with less snow than the ESSFvc1; and wetter, with more snow than the ESSFdc1.
- 1650-1950 m (south aspect) 1950-2400 (north aspect) Upper slopes in the Monashee and Selkirk mountains south of Revelstoke.
- Morainal soils with loamy to silty surface textures occur on lower to upper slopes. Colluvial soils with silty textures are found on upper, steeper slopes. These shallow to bedrock soils are more frequent in this variant than in the ESSFwc1. Fluvial soils with silty or loamy surface textures occur on lower to level slopes. Glaciofluvial soils with variable texture are found on toe and lower slope positions. Seepage is common on mid to lower slopes.

Table 4. (..Continued)

- Climax zonal sites have stands of *Abies lasiocarpa* (subalpine fir) and *Picea engelmannii* (Engelmann spruce). *Rhododendron albiflorum* (white-flowered rhododendron), *Vaccinium membranaceum* (black huckleberry), and *Ribes* sp. (gooseberry) are common shrubs. Herbs include *Gymnocarpium dryopteris* (oak fern), *Tiarella trifoliata* var. *unifoliata* (one-leaved foamflower), *Valeriana sitchensis* (sitka valerian), and *Rubus pedatus* (five-leaved bramble).
-

Orthic or Eluviated Eutric Brunisols. The PP zone usually occurs along the lower borders of the Interior Douglas-fir zone.

The Interior Douglas-fir (IDF) zone occurs at the low to mid-elevations of the southern Rocky Mountain Trench typically above the Ponderosa Pine and below the Montane Spruce zones. It has a continental climate with warm, dry summers, a fairly long growing season, and cool winters. Open to closed mature forests of *Pseudotsuga menziesii* (Douglas-fir) are common, as well as mixed seral stands of Douglas-fir, *Larix occidentalis* (western larch) and *Pinus contorta* (lodgepole pine). There are grassland communities in parts of the IDF due to edaphic and topographic conditions and fire history. Good range condition is indicated by dominance of *Elymus spicatus* (bluebunch wheatgrass) and *Festuca idahoensis* (Idaho fescue). Soils are typically Orthic or Dark Gray Luvisols, and Eutric or Dystric Brunisols. Humus forms are usually Moders.

The Interior Cedar – Hemlock (ICH) zone occurs along the lower slopes of the Columbia Mountains, and the windward side of the continental divide along the Rocky Mountains. The ICH zone has an interior continental climate with cool wet winters and dry warm summers. *Thuja plicata* (western redcedar) and *Tsuga heterophylla* (western hemlock) dominate the climax forests. The highest diversity of tree species occurs in this zone. Tree species include *Abies grandis* (grand fir), *Picea glauca* (white spruce), *Picea engelmannii* (Engelmann spruce), their hybrids (*Picea glauca x engelmannii*), and *Abies lasiocarpa* (subalpine fir). Soils are usually Humo-Ferric Podzols. Humus forms are usually Hemimors and Mormoders.

The Montane Spruce (MS) zone occurs at middle elevations in the southern Rocky Mountains, eastern slopes of the Purcell Mountains, and the Rocky Mountain

Trench. This zone usually occurs above the IDF zone and below the Engelmann Spruce – Subalpine Fir (ESSF) zone in southern B.C. Its cool, continental climate is characterized by cold winters and moderately short, warm summers. Hybrid white spruce, Engelmann spruce and subalpine fir are dominant tree species in climax stands. Seral stands of lodgepole pine are common due to past fires and logging. Soils are mainly Brunisolic or Orthic Gray Luvisols and Eutric Brunisols. Common humus forms are Hemimors and Hemihumimors.

The Engelmann Spruce – Subalpine Fir (ESSF) zone is the largest and uppermost forested zone in southeastern B.C. with elevations ranging from 1500 to 2300 m. The zone usually occurs above the ICH or MS zones. Its continental climate is relatively cold, moist and snowy with short growing seasons and long, cold winters. The forests within this zone range from continuous forest at its lower and middle elevations to subalpine parkland at its upper limits. Engelmann spruce and subalpine fir are the dominant climax tree species with lodgepole pine as a widespread seral species after fire. Other species that also occur, usually on drier sites are *Pinus albicaulis* (whitebark pine) and *Larix lyallii* (alpine larch). Soils are usually Humo-Ferric Podzols with Mor humus forms.

Objective 1: Determine the vital attributes for Ktunaxa plants

1a) determine which plants were important to the Ktunaxa

Building a relationship with members of the Ktunaxa community was critical to this study. My proposed research methodology for working with Ktunaxa Elders was approved for 1996-1998 by the University of British Columbia Behavioural Sciences Screening Committee. In November of 1996 the Language and Culture Authority for the Ktunaxa/Kinbasket Tribal Council gave me permission to

participate in sessions related to ethnobotany and fire with the Traditional Use Study (TUS) Elders Working Group.

My project was aided by two Ktunaxa resource management projects in the Traditional Territory. The first was an ethnobotany project that began in 1997. Its purpose was to document the knowledge of the Elders on the medicinal, food, shelter and other uses of plants by the Ktunaxa Nation. The second project was the Ktunaxa TUS, an initiative of the Ktunaxa Treaty Office that began in 1996. Their broader mandate included documenting and mapping the cultural uses and knowledge within the Ktunaxa Traditional Territory.

I learned and acquired information to develop my project through informal meetings with the Elders Working Group and working with members of both Ktunaxa projects over the period November 1996 – August 1997. Often Elders from all parts of the Ktunaxa territory, including Montana and Idaho would attend. The ethnobotany team (Michael Keefer and Pete McCoy) usually brought in plant samples as a way of helping stimulate memories and discussion. Discussions amongst the Elders involved the particular use of a plant, its Ktunaxa name, and where it grew. The TUS and ethnobotany teams hosted these informal meetings and field trips on ethnobotany and fire. The working sessions and field trips were invaluable to building my understanding of the relationship between the Ktunaxa people and their environment.

I received permission to use an unpublished report, "Ethnobotany of the Kootenai Indians of Western North America" (Hart et al. 1978) from the Ktunaxa/Kinbasket Tribal Council. I compiled my list of Ktunaxa plants from this report and a preliminary report by Turner (1974) because the material was based

mainly on interviews with Ktunaxa Elders. Work in progress by the Ktunaxa Ethnobotany project was not incorporated because information on certain plants still needed to be checked by the Elders Working Group. The ethnobotany team was continuing to gather plants for their herbarium and adding to their database of Ktunaxa knowledge about the botanical resources within the Traditional Territory.

1b) determine the vital attributes of the plants important to the Ktunaxa

I assigned species types for vital attributes for each Ktunaxa plant species using a two-step assessment process. In the first step I reviewed published studies on vital attributes (Heinselman 1981; Rowe 1983; Noste and Bushey 1987), and fire ecology and fire effects data (Fischer et al. 1996) for each of the Ktunaxa species. I then used that data to assign the species types for the regeneration and establishment vital attributes (Noble and Slatyer 1977) for each plant in the Ktunaxa plants database (Appendix I). Data on the third vital attribute, critical life stages of the plants, were also added to the database if available, but were not required for the analysis that focused on a plant's mode of persistence. For the plants without published references, I inferred the species type for the vital attributes from the morphology and autecology information of the plant species as described by Hitchcock et al. (1955-69) and Parish et al. (1996). This produced a first approximation of the vital attributes of the Ktunaxa plants.

The second step was required to reduce the complexity of performing analyses with plants that had more than one species type, i.e., the plant had multiple ways of persisting through a disturbance and is indicated in the field "Selected Species Type" in Appendix I. I selected the species type most likely to be exhibited for each plant immediately after a low intensity fire. The expected plant

response, particularly for understory species was not always clear since the same species, due to microsite differences, may follow different successional pathways (Cattelino et al. 1979; Heinselman 1981). As an example, *Epilobium angustifolium* (fireweed) can regenerate vegetatively (V species) and by wind-dispersed seed (D species). For my analysis, I selected seeding in from off-site sources as the expected response immediately after a fire, assuming an available seed source. My analysis followed one possible scenario and other analyses may be run using the same dataset with other scenarios that may result in selecting a different species type.

Rowe's (1983) species groups are word descriptors of the combination of the species types for the regeneration and establishment vital attributes (Noble and Slatyer 1977) that describe a plant's mode for persistence, i.e., its immediate response to disturbance. I modified Rowe's (1983) species groups by subdividing the endurer or sprouter group into shade tolerant (VT = endurer2) and shade intolerant sprouters (VI = endurer1) and the evader group into shade tolerant (ST and CI which has relatively long-lived seed = evader2) and shade intolerant seedbankers (SI = evader1). These subdivisions allowed for closer equivalents to Noble and Slatyer's (1977) species types.

I designed a relational database of information about the Ktunaxa plant species and their vital attributes and other components needed for the analysis, including the BEC vegetation data for the Nelson Forest Region. The plots were sampled in climax or near climax stands, i.e., plots that had no fire disturbance for about 80 years.

Objective 2: Determine the validity of Rowe's (1983) hypothesis for the East Kootenay Ktunaxa plants

The Nelson Forest Region BEC database included 1288 plots with vegetation, soils, and site information for the Biogeoclimatic subzone/variants and site series described in the region's ecosystem field guide (Braumandl and Curran 1992). With permission from the B.C. Ministry of Forests Research Branch, I used 355 zonal or mesic plots for the 13 Biogeoclimatic units within the Ktunaxa Traditional Territory (Figure 2). The plots were distributed throughout the area of most of the Biogeoclimatic units. Zonal plots, by definition, support plant communities used to delineate the boundaries of a Biogeoclimatic subzone (Pojar et al. 1987) and, therefore, can be used for comparison of plants and their vital attributes between Biogeoclimatic subzone/variants.

The mean proportion and the standard deviation (S.D.) of each species group were determined for all plots within each Biogeoclimatic unit. For each plot in a Biogeoclimatic unit, the presence of a Ktunaxa plant species was counted using its assigned species group (endurer1, endurer2, evader1, evader2, resister, invader, and avoider). The total count for each species group was converted to a proportion in each plot (e.g., count of endurer1 species divided by total count for all species groups). A mean proportion of each species group was calculated from the proportions for all plots within each of the 13 Biogeoclimatic subzone/variants.

The BEC plot data included more species than my list of Ktunaxa plants, but for the purposes of this study, I restricted the plant species for my analyses to those that were known and identified by the Ktunaxa people in Turner (1974) and Hart et al. (1978). However, a test of how representative the Ktunaxa plant species are

within the zonal plots of a Biogeoclimatic unit was carried out for the Interior Douglas-fir dry mild Kootenay variant (IDFdm2). Five plots were randomly selected from the IDFdm2 plots. Estimates were made of the vital attributes for the non-Ktunaxa plant species. A comparison was made between the mean proportion of each species group for the vascular plants that were Ktunaxa plants and total plants (Ktunaxa and non-Ktunaxa plants) in the plots.

To determine whether or not Rowe's (1983) hypothesis was valid for the East Kootenay Ktunaxa plants, NDT was used as an indicator of fire cycle length. Rowe's (1983) hypothesis indicated that different species groups would be relatively more or less abundant in different fire cycles. Therefore, it was necessary to determine whether or not the relative amount (as measured by the mean proportions described above) of each species group differed with different fire cycles or NDT. This was done by using a one-way nested analysis of variance (ANOVA) (SAS Institute Inc. 1987). For this ANOVA, the independent variables were the 3 NDTs ($df = 3 - 1 = 2$) with the 13 Biogeoclimatic units nested within them ($df = 13 - 3 = 10$). A separate ANOVA was conducted for each of the dependent variables that were the 7 species groups (endurer1, endurer2, evader1, evader2, invader, resister, and avoider). Each ANOVA addressed the question of whether or not a species group comprised a significantly different proportion of the total species present in the different NDTs. Post-hoc tests using Least Square Means (LSMeans) pair-wise comparisons (SAS Institute Inc. 1987) were conducted to determine for each species group which NDTs and Biogeoclimatic units within NDTs were significantly different from each other and compared to Rowe's (1983) hypothesis, as summarized in Table 2.

For each variable, I tested the assumptions of the model by examining the residuals in a histogram for a symmetric and bell-shaped normal distribution. I also plotted the residuals against predicted values for any departure from homogeneous variance. The results from these tests showed the assumptions of the model were generally met. The 3 NDT groups tested came from the assignment of Biogeoclimatic units to NDT4, NDT3, and NDT2/NDT1 in the Biodiversity guidebook (Table 3) (BC Ministry of Forests and BC Environment 1995). For this study, I treated NDT2 and NDT1 together since there was only one Biogeoclimatic unit (ICHwk1) in the NDT1 group and both NDTs have long mean fire return intervals.

The sum of squares from the ANOVAs was used to examine the proportion of variation explained by the NDT framework (NDT model) and the Biogeoclimatic units (BGC model) for each species group. The NDT model was comprised of the 3 NDTs (NDT4, NDT3, and NDT2) and the nested Biogeoclimatic units in each NDT (Table 3). The BGC model was comprised of the 13 Biogeoclimatic units (Table 3).

Objective 3: Prediction of which Ktunaxa plants would be most affected by reduced fire frequency

If Rowe's hypothesis was found to be valid, then the species groups associated with short fire cycle length are expected to be adversely affected by fire suppression, i.e., shade intolerant sprouter (endurer1), shade intolerant seedbanker (evader1), and some plants in the shade tolerant sprouter (endurer2) and invader species groups. If Rowe's hypothesis was not found to be valid, then it would be necessary to make measurements in the field of the distributions of species groups in frequently burned and unburned areas, and comparisons of the distributions.

RESULTS

Objective 1: Determine the vital attributes for Ktunaxa plants

Sixty-four percent of the Ktunaxa plants occurred in zonal or mesic plots across the 13 Biogeoclimatic units (Appendix II). The remaining species occurred in drier or wetter forested sites, in grasslands, subalpine meadows and wetlands. The majority of Ktunaxa plants are forbs and deciduous shrubs (Figure 3). According to Rowe's (1983) categories, 45% of the species are sprouters (VI and VT species types). Two percent of the species are resisters (WI species type). Ten percent of the species are evaders or seedbankers, plants that store seed in the soil (SI and ST species types). Another type of evader is the CI species type that stores seed in the canopy and makes up 1% of the Ktunaxa species. Twenty-two percent of the species are invaders (DI species type). The remaining 20% of the species are avoiders (DR and DT species types). The list of 165 Ktunaxa plants included 10 introduced species (indicated by * in Table 5). The Ktunaxa people adopted some of these species for medicinal and other purposes, e.g., *Matricaria discoidea* (pineapple weed), and *Verbascum thapsus* (mullein). Other species, such as *Centaurea* spp. (knapweeds), were included in this list because the people knew of their invasive nature and ability to displace other plants.

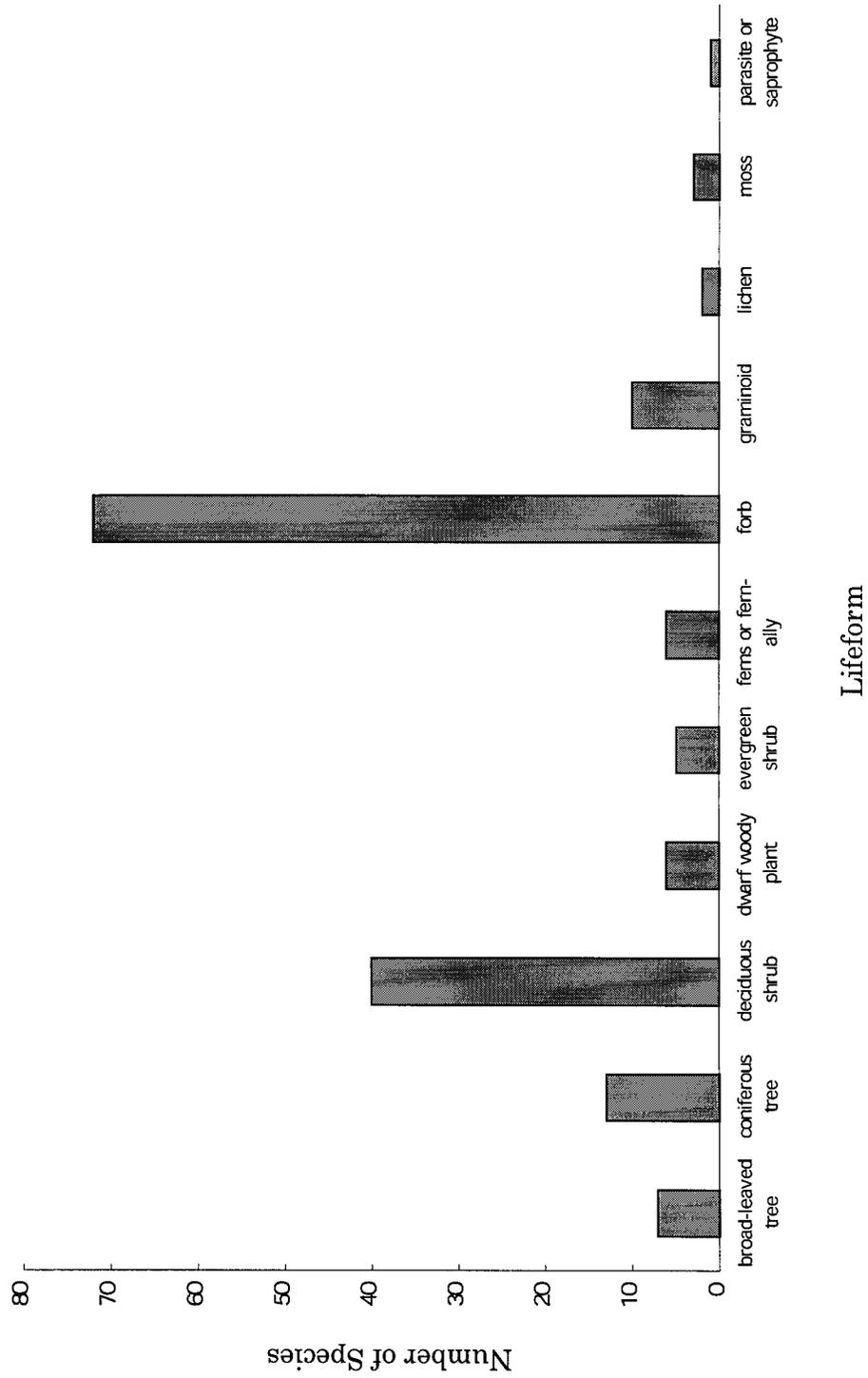


Figure 3. Ktunaxa species by lifeform (after Meidinger *et al.* 1997)

Table 5. List of 165 Ktunaxa plants by species group

*indicates introduced species

Species Group	Scientific Name	Common Name
Evader2	<i>Pinus contorta</i>	lodgepole pine
Invader	<i>Agoseris glauca</i>	short-beaked agoseris
Invader	<i>Alnus tenuifolia</i>	mountain alder
Invader	<i>Anemone patens</i>	prairie crocus
Invader	<i>Artemisia dracunculus</i>	tarragon
Invader	<i>Artemisia frigida</i>	prairie sagewort
Invader	<i>Artemisia ludoviciana</i>	western mugwort
Invader	<i>Artemisia michauxiana</i>	Michaux's mugwort
Invader	<i>Betula papyrifera</i>	paper birch
Invader	<i>Bromus carinatus</i>	California brome
Invader	<i>Bromus tectorum*</i>	cheatgrass
Invader	<i>Carex scoparia</i>	pointed broom sedge
Invader	<i>Castilleja miniata</i>	scarlet paintbrush
Invader	<i>Centaurea diffusa*</i>	diffuse knapweed
Invader	<i>Centaurea maculosa*</i>	spotted knapweed
Invader	<i>Centaurea repens</i>	Russian knapweed
Invader	<i>Cirsium arvense</i>	Canada thistle
Invader	<i>Cirsium undulatum</i>	wavy-leaved thistle
Invader	<i>Cirsium vulgare*</i>	bull thistle
Invader	<i>Cleome serrulata</i>	Rocky Mountain bee-plant
Invader	<i>Dodecatheon conjugens</i>	slimpod shootingstar
Invader	<i>Dodecatheon pulchellum</i>	few-flowered shootingstar
Invader	<i>Epilobium angustifolium</i>	fireweed
Invader	<i>Gaillardia aristata</i>	brown-eyed Susan
Invader	<i>Heuchera cylindrica</i>	round-leaved alumroot
Invader	<i>Lappula redowskii</i>	western stickseed
Invader	<i>Mahonia aquifolium</i>	tall Oregon-grape
Invader	<i>Opuntia polyacantha</i>	plains prickly-pear cactus
Invader	<i>Phleum pratense*</i>	common timothy
Invader	<i>Pinus albicaulis</i>	whitebark pine
Invader	<i>Pinus monticola</i>	western white pine
Invader	<i>Plantago major*</i>	common plantain
Invader	<i>Rhamnus purshiana</i>	casacara
Invader	<i>Sorbus scopulina</i>	western mountain-ash
Invader	<i>Sorbus sitchensis</i>	Sitka mountain-ash
Invader	<i>Taraxacum officinale*</i>	common dandelion
Invader	<i>Urtica dioica</i>	stinging nettle
Avoider	<i>Abies grandis</i>	grand fir
Avoider	<i>Abies lasiocarpa</i>	subalpine fir
Avoider	<i>Alnus crispa</i>	green alder
Avoider	<i>Arnica cordifolia</i>	heart-leaved arnica

Table 5. (..Continued)

Species Group	Scientific Name	Common Name
Avoider	<i>Betula glandulosa</i>	scrub birch
Avoider	<i>Bryoria fremontii</i>	edible horsehair
Avoider	<i>Chimaphila umbellata</i>	prince's-pine
Avoider	<i>Clematis ligusticifolia</i>	white clematis
Avoider	<i>Clematis occidentalis</i>	Columbia clematis
Avoider	<i>Dicranum scoparium</i>	broom moss
Avoider	<i>Geum macrophyllum</i>	large-leaved avens
Avoider	<i>Goodyera oblongifolia</i>	rattlesnake-plantain
Avoider	<i>Heracleum lanatum</i>	cow-parsnip
Avoider	<i>Juniperus communis</i>	common juniper
Avoider	<i>Juniperus scopulorum</i>	Rocky Mountain juniper
Avoider	<i>Letharia vulpina</i>	common wolf lichen
Avoider	<i>Linnaea borealis</i>	twinline
Avoider	<i>Lonicera involucrata</i>	black twinberry
Avoider	<i>Lonicera utahensis</i>	Utah honeysuckle
Avoider	<i>Nuphar polysepalum</i>	yellow waterlily
Avoider	<i>Oplopanax horridus</i>	devil's club
Avoider	<i>Picea engelmannii</i>	Engelmann spruce
Avoider	<i>Picea glauca</i>	white spruce
Avoider	<i>Pterospora</i> sp.	pinedrops
Avoider	<i>Rhytidiadelphus triquetrus</i>	electrified cat's-tail moss
Avoider	<i>Selaginella wallacei</i>	Wallace's selaginella
Avoider	<i>Sium suave</i>	water-parsnip
Avoider	<i>Smilacina racemosa</i>	false Solomon's-seal
Avoider	<i>Smilacina stellata</i>	star-flowered false Solomon's-seal
Avoider	<i>Sphagnum</i> sp.	peat moss
Avoider	<i>Streptopus amplexifolius</i>	clasping twistedstalk
Avoider	<i>Taxus brevifolia</i>	western yew
Avoider	<i>Thuja plicata</i>	western redcedar
Avoider	<i>Veratrum viride</i>	Indian hellebore
Evader1	<i>Ceanothus sanguineus</i>	redstem ceanothus
Evader1	<i>Ceanothus velutinus</i>	snowbrush
Evader1	<i>Chenopodium capitatum</i>	strawberry-blite
Evader1	<i>Fragaria vesca</i>	wood strawberry
Evader1	<i>Fragaria virginiana</i>	wild strawberry
Evader1	<i>Geranium viscosissimum</i>	sticky purple geranium
Evader1	<i>Hordeum jubatum</i>	foxtail barley
Evader1	<i>Matricaria discoidea</i> *	pineapple weed
Evader1	<i>Oxytropis</i> sp.	locoweed
Evader1	<i>Ribes cereum</i>	squaw currant
Evader1	<i>Ribes irriguum</i>	Idaho gooseberry
Evader1	<i>Ribes oxycanthoides</i>	northern gooseberry
Evader1	<i>Sambucus cerulea</i>	blue elderberry
Evader1	<i>Sambucus racemosa</i>	red elderberry

Table 5. (..Continued)

Species Group	Scientific Name	Common Name
Evader2	<i>Purshia tridentata</i>	antelope-brush
Evader2	<i>Ribes lacustre</i>	black gooseberry
Evader2	<i>Viburnum edule</i>	highbush-cranberry
Endurer1	<i>Achillea millefolium</i>	yarrow
Endurer1	<i>Allium cernuum</i>	nodding onion
Endurer1	<i>Apocynum androsaemifolium</i>	spreading dogbane
Endurer1	<i>Apocynum cannabinum</i>	hemp dogbane
Endurer1	<i>Arctostaphylos uva-ursi</i>	kinnikinnick
Endurer1	<i>Calochortus apiculatus</i>	three-spot mariposa lily
Endurer1	<i>Calochortus macrocarpus</i>	sagebrush mariposa lily
Endurer1	<i>Camassia quamash</i>	common camas
Endurer1	<i>Chrysothamnus nauseosus</i>	rabbit-brush
Endurer1	<i>Claytonia lanceolata</i>	western springbeauty
Endurer1	<i>Cornus stolonifera</i>	red-osier dogwood
Endurer1	<i>Corylus cornuta</i>	beaked hazelnut
Endurer1	<i>Elaeagnus commutata</i>	silverberry
Endurer1	<i>Fritillaria pudica</i>	yellow bell
Endurer1	<i>Juncus balticus</i>	Baltic rush
Endurer1	<i>Lewisia rediviva</i>	bitterroot
Endurer1	<i>Lilium columbianum</i>	tiger lily
Endurer1	<i>Lilium philadelphicum</i>	wood lily
Endurer1	<i>Lithospermum ruderale</i>	lemonweed gromwell
Endurer1	<i>Lomatium geyeri</i>	Geyer's desert-parsley
Endurer1	<i>Monarda fistulosa</i>	wild bergamot
Endurer1	<i>Petasites sagittatus</i>	arrow-leaved coltsfoot
Endurer1	<i>Philadelphus lewisii</i>	mock-orange
Endurer1	<i>Populus balsamifera</i> ssp.	black cottonwood
Endurer1	<i>Populus tremuloides</i>	trembling aspen
Endurer1	<i>Prunus virginiana</i>	choke cherry
Endurer1	<i>Pteridium aquilinum</i>	bracken fern
Endurer1	<i>Rosa acicularis</i>	prickly rose
Endurer1	<i>Rosa woodsii</i>	prairie rose
Endurer1	<i>Rubus idaeus</i>	red raspberry
Endurer1	<i>Rubus leucodermis</i>	black raspberry
Endurer1	<i>Rubus parviflorus</i>	thimbleberry
Endurer1	<i>Rubus pedatus</i>	five-leaved bramble
Endurer1	<i>Sagittaria latifolia</i>	wapato
Endurer1	<i>Salix exigua</i>	sandbar willow
Endurer1	<i>Salix scouleriana</i>	Scouler's willow
Endurer1	<i>Scirpus acutus</i>	hard-stemmed bulrush
Endurer1	<i>Typha latifolia</i>	common cattail
Endurer1	<i>Verbascum thapsus</i> *	great mullein
Endurer1	<i>Xerophyllum tenax</i>	bear-grass

Table 5. (..Continued)

Species Group	Scientific Name	Common Name
Endurer1	<i>Zigadenus venenosus</i>	meadow death-camas
Endurer2	<i>Acer glabrum</i>	Douglas maple
Endurer2	<i>Amelanchier alnifolia</i>	saskatoon
Endurer2	<i>Angelica genuflexa</i>	kneeling angelica
Endurer2	<i>Aralia nudicaulis</i>	wild sarsaparilla
Endurer2	<i>Athyrium filix-femina</i>	lady fern
Endurer2	<i>Balsamorhiza sagittata</i>	arrow-leaved balsamroot
Endurer2	<i>Calamagrostis rubescens</i>	pinegrass
Endurer2	<i>Cicuta douglasii</i>	Douglas' water-hemlock
Endurer2	<i>Crataegus columbiana</i>	red hawthorn
Endurer2	<i>Crataegus douglasii</i>	black hawthorn
Endurer2	<i>Elymus spicatus</i>	bluebunch wheatgrass
Endurer2	<i>Equisetum arvense</i>	common horsetail
Endurer2	<i>Equisetum hyemale</i>	scouring-rush
Endurer2	<i>Equisetum pratense</i>	meadow horsetail
Endurer2	<i>Erythronium grandiflorum</i>	yellow glacier lily
Endurer2	<i>Hierochloa odorata</i>	common sweetgrass
Endurer2	<i>Holodiscus discolor</i>	oceanspray
Endurer2	<i>Ledum glandulosum</i>	trapper's tea
Endurer2	<i>Ledum groenlandicum</i>	Labrador tea
Endurer2	<i>Ligusticum canbyi</i>	Canby's lovage
Endurer2	<i>Lupinus sericeus</i>	silky lupine
Endurer2	<i>Mentha arvensis</i>	field mint
Endurer2	<i>Osmorhiza occidentalis</i>	western sweet-cicely
Endurer2	<i>Perideridia gairdneri</i>	Gairdner's yampah
Endurer2	<i>Rhus glabra</i>	smooth sumac
Endurer2	<i>Rhus radicans</i>	poison-ivy
Endurer2	<i>Shepherdia canadensis</i>	soopolallie
Endurer2	<i>Spiraea betulifolia</i>	birch-leaved spirea
Endurer2	<i>Symphoricarpos albus</i>	common snowberry
Endurer2	<i>Vaccinium caespitosum</i>	dwarf blueberry
Endurer2	<i>Vaccinium membranaceum</i>	black huckleberry
Endurer2	<i>Vaccinium myrtillus</i>	low bilberry
Endurer2	<i>Vaccinium scoparium</i>	grouseberry
Resister	<i>Larix occidentalis</i>	western larch
Resister	<i>Pinus ponderosa</i>	ponderosa pine
Resister	<i>Pseudotsuga menziesii</i>	Douglas-fir

Objective 2: Determine the validity of Rowe's (1983) hypothesis for the East Kootenay Ktunaxa plants

I calculated the mean proportion and standard deviation of species groups (endurer1, evader1, evader2, resister, invader, endurer2, and avoider) from the BEC zonal plot data for each Biogeoclimatic unit (Figure 4). The total number of observations per plot was sufficiently large to assume a normally distributed population where approximately 68% will be within +/- one standard deviation of the mean. A large standard deviation indicates a high degree of variability. A number of patterns were seen for some of the species groups within the Biogeoclimatic units. Subalpine and wetter Interior Cedar – Hemlock ecosystems have a higher proportion of the avoider species group relative to the other species groups (Figure 4). The ponderosa pine, and drier Interior Cedar – Hemlock and Douglas-fir ecosystems have higher proportions of shade intolerant sprouter (endurer1), shade tolerant sprouter (endurer2), and invader species groups relative to the other species groups (Figure 4).

The proportions of the species groups within the 13 Biogeoclimatic units are presented in Figure 5. For most of the species groups, a trend was observed related to moisture and elevation gradients. The proportion of avoider and shade tolerant seedbanker (evader2) species groups tended to increase with moisture and elevation in the Biogeoclimatic units (Figure 5). The proportion of shade intolerant sprouter (endurer1) and shade intolerant seedbanker (evader1) species groups generally decreased with increasing moisture and elevation in the Biogeoclimatic units (Figure 5). The resister species group also decreased with increasing moisture and elevation in the Biogeoclimatic units, and was absent in three subalpine

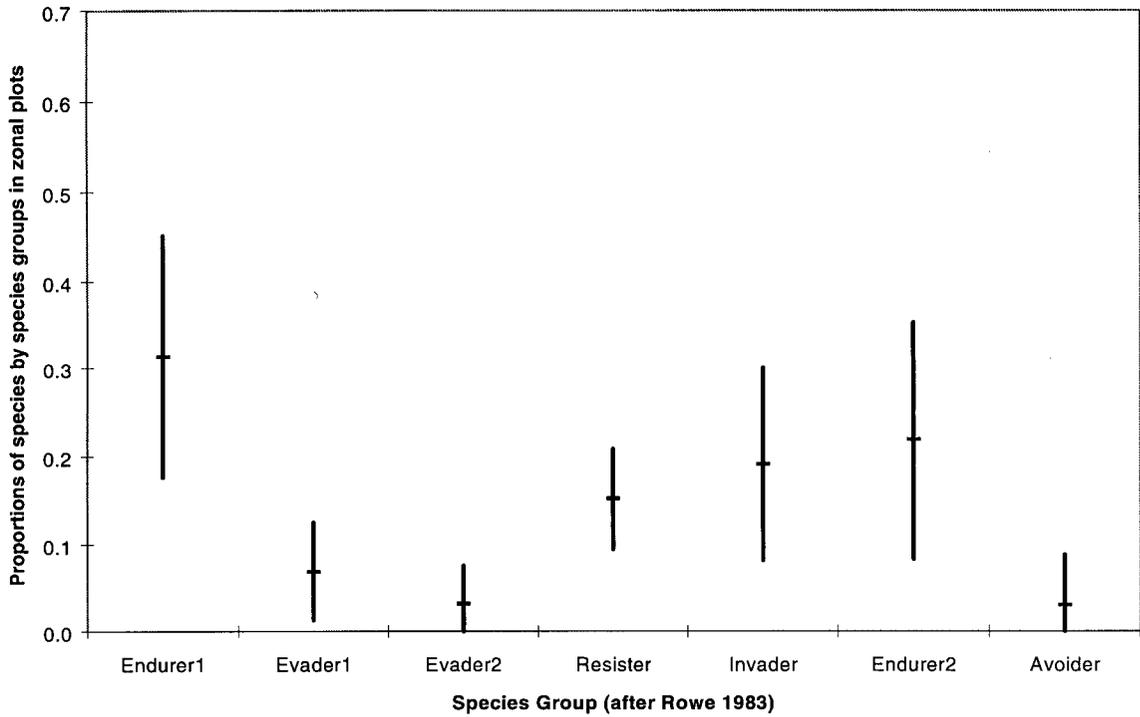


Figure 4a. Mean proportions (± 1 S.D.) of species groups in zonal plots of the Ponderosa Pine dry hot Kootenay variant (PPdh2); $n=11$ plots.

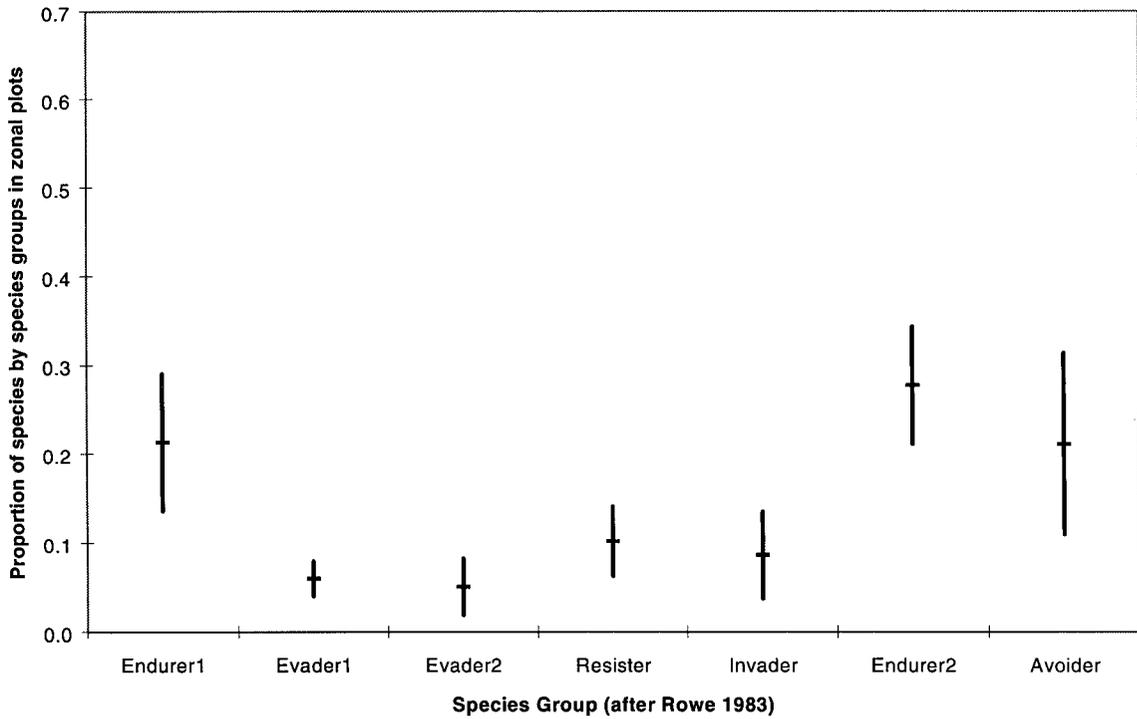


Figure 4b. Mean proportions (± 1 S.D.) of species groups in zonal plots of the Interior Douglas-fir dry mild Kootenay variant (IDFdm2); $n=26$ plots.

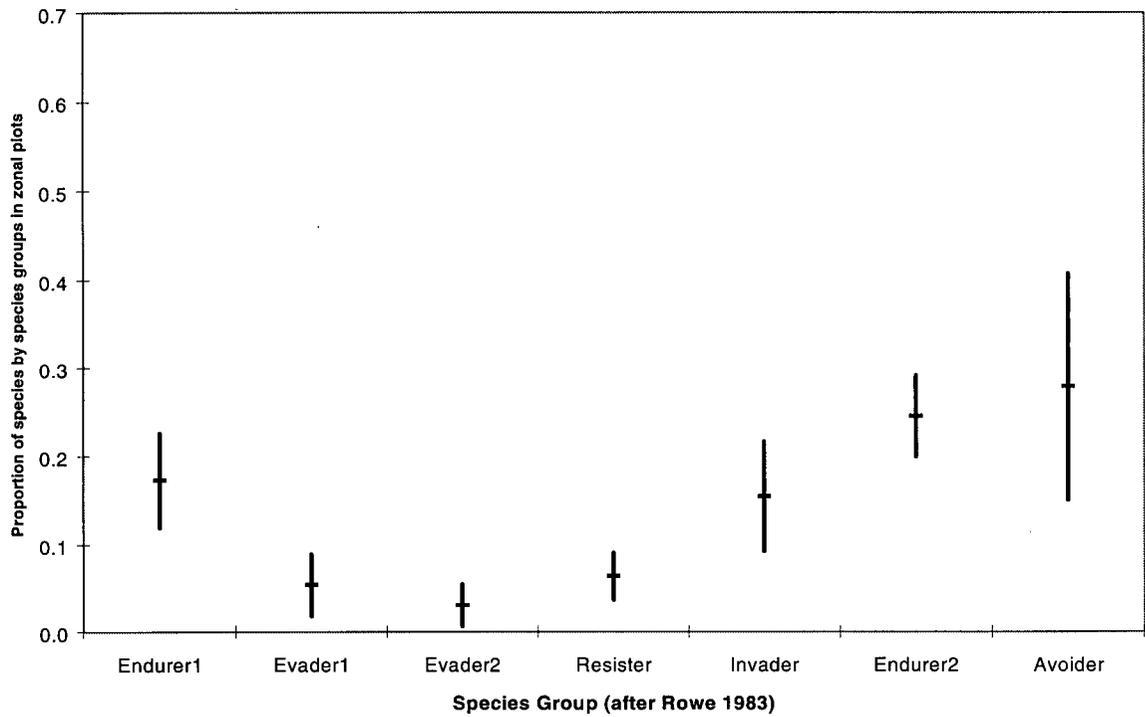


Figure 4c. Mean proportions (\pm 1 S.D.) of species groups in zonal plots of the Interior Cedar-Hemlock very dry warm subzone (ICHxw); n=6 plots.

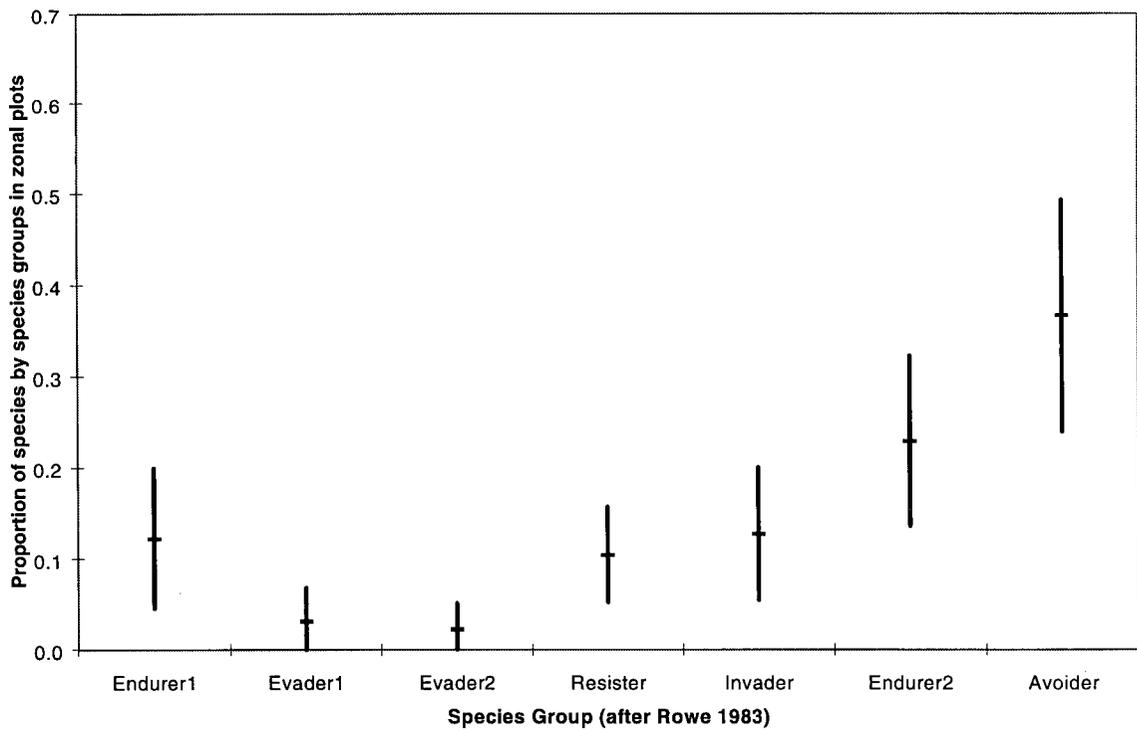


Figure 4d. Mean proportions (\pm 1 S.D.) of species groups in zonal plots of the Interior Cedar-Hemlock dry warm subzone (ICHdw); n=50 plots.

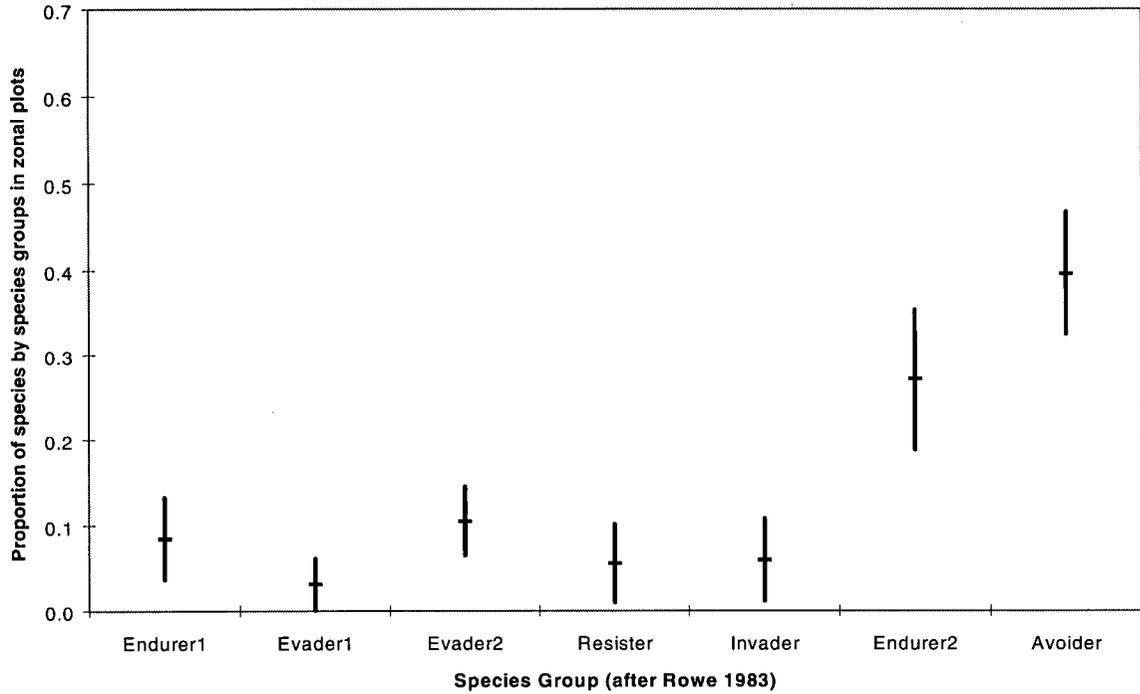


Figure 4e. Mean proportions (\pm 1 S.D.) of species groups in zonal plots of the Montane Spruce dry cool subzone (MSdk); n=52 plots.

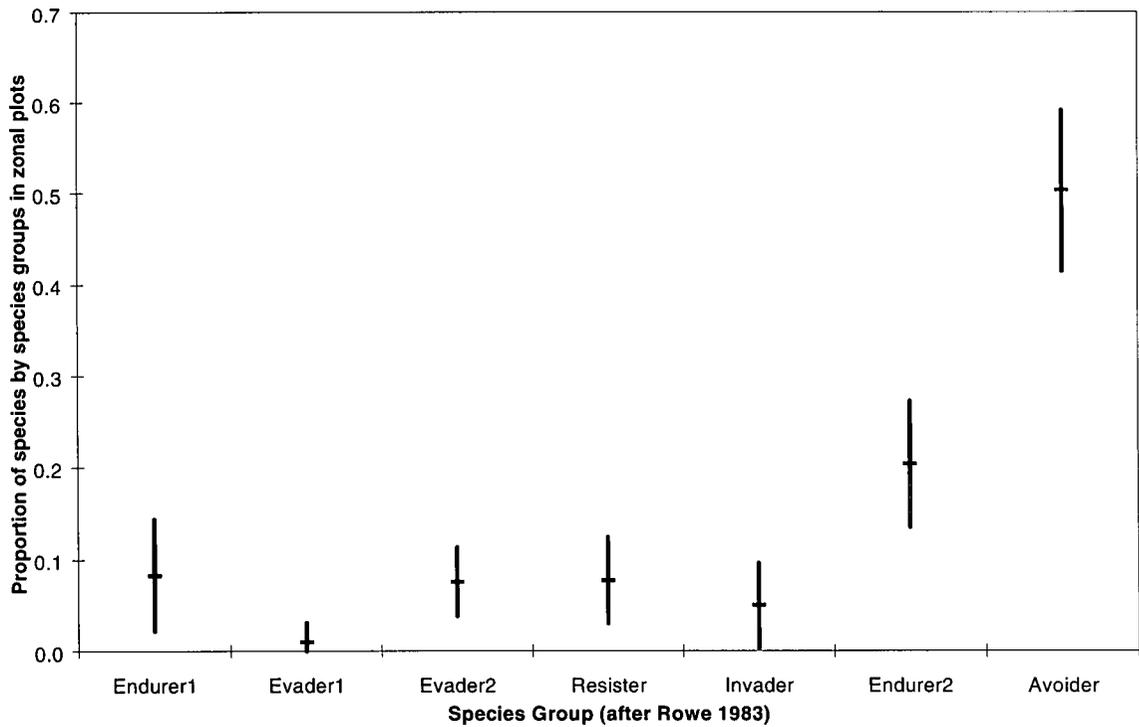


Figure 4f. Mean proportions (\pm 1 S.D.) of species groups in zonal plots of the Interior Cedar-Hemlock moist cool Kootenay variant (ICHmk1); n=40 plots.

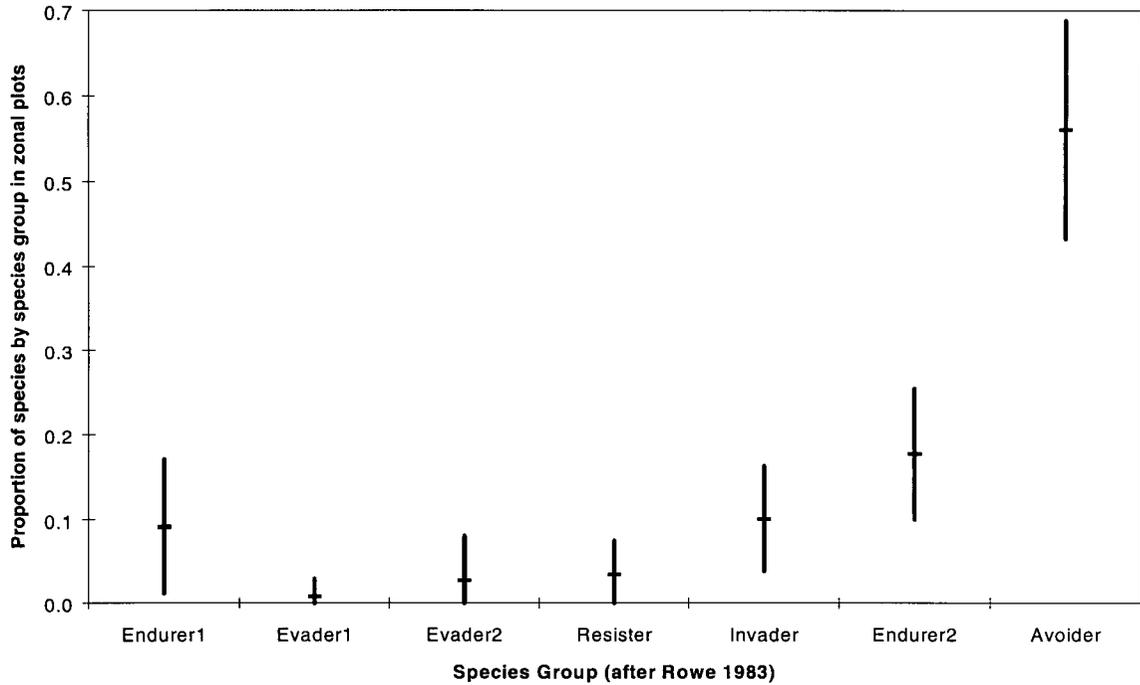


Figure 4g. Mean proportions (+/- 1 S.D.) of species groups in zonal plots of the Interior Cedar-Hemlock moist warm Golden variant (ICHmw1); n=16 plots.

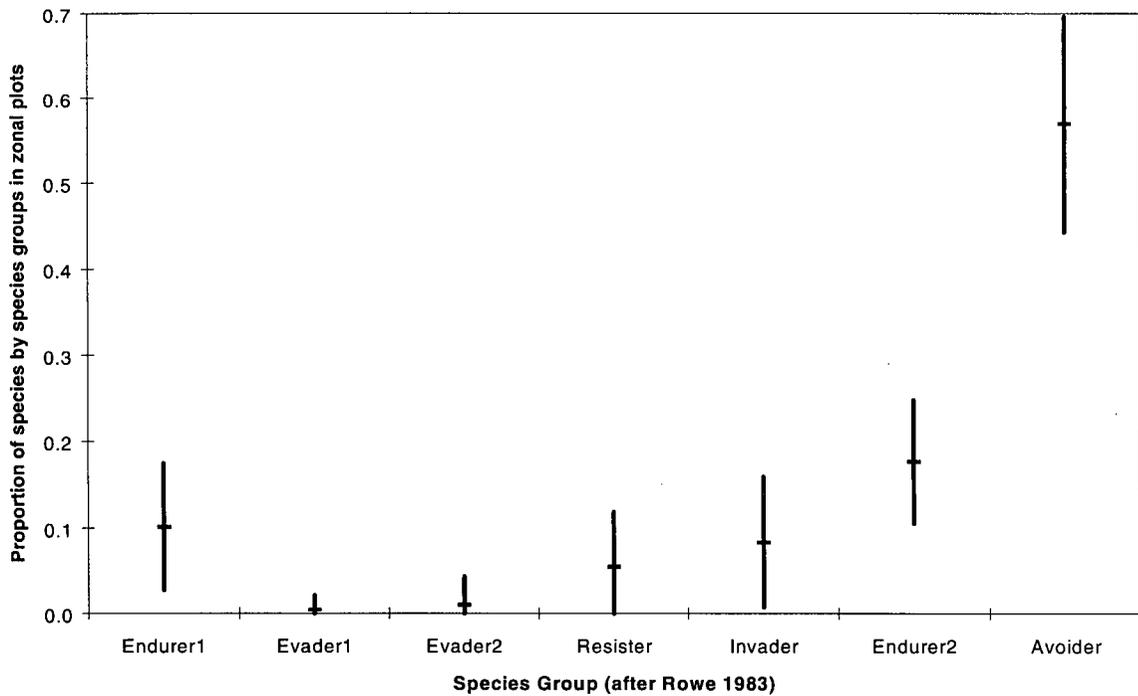


Figure 4h. Mean proportions (+/- 1 S.D.) of species groups in zonal plots of the Interior Cedar-Hemlock moist warm Columbia-Shuswap variant (ICHmw2); n=65 plots.

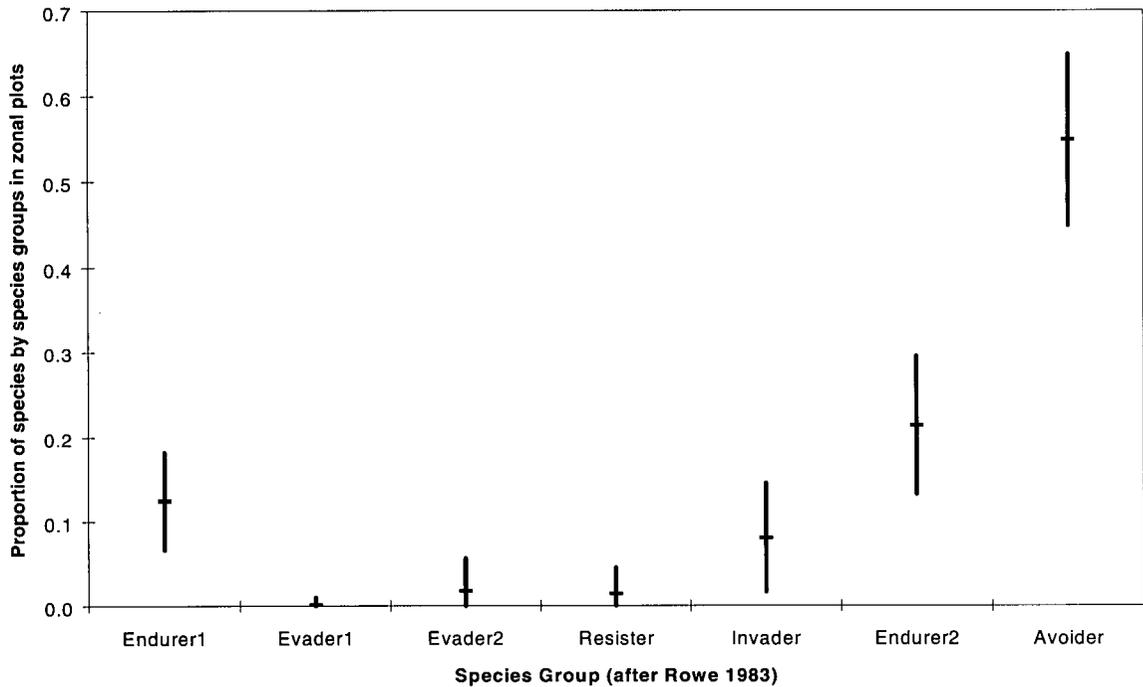


Figure 4i. Mean proportions (\pm 1 S.D.) of species groups in zonal plots of the Interior Cedar-Hemlock wet cool Wells Gray variant (ICHwk1); n=41 plots.

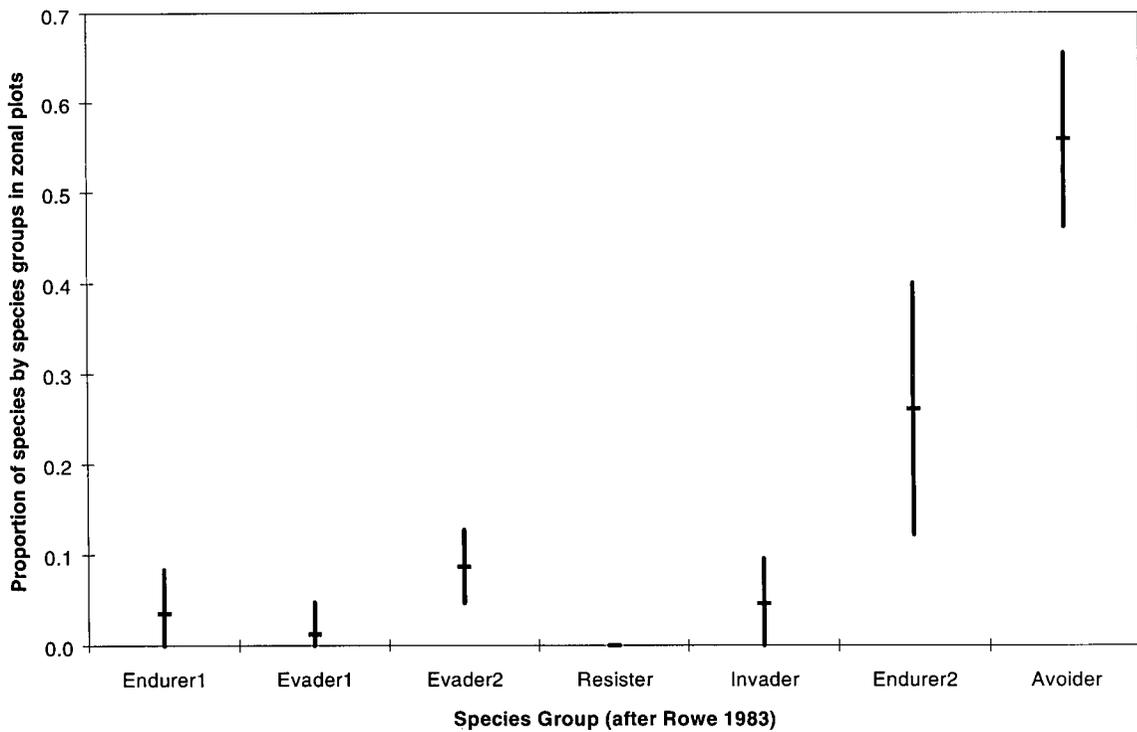


Figure 4j. Mean proportions (\pm 1 S.D.) of species groups in zonal plots of the Engelmann Spruce - Subalpine Fir dry cool subzone (ESSFdk); n=8 plots.

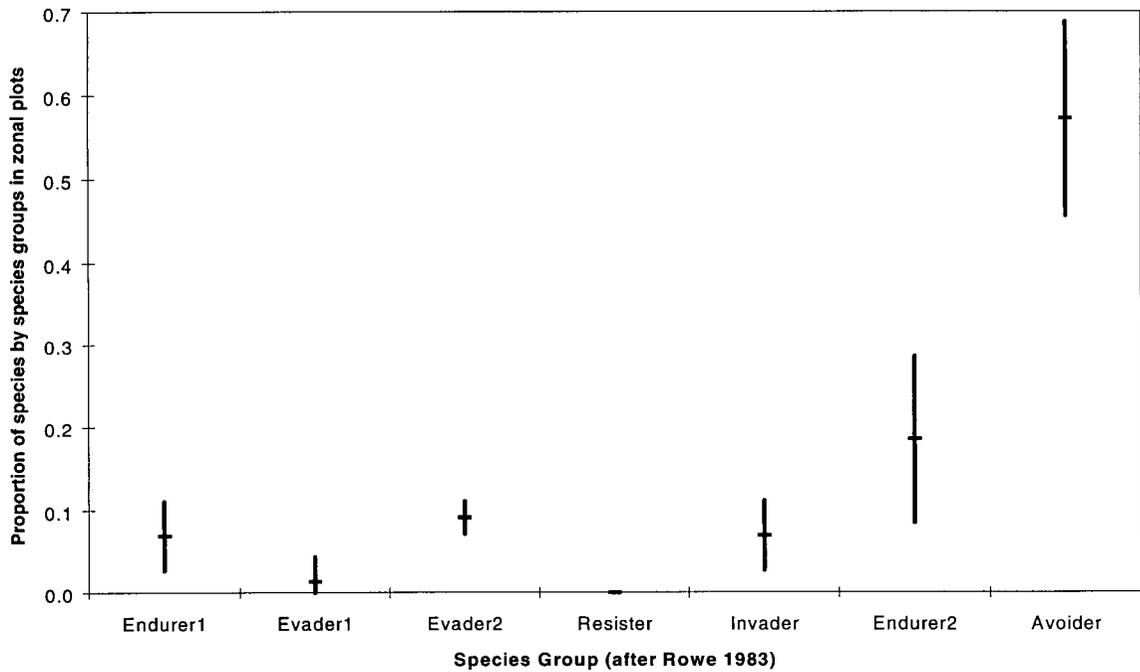


Figure 4k. Mean proportions (\pm 1 S.D.) of species groups in zonal plots of the Engelmann Spruce - Subalpine Fir wet mild subzone (ESSFwm); n=6 plots.

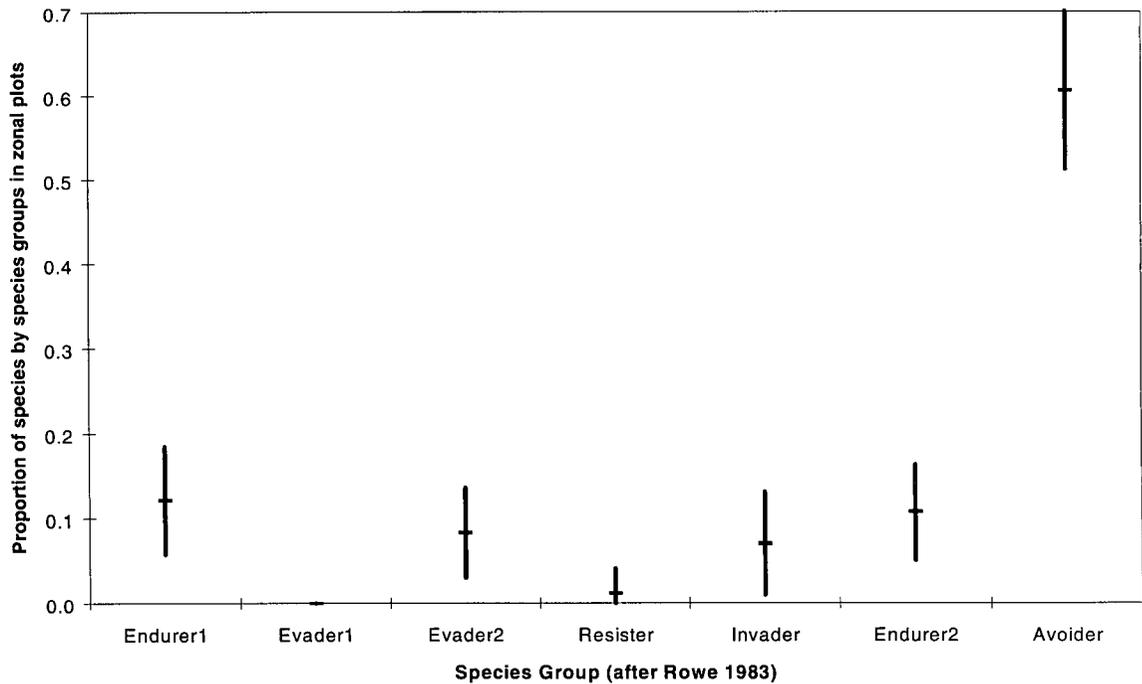


Figure 4l. Mean proportions (\pm 1 S.D.) of species groups in zonal plots of the Engelmann Spruce - Subalpine Fir wet cold Columbia variant (ESSFwc1); n=6 plots.

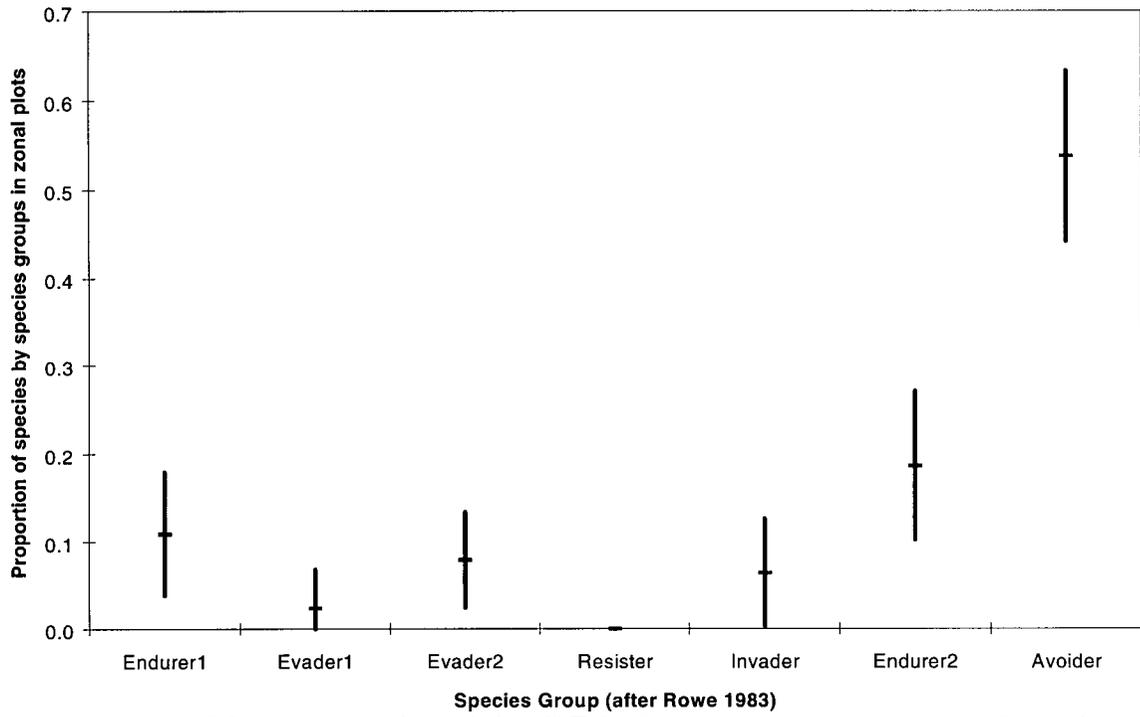
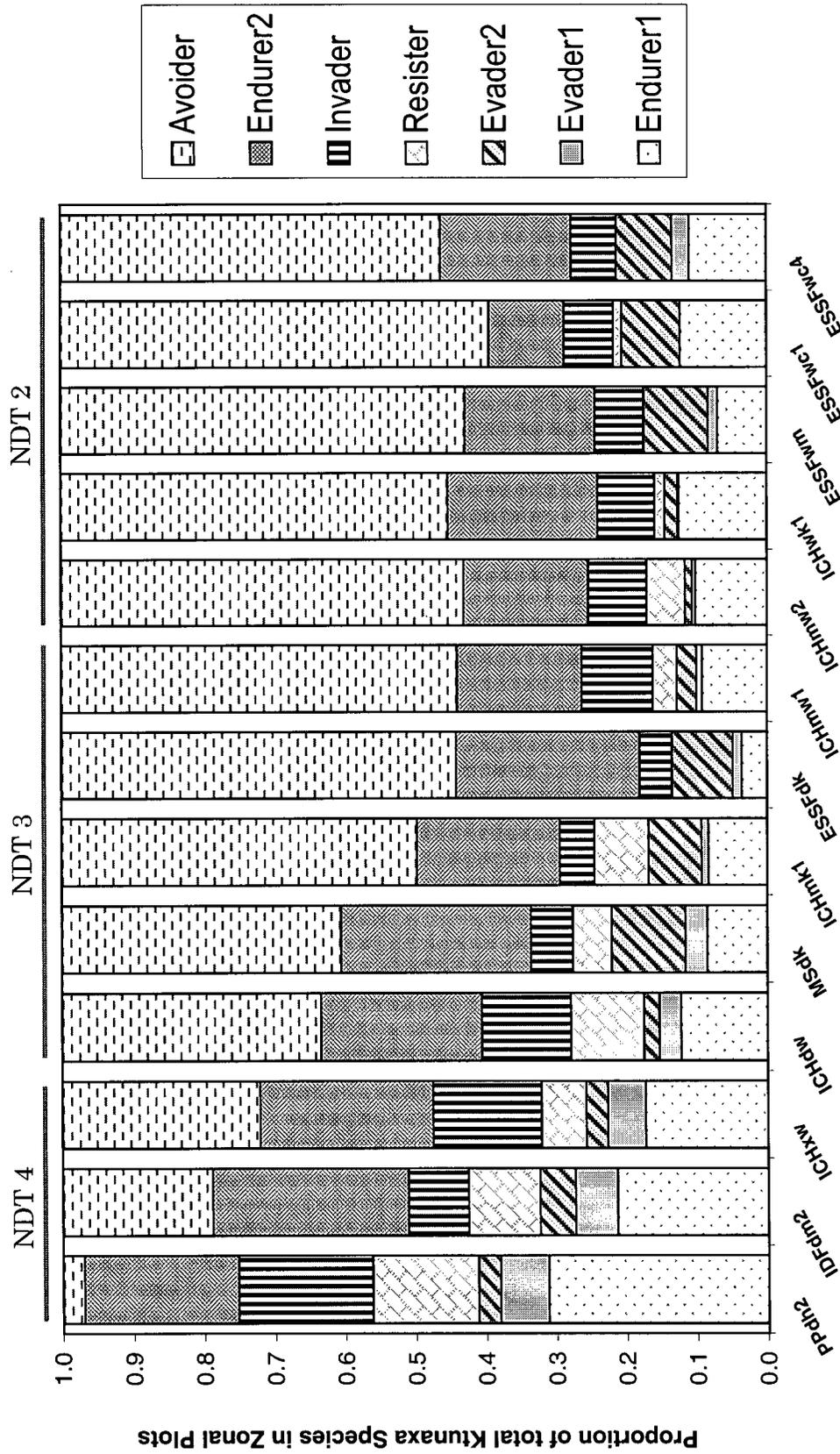


Figure 4m. Mean proportions (± 1 S.D.) of species groups in zonal plots of the Engelmann Spruce - Subalpine Fir wet cold Selkirk variant (ESSFwc4); n=28 plots.



Biogeoclimatic Units

Figure 5. Proportions of Kunaxa species by species groups in zonal plots of 13 biogeoclimatic units.

PPdh2 = Ponderosa Pine dry hot subzone, Kootenay variant; IDfcm2 = Interior Douglas-fir dry mild subzone, Kootenay variant; ICHxw = Interior Cedar-Hemlock very dry warm subzone; ICHdw = Interior Cedar-Hemlock dry warm subzone; MSdk = Montane Spruce dry cool subzone; ICHmk1 = Interior Cedar-Hemlock moist cool subzone, Kootenay variant; ESSFdk = Engelmann Spruce - Subalpine Fir dry cool subzone; ICHmw1 = Interior Cedar-Hemlock moist warm subzone, Golden variant; ICHmw2 = Interior Cedar-Hemlock moist warm subzone, Columbia-Shuswap variant; ICHwk1 = Interior Cedar-Hemlock wet cool subzone, Wells Gray variant; ESSFwm = Engelmann Spruce - Subalpine Fir wet mild subzone; ESSFw1 = Engelmann Spruce - Subalpine Fir wet cold subzone, Columbia variant; ESSFw4 = Engelmann Spruce - Subalpine Fir wet cold subzone, Selkirk variant.

Biogeoclimatic units (Figure 5). The shade tolerant sprouter (endurer2) and invader species groups were present in relatively high proportions in each Biogeoclimatic unit, but with no particular trend related to moisture or elevation (Figure 5).

For each species group the ANOVA found significantly different proportions occurred in different NDT groups (Table 6). For the shade intolerant sprouter (endurer1), shade intolerant seedbanker (evader1), resister and invader species groups, the post-hoc tests using the LSMeans procedure (SAS Institute Inc. 1987) showed they were significantly greater in Biogeoclimatic units with short fire cycle length (NDT4) than in the other two NDTs (Table 6). The avoider species group was significantly greater in Biogeoclimatic units with long fire cycle length (NDT2) than the other NDTs (Table 6). The shade tolerant sprouter (endurer2) species group was significantly greater in NDT3 and NDT4 than in NDT2 (Table 6). The shade tolerant seedbanker (evader2) group was significantly greater in Biogeoclimatic units with intermediate fire cycle length (NDT3) than in the other NDTs (Table 6).

The sum of squares from the ANOVA was used to examine the proportion of variation explained by the NDT framework (NDT model) and the Biogeoclimatic units (BGC model) (Table 7). The proportion of variation that was explained by the BGC model ranged from 62% for the avoider species group to 18% for the shade tolerant sprouter (endurer2) species group (Table 7). On average, the BGC model accounted for less than 50% of the variation. The BGC model explained the least amount of variation for the shade intolerant sprouter (endurer1), shade tolerant sprouter (endurer2), shade intolerant seedbanker (evader1), and invader species

Table 6. One-way nested ANOVA testing the Natural Disturbance Type (NDT) framework for species groups

Species Group	Source	DFn	F	p-value	Results of pairwise comparison using LSMeans procedure*	
					NDT	Biogeoclimatic units**
Endurer1	NDT	2	70.16	<.0001	NDT2 ^b	H ^a I ^a J ^a K ^a L ^a M ^a
	BGC(NDT)	10	4.35	<.0001	NDT3 ^b	D ^b E ^a F ^a G ^a
	Error	342			NDT4 ^a	A ^a B ^b C ^b
Endurer2	NDT	2	22.3	<.0001	NDT2 ^b	H ^{ab} I ^{ab} J ^a K ^{ab} L ^b M ^{ab}
	BGC(NDT)	10	3.16	0.0007	NDT3 ^a	D ^{ab} E ^a F ^b G ^{ab}
	Error	342			NDT4 ^a	A ^a B ^a C ^a
Evader1	NDT	2	59.74	<.0001	NDT2 ^c	H ^{ab} I ^a J ^a K ^{ab} L ^{ab} M ^b
	BGC(NDT)	10	3.08	0.0009	NDT3 ^b	D ^a E ^a F ^b G ^{ab}
	Error	342			NDT4 ^a	A ^a B ^a C ^a
Evader2	NDT	2	36.73	<.0001	NDT2 ^b	H ^{ab} I ^a J ^a K ^b L ^b M ^b
	BGC(NDT)	10	21.94	<.0001	NDT3 ^a	D ^a E ^c F ^b G ^{bc}
	Error	342			NDT4 ^b	A ^a B ^a C ^a
Invader	NDT	2	8.87	0.0002	NDT2 ^b	H ^a I ^a J ^a K ^a L ^a M ^a
	BGC(NDT)	10	7.16	<.0001	NDT3 ^b	D ^a E ^b F ^b G ^b
	Error	342			NDT4 ^a	A ^a B ^b C ^b
Resister	NDT	2	65.56	<.0001	NDT2 ^c	H ^{ab} I ^a J ^b K ^{ab} L ^{ab} M ^b
	BGC(NDT)	10	10.34	<.0001	NDT3 ^b	D ^a E ^b F ^{ab} G ^c
	Error	342			NDT4 ^a	A ^a B ^b C ^b
Avoider	NDT	2	238.69	<.0001	NDT2 ^a	H ^a I ^a J ^a K ^a L ^a M ^a
	BGC(NDT)	10	8.75	<.0001	NDT3 ^b	D ^a E ^a F ^b G ^b
	Error	342			NDT4 ^c	A ^a B ^b C ^b

DFn = degrees of freedom

* NDT or Biogeoclimatic units sharing one or more superscript letters are not significantly different from each other for a given species group at $\alpha=0.05$ using LSMeans pairwise comparison test (SAS Institute, 1987). Bonferroni correction was applied to control experiment-wise Type I error.

** A = PPdh2; B = IDFdm2; C = ICHxw; D = ICHdw; E = MSdk; F = ICHmk1; G = ESSFdk; H = ICHmw1; I = ICHmw2; J = ICHwk1; K = ESSFwm; L = ESSFwc1; M = ESSFwc4.

Table 7. Proportion of the variation explained by the NDT model and the Biogeoclimatic model in one-way nested ANOVA

Source	Species Group						
	Avoider	Endurer1	Endurer2	Evader1	Evader2	Invader	Resister
NDT model	0.53	0.27	0.11	0.24	0.12	0.04	0.23
BGC model	0.62	0.35	0.18	0.31	0.46	0.21	0.41
NDT of BGC	0.85	0.76	0.59	0.79	0.25	0.35	0.56
Error	0.38	0.65	0.82	0.69	0.54	0.79	0.59

The values are the proportion of sum of squares for NDT and BGC to the total sums of squares; NDT of BGC is the ratio of the NDT model/BGC model. Source Error pertains to the BGC model.

groups that have adaptations for recurrent fire disturbance. The NDT model was able to explain only 4% of the variation for the invader species group, and up to 53% for the avoider species group (Table 7). For all of the species groups, the NDT model explained less variation than the BGC model, however, for the avoider, shade intolerant sprouter (endurer1), shade tolerant sprouter (endurer2), shade intolerant seedbanker (evader1), and resister species groups, the NDT model accounted for 56% – 85% of the variation covered by the BGC model. The NDT model explained the least variation for the shade tolerant sprouter (endurer2), shade tolerant seedbanker (evader2), and invader species groups.

The NDT framework assigned Biogeoclimatic units based on their historic fire cycle length. However, fire suppression has lengthened the fire cycle length, particularly in ecosystems with short and intermediate fire cycle lengths (NDT4 and NDT3). The highest proportion of variation explained by the NDT and BGC models was for the avoider species group, with significantly higher proportion in ecosystems with long fire cycle length (Table 6). Conversely, the BGC and NDT models explained the lowest proportion of variation for shade intolerant seedbanker (evader1), shade intolerant sprouter (endurer1), shade tolerant sprouter (endurer2), and invader species groups, all adapted to recurrent fire disturbance (Table 7).

Objective 3: Prediction of which Ktunaxa plants would be most affected by reduced fire frequency

Assuming that Rowe's hypothesis is valid which is likely, based on the results above, and the following discussion, the Ktunaxa plants in the shade intolerant seedbanker (evader1), shade intolerant sprouter (endurer1), shade tolerant sprouter (endurer2), and invader species groups listed in Table 5 are predicted to be

adversely affected by reduced fire frequency. The following are a few examples of Ktunaxa plants that regenerate vegetatively, from seedbanks, and wind-borne seed (Table 5):

Shade intolerant sprouter (endurer1):

Achillea millefolium (yarrow), *Allium cernuum* (nodding onion)

Shade tolerant sprouter (endurer2):

Shepherdia canadensis (soopoallalie), *Amelanchier alnifolia* (saskatoon)

Vaccinium membranaceum (black huckleberry)

Shade intolerant seedbanker (evader1):

Sambucus cerulea (blue elderberry), *Sambucus racemosa* (red elderberry)

Shade tolerant seedbanker (evader2):

Viburnum edule (highbush-cranberry)

Invader:

Betula papyrifera (paper birch), *Epilobium angustifolium* (fireweed)

DISCUSSION

Objective 1: Determine the vital attributes for Ktunaxa plants

The list of plant species from Ktunaxa oral history provided insight into plants that long-term local residents relied on for their yearly food, medicinal and technology needs. The plants and their vital attributes formed the basis for testing the relationship between vital attributes and the NDT framework in forested ecosystems. There were a number of underlying assumptions related to vital attributes theory that could influence the results. Vital attributes theory assumes that a constant fire severity is experienced over a landscape. It also assumes that a

seed source will always be available for the species groups that have a seed-based mechanism for regeneration. The determination of vital attributes was a synthesis of the available plant life history, fire ecology and fire effects data for each species, and formed the crux of this study. For the analyses in this study, the underlying assumption was that my assignment of the vital attributes for Ktunaxa plants was correct.

There were some difficulties faced in assigning vital attributes. The most common one was the scarcity of data on understory species response to fire disturbance. In those cases, I made my best estimate of the species group based on plant autecology and morphology information. My assignment of vital attributes did not always correspond with those for the same species in another study. One reason is many of the plants have multiple strategies for persistence on a site. Some common combinations were invader/endurer, endurer/avoider, and invader/evader (Appendix I). Microsite differences at the local level, and provenance differences at the regional level can also affect the mechanism exhibited by a plant (Cattelino et al. 1979; Heinselman 1981; Rowe 1983). For this study, I made the assumption that the vital attributes for the Ktunaxa plants remained constant within a community and across ecosystems.

Based on my determination of the vital attributes for Ktunaxa plants, the majority of the plants were sprouter and invader species (Table 5). The relative proportion of these species groups suggests plants important to the Ktunaxa were those that could maintain their presence and productivity within an environment with recurrent fire disturbance. This is consistent with the growing evidence of the

use of fire by aboriginal peoples for maintaining plant resources (Lewis 1982; Blackburn and Anderson 1993; Boyd 1999).

Objective 2: Determine the validity of Rowe's (1983) hypothesis for the East Kootenay Ktunaxa plants

The Natural Disturbance Type framework was designed to capture much of the inherent variability in natural disturbance regimes within broad categories (BC Ministry of Forests and BC Environment 1995). The Natural Disturbance Type and assignment of Biogeoclimatic units and their associated mean fire return interval probably will probably be refined over time as more data become available. There are possible inaccuracies in the mean fire return intervals at the local level, but for the purposes of this study, the broad categories at the landscape level were assumed to be an appropriate surrogate for fire cycle length in Rowe's (1983) hypothesis.

In determining the proportion of the species groups for each of the Biogeoclimatic units, one of the underlying assumptions was the Ktunaxa plants were representative of the total species composition in a plot. The proportions of species groups for Ktunaxa plants were similar to those for total plants in 5 randomly selected plots in the Interior Douglas-fir (IDFdm2) Biogeoclimatic unit except that the proportion of the shade intolerant sprouter (endurer1) species group was slightly higher (less than 10%) for the total plant dataset, many of which were forbs. While not conclusive, this provides some confidence that the distribution of species groups among Ktunaxa plants was similar to that among all plants, so that the Ktunaxa plant species group distribution can, in fact, be used to test the validity of Rowe's hypothesis for southeastern British Columbia.

The BEC plot data had a degree of variability in the zonal or mesic plots used. Some of the variation in the vegetation may be related to the different site histories of the stands sampled and the initial species composition that influenced their successional pathways. An underlying assumption was the plot data are representative of the ecological units in this study. Potential bias in the data due to the BEC sampling methodology and potential errors in the vegetation data collection was recognized. However, the zonal plots provided a way to stratify the data within the BEC framework to examine mechanisms of vegetation change across ecological units at the landscape level.

Although there has been active fire suppression across southeastern British Columbia for a period of at least 50 years, there still appears to be discernible patterns of species groups within the Biogeoclimatic units. The patterns observed in the proportions graphed for each species group suggest a correlation between the relative proportions of the species groups and moisture and elevation gradients (Figure 4). High elevation subalpine and wetter Interior Cedar – Hemlock units with long fire cycle length had higher relative proportions of avoider species (Figure 4g-m). The dry ponderosa pine, Interior Douglas-fir, and drier Interior Cedar – Hemlock units with short fire cycle length had higher proportions of shade intolerant sprouter (endurer1), shade tolerant sprouter (endurer2), and invader species groups relative to the other species groups (Figure 4a-c).

The trends observed across Biogeoclimatic units suggest a similar correlation between species groups and moisture and elevation gradients and fire cycle length (Figure 5). The high elevation subalpine and wetter Interior Cedar – Hemlock units had the highest proportions of avoider and shade tolerant seedbanker (evader2)

species groups. These species groups can persist in ecosystems for long periods without disturbance. Shade intolerant sprouter (endurer1) and shade intolerant seedbanker (evader1) species groups decreased with increasing moisture and elevation (Figure 5). The shade intolerant sprouter (endurer1) species group can persist without disturbance, but its frequency would probably be reduced as more shade tolerant species became established. The shade intolerant seedbanker (evader1) species group is also vulnerable because it relies on fire disturbance to germinate relatively short-term viable seed stored in the soil.

The resister species group was absent from three of the subalpine units (ESSFdk, ESSFwm, and ESSFwc4), which was not surprising since most subalpine tree species are usually in the avoider species group (Agee 1993). Proportions of the resister species group were highest in the dry ponderosa pine and Interior Douglas-fir units, but there are shade tolerance differences between ponderosa pine and Douglas-fir, even though both were classified as resisters. Studies on the effects of fire suppression in these ecosystems report a shift to more shade tolerant tree species, i.e., Douglas-fir (Agee 1994). Another study contrasting the fire regimes of circa 1900 and circa 1990 in the Interior Columbia River Basin reported greatest changes were associated with dry forest vegetation types, such as ponderosa pine and Douglas-fir, and an increase in fire severity in these types (Morgan et al. 1994). If there have been stand structure and vegetation changes, some changes to the relative proportions of species groups are likely. This suggests there possibly have been shifts in the relative proportions of those species groups more affected by reduced frequency of fire in the dry ponderosa pine, Interior Douglas-fir and drier Interior Cedar – Hemlock units.

The results of the post-hoc tests for the one-way nested ANOVA for each of the species groups (Table 7) were fairly consistent with Rowe's (1983) hypothesis of the relationship between species groups and fire cycle length (Table 2). The shade intolerant sprouter (endurer1) and shade intolerant seedbanker (evader1) species groups were significantly greater in ecosystems with short fire cycle length (NDT4). The shade tolerant seedbanker (evader2) species group was significantly greater in ecosystems with intermediate fire cycle length (NDT3). The avoider species group was significantly greater in ecosystems with long fire cycle length (NDT2).

Of Rowe's seven species groups, four were found to be distributed as predicted, while the shade tolerant sprouter (endurer2) species group was distributed almost as predicted. The differences were primarily in the resisters and invaders. The resister species group was significantly greater in ecosystems with short fire cycle length (NDT4), rather than with intermediate fire cycle length. This is possibly due to resister tree species in boreal ecosystems, such as *Pinus banksiana* (jack pine) not being as well adapted to fire as ponderosa pine and Douglas-fir, i.e., with thick, corky bark. In the absence of fire, resisters can increase in otherwise high fire frequency areas for species such as Douglas-fir that is classified as a resister, and is shade tolerant. The invader species group was significantly greater in ecosystems with short fire cycle length (NDT4), rather than having similar proportions in all three fire cycle lengths. Higher proportions of invader species in these ecosystems may be related to other sources of disturbance not examined in this study, such as grazing by wildlife and domestic livestock. The shade tolerant sprouter (endurer2) species group was significantly greater in

ecosystems with short and intermediate (NDT4 and NDT3) fire cycle lengths, rather than having similar proportions in all three fire cycle lengths.

The proportion of variation explained by the NDT model using the sum of squares from the ANOVAs showed the highest proportion was explained for the avoider species group and considerably less variation for the other species groups (Table 7). The BGC model (13 Biogeoclimatic units) explained the least variation for those species groups that are adapted to recurrent disturbance, i.e., shade intolerant sprouter (endurer1), shade intolerant seedbanker (evader1), shade tolerant sprouter (endurer2), and invader species groups (Table 7). These results suggest that ecosystems subjected to long periods of fire suppression will possibly experience some change in plant species that belong to these mostly shade intolerant species groups.

Objective 3: Prediction of which Ktunaxa plants would be most affected by reduced fire frequency

Based on the findings of this study and the suggestion from this study that Rowe's hypothesis is valid, the Ktunaxa plant resources that most likely will be adversely affected by reduced fire frequency are plants with the ability to resprout from underground parts, e.g., rhizomes, root crown, after a fire (endurer1, endurer2), plants that store their seed in mineral soil (evader1), and plants that establish rapidly from wind-borne seed (invader).

Fire cycle length is only one factor that can affect the Ktunaxa plants, although it was not possible to include all of these factors in this study. Disturbance agents, such as grazing, and insect and disease outbreaks in these ecosystems can also influence the distribution and abundance of plant species.

Grazing by wild and domestic livestock is an important factor in the East Kootenay region. The Ktunaxa introduced horses to the East Kootenay region in the 1700s and feral horses roamed on Crown rangelands until the 1950s (Demarchi 1986). Domestic livestock grazing has been present in the East Kootenay region since the mid-1850s. Forage resources became limited for livestock and wild ungulate species by the 1960s as populations increased while the available land base decreased with the construction of the Libby Dam on the Columbia River (Demarchi 1986). If grazing becomes a part of the normal environment, then it is possible to affect the reproduction of a species to the point of its disappearance from a site (Noble and Slatyer 1980). An example of this change in the natural disturbance regime was the effects of elk on aspen in the Rocky Mountain National Park (Baker et al. 1997) and on deciduous shrub species in Yellowstone National Park (Kay 1995).

CONCLUSIONS

Objective 1: Determine the vital attributes for Ktunaxa plants

Vital attributes were derived for each of the Ktunaxa plants. Through the process, it was discovered that many plant species exhibit multiple strategies for surviving disturbance within a community and in different ecosystems, which adds to the complexity of using vital attributes to predict plant response to disturbance. More research is needed on the life histories of herbaceous species and their adaptive traits, as identified by other workers (Cattelino et al. 1979; Hobbs et al. 1984). The vital attributes of Ktunaxa plants should be used in conjunction with as much information as possible on the site and disturbance history of the ecosystems involved and their surrounding areas.

Objective 2: Determine the validity of Rowe's (1983) hypothesis for the East Kootenay Ktunaxa plants

Given the assumptions made in the foregoing discussion regarding the vital attributes theory, the assignment of the vital attributes, Ktunaxa plants representation of the total plants within a plot, the potential bias and error in the BEC plot data, and the accuracy of the NDT framework, the data from this study were unable to conclusively validate Rowe's hypothesis on the relationship between vital attributes and fire cycle length, but that it could be valid for southeastern British Columbia. According to Rowe's hypothesis, if fire cycle length is increased, then the species groups most likely affected will be those favoured by short fire cycle length.

Objective 3: Prediction of which Ktunaxa plants would be most affected by reduced fire frequency

Based on the results of this study and the assumption that Rowe's hypothesis was valid, Ktunaxa plants in the species groups most likely to be adversely affected by fire suppression are those adapted to recurrent disturbance: the shade intolerant and tolerant sprouters (endurer1, endurer2), shade intolerant seedbanker (evader1), and invader species groups (Table 8). This study and its associated database will be useful to the Ktunaxa for identifying the ecosystems in which the Ktunaxa plants occur and developing a plant conservation strategy for specific culturally important plants. In ecosystems where the fire regimes have been severely altered, consideration must be given to whether it is feasible to re-introduce fire without some mechanical pre-treatment and the possible positive response of non-target species, including exotics to disturbance (Hobbs and Huenneke 1992).

Table 8. List of Ktunaxa plants by species group most likely affected by reduced fire frequency
 *indicates introduced species

Species Group	Scientific Name	Common Name
Invader	<i>Agoseris glauca</i>	short-beaked agoseris
Invader	<i>Alnus tenuifolia</i>	mountain alder
Invader	<i>Anemone patens</i>	prairie crocus
Invader	<i>Artemisia dracunculus</i>	tarragon
Invader	<i>Artemisia frigida</i>	prairie sagewort
Invader	<i>Artemisia ludoviciana</i>	western mugwort
Invader	<i>Artemisia michauxiana</i>	Michaux's mugwort
Invader	<i>Betula papyrifera</i>	paper birch
Invader	<i>Bromus carinatus</i>	California brome
Invader	<i>Bromus tectorum*</i>	cheatgrass
Invader	<i>Carex scoparia</i>	pointed broom sedge
Invader	<i>Castilleja miniata</i>	scarlet paintbrush
Invader	<i>Centaurea diffusa*</i>	diffuse knapweed
Invader	<i>Centaurea maculosa*</i>	spotted knapweed
Invader	<i>Centaurea repens</i>	Russian knapweed
Invader	<i>Cirsium arvense</i>	Canada thistle
Invader	<i>Cirsium undulatum</i>	wavy-leaved thistle
Invader	<i>Cirsium vulgare*</i>	bull thistle
Invader	<i>Cleome serrulata</i>	Rocky Mountain bee-plant
Invader	<i>Dodecatheon conjugens</i>	slimpod shootingstar
Invader	<i>Dodecatheon pulchellum</i>	few-flowered shootingstar
Invader	<i>Epilobium angustifolium</i>	fireweed
Invader	<i>Gaillardia aristata</i>	brown-eyed Susan
Invader	<i>Heuchera cylindrica</i>	round-leaved alumroot
Invader	<i>Lappula redowskii</i>	western stickseed
Invader	<i>Mahonia aquifolium</i>	tall Oregon-grape
Invader	<i>Opuntia polyacantha</i>	plains prickly-pear cactus
Invader	<i>Phleum pratense*</i>	common timothy
Invader	<i>Pinus albicaulis</i>	whitebark pine
Invader	<i>Pinus monticola</i>	western white pine
Invader	<i>Plantago major*</i>	common plantain
Invader	<i>Rhamnus purshiana</i>	casacara
Invader	<i>Sorbus scopulina</i>	western mountain-ash
Invader	<i>Sorbus sitchensis</i>	Sitka mountain-ash
Invader	<i>Taraxacum officinale*</i>	common dandelion
Invader	<i>Urtica dioica</i>	stinging nettle

Table 8. (..Continued)

Species Group	Scientific Name	Common Name
Evader1	<i>Ceanothus sanguineus</i>	redstem ceanothus
Evader1	<i>Ceanothus velutinus</i>	snowbrush
Evader1	<i>Chenopodium capitatum</i>	strawberry-blite
Evader1	<i>Fragaria vesca</i>	wood strawberry
Evader1	<i>Fragaria virginiana</i>	wild strawberry
Evader1	<i>Geranium viscosissimum</i>	sticky purple geranium
Evader1	<i>Hordeum jubatum</i>	foxtail barley
Evader1	<i>Matricaria discoidea*</i>	pineapple weed
Evader1	<i>Oxytropis</i> sp.	locoweed
Evader1	<i>Ribes cereum</i>	squaw currant
Evader1	<i>Ribes irriguum</i>	Idaho gooseberry
Evader1	<i>Ribes oxycanthoides</i>	northern gooseberry
Evader1	<i>Sambucus cerulea</i>	blue elderberry
Evader1	<i>Sambucus racemosa</i>	red elderberry
Endurer1	<i>Achillea millefolium</i>	yarrow
Endurer1	<i>Allium cernuum</i>	nodding onion
Endurer1	<i>Apocynum androsaemifolium</i>	spreading dogbane
Endurer1	<i>Apocynum cannabinum</i>	hemp dogbane
Endurer1	<i>Arctostaphylos uva-ursi</i>	kinnikinnick
Endurer1	<i>Calochortus apiculatus</i>	three-spot mariposa lily
Endurer1	<i>Calochortus macrocarpus</i>	sagebrush mariposa lily
Endurer1	<i>Camassia quamash</i>	common camas
Endurer1	<i>Chrysothamnus nauseosus</i>	rabbit-brush
Endurer1	<i>Claytonia lanceolata</i>	western springbeauty
Endurer1	<i>Cornus stolonifera</i>	red-osier dogwood
Endurer1	<i>Corylus cornuta</i>	beaked hazelnut
Endurer1	<i>Elaeagnus commutata</i>	silverberry
Endurer1	<i>Fritillaria pudica</i>	yellow bell
Endurer1	<i>Juncus balticus</i>	Baltic rush
Endurer1	<i>Lewisia rediviva</i>	bitterroot
Endurer1	<i>Lilium columbianum</i>	tiger lily
Endurer1	<i>Lilium philadelphicum</i>	wood lily
Endurer1	<i>Lithospermum ruderale</i>	lemonweed gromwell
Endurer1	<i>Lomatium geyeri</i>	Geyer's desert-parsley
Endurer1	<i>Monarda fistulosa</i>	wild bergamot
Endurer1	<i>Petasites sagittatus</i>	arrow-leaved coltsfoot
Endurer1	<i>Philadelphus lewisii</i>	mock-orange
Endurer1	<i>Populus balsamifera</i> ssp.	black cottonwood
Endurer1	<i>Populus tremuloides</i>	trembling aspen
Endurer1	<i>Prunus virginiana</i>	choke cherry
Endurer1	<i>Pteridium aquilinum</i>	bracken fern
Endurer1	<i>Rosa acicularis</i>	prickly rose
Endurer1	<i>Rosa woodsii</i>	prairie rose
Endurer1	<i>Rubus idaeus</i>	red raspberry

Table 8. (..Continued)

Species Group	Scientific Name	Common Name
Endurer1	<i>Rubus leucodermis</i>	black raspberry
Endurer1	<i>Rubus parviflorus</i>	thimbleberry
Endurer1	<i>Rubus pedatus</i>	five-leaved bramble
Endurer1	<i>Sagittaria latifolia</i>	wapato
Endurer1	<i>Salix exigua</i>	sandbar willow
Endurer1	<i>Salix scouleriana</i>	Scouler's willow
Endurer1	<i>Scirpus acutus</i>	hard-stemmed bulrush
Endurer1	<i>Typha latifolia</i>	common cattail
Endurer1	<i>Verbascum thapsus*</i>	great mullein
Endurer1	<i>Xerophyllum tenax</i>	bear-grass
Endurer1	<i>Zigadenus venenosus</i>	meadow death-camas
Endurer2	<i>Acer glabrum</i>	Douglas maple
Endurer2	<i>Amelanchier alnifolia</i>	saskatoon
Endurer2	<i>Angelica genuflexa</i>	kneeling angelica
Endurer2	<i>Aralia nudicaulis</i>	wild sarsaparilla
Endurer2	<i>Athyrium filix-femina</i>	lady fern
Endurer2	<i>Balsamorhiza sagittata</i>	arrow-leaved balsamroot
Endurer2	<i>Calamagrostis rubescens</i>	pinegrass
Endurer2	<i>Cicuta douglasii</i>	Douglas' water-hemlock
Endurer2	<i>Crataegus columbiana</i>	red hawthorn
Endurer2	<i>Crataegus douglasii</i>	black hawthorn
Endurer2	<i>Elymus spicatus</i>	bluebunch wheatgrass
Endurer2	<i>Equisetum arvense</i>	common horsetail
Endurer2	<i>Equisetum hyemale</i>	scouring-rush
Endurer2	<i>Equisetum pratense</i>	meadow horsetail
Endurer2	<i>Erythronium grandiflorum</i>	yellow glacier lily
Endurer2	<i>Hierochloa odorata</i>	common sweetgrass
Endurer2	<i>Holodiscus discolor</i>	oceanspray
Endurer2	<i>Ledum glandulosum</i>	trapper's tea
Endurer2	<i>Ledum groenlandicum</i>	Labrador tea
Endurer2	<i>Ligusticum canbyi</i>	Canby's lovage
Endurer2	<i>Lupinus sericeus</i>	silky lupine
Endurer2	<i>Mentha arvensis</i>	field mint
Endurer2	<i>Osmorhiza occidentalis</i>	western sweet-cicely
Endurer2	<i>Perideridia gairdneri</i>	Gairdner's yampah
Endurer2	<i>Rhus glabra</i>	smooth sumac
Endurer2	<i>Rhus radicans</i>	poison-ivy
Endurer2	<i>Shepherdia canadensis</i>	soopolallie
Endurer2	<i>Spiraea betulifolia</i>	birch-leaved spirea
Endurer2	<i>Symphoricarpos albus</i>	common snowberry
Endurer2	<i>Vaccinium caespitosum</i>	dwarf blueberry
Endurer2	<i>Vaccinium membranaceum</i>	black huckleberry
Endurer2	<i>Vaccinium myrtillus</i>	low bilberry
Endurer2	<i>Vaccinium scoparium</i>	grouseberry

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APPENDICES

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
ABIEGRA	<i>Abies grandis</i>	grand fir

VITAL ATTRIBUTE DATA

Regeneration	D, (C)	Establishment	T
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Life History	m=20, l=250
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Selected Species Type	DT	Species Group	Avoider
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Notes	In Interior B.C., grand fir is only found in moist river valleys. Shallow roots. In B.C. reproduction of grand fir is most common after fire or other disturbance
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Successional Status	Never seral on sites with frequent fires. It can be either climax or seral on sites that experience infrequent crown fires.
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Fire Response	moderately susceptible
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Fire Source	Fischer <i>et al.</i> 1996.
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ADDITIONAL INFORMATION

Aboriginal Uses	Widely used for medicinal purposes. See Moerman (1998) for detailed reference. Used as building materials. See Turner (1998) for detailed reference and other uses.
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Wildlife Uses	Fir needles are a major part of the diet of grouse. Birds and the Douglas' squirrel and other small mammals eat the seeds.
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Wildlife Cover Value	Good thermal and hiding cover for big game animals. Good nesting and roosting sites for birds. Old, rotten grand fir trees and snags provide nesting and feeding sites for cavity nesters.
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Nutritional Value	No entry
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Other Uses	Grand fir is grown commercially for Christmas trees.
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APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
ABIELAS	<i>Abies lasiocarpa</i>	subalpine fir

VITAL ATTRIBUTE DATA

Regeneration	D, (C)	Establishment	R
Life History	m=20, l=150-200		
Selected Species Type	DR	Species Group	Avoider
Notes	Crown fires common. High mortality even from low intensity fires.		
Successional Status	Shade tolerant climax		
Fire Response	Very fire sensitive		
Fire Source	Fischer <i>et al.</i> 1996.		

ADDITIONAL INFORMATION

Aboriginal Uses	Used as a cold remedy and ceremonial medicine. See Moerman (1998) for detailed reference. All parts of the tree used for many household purposes. See Turner (1998) for detailed reference.
Wildlife Uses	Mule deer, elk, moose, woodland caribou, black bear, and grizzly bear often use subalpine fir habitats as summer range. Snowshoe hare, flying squirrel, red squirrel, porcupine, pine marten, fisher, lynx, and several species of mice, voles, chipmunks, and shrews all inhabit subalpine fir forests. Numerous birds nest and feed in subalpine fir forests (woodpeckers, flycatchers, kinglets, nuthatches, juncos, thrushes, chickadees, crossbills, pine siskin, owls, and grouse. Old-growth subalpine fir stands in northern Idaho may provide critical habitat for woodland caribou. Numerous subalpine fir habitat types, especially those containing huckleberries (<i>Vaccinium</i> spp.) provide critical habitat for grizzly bears.
Wildlife Cover Value	Subalpine fir habitat types provide excellent hiding cover for deer, elk, mountain goats, moose, and bear. Dense thickets of small trees provide good hiding cover for small mammals such as snowshoe hares and porcupines, and provide overwintering habitat and escape cover for blue grouse.
Nutritional Value	Subalpine fir is low in protein value, but fair in energy value.
Other Uses	Resin from the bark is used in the optical industry and in laboratories as a cement for lenses and microscope slides.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
ACERGLA	<i>Acer glabrum</i>	Douglas maple

VITAL ATTRIBUTE DATA

Regeneration	V, D	Establishment	T
Life History	p, m~10, l=150?		
Selected Species Type	VT	Species Group	Endurer, Avoider
Notes	Usually has large stumps and a deep root system.		

Successional Status Long-lived, shade tolerant seral species.

Fire Response Sprouts from root crown

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Minor use for medicinal purposes (Moerman 1986). Its tough, pliable wood was widely used for many technologies, including snowshoes, and household utensils. See Turner (1998) for detailed reference and other uses.

Wildlife Uses Highly valued browse species for moose, elk, mule deer, and white-tailed deer, and is especially important as a winter food source. Seeds, buds, and flowers provide food for numerous birds and small mammals. Squirrels and chipmunks eat the seed and frequently cache them. Buds are eaten by grouse, and leaves and seed stalks are used by numerous birds for nests.

Wildlife Cover Value Brushfields that develop after fire or other disturbance are prime winter range and provide both cover and food for moose, elk, and deer.

Nutritional Value No entry

Other Uses Seems best suited for game range revegetation in mountain shrub, open conifer, and aspen types.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
ACHIMIL	<i>Achillea millefolium</i>	yarrow

VITAL ATTRIBUTE DATA

Regeneration V, D Establishment I

Life History p

Selected Species Type VI Species Group Invader, Endurer

Notes Due to extensive rhizome sprouting, western yarrow usually increases immediately in density, frequency, and cover for at least the first few years following a fire.

Successional Status Invader species and appears to be tolerant of competition.

Fire Response Rapid rhizome spread

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Very widely used for medicinal purposes. See Moerman (1998) for detailed reference. Used for making a smudge for repelling mosquitoes. See Turner (1998) for detailed reference.

Wildlife Uses Occasionally consumed by domestic livestock and wildlife (sheep, pronghorn, and deer). An important and favoured food of 4-8 week-old sage grouse chicks.

Wildlife Cover Value No entry

Nutritional Value Compared with other forbs, western yarrow is rated as poor in energy and protein content.

Other Uses Extensive system rhizomes makes western yarrow a good soil binder and is used in certain types of erosion control.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
AGOSGLA	<i>Agoseris glauca</i>	short-beaked agoseris

VITAL ATTRIBUTE DATA

Regeneration	D	Establishment	I
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Life History

Selected Species Type	DI	Species Group	Invader
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Notes Taprooted perennial.

Successional Status No entry

Fire Response No entry

Fire Source Hitchcock *et al.* 1955-69.

ADDITIONAL INFORMATION

Aboriginal Uses Milky latex was allowed to harden and then chewed like bubblegum. See Turner (1997) for detailed reference.

Wildlife Uses No entry

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
ALLICER	<i>Allium cernuum</i>	nodding onion

VITAL ATTRIBUTE DATA

Regeneration	D, V	Establishment I
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Life History

Selected Species Type	VI	Species Group	Invader, Endurer
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Notes Bulbs elongate, clustered, often short-rhizomatous at base.

Successional Status No entry

Fire Response No entry

Fire Source Hitchcock *et al.* 1955-69.

ADDITIONAL INFORMATION

Aboriginal Uses Widely used for medicinal purposes. See Moerman (1998) for detailed reference. Bulbs were a popular food on the coast and interior of BC (Turner 1997). Vancouver Island Salish rubbed the bulbs on their skin as an insect repellent (Turner 1998).

Wildlife Uses No entry

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
ALNUTEN	<i>Alnus tenuifolia</i>	mountain alder

VITAL ATTRIBUTE DATA

Regeneration V,D Establishment I

Life History p

Selected Species Type DI Species Group Endurer, Invader

Notes Seldom grows away from water. Fires are infrequent. *Alnus tenuifolia* has the ability to sprout from its root crown and numerous wind- and water-dispersed seeds.

Successional Status Quite shade tolerant. Early seral species. Seasonal disturbances from flooding provides suitable seedbeds for establishment of new plants. Many *Alnus tenuifolia* communities appear to be seral to cottonwood and willow.

Fire Response Ability to sprout from its root crown

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Used for medicinal purposes. See Moerman (1998) for detailed reference. Used in many technologies. See Turner (1998) for detailed reference.

Wildlife Uses Twigs and leaves of younger *Alnus tenuifolia* are eaten by deer, elk, and moose. Muskrats, beavers, cottontails, and snowshoe hares all eat alder twigs and leaves. Beavers eat the bark and build dams and lodges with the stems. Alder seeds, buds, and catkins are eaten by redpolls, siskins, chickadees, and goldfinches and are considered to be an important winter food source.

Wildlife Cover Value *Alnus tenuifolia* communities provide hiding and thermal cover for white-tailed and mule deer and often serve as travel corridors for big game animals. Many bird species use *Alnus tenuifolia* communities for nesting and rearing. When *Alnus tenuifolia* overhangs a streambank, plants provide cover and shade for salmonids.

Nutritional Value Energy value has been rated fair and its protein value as poor.

Other Uses Recommended for use in revegetating disturbed riparian areas.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
AMELALN	<i>Amelanchier alnifolia</i>	saskatoon

VITAL ATTRIBUTE DATA

Regeneration V Establishment T

Life History p

Selected Species Type VT Species Group Endurer

Notes Fire, clipping, or grazing stimulates growth. *Amelanchier alnifolia* is most vigorous in seral situations, and beyond a certain point during succession, productivity will drop.

Successional Status Seral species, long-lived, can remain suppressed in closed conifer stands for long periods of time.

Fire Response New shoots sprout from rhizomes

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Used for medicinal purposes. See Moerman (1998) for detailed reference. Saskatoon berries were the most extensively used by the interior First Peoples of BC. Many varieties were classified by interior groups. See Turner (1997) for detailed reference. Saskatoon wood was the major arrow-making material. See Turner (1998) for detailed reference.

Wildlife Uses White-tailed deer, mule deer, elk, bighorn sheep, mountain goat, and moose use it primarily as winter forage. Small mammals, bears, and many species of birds eat the berries.

Wildlife Cover Value Used for cover mainly by mule deer, white-tailed deer, small mammals, small nongame birds, and upland game birds.

Nutritional Value Rated fair in energy and protein value.

Other Uses Used today in pies and preserves.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
ANEMPAT	<i>Anemone patens</i>	prairie crocus

VITAL ATTRIBUTE DATA

Regeneration	D	Establishment	I
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Life History

Selected Species Type	DI	Species Group	Invader
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Notes Perennial, propagates easily from large, spherical clusters of silky-haired, long-plumed seeds (Parish *et al.* 1996).

Successional Status Common in the southern Rocky Mountain Trench, locally common in grasslands, dry meadows and mountain slopes.

Fire Response No entry

Fire Source Hitchcock *et al.* 1955-69.

ADDITIONAL INFORMATION

Aboriginal Uses Used by the Chippewa and Omaha for medicinal purposes (Moerman 1986). Minor use for medicinal purposes by BC Interior First Peoples (Turner 1997).

Wildlife Uses No entry

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
ANGEGEN	<i>Angelica genuflexa</i>	kneeling angelica

VITAL ATTRIBUTE DATA

Regeneration	D, V	Establishment	T
Life History			
Selected Species Type	VT	Species Group	Avoider, Endurer
Notes	Possibly fibrous rooted.		

Successional Status No entry

Fire Response No entry

Fire Source Hitchcock *et al.* 1955-69.

ADDITIONAL INFORMATION

Aboriginal Uses *Angelica* genus widely used for medicinal purposes. See Moerman (1998) for detailed reference. Children made whistles and blowguns from the hollow stems. See Turner (1998) for detailed reference.

Wildlife Uses No entry

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
APOCAND	<i>Apocynum androsaemifolium</i>	spreading dogbane

VITAL ATTRIBUTE DATA

Regeneration	V	Establishment	I
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Life History

Selected Species Type	VI	Species Group	Endurer
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Notes Rhizomatous perennial, 20-50cm tall (Parish *et al.* 1996).

Successional Status No entry

Fire Response No entry

Fire Source Parish *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Widely used for medicinal purposes. See Moerman (1998) for detailed reference. Was occasionally used when *Apocynum cannabinum* was not available as a source of plant fibre. See Turner (1998) for detailed reference.

Wildlife Uses No entry

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
APOCCAN	<i>Apocynum cannabinum</i>	hemp dogbane

VITAL ATTRIBUTE DATA

Regeneration	V	Establishment	I
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Life History

Selected Species Type	VI	Species Group	Endurer
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Notes Bushy, rhizomatous herbaceous perennial that grows up to 1 metre tall, with smooth, often reddish stems (Turner 1998).

Successional Status No entry

Fire Response Estimated from *Apocynum androsaemifolium*

Fire Source Estimated from *Apocynum androsaemifolium*

ADDITIONAL INFORMATION

Aboriginal Uses Widely used for medicinal purposes. See Moerman (1998) for detailed reference. Most important source of plant fibre for First Peoples of the southern interior. See Turner (1998) for detailed reference and uses.

Wildlife Uses No entry

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
ARALNUD	<i>Aralia nudicaulis</i>	wild sarsaparilla

VITAL ATTRIBUTE DATA

Regeneration V, S Establishment T

Life History p

Selected Species Type VT Species Group Endurer, Evader

Notes Forms extensive colonies by vegetative reproduction. Surviving rhizomes sprout and vigorously grow following fall or spring fires. New rhizomes are produced.

Successional Status Shade tolerant, characteristic of a wide range of climax forests.

Fire Response Surviving rhizomes sprout.

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Roots and leaves widely used for medicinal purposes. See Moerman (1998) for detailed reference.

Wildlife Uses Browsed by livestock and wildlife. Grizzly and black bear consume the fruits. Frequently browsed in summer by caribou, and is a preferred spring food of moose.

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses Rhizomes have been used to make beverages such as root beer.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
ARCTUVA	<i>Arctostaphylos uva-ursi</i>	kinnikinnick

VITAL ATTRIBUTE DATA

Regeneration	V, (S)	Establishment	I
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Life History	p
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Selected Species Type	VI	Species Group	Endurer
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Notes Bearberry is a sprouting species that is best suited to short fire cycles with low fuel buildup and low fire intensities. Its roots are in organic soil horizons.

Successional Status Seral, shade-intolerant species. It grows best in high light conditions.

Fire Response Sprouting from root crown or rooted stems.

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Widely used for medicinal purposes. See Moerman (1998) for detailed reference. Most interior aboriginal groups ate kinnikinnick berries raw or cooked. Its leaves were used as tobacco. See Turner (1997) for detailed reference.

Wildlife Uses Browsed by bighorn sheep, mountain goat, black-tailed deer, and white-tailed deer. Important to moderately important browse for Rocky Mountain mule deer. Fruit is eaten by black bear and grizzly bear in the autumn, and is especially important to bears in the early spring.

Wildlife Cover Value Fair to good cover for small mammals and small nongame birds.

Nutritional Value Energy and protein values of bearberry browse are low.

Other Uses Bearberry leaves are used medicinally in Poland and many other countries. For medical use the leaves are best collected in the fall.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
ARTEDRA	<i>Artemisia dracunculus</i>	tarragon

VITAL ATTRIBUTE DATA

Regeneration	V, D	Establishment	I
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Life History	p
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Selected Species Type	DI	Species Group	Endurer, Invader
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Notes	Plants generally increase to grazing pressure on native grassland sites in Montana.
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Successional Status	Pioneer species. It invades disturbed sites in a wide variety of nonforested and forested communities.
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Fire Response	Rhizomes and numerous wind-dispersed seed.
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Fire Source	Fischer <i>et al.</i> 1996.
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ADDITIONAL INFORMATION

Aboriginal Uses	Used for medicinal purposes. See Moerman (1998) for detailed reference. Valued for its aromatic fragrance which acts as an effective insect repellent. See Turner (1998) for detailed reference.
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Wildlife Uses	Limited value as a forage species. May be of seasonal importance to domestic sheep, mule deer, and other game animals.
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Wildlife Cover Value	Fair to good for small mammals.
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Nutritional Value	Rated fair in energy and protein value.
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Other Uses	Widely used as a seasoning and also as an herb for flavoring vinegar.
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APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
ARTEFRI	<i>Artemisia frigida</i>	prairie sagewort

VITAL ATTRIBUTE DATA

Regeneration	D, V, S	Establishment	I
Life History	p, m-2-3		
Selected Species Type	DI	Species Group	Invader, Endurer, Evader

Notes *Artemisia frigida* typically increases in response to livestock grazing. *Artemisia frigida* has a relatively deep and extensive fibrous roots that arise adventitiously from the horizontal stem. Produces abundant small, wind-dispersed seed. Variable response of *Artemisia frigida* to fire are influenced by season of burn, fire intensity, site characteristics, plant associations, and geographic and climatic factors.

Successional Status Occurs in both seral and climax vegetation.

Fire Response Variable response (increase, decrease)

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Widely used for medicinal purposes. See Moerman (1998) for detailed reference. Valued for its aromatic fragrance which acts as an effective insect repellent. See Turner (1998) for detailed reference.

Wildlife Uses Varies seasonally and geographically. For many wildlife species it is a preferred forage during spring, fall, and winter, but is of little value during summer. Elk, pronghorn, mule deer, white-tailed deer, bison, bighorn sheep, Dall sheep, and mountain goats feed on *Artemisia frigida*. It is important sage grouse food in Central Montana. Used to some degree by cattle and by domestic sheep and goats.

Wildlife Cover Value Poor to good for small mammals.

Nutritional Value *Artemisia frigida* provides at least fair energy and protein value. Food value varies according to phenological development and perhaps ecotype as well.

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
ARTELUD	<i>Artemisia ludoviciana</i>	western mugwort

VITAL ATTRIBUTE DATA

Regeneration	V, D	Establishment	I
Life History	p		
Selected Species Type	DI	Species Group	Endurer, Invader
Notes	Studies in Alberta indicate <i>Artemisia ludoviciana</i> is well adapted to repeated, annual spring burning.		

Successional Status Pioneer species that rapidly invades disturbed sites; long-lived, can coexist with later arriving species.

Fire Response Rhizomes, basal sprouting, off-site seeds

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Widely used for medicinal purposes. See Moerman (1998) for detailed reference. Valued for its aromatic fragrance which acts as an effective insect repellent. See Turner (1998) for detailed reference.

Wildlife Uses Limited value as a forage species. It may be of seasonal importance to domestic sheep, mule deer, elk, and other game animals.

Wildlife Cover Value Fair to poor for most mammals and birds.

Nutritional Value Rated fair in energy and protein value.

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
ARTEMIC	<i>Artemisia michauxiana</i>	Michaux's mugwort

VITAL ATTRIBUTE DATA

Regeneration	D, V	Establishment I
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Life History

Selected Species Type	DI	Species Group	Invader, Endurer
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Notes	Perennial, several-stemmed from a woody caudex, commonly rhizomatous and sometimes apparently with a taproot.
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Successional Status	No entry
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Fire Response	No entry
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Fire Source	Hitchcock <i>et al.</i> 1955-69.
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ADDITIONAL INFORMATION

Aboriginal Uses	No entry
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Wildlife Uses	No entry
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Wildlife Cover Value	No entry
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Nutritional Value	No entry
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Other Uses	No entry
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APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
ATHYFIL	<i>Athyrium filix-femina</i>	lady fern

VITAL ATTRIBUTE DATA

Regeneration V Establishment T

Life History p

Selected Species Type VT Species Group Endurer

Notes Lady fern occurs on wet sties that burn infrequently. Reproduces from rhizomes and spores.

Successional Status Pioneer species. Lady fern can establish in the young seral stage to the mature climax stage.

Fire Response Resprouts from surviving rhizomes.

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Used by some groups for easing pain. See Moerman (1998) for detailed reference. Minor use mentioned in Turner (1998).

Wildlife Uses Fronds provide a food source for grizzly bears.

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
BALSSAG	<i>Balsamorhiza sagittata</i>	arrow-leaved balsamroot

VITAL ATTRIBUTE DATA

Regeneration	D, V	Establishment	T
Life History	p, m=3-4		
Selected Species Type	VT	Species Group	Avoider, Endurer
Notes	Increases in frequency and density after fire due to seed production (2-5 years).		

Successional Status Climax indicator in several sagebrush and grassland habitat types. Arrowleaf balsamroot also does well after fire.

Fire Response Regrowth from thick caudex.

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Mainly the roots widely used for medicinal purposes. See Moerman (1998) for detailed reference. Roots, young shoots, bud-stems and seeds used by peoples of southern interior BC. See Turner (1997) for detailed reference). Used as insulating layer inside moccasins by the Okanagan. See Turner (1998) for detailed reference and other uses.

Wildlife Uses Provides some forage for cattle, sheep, horses, pronghorn, bighorn sheep, and mule deer. Flowering heads preferred over foliage.

Wildlife Cover Value Poor to good for small mammals, small nongame birds, and upland game birds.

Nutritional Value Rated fair in energy value and poor in protein value.

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
BETUPAP	<i>Betula papyrifera</i>	paper birch

VITAL ATTRIBUTE DATA

Regeneration	D, V	Establishment	I
Life History	p, m=15, l=140		
Selected Species Type	DI	Species Group	Invader, Endurer
Notes	Shade-intolerant. Undamaged trees within a burn or trees in nearby unburned stands are necessary for postfire seedling establishment. Seedling establishment is generally greatest from postfire years 2 to 5.		
Successional Status	Short-lived, shade-intolerant, pioneer species. Paper birch seeds in aggressively after wildfire, often forming large, essentially pure stands.		
Fire Response	Sprouts from the root collar, seed trees		
Fire Source	Fischer <i>et al.</i> 1996.		

ADDITIONAL INFORMATION

Aboriginal Uses	Baskets and canoes were items interior peoples most commonly made from birch bark. See Turner (1998) for detailed reference and other uses.
Wildlife Uses	Important moose browse. White-tailed deer eat considerable amounts of paper birch leaves in the fall. Snowshoe hares browse seedlings and saplings and porcupines feed on the inner bark of trees. Paper birch is also eaten by beavers. Numerous birds and small mammals eat paper birch buds, catkins and seeds. Voles and shrews also eat the seeds. Yellow-bellied sapsuckers peck holes in the bark to feed on the sap.
Wildlife Cover Value	Young paper birch stands provide prime deer and moose cover. Numerous cavity-nesting birds nest in paper birch, including woodpeckers, chickadees, nuthatches, and swallows.
Nutritional Value	Poor quality winter browse for moose due to high lignin content in twigs.
Other Uses	Commercially used for veneer, plywood, and pulpwood, furniture, cabinets, chips in pulp and paper manufacture, and fireplace and wood stove fuel. Paper birch is useful for long-term revegetation and soil stabilization of severely disturbed sites.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
BROMCAR	<i>Bromus carinatus</i>	California brome

VITAL ATTRIBUTE DATA

Regeneration	D	Establishment	I
Life History	p, m=1		
Selected Species Type	DI	Species Group	Invader
Notes	California brome's coarse stems burn quickly and transfer little heat down below the soil surface.		

Successional Status Occurs on highly disturbed sites and climax communities.

Fire Response Surviving seeds or off-site seed.

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses No entry

Wildlife Uses Utilized by livestock primarily in spring and early summer.

Wildlife Cover Value Fair to good for small mammals, small nongame birds, and upland game birds.

Nutritional Value Nutritional content (percent dry matter and chemical composition) varies with vegetation type and site characteristics. Nutritional content also varies with phenological stage.

Other Uses Recommended for revegetation in aspen, subalpine, and mountain-brush zones. It exhibits very good initial establishment, growth rate, and herbage yield, and good natural spread.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
BROMTEC	<i>Bromus tectorum</i>	cheatgrass

VITAL ATTRIBUTE DATA

Regeneration D Establishment I

Life History m=1, l=40-50

Selected Species Type DI Species Group Invader

Notes Exotic, annual species. Favoured by overgrazing, cultivation, or frequent fire. Shade-intolerant. Life cycle complete by early spring. Highly flammable due to complete summer drying, fine structure, and tendency to accumulate litter.

Successional Status Both an early seral invader and a climax dominant on many sites that historically supported a perennial grass and forb understory.

Fire Response Seeds survive in unburned organic material

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses No entry

Wildlife Uses Provides good nutrition for livestock in the spring.

Wildlife Cover Value Poor to good for small nongame birds and small mammals.

Nutritional Value Nutritive value drops rapidly as it matures.

Other Uses Used to eliminate more noxious plants such as *Halogeton glomeratus*.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
BRYOFRE	<i>Bryoria fremontii</i>	edible horsehair

VITAL ATTRIBUTE DATA

Regeneration	D	Establishment	R
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Life History

Selected Species Type	DR	Species Group	Avoider
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Notes Grows on branches, disperses mostly by asexual means, either by fragmentation or by the soredia carried away by birds and other animals (Parish *et al.* 1996).

Successional Status No entry

Fire Response No entry

Fire Source Rowe 1983

ADDITIONAL INFORMATION

Aboriginal Uses Food plant of many B.C. Interior First Peoples. See Turner (1997) for detailed reference.

Wildlife Uses No entry

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
CALARUB	<i>Calamagrostis rubescens</i>	pinegrass

VITAL ATTRIBUTE DATA

Regeneration V **Establishment** T

Life History p

Selected Species Type VT **Species Group** Endurer

Notes Native, perennial, rhizomatous grass with sod-forming habit in open areas. Aggressively competes for moisture.

Successional Status Late seral to climax species in different habitat types.

Fire Response Sprouts from rhizomes.

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Used in a number of food and clothing technologies. See Turner (1998) for detailed reference.

Wildlife Uses Primary forage on southern B.C. ranges for cattle. Also an important forage for black bear, deer, elk, pronghorn, and domestic sheep in some areas.

Wildlife Cover Value Poor to good for small mammals and birds.

Nutritional Value Moderate quality forage, but its value decreases throughout the growing season.

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
CALOAPI	<i>Calochortus apiculatus</i>	three-spot mariposa lily

VITAL ATTRIBUTE DATA

Regeneration	D, V	Establishment	I
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Life History

Selected Species Type	VI	Species Group	Invader, Endurer
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Notes Perennial, 10-30 cm tall, from deep-seated, fleshy bulbs. Infrequent at low elevations in East Kootenays and Okanagan Basin, on dry grassy slopes and in open woodlands (Parish *et al.* 1996).

Successional Status	No entry
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Fire Response	No entry
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Fire Source	Hitchcock <i>et al.</i> 1955-69.
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ADDITIONAL INFORMATION

Aboriginal Uses	No entry
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Wildlife Uses	No entry
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Wildlife Cover Value	No entry
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Nutritional Value	No entry
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Other Uses	No entry
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APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
CALOMAC	<i>Calochortus macrocarpus</i>	sagebrush mariposa lily

VITAL ATTRIBUTE DATA

Regeneration	D, V	Establishment	I
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Life History

Selected Species Type	VI	Species Group	Invader, Endurer
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Notes Perennial, 20-50 cm tall, from deep-seated, oval bulbs; stems stout and often bear bulblets at base of leaves. Widespread and common at low elevations in Fraser, Thompson and Okanagan basins and southern Rocky Mountain Trench, in dry grasslands and open ponderosa pine forests (Parish *et al.* 1996).

Successional Status	No entry
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Fire Response	No entry
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Fire Source	Hitchcock <i>et al.</i> 1955-69.
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ADDITIONAL INFORMATION

Aboriginal Uses	Bulbs were eaten by many Interior First Peoples. See Turner (1997) for detailed reference.
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Wildlife Uses	No entry
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Wildlife Cover Value	No entry
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Nutritional Value	No entry
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Other Uses	No entry
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APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
CAMAQUA	<i>Camassia quamash</i>	common camas

VITAL ATTRIBUTE DATA

Regeneration	V	Establishment	I
Life History	p, m=2-3		
Selected Species Type	VI	Species Group	Endurer
Notes	Shade intolerant.		

Successional Status In grasslands and meadows, it is most prevalent in initial and early seral communities, but also occurs in later seres.

Fire Response Top-killed, but bulbs protected by soil.

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Bulbs were eaten by Coastal and Interior First Peoples. See Turner (1997) for detailed reference.

Wildlife Uses Livestock, elk, moose, and caribou graze *Camassia quamash*. Pigs consume the bulbs.

Wildlife Cover Value No entry

Nutritional Value Forage is poor in energy and protein value. Bulbs contain inulin that is converted to fructose when cooked.

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
CARESCO	<i>Carex scoparia</i>	pointed broom sedge

VITAL ATTRIBUTE DATA

Regeneration	D	Establishment	I
Life History			
Selected Species Type	DI	Species Group	Invader
Notes	No entry		

Successional Status No entry

Fire Response No entry

Fire Source Heinselman 1981.

ADDITIONAL INFORMATION

Aboriginal Uses Possibly used as weaving material. See Turner (1998) for reference on sedges.

Wildlife Uses No entry

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
CASTMIN	<i>Castilleja miniata</i>	scarlet paintbrush

VITAL ATTRIBUTE DATA

Regeneration D Establishment I

Life History

Selected Species Type DI Species Group Invader

Notes Perennial, to 80cm tall, with several usually unbranched flowering stems from a woody base (Parish *et al.* 1996).

Successional Status No entry

Fire Response No entry

Fire Source Hitchcock *et al.* 1955-69.

ADDITIONAL INFORMATION

Aboriginal Uses Used for medicinal purposes by the Gitksan (Moerman 1986).

Wildlife Uses No entry

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
CEANSAN	<i>Ceanothus sanguineus</i>	redstem ceanothus

VITAL ATTRIBUTE DATA

Regeneration	D, S, V	Establishment	I
Life History	p, m=3-6, l=20		
Selected Species Type	SI	Species Group	Invader, Evader, Endurer
Notes	Seeds need heat for germination. Vast numbers of long-lived seed in soil or duff.		

Successional Status Usually early seral to mid-seral species. Primarily dependent on fire for regeneration, but can be eliminated if burned too frequently. Seedbanking is important.

Fire Response Sprouting from root crown, heat germinated seed

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Minor use for medicinal purposes. See Moerman (1998) and Turner (1997) for detailed reference. The Okanagan used the wood as a fuel for smoking deer meat if other woods were not available (Turner 1998).

Wildlife Uses Highly valued browse, particularly for elk. Mule deer, white-tailed deer, also use it intensively. Small mammals feed on the foliage and seedlings. Birds, rodents, ants and other insects consume large numbers of seeds. *Ceanothus sanguineus* is eaten by all classes of livestock.

Wildlife Cover Value Excellent cover for many birds and mammals.

Nutritional Value Fire, weather conditions, phenological development, and site characteristics may influence nutritional value of *Ceanothus sanguineus*.

Other Uses Deep root system and nitrogen-fixing ability can aid in soil stabilization.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
CEANVEL	<i>Ceanothus velutinus</i>	snowbrush

VITAL ATTRIBUTE DATA

Regeneration	S, V, D	Establishment	I
Life History	p, m=8, l=10-75		
Selected Species Type	SI	Species Group	Evader, Endurer, Invader
Notes	<i>Ceanothus velutinus</i> can be eliminated where fire intervals are extremely short.		

Successional Status Long-lived seral or climax species - wide ecological amplitude. Requires fire for establishment. Long-lived seed in the soil requires heat to germinate.

Fire Response Seed heat germinated, sprouting from root crown

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Used for medicinal purposes. See Moerman (1998) for detailed reference. The leaves were used to make a tea, sometimes for medicine and also as a beverage (Turner 1997). The Secwepemc placed branches on a hot stove to fumigate a house. The smoke acted as a disinfectant and insect repellent (Turner 1998).

Wildlife Uses Provides food and cover for a wide variety of wildlife species: elk, mule deer, white-tailed deer, moose, jackrabbits and pica, chipmunks and other small mammals, and birds.
Worthless to cattle.

Wildlife Cover Value Good cover for smaller birds and mammals.

Nutritional Value General protein and energy value is described as "poor", but varies according to site, plant part, and seasonal development.

Other Uses Deep rooting and nitrogen-fixing ability can be used for preventing soil erosion.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
CENTDIF	<i>Centaurea diffusa</i>	diffuse knapweed

VITAL ATTRIBUTE DATA

Regeneration	D, (S)	Establishment I
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Life History	m=2-5
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Selected Species Type	DI	Species Group	Invader, Evader
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Notes Biennial life cycle. Stout taproot. Introduced from Eurasia in late 1800s. Biological control agents have not yet been effective at reducing plant densities, but have been effective at reducing seed production.

Successional Status	Early successional species. Reproduces entirely by seed - prolific producer.
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Fire Response	Regenerates from buried seed or off-site sources.
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Fire Source	Fischer <i>et al.</i> 1996.
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ADDITIONAL INFORMATION

Aboriginal Uses	No entry
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Wildlife Uses	Mule deer, white-tailed deer, elk, and bighorn sheep graze knapweed species. Rodents eat <i>Centaurea diffusa</i> seeds.
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Wildlife Cover Value	No entry
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Nutritional Value	No entry
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Other Uses	<i>Centaurea diffusa</i> provides nectar for honeybees.
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APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
CENTMAC	<i>Centaurea maculosa</i>	spotted knapweed

VITAL ATTRIBUTE DATA

Regeneration D, S **Establishment** I

Life History m=2-5, l=3-5

Selected Species Type DI **Species Group** Invader, Evader

Notes Biennial life cycle. Stout taproot. *Centaurea maculosa* has ability to invade undisturbed communities. Biological control agents have not been effective in reducing plant densities, but have been effective at reducing seed production. Prescribed burning may be useful in conjunction with herbicides.

Successional Status Early successional species, shade intolerant.

Fire Response Regenerates from buried seed or off-site sources.

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses No entry

Wildlife Uses Mule deer, white-tailed deer, elk, and bighorn sheep browse flowerheads and rosettes of spotted knapweed. Domestic sheep also graze the rosettes and flowerheads. Rodents eat *Centaurea maculosa* seeds.

Wildlife Cover Value Poor cover for upland gamebirds, small nongame birds, and small mammals in Montana.

Nutritional Value *Centaurea maculosa* can be used as livestock forage, if collected before flowering.

Other Uses *Centaurea maculosa* provides nectar for honeybees.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
CENTREP	<i>Centaurea repens</i>	Russian knapweed

VITAL ATTRIBUTE DATA

Regeneration	V, D	Establishment	I
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Life History	p, m=1
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Selected Species Type	DI	Species Group	Endurer, Invader
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Notes Classified as a noxious weed. Control is difficult because of its perennial root system and allelopathic characteristics.

Successional Status Seral species. Invades disturbed sites and may move into undisturbed sites and pastures when growing conditions are ideal. Survives for long periods of time due to long-lived roots and ability to suppress other vegetation.

Fire Response Sprouts from rhizomes; off-site seed.

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses No entry

Wildlife Uses Seeds are eaten by birds and rodents. Considered important forage for bighorn sheep and is browsed by white-tailed deer in Montana. Not generally used as forage by livestock.

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
CHENCAP	<i>Chenopodium capitatum</i>	strawberry-blite

VITAL ATTRIBUTE DATA

Regeneration	D, S	Establishment I
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Life History

Selected Species Type	SI	Species Group	Invader, Evader
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Notes Annual, flowers in dense clusters resembling a strawberry in both colour and shape (Parish *et al.* 1996).

Successional Status No entry

Fire Response No entry

Fire Source Hitchcock *et al.* 1955-69.

ADDITIONAL INFORMATION

Aboriginal Uses Used for medicinal purposes. See Moerman (1998) for detailed reference. Flowers and fruits used to make a red dye, but were not eaten. See Turner (1997; 1998) for detailed reference.

Wildlife Uses No entry

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
CHIMUMB	<i>Chimaphila umbellata</i>	prince's-pine

VITAL ATTRIBUTE DATA

Regeneration	D, V	Establishment	R, (T)
Life History	no entry		
Selected Species Type	DR	Species Group	Avoider, (Endurer)
Notes	Sensitive to trampling. It often persists only on sheltered, unburned microsites.		

Successional Status	More frequent in mid-successional stages and mature forests, but is present throughout succession and occurs in stands of all ages.
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Fire Response	Fire-sensitive; often shows a strong decline
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Fire Source	Fischer <i>et al.</i> 1996.
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ADDITIONAL INFORMATION

Aboriginal Uses	Widely used for medicinal purposes. See Moerman (1998) for detailed reference. The leaves, stems and roots were boiled by some interior groups to make a tea. The Flathead of Montana smoked the leaves. See Turner (1997) for detailed reference.
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Wildlife Uses	Minor use by elk in the Pacific Northwest and white-tailed deer in Montana.
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Wildlife Cover Value	No entry
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Nutritional Value	No entry
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Other Uses	No entry
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APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
CHRYNAU	<i>Chrysothamnus nauseosus</i>	rabbit-brush

VITAL ATTRIBUTE DATA

Regeneration	D, V	Establishment	I
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Life History	p, l~10
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Selected Species Type	VI	Species Group	Invader, Endurer
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Notes	Produces numerous, viable, wind-dispersed seed. Sprouting originates at or near the soil surface from buds on or near the stem base. Sensitive to competition and is relatively short-lived.
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Successional Status	Seral species in sagebrush habitat types.
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Fire Response	Sprouts from adventitious buds; off-site seed.
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Fire Source	Fischer <i>et al.</i> 1996.
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ADDITIONAL INFORMATION

Aboriginal Uses	Used for a variety of medicinal purposes. See Moerman (1998) for detailed reference. Pungent smelling branches used for smoking hides and rubbing on horses as an insect repellent. See Turner (1998) for detailed reference.
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Wildlife Uses	Forage value varies greatly among subspecies and ecotypes. All subspecies are considered to be slightly toxic to livestock.
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Wildlife Cover Value	Varies with subspecies, but in general cover is fair to good for upland game birds, waterfowl, small nongame birds, and small mammals.
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Nutritional Value	Rated "good" for energy and protein content.
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Other Uses	Excellent plant for erosion control due to its deep root system and ability to establish rapidly.
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APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
CICUDOU	<i>Cicuta douglasii</i>	Douglas' water-hemlock

VITAL ATTRIBUTE DATA

Regeneration	V, D	Establishment	T
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Life History

Selected Species Type	VT	Species Group	Endurer
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Notes Low to mid-elevations in marshes, stream edges, ditches and other wet places.

Successional Status No entry

Fire Response No entry

Fire Source Hitchcock *et al.* 1955-69.

ADDITIONAL INFORMATION

Aboriginal Uses Recognized as poisonous, but also used for medicinal purposes. See Moerman (1998) for detailed reference. The Okanagan used the powdered root as an arrow poison (Turner 1998).

Wildlife Uses No entry

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
CIRSARV	<i>Cirsium arvense</i>	Canada thistle

VITAL ATTRIBUTE DATA

Regeneration	D, V, S	Establishment	I
Life History	p, m=1		
Selected Species Type	DI	Species Group	Invader, Endurer, Evader
Notes	Classified as a noxious weed. Control is difficult because of the perennial root system, abundant long-lived seed, and widespread and diverse habitat of the plant. It can infest even relatively undisturbed vegetation. Prescribed burning may slow the spread of <i>Cirsium arvense</i> .		
Successional Status	Invades disturbed sites and may move into productive sites when growing conditions are ideal. Aggressively invades wet meadow communities and range sites.		
Fire Response	Perennating buds on roots; off-site seed.		
Fire Source	Fischer <i>et al.</i> 1996.		

ADDITIONAL INFORMATION

Aboriginal Uses	Used for medicinal purposes. See Moerman (1998) for detailed reference.
Wildlife Uses	Some use by wildlife has been reported, but ungulates probably consume this plant only when other more palatable forage is scarce.
Wildlife Cover Value	Fair to good for upland game birds, small nongame birds, small mammals, and waterfowl.
Nutritional Value	Nutritive value equal to or exceeding that of alfalfa.
Other Uses	Honey is produced from the nectar.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
CIRSUND	<i>Cirsium undulatum</i>	wavy-leaved thistle

VITAL ATTRIBUTE DATA

Regeneration	D	Establishment	I
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Life History

Selected Species Type	DI	Species Group	Invader
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Notes Grows in dry well-drained open places in foothills and plains; dry areas of southern interior BC.

Successional Status No entry

Fire Response No entry

Fire Source estimated from *Cirsium vulgare*

ADDITIONAL INFORMATION

Aboriginal Uses Used for medicinal purposes. See Moerman (1998) for detailed reference. Roots were steamed in pits or boiled in stews. They contain inulin. See Turner (1997) for detailed reference.

Wildlife Uses No entry

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
CIRSVUL	<i>Cirsium vulgare</i>	bull thistle

VITAL ATTRIBUTE DATA

Regeneration D, (V) Establishment I

Life History m=5

Selected Species Type DI Species Group Invader

Notes Introduced biennial herb. Wind-dispersed seeds and short fleshy taproot. Short-lived seeds in seedbanks.

Successional Status Seral species, cannot withstand deep shade.

Fire Response Off-site seed; may sprout from stems.

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Used for medicinal purposes. See Moerman (1998) for detailed reference.

Wildlife Uses Sheep eat *Cirsium vulgare* seedlings or small rosettes. Rabbits eat leaves and flowering stems, especially in winter and early spring. Gophers and other small burrowing animals eat the roots, especially taproots of rosettes.

Wildlife Cover Value Fair to good for upland game birds, small nongame birds, and small mammals.

Nutritional Value Energy value and protein value of *Cirsium vulgare* for livestock is poor.

Other Uses *Cirsium vulgare* is edible.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
CLAYLAN	<i>Claytonia lanceolata</i>	western springbeauty

VITAL ATTRIBUTE DATA

Regeneration	D, V	Establishment	I
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Life History

Selected Species Type	VI	Species Group	Invader, Endurer
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Notes Small spherical corms. Found on dry sagebrush foothills to damp alpine meadows. Most abundant in interior mountain meadows.

Successional Status No entry

Fire Response No entry

Fire Source Hitchcock *et al.* 1955-69.

ADDITIONAL INFORMATION

Aboriginal Uses Spring beauty was an important source of carbohydrates for aboriginal peoples of the interior. The corms could be stored like potatoes. See Turner (1997) for detailed reference.

Wildlife Uses Corms were dug up and hidden in winter food caches by voles, pikas, marmots and other small mammals (Turner 1997).

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
CLEMLIG	<i>Clematis ligusticifolia</i>	white clematis

VITAL ATTRIBUTE DATA

Regeneration D Establishment R

Life History

Selected Species Type DR Species Group Avoider

Notes Showy clusters of feathery, plumed seeds.

Successional Status No entry

Fire Response No entry

Fire Source Hitchcock *et al.* 1955-69.

ADDITIONAL INFORMATION

Aboriginal Uses Used for medicinal purposes. See Moerman (1998) for detailed reference. The stringy bark fibre of *Clematis ligusticifolia* was stripped off and woven into bags, mats, capes, and other garments. See Turner (1998) for detailed reference and other uses.

Wildlife Uses No entry

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
CLEMOCC	<i>Clematis occidentalis</i>	Columbia clematis

VITAL ATTRIBUTE DATA

Regeneration	D	Establishment	R
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Life History

Selected Species Type	DR	Species Group	Avoider
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Notes Easily propagated from fresh seeds in the autumn, or by layering a section of the vine (Parish *et al.* 1996).

Successional Status No entry

Fire Response No entry

Fire Source Hitchcock *et al.* 1955-69.

ADDITIONAL INFORMATION

Aboriginal Uses Minor use for medicinal purposes (Moerman 1986). Was combined with *Pterospora andromeda* to make a shampoo (Turner 1998).

Wildlife Uses No entry

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
CLEOSER	<i>Cleome serrulata</i>	stinking-clover

VITAL ATTRIBUTE DATA

Regeneration	D	Establishment	I
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Life History

Selected Species Type	DI	Species Group	Invader
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Notes Annual, fruits are linear, cylindrical pods. Usually found on dry open sites, often on disturbed ground (Kershaw *et al.* 1998).

Successional Status No entry

Fire Response No entry

Fire Source Hitchcock *et al.* 1955-69.

ADDITIONAL INFORMATION

Aboriginal Uses Minor use for medicinal purposes. See Moerman (1998) for detailed reference.

Wildlife Uses No entry

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
CORNSTO	<i>Cornus stolonifera</i>	red-osier dogwood

VITAL ATTRIBUTE DATA

Regeneration	V, S	Establishment I
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Life History	p, m=3-4
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Selected Species Type	VI	Species Group	Endurer, Evader
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Notes Thick, extensive root system. In moist forests of B.C., *Cornus stolonifera* appears to increase in abundance following logging and burning.

Successional Status Early to mid-seral species.

Fire Response Sprout from roots, stolons, base of aerial stems

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Widely used for medicinal purposes. See Moerman (1998) for detailed reference. Berries are extremely bitter, but eaten by all of the southern interior aboriginal groups. See Turner (1997) for detailed reference. Widely used in different technologies. See Turner (1998) for detailed reference.

Wildlife Uses *Cornus stolonifera* is used for food and cover by white-tailed deer, mule deer, elk, moose, mountain goats, cottontail rabbits, snowshoe hares, and numerous birds. Its fruit is a key food for grizzly and black bear. Deer mice, meadow voles, and other small rodents feed on the young stems and bark. Beavers use it for food and to build dams and lodges. Livestock eat *Cornus stolonifera*, but it is not a preferred species.

Wildlife Cover Value Valuable cover for birds and other small mammals, especially where it grows in thickets. Provides cover and shade in streams for trout. In the Pacific Northwest, *Cornus stolonifera* and other riparian species provide good mule deer fawning and fawn-rearing areas in addition to good year-round security and thermal cover.

Nutritional Value Rated fair in energy value and poor in protein value, but there appears to be little or no inhibition of protein availability in the stems browsed in the winter.

Other Uses Well adapted to rehabilitating moist sites. Excellent at stabilizing soil, easy to establish, and grows rapidly.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
CORYCOR	<i>Corylus cornuta</i>	beaked hazelnut

VITAL ATTRIBUTE DATA

Regeneration V, (D) Establishment I, T

Life History p, m<10

Selected Species Type VI Species Group Endurer

Notes Heavy browsing by deer can stimulate beaked hazel to produce basal sprouts or suckers. Above ground parts are easily killed by fire.

Successional Status Exhibits both tolerant and intolerant behaviour.

Fire Response Sprouts from root crown, lateral root suckers.

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Used for medicinal purposes. See Moerman (1998) for detailed reference. Hazelnuts were gathered in the fall and were widely traded among aboriginal groups in BC. See Turner (1997) for detailed reference. The shoots were used to make arrows and for making rope. See Turner (1998) for detailed reference and other uses.

Wildlife Uses Variable use by livestock and wildlife. Birds consume the buds and catkins. Nuts are staple food of the Steller's Jay, chickadee, Townsend's chipmunk, Allen's chipmunk, golden-mantled squirrel, and digger squirrel.

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses *Corylus cornuta* is valuable as a soil binder on steep slopes. Edible nuts have a sweet flavor and are commonly collected.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
CRATCOL	<i>Crataegus columbiana</i>	red hawthorn

VITAL ATTRIBUTE DATA

Regeneration	V, D	Establishment	T
Life History			
Selected Species Type	VT	Species Group	Endurer, Avoider
Notes	No entry		

Successional Status	No entry
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Fire Response	Similar to <i>Crataegus douglasii</i> , resprout and sucker from root system
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Fire Source	Estimated from <i>Crataegus douglasii</i>
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ADDITIONAL INFORMATION

Aboriginal Uses	Fruit was eaten, but not highly regarded because of its large seeds. See Turner (1997) for detailed reference. Spines were used as needles. Red hawthorn wood was used less frequently than black hawthorn wood. See Turner (1998) for detailed reference and uses.
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Wildlife Uses	No entry
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Wildlife Cover Value	No entry
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Nutritional Value	No entry
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Other Uses	No entry
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APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
CRATDOU	<i>Crataegus douglasii</i>	black hawthorn

VITAL ATTRIBUTE DATA

Regeneration V, D Establishment T

Life History p

Selected Species Type VT Species Group Endurer, Avoider

Notes Shallow and diffuse root structure that allows for sprouting and sucker-rooting following top-kill. Tendency for build-up of ladder fuels which result in crown fires.

Successional Status Usually occurs as an understory species. It does not occupy disturbed sites.

Fire Response Resprout and sucker from the root system.

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Used for medicinal purposes. See Moerman (1998) for detailed reference. Fruit was eaten, but not highly regarded because of its large seeds. See Turner (1997) for detailed reference. Black hawthorn wood was used for a number of technologies. See Turner (1998) for detailed reference and uses.

Wildlife Uses *Crataegus douglasii* thickets provide abundant food source (fruits and stems) for wildlife species (grouse, mule deer and small mammals).

Wildlife Cover Value Good structural diversity that provides both thermal and hiding cover for birds and small mammals.

Nutritional Value In general, energy and protein value of *Crataegus douglasii* is fair.

Other Uses Can be used as a soil and streambank stabilizer.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
DICRSCO	<i>Dicranum scoparium</i>	broom moss

VITAL ATTRIBUTE DATA

Regeneration	D	Establishment	R
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Life History

Selected Species Type	DR	Species Group	Avoider
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Notes	No entry
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Successional Status	No entry
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Fire Response	No entry
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Fire Source	Heinselman 1981.
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ADDITIONAL INFORMATION

Aboriginal Uses	No entry
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Wildlife Uses	No entry
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Wildlife Cover Value	No entry
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Nutritional Value	No entry
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Other Uses	No entry
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APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
DODECON	<i>Dodecatheon conjugens</i>	slimpod shootingstar

VITAL ATTRIBUTE DATA

Regeneration	D	Establishment	I
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Life History

Selected Species Type	DI	Species Group	Invader
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Notes Glandular, hairy leaves, perennial herb. Grows in moist, open sites in plains, foothills and montane zones from BC and Alberta to Wyoming.

Successional Status	No entry
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Fire Response	No entry
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Fire Source	Hitchcock <i>et al.</i> 1955-69.
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ADDITIONAL INFORMATION

Aboriginal Uses	No entry
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Wildlife Uses	No entry
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Wildlife Cover Value	No entry
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Nutritional Value	No entry
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Other Uses	No entry
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APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
DODEPUL	<i>Dodecatheon pulchellum</i>	few-flowered shootingstar

VITAL ATTRIBUTE DATA

Regeneration	D	Establishment	I
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Life History

Selected Species Type	DI	Species Group	Invader
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Notes Hairless, perennial herb, 5-40 cm tall, from very short rhizomes with pale roots (Kershaw *et al.* 1998). Short erect rootstocks. Grows on moist to wet sites; plains to alpine.

Successional Status	No entry
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Fire Response	No entry
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Fire Source	Hitchcock <i>et al.</i> 1955-69.
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ADDITIONAL INFORMATION

Aboriginal Uses	The Okanagan mashed the flowers and smeared them on arrows as a pink stain (Turner 1998).
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Wildlife Uses	No entry
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Wildlife Cover Value	No entry
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Nutritional Value	No entry
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Other Uses	No entry
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APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
ELYMSPI	<i>Elymus spicatus</i>	bluebunch wheatgrass

VITAL ATTRIBUTE DATA

Regeneration V, (D) Establishment T

Life History p

Selected Species Type VT Species Group Endurer, Avoider

Notes First-year seedlings are slow growing and appear to be less vigorous than competing species such as *Bromus tectorum*. Drought resistant.

Successional Status Late to climax successional species. Does occur in immediate postburn stands because of its ability to survive most fires.

Fire Response Sprouts from basal buds.

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Used in minor ways in technologies. See Turner (1998:113) for detailed reference.

Wildlife Uses Important year-round forage species for all classes of livestock. Common winter forage for mule deer, elk, bison, and bighorn sheep.

Wildlife Cover Value Fair to good for small mammals, small nongame birds, and upland game birds.

Nutritional Value Rated good in energy content and relatively poor in protein content.

Other Uses Used in seeding mixes for establishing native plant communities.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
EQUIARV	<i>Equisetum arvense</i>	common horsetail

VITAL ATTRIBUTE DATA

Regeneration	V, (D)	Establishment	T
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Life History	p, long-lived
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Selected Species Type	VT	Species Group	Endurer
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Notes Common indicator or herbaceous layer dominant for mesic, hygric, and subhygric sites. Usually occurs in moist habitats that do not undergo frequent fire, but its deep rhizomes are adapted to survive severe fires. Probably toxic to surrounding vegetation due to high levels of alkaloids.

Successional Status Present in both seral and climax communities; its presence is largely dictated by edaphic conditions rather than shade or other factors.

Fire Response Sprouts from rhizomes.

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Widely used for medicinal purposes. See Moerman (1998) for detailed reference.
See Turner (1998) for details on technological uses.

Wildlife Uses Common food item consumed by grizzly bears.

Wildlife Cover Value Fair to poor.

Nutritional Value No entry

Other Uses Silica extracted from *Equisetum arvense* is utilized in the manufacture of remineralizing and diuretic medicinal products.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
EQUIHYE	<i>Equisetum hyemale</i>	scouring-rush

VITAL ATTRIBUTE DATA

Regeneration	V, (D)	Establishment	T
Life History	p		
Selected Species Type	VT	Species Group	Endurer
Notes	Used data from <i>Equisetum arvense</i> .		

Successional Status No entry

Fire Response No entry

Fire Source Estimated from *Equisetum arvense*

ADDITIONAL INFORMATION

Aboriginal Uses Widely used for medicinal purposes. See Moerman (1998) for detailed reference.
See Turner (1998) for details on technological uses.

Wildlife Uses No entry

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
EQUIPRA	<i>Equisetum pratense</i>	meadow horsetail

VITAL ATTRIBUTE DATA

Regeneration	V, (D)	Establishment	T
Life History	p		
Selected Species Type	VT	Species Group	Endurer
Notes	Used data from <i>Equisetum arvense</i> .		

Successional Status No entry

Fire Response No entry

Fire Source Estimated from *Equisetum arvense*

ADDITIONAL INFORMATION

Aboriginal Uses Medicinal use by the Ojibwa. See Moerman (1998) for detailed reference.

Wildlife Uses No entry

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
ERYTGRA	<i>Erythronium grandiflorum</i>	yellow glacier lily

VITAL ATTRIBUTE DATA

Regeneration	V, D	Establishment	T
Life History	p, m~8		
Selected Species Type	VT	Species Group	Endurer, Avoider
Notes	Emerges very soon after snowmelt, generally having only 10 weeks between first emergence and leaf fall.		

Successional Status	Present in early, mid-, or late seres.
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Fire Response	Resprouts from deep-seated corm.
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Fire Source	Fischer <i>et al.</i> 1996.
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ADDITIONAL INFORMATION

Aboriginal Uses	Minor use for medicinal purposes (Moerman 1986). Bulbs were a food source for many First Peoples of southern interior BC. See Turner (1997) for detailed reference.
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Wildlife Uses	<i>Erythronium grandiflorum</i> corms are an important forage for grizzly bears. Foliage is grazed by sheep and cattle, and mule deer.
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Wildlife Cover Value	No entry
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Nutritional Value	No entry
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Other Uses	No entry
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APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
FRAGVES	<i>Fragaria vesca</i>	wood strawberry

VITAL ATTRIBUTE DATA

Regeneration	D, S, V	Establishment I
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Life History

Selected Species Type	SI	Species Group	Invader, Evader
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Notes Stolons, crowns just below mineral soil surface or in the duff.

Successional Status No entry

Fire Response No entry

Fire Source Hitchcock *et al.* 1955-69.

ADDITIONAL INFORMATION

Aboriginal Uses *Fragaria vesca* and other species were widely used for medicinal purposes. See Moerman (1998) for detailed reference. All interior First Peoples eat them usually fresh, but in the past, if enough could be gathered, they were dried for later use. See Turner (1997) for detailed reference.

Wildlife Uses No entry

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
FRAGVIR	<i>Fragaria virginiana</i>	wild strawberry

VITAL ATTRIBUTE DATA

Regeneration	D, S, V	Establishment I
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Life History

Selected Species Type	SI	Species Group	Invader, Evader
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Notes Stolons, crowns just below mineral soil surface or in the duff.

Successional Status No entry

Fire Response No entry

Fire Source Hitchcock *et al.* 1955-69.

ADDITIONAL INFORMATION

Aboriginal Uses *Fragaria virginiana* and other species were widely used for medicinal purposes. See Moerman (1998) for detailed reference. All interior First Peoples eat them usually fresh, but in the past, if enough could be gathered, they were dried for later use. See Turner (1997) for detailed reference.

Wildlife Uses No entry

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
FRITPUD	<i>Fritillaria pudica</i>	yellow bell

VITAL ATTRIBUTE DATA

Regeneration	V, D	Establishment	I
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Life History

Selected Species Type	VI	Species Group	Endurer, Invader
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Notes Perennial, 10-25cm tall, with small scaly bulbs (Parish *et al.* 1996).

Successional Status	No entry
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Fire Response	No entry
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Fire Source	Parish <i>et al.</i> 1996.
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ADDITIONAL INFORMATION

Aboriginal Uses	Bulbs were eaten by the Nlaka'pamux, Okanagan and Secwepemc (Turner 1997).
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Wildlife Uses	No entry
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Wildlife Cover Value	No entry
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Nutritional Value	No entry
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Other Uses	No entry
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APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
GAILARI	<i>Gaillardia aristata</i>	brown-eyed Susan

VITAL ATTRIBUTE DATA

Regeneration D Establishment I

Life History

Selected Species Type DI Species Group Invader

Notes Perennial, 20-70 cm tall, from a slender taproot, with several hairy, unbranched stems (Parish *et al.* 1996).

Successional Status No entry

Fire Response No entry

Fire Source Hitchcock *et al.* 1955-69.

ADDITIONAL INFORMATION

Aboriginal Uses The Thompson made a decoction of the plant for headaches (Moerman 1986).

Wildlife Uses No entry

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
GERAVIS	<i>Geranium viscosissimum</i>	sticky purple geranium

VITAL ATTRIBUTE DATA

Regeneration	D, S	Establishment I
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Life History

Selected Species Type	SI	Species Group	Invader, Evader
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Notes Perennial, stems and leaves densely covered with sticky, glandular hairs. Fruits elongated, glandular hairy capsules (Parish *et al.* 1996).

Successional Status No entry

Fire Response No entry

Fire Source Hitchcock *et al.* 1955-69.

ADDITIONAL INFORMATION

Aboriginal Uses Minor use for medicinal purposes (Moerman 1986).

Wildlife Uses No entry

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
GEUMMAC	<i>Geum macrophyllum</i>	large-leaved avens

VITAL ATTRIBUTE DATA

Regeneration	D, V	Establishment	T
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Life History

Selected Species Type	DT	Species Group	Avoider, Endurer
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Notes Rhizomatous perennial with hairy stems. Clusters of hairy seeds. Scattered at low to subalpine elevations in moist and wet forests, seepage areas, openings and clearings (Parish *et al.* 1996).

Successional Status	No entry
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Fire Response	No entry
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Fire Source	Hitchcock <i>et al.</i> 1955-69.
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ADDITIONAL INFORMATION

Aboriginal Uses	Widely used for medicinal purposes. See Moerman (1998) for detailed reference.
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Wildlife Uses	No entry
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Wildlife Cover Value	No entry
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Nutritional Value	No entry
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Other Uses	No entry
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APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
GOODOBL	<i>Goodyera oblongifolia</i>	rattlesnake-plantain

VITAL ATTRIBUTE DATA

Regeneration	D	Establishment	R
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Life History

Selected Species Type	DR	Species Group	Avoider
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Notes Perennial, with short creeping rhizomes (Parish *et al.* 1996).

Successional Status	Widespread and common at low to subalpine elevations in mossy dry to moist, shady coniferous forests (Parish <i>et al.</i> 1996).
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Fire Response	No entry
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Fire Source	Parish <i>et al.</i> 1996.
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ADDITIONAL INFORMATION

Aboriginal Uses	<i>Goodyera</i> genus is widely used for medicinal purposes. See Moerman (1986) for detailed reference.
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Wildlife Uses	No entry
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Wildlife Cover Value	No entry
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Nutritional Value	No entry
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Other Uses	No entry
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APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
HERALAN	<i>Heracleum lanatum</i>	cow-parsnip

VITAL ATTRIBUTE DATA

Regeneration D Establishment T

Life History p

Selected Species Type DT Species Group Avoider

Notes *Heracleum lanatum* can occur throughout succession in moist or wet subalpine fir-Engelmann spruce habitats with estimated average fire-free intervals of about 330 years. Stands are susceptible to severe burns when drought occurs. *Heracleum lanatum* also occurs throughout succession in communities characterized by more frequent fire, including quaking aspen.

Successional Status Occurs in seral and climax communities. It is shade tolerant, but also grows in some open habitats.

Fire Response Seed from residual plants.

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Widely used for medicinal purposes. See Moerman (1998) for detailed reference. Used by every aboriginal group in BC as a green vegetable. See Turner (1997) for detailed reference. Leaves were used to cover berry baskets or to carry berries. See Turner (1998) for detailed reference and other uses.

Wildlife Uses Valuable forage species for livestock, deer, elk, moose, and bear. In low elevation riparian areas *Heracleum lanatum* is an important food for grizzly bear, especially in the spring.

Wildlife Cover Value Rated poor to good for small nongame birds and small mammals.

Nutritional Value Rated good for elk, mule deer, and white-tailed deer.

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
HEUCCYL	<i>Heuchera cylindrica</i>	round-leaved alumroot

VITAL ATTRIBUTE DATA

Regeneration	D	Establishment	I
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Life History

Selected Species Type	DI	Species Group	Invader
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Notes Robust perennial with a branching crown, and a short, thick rhizome. Many seeded capsules.

Successional Status No entry

Fire Response No entry

Fire Source Hitchcock *et al.* 1955-69.

ADDITIONAL INFORMATION

Aboriginal Uses Minor use for medicinal purposes (Moerman 1986). Leaves were used for tea. The roots were made into a poultice for mouth sores, boils and skin infections. See Turner (1997) for detailed reference.

Wildlife Uses No entry

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
HIERODO	<i>Hierochloe odorata</i>	common sweetgrass

VITAL ATTRIBUTE DATA

Regeneration V Establishment T

Life History p

Selected Species Type VT Species Group Endurer

Notes *Hierochloe odorata* is a member of some meadow communities succeeded by forest in the absence of disturbance. Fire exclusion from these communities may favour other species over *Hierochloe odorata*.

Successional Status Usually found in mid-successional communities. It can withstand some soil disturbance.

Fire Response Culms from basal buds; sprouts from rhizomes.

Fire Source Fischer *et al.* 1996

ADDITIONAL INFORMATION

Aboriginal Uses Widely used as a ceremonial medicine. See Moerman (1998) for detailed reference. Woven into fragrant baskets, plaited into bundles as a sachet or burned as an incense. See Turner (1998) for detailed reference and other uses.

Wildlife Uses *Hierochloe odorata* produces very little forage.

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses May be used for soil stabilization - dense root and rhizome development. Dried *Hierochloe odorata* foliage is fragrant because of its coumarin content and is used as incense and in making perfume.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
HOLODIC	<i>Holodiscus discolor</i>	oceanspray

VITAL ATTRIBUTE DATA

Regeneration	V, S	Establishment	T
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Life History p, l >26

Selected Species Type	VT	Species Group	Endurer, Evader
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Notes *Holodiscus discolor* is dependent on wind-dispersed seed for preburn regeneration, with basal crown sprouting being the predominant mode of postburn reproduction. *Holodiscus discolor* also relies on seedbanks in the duff and litter for postburn regeneration. Intolerant of multiple burns.

Successional Status Climax species in a number of forested communities throughout its range.

Fire Response Basal stem sprouting; seedbanks; off-site seed.

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Widely used for medicinal purposes. See Moerman (1998) for detailed reference. Its wood is valued for its hardness and strength. It was used by almost all of the southern interior peoples for making digging sticks, and by many groups for making spear and harpoon shafts, bows, and arrows. See Turner (1998) for detailed reference and other uses.

Wildlife Uses Minor importance as a browse species. Generally, big game use of *Holodiscus discolor* is variable.

Wildlife Cover Value Dense shrubby stands in the northern Rocky Mountains provide visual and thermal cover for deer and elk, and nesting habitat, cover, and food for a variety of nongame birds and animals.

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
HORDJUB	<i>Hordeum jubatum</i>	foxtail barley

VITAL ATTRIBUTE DATA

Regeneration	D, S	Establishment I
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Life History

Selected Species Type	SI	Species Group	Invader, Evader
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Notes Tufted perennial. Very common weedy species at low to mid elevations in meadows and disturbed sites (Parish *et al.* 1996).

Successional Status	No entry
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Fire Response	No entry
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Fire Source	Hitchcock <i>et al.</i> 1955-69.
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ADDITIONAL INFORMATION

Aboriginal Uses	Minor use for medicinal purposes (Moerman 1986).
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Wildlife Uses	No entry
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Wildlife Cover Value	No entry
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Nutritional Value	No entry
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Other Uses	No entry
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APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
JUNCBAL	<i>Juncus balticus</i>	Baltic rush

VITAL ATTRIBUTE DATA

Regeneration	V, D	Establishment	I
Life History	p		
Selected Species Type	VI	Species Group	Endurer, Avoider
Notes	<i>Juncus balticus</i> is a thick, mat-forming, rhizomatous graminoid.		

Successional Status Climax component of several western community types and plant associations. *Juncus balticus* is usually grazing induced and an indicator of disturbed sites.

Fire Response Sprouts from extensive rhizomes.

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses No entry

Wildlife Uses Important forage species for livestock and elk. It is used as a hay crop for cattle. Provides important nesting, hiding, and feeding cover for shorebirds and waterfowl.

Wildlife Cover Value Rated as a good cover for waterfowl, nongame birds, and small mammals.

Nutritional Value No entry

Other Uses Excellent streambank stabilizer because of its thick rhizomes. Good protection against erosion because it increases with grazing.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
JUNICOM	<i>Juniperus communis</i>	common juniper

VITAL ATTRIBUTE DATA

Regeneration D Establishment R

Life History 1 >100

Selected Species Type DR Species Group Avoider

Notes Most fires kill *Juniperus communis*. Slow post-fire recovery. *Juniperus communis* generally appears to increase in response to grazing. Often grows as a low, decumbent mat-forming shrub.

Successional Status *Juniperus communis* is a component of a diverse array of climax communities.

Fire Response Re-establishes from off-site seed; seedbanks

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Widely used for medicinal purposes. See Moerman (1998) for detailed reference.

Wildlife Uses Deer and mountain goats browse *Juniperus communis* to a limited extent. Domestic livestock rarely use *Juniperus communis*. The berries are relished by many bird species and mammals. Birds are the most important dispersal agents of *Juniperus communis* seeds.

Wildlife Cover Value Provides shade and cover for smaller birds and mammals. Provides especially good nesting cover wild turkeys.

Nutritional Value *Juniperus communis* berries are low in nutritional value when compared with the fruits of many other species.

Other Uses Highly valued as an ornamental. This species was first cultivated in 1560.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
JUNISCO	<i>Juniperus scopulorum</i>	Rocky Mountain juniper

VITAL ATTRIBUTE DATA

Regeneration	W, D	Establishment	R
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Life History	m=10-20, l~250-300
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Selected Species Type	DR	Species Group	Avoider
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Notes Characterized by a long lifespan and slow growth rate. Younger trees can be killed when the stem or crown is scorched. Older trees are generally killed by hot fires or when low-hanging branches allow the fire to enter the crown.

Successional Status *Juniperus scopulorum* is an indicator of climax in a number of ponderosa pine, sagebrush grassland and mountain brushland habitat types. Also considered a pioneer species in some earlier seral communities.

Fire Response Off-site seed, carried by animals or water

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Widely used for medicinal purposes. See Moerman (1998) for detailed reference. Boughs were used to clean and fumigate houses. See Turner (1998) for detailed reference and other uses.

Wildlife Uses Provides food and cover for elk, mule deer, white-tail deer, bighorn sheep, and antelope. Its berries are readily consumed by migratory birds, as well as turkeys, and other upland game birds.

Wildlife Cover Value Fair to good for elk, mule deer, white-tailed deer, small mammals, small non-game birds, and upland game birds.

Nutritional Value Rated as good in energy value and fair in protein value.

Other Uses Cultivated as an ornamental since 1936.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
LAPPRED	<i>Lappula redowskii</i>	western stickseed

VITAL ATTRIBUTE DATA

Regeneration	D	Establishment	I
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Life History

Selected Species Type	DI	Species Group	Invader
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Notes Annual or occasionally biennial, with simple to branched stems. Fruits are four nutlets, with conspicuous barb-tipped prickles on edges. Often weedy, on dry to mesic disturbed sites, roadsides and overgrazed pastures (Parish *et al.* 1996).

Successional Status

Fire Response No entry

Fire Source Hitchcock *et al.* 1955-69.

ADDITIONAL INFORMATION

Aboriginal Uses Minor use for medicinal purposes. See Moerman (1998) for detailed reference.

Wildlife Uses No entry

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
LARIOCC	<i>Larix occidentalis</i>	western larch

VITAL ATTRIBUTE DATA

Regeneration W, D Establishment I

Life History m~40, l >700

Selected Species Type WI Species Group Invader, Resister

Notes *Larix occidentalis* is the most fire-resistant tree in the northern Rocky Mountains and interior Pacific Northwest. Seedlings grow best on burned seedbeds.

Successional Status Long-lived and highly shade intolerant seral species.

Fire Response Survivors become seed trees.

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Used in a decoction by the Thompson for washing infants (Moerman 1986). Cambium and sap were used as a source of sugar. See Turner (1997) for detailed reference. Seldom used by First Peoples of BC. Pitch was used to make a red paint. See Turner (1998) for detailed reference.

Wildlife Uses Deer, elk, moose, black bear, grizzly bear, and many species of birds and small mammals occur in seral *Larix occidentalis* forests. *Larix occidentalis* needles are a major food source for the blue grouse and spruce grouse.

Wildlife Cover Value Snags provide nesting areas for cavity-nesting songbirds, woodpeckers, owls, osprey, and bald eagle.

Nutritional Value

Other Uses Primarily used for construction lumber.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
LEUGLA	<i>Ledum glandulosum</i>	trapper's tea

VITAL ATTRIBUTE DATA

Regeneration	V, (D)	Establishment	T
Life History	p		
Selected Species Type	VT	Species Group	Endurer
Notes	No entry		

Successional Status No entry

Fire Response No entry

Fire Source Estimated from *Ledum groenlandicum*

ADDITIONAL INFORMATION

Aboriginal Uses Leaves, and sometimes branch tips and twigs were used to make a tea. Some medicinal attributes to the tea. See Turner (1997) for detailed reference.

Wildlife Uses No entry

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
LEDUGRO	<i>Ledum groenlandicum</i>	Labrador tea

VITAL ATTRIBUTE DATA

Regeneration	V, (D)	Establishment	T
Life History	p		
Selected Species Type	VT	Species Group	Endurer
Notes	Reproduces primarily vegetatively by sprouting from rhizomes, but can reproduce by seed.		

Successional Status Important component of woodland understories through the early, mid-seral, and late stages of succession. One of the first plants to recolonize burned bogs and grows rapidly following fire.

Fire Response Sprouts from rhizomes or root crown.

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Widely used for medicinal purposes. See Moerman (1998) for detailed reference. Many aboriginal peoples made a tea from the leaves and twigs, both for a beverage and as a medicine. See Turner (1997) for detailed reference.

Wildlife Uses Leaves and twigs are browsed by caribou and moose.

Wildlife Cover Value Provides cover for a variety of small wildlife species.

Nutritional Value Rated low in digestibility for black-tailed deer.

Other Uses Potential for revegetating disturbed sites, such as mine reclamation projects.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
LETHVUL	<i>Letharia vulpina</i>	common wolf lichen

VITAL ATTRIBUTE DATA

Regeneration	Establishment
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Life History

Selected Species Type	DR	Species Group	Avoider
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Notes	No entry
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Successional Status	No entry
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Fire Response	No entry
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Fire Source	Rowe 1983
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ADDITIONAL INFORMATION

Aboriginal Uses	No entry
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Wildlife Uses	No entry
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Wildlife Cover Value	No entry
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Nutritional Value	No entry
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Other Uses	No entry
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APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
LEWIRED	<i>Lewisia rediviva</i>	bitterroot

VITAL ATTRIBUTE DATA

Regeneration	D, V	Establishment I
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Life History	p
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Selected Species Type	VI	Species Group	Invader, Endurer
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Notes Increases in response to heavy grazing. Usually dormant in summer and early, so *Lewisia rediviva* deep, branched taproot escapes most wildfires. Spring burning is probably more harmful than fall burning. Grows in dry, gravelly or sandy soil from sagebrush plains to lower mountains and is restricted to the driest parts of the southern interior.

Successional Status Colonizer in primary succession. Requires full sunlight and generally occurs in initial communities and/or early seres in secondary succession.

Fire Response Wind-blown seed, but not documented in literature.

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses To many of the interior groups bitterroot was the most important of all edible roots. See Turner (1997) for detailed reference.

Wildlife Uses Rodents consume the leaves and seeds, e.g. deer mouse.

Wildlife Cover Value No entry

Nutritional Value Aboveground portions of *Lewisia rediviva* are poor in energy and protein value.

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
LIGUCAN	<i>Ligusticum canbyi</i>	Canby's lovage

VITAL ATTRIBUTE DATA

Regeneration	D, V	Establishment	T
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Life History

Selected Species Type	VT	Species Group	Avoider, Endurer
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Notes Taprooted perennial. Grows in moist or wet stream banks and meadows at moderate to high elevations.

Successional Status No entry

Fire Response No entry

Fire Source Hitchcock *et al.* 1955-69.

ADDITIONAL INFORMATION

Aboriginal Uses Reported use by a few groups for medicinal purposes (Moerman 1986). Used as a smoking condiment mixed with tobacco. See Turner (1997) for detailed reference and other uses.

Wildlife Uses No entry

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
LILICOL	<i>Lilium columbianum</i>	tiger lily

VITAL ATTRIBUTE DATA

Regeneration	D, V	Establishment	I
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Life History

Selected Species Type	VI	Species Group	Invader, Endurer
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Notes Perennial, from a cluster of scaly bulbs (Parish *et al.* 1996).

Successional Status No entry

Fire Response No entry

Fire Source Hitchcock *et al.* 1955-69.

ADDITIONAL INFORMATION

Aboriginal Uses Bulbs were eaten by Interior and Coastal First Peoples. See Turner (1997) for detailed reference.

Wildlife Uses No entry

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
LILIPHI	<i>Lilium philadelphicum</i>	wood lily

VITAL ATTRIBUTE DATA

Regeneration	D, V	Establishment	I
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Life History

Selected Species Type	VI	Species Group	Invader, Endurer
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Notes Perennial, with a cluster of thick, white pointed bulb scales (Parish *et al.* 1996).

Successional Status No entry

Fire Response No entry

Fire Source Hitchcock *et al.* 1955-69.

ADDITIONAL INFORMATION

Aboriginal Uses Used for a number of medicinal purposes. See Moerman (1998) for detailed reference. Bulbs were eaten by the Ktunaxa (Turner 1997).

Wildlife Uses No entry

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
LINNBOR	<i>Linnaea borealis</i>	twinflower

VITAL ATTRIBUTE DATA

Regeneration V, D **Establishment** T

Life History p, m=5-10

Selected Species Type DT **Species Group** Avoider

Notes Shallow, fibrous network of roots with their growing points within and slightly below the duff layer; numerous short aerial stems rising from the stolon. Killed even by low-intensity fire. Vegetative reproduction by stolons is the primary method of *Linnaea borealis* regeneration.

Successional Status Found in recently disturbed, seral, and climax plant communities.

Fire Response Stolons from unburned plants.

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Used for medicinal purposes. See Moerman (1998) for detailed reference.

Wildlife Uses Provides about ten percent of winter diets of Roosevelt elk of British Columbia, Washington, and Oregon.

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
LITHRUD	<i>Lithospermum ruderale</i>	lemonweed gromwell

VITAL ATTRIBUTE DATA

Regeneration	V, D	Establishment	I
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Life History

Selected Species Type	VI	Species Group	Endurer, Invader
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Notes Hairy perennial, 20-60 cm tall, with several leafy stems clustered on a coarse woody taproot (Parish *et al.* 1996).

Successional Status No entry

Fire Response No entry

Fire Source Hitchcock *et al.* 1955-69.

ADDITIONAL INFORMATION

Aboriginal Uses Used for medicinal purposes. See Moerman (1998) for detailed reference. Roots used to make a tea to improve the appetite (Turner 1997). Roots were used to make a red dye by many aboriginal groups. See Turner (1998) for detailed reference and other uses.

Wildlife Uses No entry

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
LOMAGEY	<i>Lomatium geyeri</i>	Geyer's desert-parsley

VITAL ATTRIBUTE DATA

Regeneration	D, V	Establishment	I
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Life History

Selected Species Type	VI	Species Group	Invader, Endurer
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Notes Taprooted, sometimes short and tuberous-thickened (Parish *et al.* 1996).

Successional Status No entry

Fire Response No entry

Fire Source Hitchcock *et al.* 1955-69.

ADDITIONAL INFORMATION

Aboriginal Uses *Lomatium* genus is widely used for medicinal purposes. See Moerman (1986) for detailed reference. *L. macrocarpum* grows in similar habitats. Carrot-like roots are dug up and eaten raw or cooked. See Turner (1997) for detailed reference.

Wildlife Uses No entry

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
LONIINV	<i>Lonicera involucrata</i>	black twinberry

VITAL ATTRIBUTE DATA

Regeneration	V, D, S	Establishment	T
Life History	p		
Selected Species Type	DT	Species Group	Avoider
Notes	Slow recovery or elimination with severe fires.		

Successional Status No entry

Fire Response Vigorous resprouting after light burns.

Fire Source Estimated from *Lonicera utahensis*

ADDITIONAL INFORMATION

Aboriginal Uses Widely used for medicinal purposes. See Moerman (1998) and Parish *et al.* (1996) for detailed reference. Berries were believed to be poisonous, but considered a favourite food of bears. See Turner (1997) for detailed reference. Several groups used the purple juice from the berries as a dye. See Turner (1998) for detailed reference.

Wildlife Uses No entry

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
LONIUTA	<i>Lonicera utahensis</i>	Utah honeysuckle

VITAL ATTRIBUTE DATA

Regeneration	V, D	Establishment	T
Life History	p, m=5-10		
Selected Species Type	DT	Species Group	Endurer, Avoider
Notes	<i>Lonicera utahensis</i> is usually top-killed. Regrowth is slow.		

Successional Status Important shrub in late seral to climax communities in mesic coniferous forests.

Fire Response Sprouts from root crown.

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Minor use for medicinal purposes (Moerman 1986). Berries were sometimes eaten by Okanagan hunters. See Turner (1997) for detailed reference.

Wildlife Uses Valuable summer and fall browse for elk, but a minor browse species for white-tailed deer. Grizzly bears eat *Lonicera utahensis* fruits summer and fall.

Wildlife Cover Value Fair to good cover for small mammals and nongame and upland game birds.

Nutritional Value Poor protein and energy value.

Other Uses Recommended for reclamation plantings in the Intermountain region on riparian sites, such as wet meadow and forest types.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
LUPISER	<i>Lupinus sericeus</i>	silky lupine

VITAL ATTRIBUTE DATA

Regeneration V, S Establishment T

Life History p

Selected Species Type VT Species Group Endurer, Evader

Notes Increases under intensive grazing. Deeply buried root system. Not rhizomatous but will sprout from the caudex.

Successional Status Present in early, late and climax seral stages in a range of habitats including grasslands, sagebrush, mountain brush, and aspen and conifer forests.

Fire Response Sprouts from the caudex; seedbank

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Lupine flowers were used as bedding and flooring in the sweat-house by the Okanagan. They considered lupines blooming in spring a sign that the marmots were fat enough to eat (Turner 1998).

Wildlife Uses Consumed in a moderate to high degree by white-tailed deer, upland game birds, small nongame birds, and small mammals. Highly toxic plant, especially to sheep.

Wildlife Cover Value Fair to good cover for small nongame birds and small mammals.

Nutritional Value Generally poor in energy and protein value.

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
MAHOAQU	<i>Mahonia aquifolium</i>	tall Oregon-grape

VITAL ATTRIBUTE DATA

Regeneration	D, V, S?	Establishment	I
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Life History

Selected Species Type	DI	Species Group	Invader
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Notes Stoloniferous to (more often) erect and stiff-branched woody shrub.

Successional Status No entry

Fire Response No entry

Fire Source Hitchcock *et al.* 1955-69.

ADDITIONAL INFORMATION

Aboriginal Uses Used for medicinal purposes. See Moerman (1998) for detailed reference. The tart berries were eaten by Interior as well as coastal groups. See Turner (1997) for detailed reference. Inner bark of the stems and roots contain a bright yellow pigment that was extracted and used as a dye in basketry. See Turner (1998) for detailed reference.

Wildlife Uses No entry

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
MATRDIS	<i>Matricaria discoidea</i>	pineapple weed

VITAL ATTRIBUTE DATA

Regeneration D, S Establishment I

Life History

Selected Species Type SI Species Group Invader, Evader

Notes Annual, pineapple-scented, with a short taproot, achenes with a short, membranous pappus (Parish *et al.* 1996).

Successional Status No entry

Fire Response No entry

Fire Source Hitchcock *et al.* 1955-69.

ADDITIONAL INFORMATION

Aboriginal Uses Widely used for medicinal purposes. See Moerman (1998) for detailed reference. Used for its scent. See Turner (1997) for detailed reference.

Wildlife Uses No entry

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
MENTARV	<i>Mentha arvensis</i>	field mint

VITAL ATTRIBUTE DATA

Regeneration	D, V	Establishment	T
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Life History

Selected Species Type	VT	Species Group	Avoider, Endurer
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Notes Rhizomatous perennial. Widespread and common at low and mid elevations in wet seepage sites, wetland edges and lakeshores (Parish *et al.* 1996).

Successional Status No entry

Fire Response

Fire Source Hitchcock *et al.* 1955-69.

ADDITIONAL INFORMATION

Aboriginal Uses Very widely used for medicinal purposes. See Moerman (1998) for detailed reference. Most interior groups used the leaves, fresh or dried, for tea. The tea can be used as a beverage or a stronger brew as a medicine for colds, coughs, consumption and fever. See Turner (1997) for detailed reference. Used for its scent and as an insect repellent. See Turner (1998) for detailed reference.

Wildlife Uses No entry

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
MONAFIS	<i>Monarda fistulosa</i>	wild bergamot

VITAL ATTRIBUTE DATA

Regeneration	V, D	Establishment	I
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Life History

Selected Species Type	VI	Species Group	Endurer, Invader
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Notes Perennial with creeping rhizomes. Scattered and infrequent in mid-elevation grasslands, dry open forests, clearings and disturbed sites (Parish *et al.* 1996).

Successional Status No entry

Fire Response No entry

Fire Source Hitchcock *et al.* 1955-69.

ADDITIONAL INFORMATION

Aboriginal Uses Widely used for medicinal purposes. See Moerman (1998) for detailed reference. Leaves were steeped in hot water to make a refreshing tea. The plant was sometimes burned as a smudge against mosquitoes. See Turner (1997; 1998) for detailed reference and other uses.

Wildlife Uses No entry

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
NUPHPOL	<i>Nuphar polysepalum</i>	Yellow waterlily

VITAL ATTRIBUTE DATA

Regeneration **Establishment**

Life History

Selected Species Type DR **Species Group** "Avoider"

Notes Aquatic perennial with massive, submerged, prehistoric-looking rhizomes; stems thick and fleshy (Parish *et al.* 1996).

Successional Status No entry

Fire Response N/A

Fire Source Hitchcock *et al.* 1955-69.

ADDITIONAL INFORMATION

Aboriginal Uses Used for medicinal purposes. See Moerman (1998) for detailed reference.

Wildlife Uses No entry

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
OPLOHOR	<i>Oplopanax horridus</i>	devil's club

VITAL ATTRIBUTE DATA

Regeneration	V, D	Establishment	R
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Life History	p
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Selected Species Type	DR	Species Group	Avoider
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Notes *Oplopanax horridus* sites burn infrequently. Susceptible to fire-kill, probably absent from burn sites for decades following stand-replacing fire. Re-establishes on these sites from animal-dispersed seed after the canopy has closed enough.

Successional Status Present in late seral, climax, and old growth communities. Moderately shade tolerant.

Fire Response May sprout from root crown, rhizomes.

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Roots and stems widely used for medicinal purposes. See Moerman (1998) for detailed reference. Used in many technologies by coastal and interior peoples. See Turner (1998) for detailed reference.

Wildlife Uses Not preferred by browsing animals. Black-tailed deer, white-tailed deer, and elk utilize it lightly in spring and summer. Grizzly and black bear consume devil's club seeds, leaves, stems, and berries.

Wildlife Cover Value Provides shade cover for salmonoid fishes and their eggs. Provides hiding, escape, and thermal cover for various birds, rodents, and the vagrant shrew.

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
OPUNPOL	<i>Opuntia polyacantha</i>	plains prickly-pear cactus

VITAL ATTRIBUTE DATA

Regeneration	V, D	Establishment	I
Life History	p, m~6-8		
Selected Species Type	DI	Species Group	Invader, (Endurer)
Notes	Invades overgrazed rangeland. The degree which prickly-pear species can survive a burn and resprout is related to local fire intensity.		

Successional Status	Scattered throughout numerous seral and climax communities.
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Fire Response	Sprouts from root crown, and adventitious rooting
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Fire Source	Fischer <i>et al.</i> 1996.
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ADDITIONAL INFORMATION

Aboriginal Uses	Used by the Navaho as a poison for hunting (Moerman 1986). Succulent stem segments were an important food of the BC Interior Salish. See Turner (1997) for detailed reference and other uses. The spines were used as hooks and the juice helped fix painted designs on wood and buckskin. See Turner (1998) for detailed reference and other uses.
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Wildlife Uses	Used by birds and wildlife for food and cover. High oxalic acid content.
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Wildlife Cover Value	Provides some cover for quail and other birds.
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Nutritional Value	Fair in energy value and poor in protein value.
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Other Uses	No entry
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APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
OSMOOCC	<i>Osmorhiza occidentalis</i>	western sweet-cicely

VITAL ATTRIBUTE DATA

Regeneration	D, V	Establishment	T
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Life History

Selected Species Type	VT	Species Group	Avoider, Endurer
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Notes Plants, especially the roots, with a strong heavy odor somewhat like that of licorice, stems stout, clustered on the summit of a caudex and stout root.

Successional Status No entry

Fire Response No entry

Fire Source Hitchcock *et al.* 1955-69.

ADDITIONAL INFORMATION

Aboriginal Uses Used for medicinal purposes by the Blackfeet, Cheyenne and Karok. See Moerman (1998) for detailed reference. Thick aromatic roots were eaten. See Turner (1997) for detailed reference.

Wildlife Uses No entry

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
OXYTROP	<i>Oxytropis</i> sp.	locoweed

VITAL ATTRIBUTE DATA

Regeneration S Establishment I

Life History m=1

Selected Species Type SI Species Group Evader

Notes Locoweed poisoning of livestock is the most widespread poisonous plant problem in the western U.S.

Successional Status Colonizer following disturbance on western rangelands. Also occurs in climax meadow and sagebrush steppe communities. Drought tolerant but not tolerant of excessive shade.

Fire Response Seed in the soil heat scarified and germinate.

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses *Oxytropis* species were used for medicinal purposes. See Moerman (1998) for detailed reference.

Wildlife Uses Causes locoism (chronic neurological damage) in all classes of livestock. *Oxytropis sericea* is poisonous to deer and elk if consumed in large quantities.

Wildlife Cover Value No entry

Nutritional Value All parts of the plant are toxic, and poisonous at all stages of growth.

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
PERIGAI	<i>Perideridia gairdneri</i>	Gairdner's yampah

VITAL ATTRIBUTE DATA

Regeneration	D, V	Establishment	T
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Life History

Selected Species Type	VT	Species Group	Avoider, Endurer
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Notes Caraway-scented perennial, with solitary, slender stems from more or less tuberous roots (Parish *et al.* 1996).

Successional Status No entry

Fire Response No entry

Fire Source Hitchcock *et al.* 1955-69.

ADDITIONAL INFORMATION

Aboriginal Uses Reported use by the Blackfeet and Cheyenne for medicinal purposes (Moerman 1986). Sweet, anise-flavoured roots eaten by Interior First Peoples. See Turner (1997) for detailed reference.

Wildlife Uses No entry

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
PETASAG	<i>Petasites sagittatus</i>	arrow-leaved coltsfoot

VITAL ATTRIBUTE DATA

Regeneration	V, D	Establishment	I
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Life History

Selected Species Type	VI	Species Group	Endurer, Invader
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Notes Perennial, from a creeping rhizome. Scattered and locally common at low to subalpine elevations in wetlands and wet ditches, often in standing water (Parish *et al.* 1996).

Successional Status No entry

Fire Response No entry

Fire Source Hitchcock *et al.* 1955-69.

ADDITIONAL INFORMATION

Aboriginal Uses Secwepemc women gathered and dried the leaves, removing the large veins. Cottony material was used as a sanitary napkin. See Turner (1998) for detailed reference.

Wildlife Uses No entry

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
PHILLEW	<i>Philadelphus lewisii</i>	mock-orange

VITAL ATTRIBUTE DATA

Regeneration	V, S	Establishment	I
Life History	p		
Selected Species Type	VI	Species Group	Endurer, Evader
Notes	Top-killed by fire, but the root crown usually survives and sprouts vigorously.		
Successional Status	Early to mid-seral species and is often present in seral shrub communities following logging and burning. Tolerant of moderate shade.		
Fire Response	Sprouts from root crown.		
Fire Source	Fischer <i>et al.</i> 1996.		

ADDITIONAL INFORMATION

Aboriginal Uses	Minor use for medicinal purposes (Moerman 1986). Its strong wood was widely used for making many different implements. See Turner (1998) for detailed reference and other uses.
Wildlife Uses	Moderately important winter forage species for deer and elk in the northern Rocky Mountains. In southern British Columbia, it is of moderate importance as a winter forage for white-tailed deer and Rocky Mountain elk.
Wildlife Cover Value	Occurs in dense shrub habitats that probably provide good cover for wildlife.
Nutritional Value	No entry
Other Uses	No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
PHLEPRA	<i>Phleum pratense</i>	common timothy

VITAL ATTRIBUTE DATA

Regeneration	D, V	Establishment	I
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Life History	p, l=6-7
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Selected Species Type	DI	Species Group	Invader, Endurer
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Notes	Colonizes disturbed areas via seed. Extensive tiller mats of timothy limit cryptogam colonization sites and reduce native graminoid colonization.
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Successional Status	Usually occurs in early to mid-seral stages, although it can also cominate in self-perpetuating grasslands.
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Fire Response	Sprouts from roots; tiller production increases.
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Fire Source	Fischer <i>et al.</i> 1996.
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ADDITIONAL INFORMATION

Aboriginal Uses	No entry
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Wildlife Uses	Exotic species that is palatable and nutritious forage for domestic livestock and big game animals.
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Wildlife Cover Value	Provides important cover for a variety of game birds, small mammals, and waterfowl.
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Nutritional Value	Nutritive value decreases as plants mature.
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Other Uses	Cultivated for both hay and pasture throughout North America. Widely used for rehabilitation of cutover, burned-over, and overgrazed mountain rangelands.
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APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
PICEENG	<i>Picea engelmannii</i>	Engelmann spruce

VITAL ATTRIBUTE DATA

Regeneration	D, C	Establishment	R
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Life History m~15-40, l >450

Selected Species Type	DR	Species Group	Avoider
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Notes Generally shallow rooted, therefore, susceptible to windthrow. On some of the lower elevation Engelmann spruce and subalpine fir habitat types, Engelmann spruce will not achieve climax dominance or codominance because of repeated fires which favor shade-intolerant seral conifers. Very fire sensitive and is generally killed even by low-intensity fires.

Successional Status Shade tolerant climax species, usually codominant with subalpine fir (*Abies lasiocarpa*).

Fire Response Re-establishes by wind-dispersed seeds.

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Used by the Navaho and Thompson. See Moerman (1998) for detailed reference. Roots, bark, boughs, and wood of the tree used. See Turner (1998) for detailed references and uses.

Wildlife Uses Engelmann spruce-subalpine fir forests provide forage and habitat for a wide variety of small and large wildlife species: moose, elk, mule deer, woodland caribou, porcupine, snowshoe hare, red squirrel, chipmunks, and voles. Seeds are eaten by several species of small mammals and birds.

Wildlife Cover Value Engelmann spruce provides excellent hiding and thermal cover for deer, elk, moose, bighorn sheep, and bear. Small Engelmann spruce trees provide good year-round hiding cover for small animals

Nutritional Value *Picea engelmannii* is low in protein but fair in energy value.

Other Uses Primarily used for wood construction and prefabricated wood products. Used for reforestation projects on cool, moist sites below upper timberline. Seedlings establish best on mineral soil.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
PICEGLA	<i>Picea glauca</i>	white spruce

VITAL ATTRIBUTE DATA

Regeneration	D, C	Establishment	R
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Life History	m~30, l~200
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Selected Species Type	DR	Species Group	Avoider
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Notes Seedling establishment is best on mineral soil, tolerant of low light, and can withstand many years of suppression. White spruce is easily killed by fire: thin bark, shallow roots, lichen growth on its branches.

Successional Status Long-lived climax species that replaces pine, aspen, birch, and poplar on well-drained sites.

Fire Response Off-site wind-dispersed seed.

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Widely used for medicinal purposes. See Moerman (1998) for detailed reference. Roots, bark, boughs, and wood of the tree used. See Turner (1998) for detailed references and uses.

Wildlife Uses Snowshoe hares sometimes feed heavily on white spruce saplings and seedlings. Mice and voles eat spruce seedlings. Red squirrels clip twigs and feed on vegetative and reproductive buds in the spring. Spruce grouse feed entirely on spruce needles during winter. Numerous birds and mammals feed on white spruce seed. Red squirrels feed primarily on white spruce seed.

Wildlife Cover Value Provides good wildlife cover. May be particularly important as winter shelter.

Nutritional Value Good energy source for squirrels, which can survive the winter on a diet consisting entirely of white spruce seeds.

Other Uses Harvested primarily for pulpwood and lumber for general construction.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
PINUALB	<i>Pinus albicaulis</i>	whitebark pine

VITAL ATTRIBUTE DATA

Regeneration D **Establishment** I

Life History m >80, l=400-700

Selected Species Type DI **Species Group** Invader

Notes Distribution is strongly influenced by Clark's nutcrackers, which are important in the dispersal of seeds and establishment of seedlings. High frost resistance and low shade tolerance.

Successional Status In upper elevation subalpine forests, whitebark pine is generally seral, and is replaced by more shade tolerant trees, such as subalpine fir. Whitebark pine is favored by severe, stand-replacing fires which burn shade-tolerant associated trees.

Fire Response Seed dispersal by Clark's nutcracker

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Interior First Peoples of BC ate the whitebark pine seeds (Turner 1997).

Wildlife Uses Whitebark pine forests are highly productive in terms of forage. Seeds are present in early spring from caches, and late fall when other foods are scarce or low in digestibility. Important food source for birds, rodents, and bears.

Wildlife Cover Value Fair to good for elk, mule deer, small mammals, small nongame birds, and upland game birds.

Nutritional Value Seeds are wingless, large, and high in calories.

Other Uses Principal use of whitebark pine sites is watershed protection.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
PINUCON	<i>Pinus contorta</i>	lodgepole pine

VITAL ATTRIBUTE DATA

Regeneration	C	Establishment	I
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Life History m=5-10, l <200

Selected Species Type	CI	Species Group	Evader
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Notes Cone serotiny trait is not exhibited until trees are 20 to 30 years old. With intense fires, cones open, releasing huge amounts of seed. Germination and seedling survival are best on mineral soil. In the Canadian Rockies, typically 80-90 percent of trees bear serotinous cones.

Successional Status Intolerant, seral species. Aggressive pioneer on burned-over areas.

Fire Response Seeds released from serotinous cones.

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Widely used for medicinal purposes. See Moerman (1998) for detailed reference. Cambium was harvested by most Interior First Peoples of BC (Turner 1997). Commonly used for housing. See Turner (1998) for detailed reference and other uses.

Wildlife Uses Provides cover and habitat for big game animals, such as elk and deer. Seeds are an important food for pine squirrels. Its needles are an important blue and spruce grouse winter food.

Wildlife Cover Value Lodgepole pine stands provide good thermal and hiding cover for deer, elk, moose, and bear.

Nutritional Value One source rates lodgepole pine as a "high quality" food for ungulates. Other sources rate the energy value as fair and its protein value as poor.

Other Uses Primarily used for lumber and other wood products.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
PINUMON	<i>Pinus monticola</i>	western white pine

VITAL ATTRIBUTE DATA

Regeneration	D, S	Establishment	I
Life History	m~7, l >400		
Selected Species Type	DI	Species Group	Evader, Invader
Notes	Periodic, stand-replacing fire or other disturbance is needed to remove competing conifers and allow western white pine to develop in early seres.		

Successional Status Shade intolerant to very intolerant, fire dependent, seral species.

Fire Response Off-site seed, seedbank

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Wide range of medicinal uses. See Moerman (1998) for detailed reference. Bark was used to make storage baskets and small canoes (Turner 1998).

Wildlife Uses Western white pine provides habitat for a variety of mammals, birds, and insects. Its seeds are an important part of the diet of red squirrels and deer mice.

Wildlife Cover Value Provides nesting, thermal, and foraging cover for a variety of birds, and elk.

Nutritional Value No entry

Other Uses Valued for its wood qualities.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
PINUPON	<i>Pinus ponderosa</i>	ponderosa pine

VITAL ATTRIBUTE DATA

Regeneration W Establishment I

Life History m~7, l~300-600

Selected Species Type WI Species Group Resister

Notes Fire is an integral part of the ecology of *Pinus ponderosa*. Prior to 1900, fire frequency of surface fires 1-30 years. Drought tolerant. Thick bark and open crown structure allow it to survive most fires. Response will vary according to fire severity, tree age, and season.

Successional Status Climax species at lower elevations in its range. At higher elevations, *Pinus ponderosa* is seral to trees that are more shade tolerant and moisture demanding.

Fire Response Establishment from on-site and off-site seed.

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Widely used for medicinal purposes. See Moerman (1998) for detailed reference. Cambium was collected and eaten fresh or roasted. Seeds were gathered in the fall. See Turner (1997) for detailed reference. Widely used for fuel and building materials. See Turner (1998) for detailed reference and other uses.

Wildlife Uses *Pinus ponderosa* needles, cones, buds, pollen, twigs, seeds, and associated fungi and insects provide food for many species of birds and mammals.

Wildlife Cover Value As seedlings they provide low ground cover for small birds and mammals. Pole size stands provide good windbreaks and thickets as hiding cover for larger mammals such as elk and deer. Mature trees and standing snags provide primary and secondary cavity-nest sites.

Nutritional Value No entry

Other Uses Valuable lumber species. Widely used for soil stabilization and watershed protection in the Rocky Mountain region.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
PLANMAJ	<i>Plantago major</i>	common plantain

VITAL ATTRIBUTE DATA

Regeneration	D, V	Establishment	I
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Life History

Selected Species Type	DI	Species Group	Invader, Endurer
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Notes Perennial, to 30 cm tall, with a mass of fibrous roots and leafless flowering stalks. Widespread and common at low to mid elevations in weedy, often on disturbed ground and in waste places (Parish *et al.* 1996).

Successional Status No entry

Fire Response No entry

Fire Source Hitchcock *et al.* 1955-69.

ADDITIONAL INFORMATION

Aboriginal Uses Very widely used for medicinal purposes. See Moerman (1998) for detailed reference.

Wildlife Uses No entry

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
POPUBAL2	<i>Populus balsamifera ssp.</i>	black cottonwood

VITAL ATTRIBUTE DATA

Regeneration V, D Establishment I

Life History p, m~10, l >100

Selected Species Type VI Species Group Endurer, Invader

Notes Highly susceptible to fire damage because of its thin bark and relatively shallow root system.

Successional Status Pioneer species that commonly establishes on recently disturbed alluvium. Very shade intolerant. Dependent on periodic flooding or some form of soil disturbance to maintain seral stage.

Fire Response Sprouts from the stump, roots.

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Used for medicinal purposes. See Moerman (1998) for detailed reference. Black cottonwood cambium was eaten by many interior First Peoples. See Turner (1997) for detailed reference. The wood, bark, and buds were used in a variety of aboriginal technologies. See Turner (1998) for detailed reference and uses.

Wildlife Uses Low to high levels of forage for livestock. Provides food, cover, and shade for a variety of wildlife species. Deer and elk use may be high, depending on site and season. Crowns provide nesting sites for bald eagles, ospreys, and blue herons. A variety of birds, squirrels, raccoons nest in cottonwood trunk cavities. Beavers use cottonwood for food and building materials.

Wildlife Cover Value Ranges from fair to good. Streamside black cottonwoods contribute to favourable fish habitat.

Nutritional Value Fair energy and protein value.

Other Uses Used in the restoration of riparian areas. Its roots are effective soil stabilizers and provide valuable streambank and erosion protection.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
POPUTRE	<i>Populus tremuloides</i>	trembling aspen

VITAL ATTRIBUTE DATA

Regeneration V Establishment I

Life History p, m~10-20, l~70-150

Selected Species Type VI Species Group Endurer

Notes Regeneration is almost exclusively through vegetative means throughout most of western North America. Vegetative regeneration is primarily through suckering, although sprouting from root collars and stumps also occurs.

Successional Status May occur as either seral or climax species, depending on the interaction of a complex array of environmental factors. Occurs on an extremely wide range of sites. Three main types of successional pathways have been identified and described for aspen in the Intermountain West: 1) seral - successional to conifers; 2) stable - regeneration to aspen; and 3) decadent - successional to brush, forbs, or grass.

Fire Response Suckering, sprouting from root collar

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Widely used for medicinal purposes. See Moerman (1998) for detailed reference. The cambium was eaten by some interior First Peoples. See Turner (1997) for detailed reference. The wood was used for many technologies including canoes and saddles. See Turner (1998) for detailed reference and other uses.

Wildlife Uses New aspen suckers are nutritious and readily available food source for many large ungulates. In some areas, aspen regeneration may be seriously impacted by large populations of elk. Aspen forests provide important foraging, nesting, breeding, and resting sites for a wide variety of birds and mammals. Aspen is important browse for elk, moose, white-tailed deer, and mule deer.

Wildlife Cover Value Good hiding cover for large ungulates, and some thermal cover during the winter months. Aspen also provides good hiding and thermal cover for many smaller mammals. Beaver frequently use aspen branches in the construction of dams and lodges. Aspen stands provide protection, nesting, and roosting sites to many species of birds. Livestock also use aspen stands for shelter.

Nutritional Value Overall, fair in both energy and protein value. Nutritional values vary by season, geographic location, and plant part.

Other Uses Used most commonly in pulp products.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
PRUNVIR	<i>Prunus virginiana</i>	choke cherry

VITAL ATTRIBUTE DATA

Regeneration	V, D, S	Establishment	I
Life History	p		
Selected Species Type	VI	Species Group	Endurer, Invader, Evader
Notes	Vegetative expansion by rhizomes is its primary method of regeneration. Aerial portions are readily top-killed by fire, but the majority of plants survive due to perennating buds located on root crowns and rhizomes. Spring burning is more conducive to the rapid recovery of chokecherry than fall burning.		
Successional Status	Generally seral on forested sites; plants are relatively short-lived and decline in vigor and numbers as the forest canopy closes.		
Fire Response	Sprouts from the root crown and rhizomes		
Fire Source	Fischer <i>et al.</i> 1996.		

ADDITIONAL INFORMATION

Aboriginal Uses	Very widely used for medicinal purposes. See Moerman (1998) for detailed reference. One of the important fruits among interior First Peoples. The cherries were usually eaten fresh, but were also dried in large quantities in the sun, like raisins, or mashed and dried into cakes. See Turner (1997) for detailed reference.
Wildlife Uses	Typically forms open thickets that allow livestock and big game access to abundant amounts of nutritious and relatively palatable browse. Chokecherry berries are consumed by the following wildlife species that also act as seed dispersal agents: blue grouse, sharp-tailed grouse, quail, prairie chicken, ring-necked pheasant, magpie, cottontail rabbit, least chipmunk, black bear, and mule deer.
Wildlife Cover Value	Good for large game species, small mammals, small nongame birds, and upland game birds.
Nutritional Value	Rated good in energy value and poor in protein value. Nutritional value is relatively high in comparison with other western browse species.
Other Uses	Chokecherries are edible, and are used to make wines, syrups, jellies, and jams.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
PSEUMEN	<i>Pseudotsuga menziesii</i>	Douglas-fir

VITAL ATTRIBUTE DATA

Regeneration	W, D	Establishment	T
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Life History	1~400
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Selected Species Type	WT	Species Group	Resister
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Notes Crown scorch tends to be the principal cause of death, probably because ground fires intense enough to kill a tree by girdling it will also scorch the entire crown. In general, surviving trees tend to be taller and have larger bole diameters than trees that are killed by the same fire.

Successional Status Shade-tolerant climax species in dry to moist lower and middle elevation forests. Shade intolerant in wetter forests of the upper montane zone. Often a persistent seral species in grand fir and subalpine fir habitat types. *Pseudotsuga menziesii* is an avoider when young.

Fire Response On-site seed from surviving trees; off-site trees.

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Needles, gum, bark, and boughs used for medicinal purposes. See Moerman (1998) for detailed reference. Widely used in BC for building, household goods, and tools. See Turner (1998) for detailed reference and other uses.

Wildlife Uses Low-elevation and south-facing Douglas-fir types often serve as deer and elk winter range. Red squirrels cache great quantities of seed. Other small mammals and birds also eat large quantities of seed from the forest floor or extract seeds from the cones.

Wildlife Cover Value Douglas-fir habitat types provide excellent hiding and thermal cover for deer, elk, and bighorn sheep.

Nutritional Value Energy and protein value are rated as fair.

Other Uses Important and valuable for timber (dimensional lumber, plywood, railroad ties, house logs, posts and poles, fencing, and firewood). Also a popular Christmas tree.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
PTERAQU	<i>Pteridium aquilinum</i>	bracken fern

VITAL ATTRIBUTE DATA

Regeneration	V, D	Establishment	I
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Life History p, m~3-4, l>200

Selected Species Type	VI	Species Group	Endurer, Invader
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Notes Bracken fern produces and releases allelopathic chemicals which inhibits the germination of other species.

Successional Status Shade-intolerant pioneer and seral species that is sufficiently shade tolerant to survive in light spots in old-growth forests.

Fire Response Sprouts from dormant buds on rhizomes; spores

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Widely used for medicinal purposes. See Moerman (1998) for detailed reference. Rhizomes eaten by only a few interior groups. See Turner (1997) for detailed reference. Widespread use for household purposes. See Turner (1998) for detailed reference.

Wildlife Uses Elk and deer use are restricted to new fronds. Goats are the only livestock that eat bracken fern. Its cyanide levels are poisonous to most other livestock (horses, pigs, cattle, sheep).

Wildlife Cover Value No entry

Nutritional Value Crude protein content and carbohydrate levels decrease during the growing season. Lignin, tannin, and silicate levels tend increase during the growing season making the plant less palatable.

Other Uses The fiddleheads are commonly used today as a food for humans. Rhizomes are also used. Recent studies have shown all parts of the plant to be carcinogenic.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
PTEROSP	<i>Pterospora sp.</i>	pinedrops

VITAL ATTRIBUTE DATA

Regeneration	saprophytic	Establishment	R
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Life History

Selected Species Type	DR	Species Group	Avoider
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Notes Saprophytic perennial. Locally common at low to mid elevations, in shaded humus under conifers (Parish *et al.* 1996).

Successional Status No entry

Fire Response No entry

Fire Source Hitchcock *et al.* 1955-69.

ADDITIONAL INFORMATION

Aboriginal Uses Used for medicinal purposes. See Moerman (1998) for detailed reference. The Flathead of Montana boiled *Pterospora andromeda* with blue clematis to make a shampoo (Turner 1998).

Wildlife Uses No entry

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
PURSTRI	<i>Purshia tridentata</i>	antelope-brush

VITAL ATTRIBUTE DATA

Regeneration	D, V, S	Establishment	T
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Life History p, m~8-20, l~90-162

Selected Species Type	ST	Species Group	Avoider, Endurer, Evader
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Notes *Purshia tridentata* exhibits a great deal of variability depending on site conditions and geographic location. A few of the attributes that may vary: growth form, period of growth, fire tolerance, drought tolerance, climatic adaptation, vegetative reproduction, shade tolerance, rate of growth, seed production, palatability to wildlife and livestock.

Successional Status Generally a climax species, but is also able to establish on seral sites before other species appear.

Fire Response Sprouting(decumbent form) or off-site seed.

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Widely used for medicinal purposes. See Moerman (1998) for detailed reference.

Wildlife Uses Important browse species. Used by livestock in spring and fall and by many wild ungulates during the winter months.

Wildlife Cover Value Small mammals and nongame birds use *Purshia tridentata* for food and cover. Game birds also find forage and cover on antelope bitterbrush range.

Nutritional Value Rated good in protein and energy content. Nutrient content tends to vary with site, ecotype, and season.

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
RHAMPUR	<i>Rhamnus purshiana</i>	cascara

VITAL ATTRIBUTE DATA

Regeneration	D, V	Establishment	I
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Life History

Selected Species Type	DI	Species Group	Invader, Endurer
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Notes Usually top-killed by fire. Cascara usually reproduces by seed. It can also spread by layering. It will coppice after being stripped of bark and cut down. Birds are the main dispersers of cascara seeds.

Successional Status Shade tolerant, long-lived invader species.

Fire Response Sprouts from root crown; off-site seed.

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Used widely as a laxative. See Moerman (1998) for detailed reference. Cascara wood was used to make chisel handles by the Nuu-chah-nulth of Manhousat. The Skagit of Washington boiled the bark to make a green dye (Turner 1998).

Wildlife Uses Browse species for mule deer and elk. Other mammals that browse cascara include the Olympic black bear, Oregon gray fox, raccoon, and ring-tailed cat. Its drupes are eaten by birds. Cascara has no value as forage for livestock.

Wildlife Cover Value Brushy stands are capable of providing thermal and hiding cover.

Nutritional Value Not well understood.

Other Uses Cascara bark is processed by pharmaceutical companies in the manufacture of laxatives.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
RHUSGLA	<i>Rhus glabra</i>	smooth sumac

VITAL ATTRIBUTE DATA

Regeneration	V, (D)	Establishment	T
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Life History p

Selected Species Type	VT	Species Group	Endurer, Avoider
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Notes Variable response to grazing may be attributed to ecotypic differences or to specific site characteristics. Evidence suggests that spring fires increase *Rhus glabra* cover. Consecutive spring fires may reduce height of the plants, but numbers of plants usually increase.

Successional Status Climax indicator in a number of shrub and grassland communities, but is also a prominent species in many early seral communities.

Fire Response Sprouts vigorously from rhizomes;

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Widely used for medicinal purposes. See Moerman (1998) for detailed reference.

Wildlife Uses Small birds and mammals eat *Rhus glabra* fruits, and are key dispersal agents. *Rhus glabra* is browsed by deer, especially in the winter months.

Wildlife Cover Value Dense thickets of *Rhus glabra* provide cover for many small birds and mammals.

Nutritional Value Rated poor in both energy and protein value.

Other Uses Useful in controlling soil erosion and for roadside planting.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
RHUSRAD	<i>Rhus radicans</i>	poison-ivy

VITAL ATTRIBUTE DATA

Regeneration	V, D	Establishment	T
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Life History	p, m=3
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Selected Species Type	VT	Species Group	Endurer, Avoider
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Notes Poison-ivy sap contains urushiol which causes allergic contact dermatitis in humans. Poison-ivy has a very wide range of habitats and growth form.

Successional Status Depending on the site, poison-ivy may be present in early seral, mid-seral to climax communities.

Fire Response Sprouts from surviving rhizomes and root crowns.

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Used for medicinal purposes. See Moerman (1998) for detailed reference.

Wildlife Uses White-tailed deer eat the leaves and fruit. A wide variety of migrant and resident nongame and upland game birds consume the fruits.

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses Poison-ivy has been planted in the Netherlands for the past 50 years to prevent dike erosion.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
RHYTTRI	<i>Rhytidiadelphus triquetrus</i>	electrified cat's-tail moss

VITAL ATTRIBUTE DATA

Regeneration	D	Establishment	R
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Life History

Selected Species Type	DR	Species Group	Avoider
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Notes	No entry
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Successional Status	No entry
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Fire Response	No entry
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Fire Source	Rowe 1983
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ADDITIONAL INFORMATION

Aboriginal Uses	No entry
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Wildlife Uses	No entry
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Wildlife Cover Value	No entry
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Nutritional Value	No entry
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Other Uses	No entry
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APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
RIBECER	<i>Ribes cereum</i>	squaw currant

VITAL ATTRIBUTE DATA

Regeneration D, S Establishment I

Life History m~3

Selected Species Type SI Species Group Invader, Evader

Notes Alternate host for white pine blister rust which infests five-needled pines. Seeds require scarification to germinate. Low-severity fire may promote germination of soil-stored seed. Non-rhizomatous.

Successional Status Early to mid-seral species. Shade intolerant.

Fire Response Germination from soil-stored seed

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Fruit were usually picked and eaten fresh. Eaten also as a health food. See Turner (1997) for detailed reference.

Wildlife Uses Fair to poor browse for deer, but is important on ranges where little else is available. Chickadees and other birds eat the fruit.

Wildlife Cover Value Fair to good for small mammals and nongame birds.

Nutritional Value No entry

Other Uses The fruit is used for making jam, jelly, or pie.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
RIBEIRR	<i>Ribes irriguum</i>	Idaho gooseberry

VITAL ATTRIBUTE DATA

Regeneration	S, D	Establishment	I
Life History			
Selected Species Type	SI	Species Group	Evader, Invader
Notes	No entry		

Successional Status	No entry
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Fire Response	Estimated from <i>Ribes oxycanthoides</i>
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Fire Source	Estimated from <i>Ribes oxycanthoides</i>
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ADDITIONAL INFORMATION

Aboriginal Uses	Minor use for medicinal purposes (Moerman 1986). Berries were eaten by most interior groups, but not used in large quantities. See Turner (1997) for detailed reference.
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Wildlife Uses	No entry
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Wildlife Cover Value	No entry
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Nutritional Value	No entry
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Other Uses	No entry
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APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
RIBELAC	<i>Ribes lacustre</i>	black gooseberry

VITAL ATTRIBUTE DATA

Regeneration	D, S	Establishment	T
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Life History m~3-5, l >70

Selected Species Type	ST	Species Group	Invader, Evader
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Notes Alternate host for white pine blister rust which infests five-needled pines. Seeds have long-term viability in the organic and mineral soil. Shallow root system in the organic layer.

Successional Status Moderately shade tolerant, but grows most vigorously in canopy openings. Mineral soil is the best seedbed.

Fire Response Germination of soil-stored and off-site seed.

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Used for medicinal purposes. See Moerman (1998) and Turner (1997) for detailed reference. Berries were eaten fresh or cooked by many interior groups (Turner 1997).

Wildlife Uses *Ribes lacustre* berries are eaten by rodents, bears, and birds. Elk, mule deer, white-tailed deer, and mountain goats eat the foliage.

Wildlife Cover Value Good cover for upland game birds, small nongame birds, and small mammals.

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
RIBEOXY	<i>Ribes oxycanthoides</i>	northern gooseberry

VITAL ATTRIBUTE DATA

Regeneration S, D Establishment I

Life History m~3-5

Selected Species Type SI Species Group Evader, Invader

Notes Alternate host for white pine blister rust which infests five-needled pines. Root systems consist of shallow roots radiating from a central root crown. Seeds have long-term viability in the organic and mineral soil. May be able to sprout after low-severity fire.

Successional Status Moderately shade tolerant. Becomes established in early seral communities and remains present in mid-seral communities.

Fire Response Germination of soil-stored and off-site seed

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Minor use for medicinal purposes (Moerman 1986). Berries were eaten by most interior groups, but not used in large quantities. See Turner (1997) for detailed reference.

Wildlife Uses Berries are eaten by grizzly bears. Mule deer and elk browse the foliage in summer and fall.

Wildlife Cover Value Rated good for small mammals, small nongame birds, and upland game birds. Fair to good for mule deer and white-tailed deer.

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
ROSAACI	<i>Rosa acicularis</i>	prickly rose

VITAL ATTRIBUTE DATA

Regeneration	V, D, S	Establishment	I
Life History	p, l >100 (clones)		
Selected Species Type	VI	Species Group	Endurer, Invader, Evader
Notes	Regenerates vegetatively by means of widespread rhizomes. Seeds set frequently in open communities. Seed is dispersed by small mammals, songbirds, and grouse. Seeds exhibit deep dormancy, and germination may be stimulated by fire.		
Successional Status	Moderately shade tolerant. Depending on the site, <i>Rosa acicularis</i> occurs in early seral to climax communities.		
Fire Response	Sprouts from stems or rhizomes; on, off-site seed.		
Fire Source	Fischer <i>et al.</i> 1996.		

ADDITIONAL INFORMATION

Aboriginal Uses	Minor use for medicinal purposes by the Iroquois (Moerman 1986). Rosehips are high in Vitamin C and were eaten by many interior aboriginal groups. See Turner (1997) for detailed reference and other uses.
Wildlife Uses	Important food source for grouse, snowshoe hares, and rodents. Mule deer eat <i>Rosa acicularis</i> twigs and foliage. White-tailed deer, pronghorn, elk, moose, and mountain sheep browse on the roses. Black bear and grizzly bear eat the rosehips in the fall. Rosehips are also eaten by songbirds and small mammals.
Wildlife Cover Value	Provide excellent nesting sites and protective cover for birds, as well as shelter for small mammals.
Nutritional Value	<i>Rosa acicularis</i> rosehips are high in vitamin A and are a winter source of vitamin C. Rosehips are highly digestible.
Other Uses	Flowers are a source of nectar for bees kept by beekeepers. Juice extracted from the hips by boiling can be used to make jellies and syrups. Leaves, flowers and buds can be used to make tea.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
ROSAWOO	<i>Rosa woodsii</i>	prairie rose

VITAL ATTRIBUTE DATA

Regeneration	V, D, S	Establishment	I
Life History	p, m~2-5		
Selected Species Type	VI	Species Group	Endurer, Invader, Evader

Notes *Rosa woodsii* spreads vegetatively through underground rhizomes, sprouting from the root crown, and layering.

Successional Status Flourishes in moderate shade to full sunlight. Aggressive pioneer of abandoned fields, disturbed sites, gullies, and land cuts and fills. Persists as an understory species in mid-seral to climax communities. Long-lived perennial, bushy shrub.

Fire Response Sprouts from root crowns and rhizomes.

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Used for medicinal purposes. See Moerman (1998) for detailed reference. Rosehips are high in Vitamin C and were eaten by many interior aboriginal groups. See Turner (1997) for detailed reference and other uses. Used in a variety of technologies in different regions of BC. See Turner (1998) for detailed reference and uses.

Wildlife Uses Browsed by livestock and big game from spring through fall. Moderate use by mule deer and elk. Porcupines and beavers also browse the leaves. Many birds and mammals are sustained by the rosehips when the ground is covered with snow.

Wildlife Cover Value Dense thickets along field borders and stream courses are used for nesting and escape cover by many birds and small mammals. Fair to good environmental protection for white-tailed deer, small mammals, small nongame birds, upland game birds, and waterfowl.

Nutritional Value *Rosa woodsii* rosehips are a high source of digestible energy. Moderately high in crude protein during winter.

Other Uses Rosehips are a source of vitamin C and are dried for use in flavoring teas, jellies, fruitcakes, and puddings. Flowers provide a source of nectar for honey bees. Suitable species in erosion control with its extensive rhizomes, good survivability and revegetation characteristics.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
RUBUIDA	<i>Rubus idaeus</i>	red raspberry

VITAL ATTRIBUTE DATA

Regeneration	V, S, D	Establishment	I
Life History	p, m=2, l~5-12		
Selected Species Type	VI	Species Group	Endurer, Evader, Invader

Notes Vegetative regeneration occurs through root sprouts or "suckers", "stolons", "rhizomes", and basal stem buds or rootcrowns. The mode of vegetative regeneration depends on the type and severity of disturbance. *Rubus idaeus* can accumulate large numbers of seed in the soil which remain viable for 60-100+ years. Life cycle of *Rubus idaeus* is highly associated with disturbance, such as fire.

Successional Status Pioneer or early seral species which flourishes and completes its life cycle during the first years after disturbance. Shade-intolerant species which dominates sites during early successional stages but decreases as the canopy closes.

Fire Response Soil-stored seed; sprouts from root and stem buds

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Widely used for medicinal purposes. See Moerman (1998) for detailed reference. Wild raspberry fruit was extremely popular with all interior First Peoples and eaten fresh, or mashed and dried into cakes for winter storage. See Turner (1997) for detailed reference and other uses.

Wildlife Uses Some herbivores browse raspberry, but in general, it offers relatively poor forage. Fruits are eaten by many species of birds and mammals, who then serve as dispersal agents.

Wildlife Cover Value Dense *Rubus idaeus* thickets serve as favorable nesting habitat for many small birds, and shelter for small mammals such as rabbits and squirrels.

Nutritional Value Browse is rated as poor in energy and protein value.

Other Uses The raspberry industry in North America is a multimillion-dollar business: southern British Columbia is in one of the five primary growing regions.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
RUBULEU	<i>Rubus leucodermis</i>	black raspberry

VITAL ATTRIBUTE DATA

Regeneration	V, S, D	Establishment	I
Life History	p		
Selected Species Type	VI	Species Group	Endurer, Evader, Invader
Notes	No entry		

Successional Status No entry

Fire Response No entry

Fire Source Estimated from *Rubus idaeus*

ADDITIONAL INFORMATION

Aboriginal Uses Minor use for medicinal purposes by the Shoshone (Moerman 1986). Blackcap berries are still a common food of many interior First Peoples within the range of the plant. See Turner (1997) for detailed reference.

Wildlife Uses No entry

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
RUBUPAR	<i>Rubus parviflorus</i>	thimbleberry

VITAL ATTRIBUTE DATA

Regeneration	D, V, S	Establishment I
Life History	p, m=2, l~25	
Selected Species Type	VI	Species Group Invader, Endurer, Evader

Notes Reproduces through seed but also regenerates vegetatively, even in the absence of disturbance. Strongly rhizomatous shrub which is also capable of vigorous sprouting from rootcrowns and roots. Seedbanking is believed to represent an important post-disturbance regenerative strategy in this species. Generally enhanced by fire. In areas of rigorous fire suppression, thimbleberry fruit production and plant vigor has declined.

Successional Status Moderately shade-tolerant shrub. Persistent seral species which frequently dominates the understory during the first several decades after disturbance through rhizomes or seedling establishment.

Fire Response Sprouts from rhizomes, soil-stored, off-site seed

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Used for medicinal purposes. See Moerman (1998) for detailed reference. Thimbleberries were eaten by all aboriginal groups in the central and southern interior BC. See Turner (1997) for detailed reference and uses. The leaves were used to line steaming pits and to cover baskets of berries. See Turner (1998) for detailed reference.

Wildlife Uses In some areas, thimbleberry is an important browse species for black-tailed deer and mule deer. Leaves and bark are eaten by rodents. The fruit are an important dietary item for many birds and mammals (black and grizzly bears, and many small mammals). Birds are the main dispersal agent while small mammals play a local role.

Wildlife Cover Value Dense thickets form good nesting habitat for many small birds. Thimbleberry offers good thermal protection for big game during the hot summer months.

Nutritional Value Rated poor in energy and protein value.

Other Uses Thimbleberry fruit make excellent jelly but are too seedy for jam. Palatability tends to be greater where rainfall is greater.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
RUBUPED	<i>Rubus pedatus</i>	five-leaved bramble

VITAL ATTRIBUTE DATA

Regeneration	V, D, (S?)	Establishment	I
Life History	p		
Selected Species Type	VI	Species Group	Endurer, Invader, (Evader?)
Notes	No entry		

Successional Status No entry

Fire Response No entry

Fire Source Estimated from *Rubus idaeus*

ADDITIONAL INFORMATION

Aboriginal Uses Berries were eaten sporadically by interior First Peoples. See Turner (1997) for detailed reference.

Wildlife Uses No entry

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
SAGILAT	<i>Sagittaria latifolia</i>	wapato

VITAL ATTRIBUTE DATA

Regeneration	V, D	Establishment	I
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Life History

Selected Species Type	VI	Species Group	Endurer, Invader
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Notes Semiaquatic perennial, to 90cm tall, from tuber-bearing rhizomes. Scattered and infrequent at low to mid elevations in marshes, ponds, lake edges and wet ditches (Parish *et al.* 1996).

Successional Status	No entry
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Fire Response	No entry
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Fire Source	Hitchcock <i>et al.</i> 1955-69.
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ADDITIONAL INFORMATION

Aboriginal Uses	All parts of the plant used for medicinal purposes. See Moerman (1998) for detailed reference. Eaten by some interior First Peoples (Turner 1997).
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Wildlife Uses	No entry
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Wildlife Cover Value	No entry
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Nutritional Value	No entry
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Other Uses	No entry
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APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
SALIEXI	<i>Salix exigua</i>	sandbar willow

VITAL ATTRIBUTE DATA

Regeneration V, D Establishment I

Life History p, l~10

Selected Species Type VI Species Group Endurer, Invader

Notes Numerous seeds are produced and most germinate within 24 hours of dispersal. Seed germination requires light and constant soil moisture. Common method of vegetative regeneration is through broken pieces of stems and roots which are transported and deposited by flood waters and later sprout.

Successional Status *Salix exigua* is a pioneer species that colonizes new sand and gravel bars.

Fire Response Sprouts from roots; off-site seed

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses *Salix exigua* and other *Salix* species were used for medicinal purposes. See Moerman (1998) for detailed reference. Willows were used in a large number of technologies. See Turner (1998) for detailed reference.

Wildlife Uses Browsed heavily by elk. A favourite food of beaver. Willows in general are a preferred food of moose.

Wildlife Cover Value Stands or thickets with densely spaced stems provide excellent hiding cover for numerous wildlife species.

Nutritional Value Energy value is rated as fair and its protein value as poor.

Other Uses Ability to rapidly colonize disturbed areas make it useful for streambank stabilization projects. All willows produce salicin, which is chemically related to the commercial product, aspirin.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
SALISCO	<i>Salix scouleriana</i>	Scouler's willow

VITAL ATTRIBUTE DATA

Regeneration V, D Establishment I

Life History p, m<10, l <70

Selected Species Type VI Species Group Endurer, Invader

Notes Prolific seed producer. Light and a moist, mineral seedbed is required for good germination. Even when aboveground parts are destroyed by fire, underground plant parts usually survive.

Successional Status Shade-intolerant, long-lived seral species.

Fire Response Sprout from root crown; off-site seed

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses *Salix scouleriana* and other *Salix* species were used for medicinal purposes. See Moerman (1998) for detailed reference. Willows were used in a large number of technologies. See Turner (1998) for detailed reference.

Wildlife Uses Cattle and sheep consume the leaves and twigs - considered one of the best willows for livestock because scattered individuals grow in clumps. Highly valued browse species for moose, elk, mule deer, and white-tailed deer (especially as a winter food source). Shoots, buds, and catkins are eaten by rodents, small mammals and birds.

Wildlife Cover Value *Salix scouleriana* is a major component of seral shrub communities which provide cover for deer and elk. Also provides good environmental protection for small mammals, small nongame birds and upland game birds.

Nutritional Value Protein and digestibility remain high through the growing season to the end of September.

Other Uses All willows produce salicin which is chemically related to the commercial product, aspirin.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
SAMBCER	<i>Sambucus cerulea</i>	blue elderberry

VITAL ATTRIBUTE DATA

Regeneration	V, S, D	Establishment	I
Life History	p, m~2-3		
Selected Species Type	SI	Species Group	Endurer, Evader, Invader
Notes	Usually absent from the understory of closed-canopy forests before fire occurs and must rely on seed banks for regeneration.		

Successional Status Short-lived shade intolerant species that occurs in seral communities in openings in moist forest habitats and in moist areas within drier, more open habitats.

Fire Response Sprouts from root crown; soil-stored and off-site seed

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Coastal peoples and the transitional groups had access to red elderberry (*S. racemosa*). Southern interior groups usually harvested blue elderberries (*S. cerulea*). See Turner (1997) for detailed reference.

Wildlife Uses Many wildlife species use *Sambucus* spp. for food (e.g., many species of birds, mule deer, elk). *Sambucus cerulea* is a more important deer browse than *Sambucus racemosa*.

Wildlife Cover Value Provides cover, perching, and nesting sites for many species of birds. Also provides cover and food for small mammals.

Nutritional Value Energy value is rated as fair and its protein value as poor. Important as a late season browse because of a fairly high level of protein and essential inorganics when herbaceous plants are at their lowest nutritional ebb.

Other Uses The fruit is gathered for wine, jellies, candy, pies, and sauces, and it is cultivated commercially in Oregon.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
SAMBRAC	<i>Sambucus racemosa</i>	red elderberry

VITAL ATTRIBUTE DATA

Regeneration	V, S, D	Establishment	I
Life History	p, m~3-5		
Selected Species Type	SI	Species Group	Endurer, Evader, Invader
Notes	Ability to store seed in seed banks so that viable seeds can germinate following fire or other disturbance even if plants are absent from the prefire stand.		
Successional Status	Early to mid-seral species which can persist in relatively open conifer stands. Shade tolerant or partially shade tolerant.		
Fire Response	Sprout from rhizomes or root crowns; soil-stored seed		
Fire Source	Fischer <i>et al.</i> 1996.		

ADDITIONAL INFORMATION

Aboriginal Uses	Widely used for medicinal purposes. See Moerman (1998) for detailed reference. Coastal peoples and the transitional groups had access to red elderberry (<i>S. racemosa</i>). Southern interior groups usually harvested blue elderberries (<i>S. cerulea</i>). See Turner (1997) for detailed reference.
Wildlife Uses	<i>Sambucus</i> species provide food for many wildlife species, as well as nesting and perching habitat for birds. Elk and mule deer browse the leaves.
Wildlife Cover Value	Provides good environmental protection is fair to good for mule deer, white-tailed deer, small mammals, small nongame birds, and upland birds.
Nutritional Value	Energy value is rated as fair and its protein value is rated as poor. The fruit is high in ascorbic acid.
Other Uses	Fruit may be used for jelly or wine. Contains a cyanogenetic glycoside and an alkaloid that can cause nausea, vomiting, diarrhea, and gastrointestinal pain - highest concentration are in the roots, while very little is found in the berries.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
SCIRACU	<i>Scirpus acutus</i>	hard-stemmed bulrush

VITAL ATTRIBUTE DATA

Regeneration	D, S, V	Establishment	I
Life History	p		
Selected Species Type	VI	Species Group	Invader, Evader, Endurer
Notes	Densely colonial from extensive, stout rhizomes. Grows best on sites with saturated soil or standing water for most of the year. Fairly drought tolerant.		
Successional Status	In Montana <i>Scirpus acutus</i> colonizes newly exposed mudflats and drawdown areas. Forms a stable dominance type on sites with relatively constant water regimes.		
Fire Response	Sprouts from rhizomes; soil-stored seed and off-site seed.		
Fire Source	Fischer <i>et al.</i> 1996.		

ADDITIONAL INFORMATION

Aboriginal Uses	Minor use for medicinal purposes (Moerman 1986). Important mat-making material for coastal and interior First Peoples. See Turner (1998) for detailed reference and other uses.
Wildlife Uses	Staple food for muskrat and other small mammals. Seeds are eaten by passerines and waterfowl.
Wildlife Cover Value	Provides valuable nesting cover and escape cover for a variety of passerines and waterfowl throughout its range, including herons and egrets.
Nutritional Value	Energy rating is fair and protein content is poor.
Other Uses	<i>Scirpus acutus</i> buffers wind and wave action on lakes and ponds, which may enhance the establishment of vegetation along shorelines. Used in artificial wetlands to filter agricultural wastewater.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
SELAWAL	<i>Selaginella wallacei</i>	Wallace's selaginella

VITAL ATTRIBUTE DATA

Regeneration	D	Establishment	R
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Life History

Selected Species Type	DR	Species Group	Avoider
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Notes Main stems prostrate, rooting sparsely and forming loose, tangled mats. Scattered and fairly common at low to mid elevations, mostly on rocky cliff-faces and ledges, dry, exposed rock outcrops and rocky soils (Parish et al. 1996).

Successional Status No entry

Fire Response No entry

Fire Source Hitchcock *et al.* 1955-69.

ADDITIONAL INFORMATION

Aboriginal Uses No entry

Wildlife Uses No entry

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
SHEPCAN	<i>Shepherdia canadensis</i>	soopolallie

VITAL ATTRIBUTE DATA

Regeneration	V, D, S	Establishment	T
Life History	p, m=4-6		
Selected Species Type	VT	Species Group	Endurer, Avoider

Notes Low to moderate intensity fires may increase vigor and density of *Shepherdia canadensis* in "old-growth" stands. Berry production may also be increased for several years after fire.

Successional Status Occurs as a dominant species in the climax vegetation of ponderosa pine forests. Following fire, *Shepherdia canadensis* is found in the seedling/herb stage which lasts from 1 to 15 years, and remains after the canopy closes (percent cover decreases significantly).

Fire Response Sprouts from root crowns; off-site seed

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Used for medicinal purposes. See Moerman (1998) for detailed reference. Berries were widely used by coastal and interior First Peoples. Dried berries were a major trade item among aboriginal peoples. See Turner (1998) for detailed reference.

Wildlife Uses Provides fair to good browse for mule deer, white-tailed deer, and elk. Berries are heavily used by black bears, grizzly bears, and grouse. The fruit are also eaten by small mammals, upland game birds, and waterfowl.

Wildlife Cover Value Provides fair to good environmental protection for mule deer, white-tailed deer, upland game birds, small nongame birds, and small mammals.

Nutritional Value High protein value, but low palatability.

Other Uses Desirable for revegetating disturbed sites, because it is native, provides food and cover for wildlife, and is a nitrogen-fixing plant.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
SIUMSUA	<i>Sium suave</i>	water-parsnip

VITAL ATTRIBUTE DATA

Regeneration	D, V	Establishment	T
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Life History

Selected Species Type	DT	Species Group	Avoider, Endurer
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Notes Semiaquatic perennial, fibrous roots, with roots often emerging from lower stem nodes. Scattered and locally common at low to mid elevations in shallow water of swamps, marshes, lakeshores and ditches (Parish *et al.* 1996).

Successional Status No entry

Fire Response No entry

Fire Source Hitchcock *et al.* 1955-69.

ADDITIONAL INFORMATION

Aboriginal Uses Reported use by the Iroquois for medicinal purposes (Moerman 1986). Roots eaten by many Interior First Peoples. See Turner (1997) for detailed reference.

Wildlife Uses No entry

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
SMILRAC	<i>Smilacina racemosa</i>	false Solomon's-seal

VITAL ATTRIBUTE DATA

Regeneration	V, D	Establishment	T
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Life History

Selected Species Type	DT	Species Group	Avoider, Endurer
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Notes Perennial, from stout, fleshy rhizomes, often growing in clumps. Widespread and common at low to subalpine elevations in moist forests, openings and clearings (Parish *et al.* 1996).

Successional Status	No entry
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Fire Response	No entry
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Fire Source	Hitchcock <i>et al.</i> 1955-69.
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ADDITIONAL INFORMATION

Aboriginal Uses	Widely used for medicinal purposes. See Moerman (1998) for detailed reference. Berries were eaten and the rhizomes used to flavour food (Turner 1997). Roots or whole plants were used as a scent (Turner 1998).
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Wildlife Uses	Berries were eaten by grizzly bears and many smaller animals.
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Wildlife Cover Value	No entry
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Nutritional Value	No entry
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Other Uses	No entry
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APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
SMILSTE	<i>Smilacina stellata</i>	star-flowered false Solomon's-seal

VITAL ATTRIBUTE DATA

Regeneration	V, D	Establishment	T
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Life History

Selected Species Type	DT	Species Group	Avoider, Endurer
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Notes Perennial, from long, pale rhizomes, forms dense colonies, often in partial shade. Widespread and common at low to mid and occasionally subalpine elevations in moist forests, clearings and moist openings (Parish *et al.* 1996).

Successional Status No entry

Fire Response No entry

Fire Source Hitchcock *et al.* 1955-69.

ADDITIONAL INFORMATION

Aboriginal Uses Widely used for medicinal purposes. See Moerman (1998) for detailed reference. Berries were eaten and rhizomes were used to flavour food (Turner 1997). Roots or whole plants were used as a scent (Turner 1998).

Wildlife Uses Berries were eaten by grizzly bears and many smaller animals.

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
SORBSCO	<i>Sorbus scopulina</i>	western mountain-ash

VITAL ATTRIBUTE DATA

Regeneration	D	Establishment	I
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Life History

Selected Species Type	DI	Species Group	Invader
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Notes Use info for *Sorbus sitchensis*

Successional Status No entry

Fire Response Little known about fire effects on *Sorbus scopulina*

Fire Source Estimated from *Sorbus sitchensis*

ADDITIONAL INFORMATION

Aboriginal Uses No entry

Wildlife Uses No entry

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
SORBSIT	<i>Sorbus sitchensis</i>	Sitka mountain-ash

VITAL ATTRIBUTE DATA

Regeneration	D	Establishment	I
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Life History m~15

Selected Species Type	DI	Species Group	Invader
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Notes Seeds are mainly dispersed by birds. *Sorbus sitchensis* is common but scattered in British Columbia, where it is found in montane to subalpine, open-canopy coniferous forests. Little known about the immediate fire effects on *Sorbus sitchensis*.

Successional Status Shade intolerant and persists in clearings in climax forests. May produce allelopathic substances that inhibit growth of other vegetation

Fire Response Off-site seed

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses The berries were occasionally eaten by some of the interior First Peoples. See Turner (1997) for detailed reference and uses. The wood was used in making snowshoes and axe handles. See Turner (1998) for detailed reference and other uses.

Wildlife Uses Berries remain on the trees until late winter, making them available as winter forage for upland gamebirds, songbirds, and small mammals. Twigs supply browse for deer and moose. Black bear and grizzly bear eat the berries, leaves, and stems.

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses Used for streambank rehabilitation in Oregon and Washington.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
SPHAGNU	<i>Sphagnum</i> sp.	peat moss

VITAL ATTRIBUTE DATA

Regeneration	D	Establishment	R
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Life History

Selected Species Type	DR	Species Group	Avoider
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Notes	No entry
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Successional Status	No entry
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Fire Response	No entry
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Fire Source	Heinselman 1981.
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ADDITIONAL INFORMATION

Aboriginal Uses	General household use. See Turner (1998) for detailed reference.
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Wildlife Uses	No entry
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Wildlife Cover Value	No entry
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Nutritional Value	No entry
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Other Uses	No entry
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APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
SPIRBET	<i>Spiraea betulifolia</i>	birch-leaved spirea

VITAL ATTRIBUTE DATA

Regeneration V Establishment T

Life History p

Selected Species Type VT Species Group Endurer

Notes Rhizomatous shrub with deep root development, usually grows in extensive colonies. Found to increase in canopy cover 3 to 5 years after a burn.

Successional Status Moderately shade tolerant. Indicator of late-seral to climax conditions. Ranked as a dependable fire-survivor species.

Fire Response Sprouts from surviving root crowns and rhizomes.

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Minor use for medicinal purposes by the Shuswap (Moerman 1986).

Wildlife Uses Not an important shrub species to livestock or wildlife.

Wildlife Cover Value Rated poor because it reaches a height from 1-3 feet.

Nutritional Value Poor forage species and is generally not used by livestock or wildlife.

Other Uses High vegetative response to many types of disturbances from logging to wildfires. Regenerates quickly and provides soil stabilization after disturbance.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
STREAMP	<i>Streptopus amplexifolius</i>	clasping twistedstalk

VITAL ATTRIBUTE DATA

Regeneration	V, D	Establishment	T
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Life History

Selected Species Type	DT	Species Group	Avoider, Endurer
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Notes Perennial, from thick, short rhizomes that are covered with fibrous roots. Widespread and common at low to high elevations, in moist, rich seepage forests and openings or clearings with seepage (Parish *et al.* 1996).

Successional Status No entry

Fire Response No entry

Fire Source Hitchcock *et al.* 1955-69.

ADDITIONAL INFORMATION

Aboriginal Uses Used for a variety of medicinal purposes. See Moerman (1998) for detailed reference. Not eaten as a food plant (Turner 1997). Roots or whole plants were used as a scent (Turner 1998).

Wildlife Uses No entry

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
SYMPALB	<i>Symphoricarpos albus</i>	common snowberry

VITAL ATTRIBUTE DATA

Regeneration	V, D	Establishment	T
Life History	p		
Selected Species Type	VT	Species Group	Endurer, Avoider
Notes	Saponin in the leaves. Regeneration is mainly from rhizomes located in mineral soil.		

Successional Status	Climax shrub in many forested and nonforested communities. Shade tolerant.
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Fire Response	Sprouts from rhizomes, less from root crown.
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Fire Source	Fischer <i>et al.</i> 1996.
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ADDITIONAL INFORMATION

Aboriginal Uses	Widely used for medicinal purposes. See Moerman (1998) for detailed reference. Berries were not eaten by any interior aboriginal peoples (Turner 1997). Branches were used to make brooms. Twigs were hollowed out for pipe stems. See Turner (1998) for detailed reference and other uses.
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Wildlife Uses	Important food for quail, pheasant, grouse, and partridge. Seeds are dispersed by birds and mammals.
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Wildlife Cover Value	Provides important nesting cover for grouse and wild turkeys.
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Nutritional Value	No entry
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Other Uses	Used for rehabilitating riparian areas and mine spoils. Rhizomes help prevent soil erosion.
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APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
TARAOFF	<i>Taraxacum officinale</i>	common dandelion

VITAL ATTRIBUTE DATA

Regeneration D, S Establishment I

Life History m=1

Selected Species Type DI Species Group Invader, Evader

Notes Long-lived seedbank and prolific producer of wind-dispersed seed. Usually increases in frequency after fire. Burning to decrease cover of dandelion on rangelands should be done in the spring after growth initiation.

Successional Status Colonizer following vegetation disturbances in temperate climates throughout North America. Although the role as an early seral species does not change, the length of time dandelion populations are present varies among ecosystems.

Fire Response Germination from soil-stored and off-site seed.

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Widely used for medicinal purposes. See Moerman (1998) for detailed reference. Introduced weed from Europe around the mid 1800s. Leaves harvested and eaten as greens (Turner 1997).

Wildlife Uses Consumed by sharp-tailed grouse, pocket gophers, deer and elk, grizzly bear, black bear, greater prairie chicken, and sage grouse.

Wildlife Cover Value No entry

Nutritional Value Protein content exceeds the minimum requirements needed for body maintenance for deer in ponderosa pine communities. By late September, protein content decreases significantly.

Other Uses Tea and wine can be made from the flowers.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
TAXUBRE	<i>Taxus brevifolia</i>	western yew

VITAL ATTRIBUTE DATA

Regeneration	D, V	Establishment	R
Life History	1 > 200		
Selected Species Type	DR	Species Group	Avoider, Endurer
Notes	Seeds are poisonous. Allelopathic compounds may be concentrated in senescent leaves and leached into the litter.		

Successional Status Shade tolerant. Present in many climax or near climax communities of the Pacific Northwest and northern Rocky Mountains. Fire sensitive species is absent from areas characterized by high fire frequencies.

Fire Response Germination from off-site seed

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Use of leaves, branches, and bark for medicinal purposes. See Moerman (1986) for detailed reference. A valued wood that provided a wide variety of tools. See Turner (1998) for detailed reference.

Wildlife Uses Provides browse for deer, elk, and moose. Rabbits and other small herbivores may also browse Pacific yew. Fruit is eaten by many species of songbirds. Seed is commonly dispersed by birds.

Wildlife Cover Value *Taxus brevifolia* commonly forms a dense subcanopy which provides excellent hiding and thermal cover for large ungulates and other wildlife species. On riparian sites, it provides shade for salmonids and other anadromous fish.

Nutritional Value No entry

Other Uses Wood is fine grained, heavy, hard, and very strong. Used to make canoe paddles, tool handles, poles, and fence posts. *Taxus brevifolia* has become important recently for taxol, a substance obtained from the bark, used in cancer research.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
THUJPLI	<i>Thuja plicata</i>	western redcedar

VITAL ATTRIBUTE DATA

Regeneration D, W, (V) **Establishment** T

Life History p, m=20-30, l >500

Selected Species Type DT **Species Group** Endurer, Avoider

Notes *Thuja plicata* roots are extensive. Heavy seed crops are common, and are dispersed primarily by wind. Heavily shaded seedbeds have been associated with the best germination of *Thuja plicata* in B.C. Three natural types of vegetative reproduction occur (most often in closed canopies): layering, rooting of fallen, living branches, and rooting along the trunks of fallen, living trees.

Successional Status Very shade tolerant climax or near climax species, but it can be found in all stages of forest succession.

Fire Response Commonly killed by fire, but older trees can survive if not girdled by fire

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Widely used for medicinal purposes. See Moerman (1998) for detailed reference. Most widely used plant for technology by coastal and interior First Peoples. See Turner (1998) for detailed reference on uses.

Wildlife Uses Provides food for black-tailed deer, Roosevelt elk, and black bear.

Wildlife Cover Value Provides hiding and thermal cover for several wildlife species. Bears, raccoons, skunks, and other animals use cavities in western redcedar for dens. Cavity nesting bird species use western redcedar as nest trees.

Nutritional Value Relatively high concentrations of calcium and low concentrations of nitrogen are nearly always present in western redcedar foliage.

Other Uses Western redcedar leaf oil is used in the preparation of many products including perfumes, insecticides, and medicinal preparations. Extractives and residues are used in lead refining, boiler-water additives, and glue extenders. Extremely valuable tree to the First Peoples of the Northwest Coast.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
TYPHLAT	<i>Typha latifolia</i>	common cattail

VITAL ATTRIBUTE DATA

Regeneration	V, D	Establishment	I
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Life History p, m=1

Selected Species Type	VI	Species Group	Endurer, Invader
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Notes *Typha latifolia* is considered a weed on some irrigated agricultural lands and in managed waterfowl production areas. Prolific producer of minute seeds. Once established, a single seedling spreads rapidly by rhizomes. Prescribed burning in late fall, winter, or early spring when plant tops are dry opens up common cattail stands by removing years of accumulated litter.

Successional Status Dominant component of early successional stages in wetlands.

Fire Response Sprouts from rhizomes

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Widely used for medicinal purposes. See Moerman (1998) for detailed reference. Rhizomes, leaf bases and young flower spikes were eaten by many First Peoples in BC. Leaves were used to make mats and other household items. See Turner (1998) for detailed reference and other uses.

Wildlife Uses *Typha latifolia* rhizomes and basal portions are an important food of muskrat, nutria, and geese. For ducks, however, *Typha latifolia* is of little value as food or cover.

Wildlife Cover Value Provides nesting sites for the red-winged blackbird, yellow-headed blackbird, and marsh wren. Provides excellent hut building material for muskrat.

Nutritional Value Forage value is highest in early spring, when protein content may reach 15 percent of dry weight.

Other Uses Leaves and stems have been used around the world as bedding, thatching, and matting, and in the manufacture of baskets, boats and rafts, shoes, ropes, and paper.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
URTIDIO	<i>Urtica dioica</i>	stinging nettle

VITAL ATTRIBUTE DATA

Regeneration	D, V, S	Establishment	I
Life History	p, m=1		
Selected Species Type	DI	Species Group	Invader, Endurer, Evader
Notes	Common understory component of riparian communities. Occurs both in wetlands and uplands.		

Successional Status Moderately shade tolerant colonizer of disturbed sites. Produces abundant seed which can persist in the seedbank for an undetermined length of time.

Fire Response Sprouts from rhizomes; off-site and soil-stored seed

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Widely used for medicinal purposes. See Moerman (1998) for detailed reference. Some of the interior peoples ate the young leaves and stems by first boiling them for a short time. See Turner (1997) for detailed reference. Important source of fibre for making into twine for most coastal peoples. See Turner (1998) for detailed reference and other uses.

Wildlife Uses Wildlife food value of *Urtica dioica* is listed as poor.

Wildlife Cover Value Provides cover for small animals. *Urtica dioica* is a component of graminoids and herbaceous vegetation that provide tall, dense nesting cover for mallards and gadwalls.

Nutritional Value Rated as very nutritious (23% crude protein, 3-5% crude fats, 35-39% non-nitrogen extracts, 9-21% crude fiber, and 19-29% ash).

Other Uses Boiled stinging nettle leaves are edible and can be substituted for spinach.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
VACCCAE	<i>Vaccinium caespitosum</i>	dwarf blueberry

VITAL ATTRIBUTE DATA

Regeneration V, (D) **Establishment** T

Life History p

Selected Species Type VT **Species Group** Endurer, Avoider

Notes Vegetative regeneration appears to be of primary importance. Extensive network of shallow rhizomes enables *Vaccinium caespitosum* to rapidly reestablish after most light to moderate disturbances. Seed dispersal by birds and mammals.

Light or moderate burns, conducted when the soil is somewhat moist, may be most effective in promoting western huckleberries (*Vaccinium membranaceum*, and *Vaccinium globulare*) may also apply to *Vaccinium caespitosum*.

Successional Status Occurs in climax Douglas-fir or spruce-fir forests, however, it is also considered an important seral shrub in many areas of western North America.

Fire Response Sprouts from rhizomes; off-site seed

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Extremely popular among all interior First Peoples for its sweetness and flavour. See Turner (1997) for detailed reference.

Wildlife Uses Berries are an important food source for many birds, including the ruffed grouse, gray catbird, American robin, and eastern bluebird. The fruit are also eaten by small mammals, such as the white-footed mouse, red fox, and fox squirrel. *Vaccinium* species are an extremely important food source for grizzly and black bears.

Wildlife Cover Value Dense thickets can serve as good cover for smaller birds and mammals.

Nutritional Value Foliage is relatively high in carotene and energy content. Protein value of *Vaccinium caespitosum* browse is rated as fair. Fruits are sweet and contain high concentrations of both mono- and di-saccharides, high in vitamin C, but low in fat.

Other Uses Fruit is delicious when fresh or in jams and jellies.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
VACCMEM	<i>Vaccinium membranaceum</i>	black huckleberry

VITAL ATTRIBUTE DATA

Regeneration	V, (D)	Establishment	T
Life History	p,m~3-6 (20), l~14		
Selected Species Type	VT	Species Group	Endurer, Avoider

Notes In Montana, the *Vaccinium membranaceum* industry is currently valued at several million dollars annually and is rapidly expanding to include international markets. Complex and extensive system of underground rhizomes. Rhizome mortality is generally greater following fall fires than spring fires. Fire appears to be important for the creation and maintenance of productive huckleberry fields.

Successional Status Wide ecological amplitude, and grows on newly disturbed sites as well as in old growth stands. Climax or seral species because of its shade tolerance.

Fire Response Sprouts from rhizomes

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses *Vaccinium membranaceum* berries were eaten by all interior aboriginal peoples. They were eaten fresh or dried in the sun. See Turner (1997) for detailed reference. Some groups mashed the berries for making a purple dye. See Turner (1998) for detailed reference.

Wildlife Uses Provides valuable food and cover for a wide variety of wildlife species. Provides browse for elk, mule deer, white-tailed deer, and mountain goats. Fruits are eaten by a variety of birds and mammals. *Vaccinium membranaceum* is an extremely valuable grizzly bear food. Most *Vaccinium* species fruit are important food sources for black bears and grizzly bears from late July through September.

Wildlife Cover Value Dense thickets can serve as particularly good cover for many smaller birds and mammals.

Nutritional Value Foliage is relatively high in carotene and energy content. Total nutrient content of *Vaccinium membranaceum* browse is generally greatest in new stems. Berries are sweet and contain high concentrations of mono- and di-saccharides. Berries are rich in vitamin C and energy content but low in fats.

Other Uses Fruits are delicious fresh and are favoured for use in pies. Berries may be cooked into sauces or syrups, or made into excellent jams and jellies.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
VACCMYT	<i>Vaccinium myrtillus</i>	low bilberry

VITAL ATTRIBUTE DATA

Regeneration	V, (D)	Establishment	T
Life History	p, m~3, l~15		
Selected Species Type	VT	Species Group	Endurer, (Avoider)
Notes	Extensive, frequently branched network of rhizomes appear to be the primary form of regeneration after fire or other disturbance.		
Successional Status	Occurs as a climax dominant in many high elevation spruce-fir forests of western North America.		
Fire Response	Sprouts from rhizomes, buds on stem base		
Fire Source	Fischer <i>et al.</i> 1996.		

ADDITIONAL INFORMATION

Aboriginal Uses	Distribution of <i>Vaccinium myrtillus</i> is confined to the southeastern corner in the Kootenays. The Ktunaxa, Secwepemc and Carrier gathered the berries from August to early autumn and ate them fresh or dried. See Turner (1997) for detailed reference.
Wildlife Uses	Berries are eaten by many birds and mammals including the ring-necked pheasant, hares, grouse, partridges, ptarmigans, and bears. Seeds are widely dispersed by birds and mammals.
Wildlife Cover Value	Provides some cover for small birds and mammals.
Nutritional Value	<i>Vaccinium</i> species foliage is relatively high in carotene, manganese, and energy content. <i>Vaccinium</i> berries are sweet and contain high concentrations of mono- and di-saccharides. Berries are rich in vitamin C and energy content but low in fats.
Other Uses	Berries are juicy, edible and has a "nut-like flavor", eaten fresh or gathered for use in jams and jellies.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
VACCSCO	<i>Vaccinium scoparium</i>	grouseberry

VITAL ATTRIBUTE DATA

Regeneration V, D Establishment T

Life History p,

Selected Species Type VT Species Group Endurer, Avoider

Notes Shallow rhizomes (primarily in the duff) make it susceptible to even relatively minor soil disturbance.

Successional Status Commonly dominates the shrub layer of subalpine forests throughout the Rocky Mountains. Seral or climax dominant.

Fire Response Sprouts from rhizomes; off-site seed

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Minor use for medicinal purposes by the Cheyenne (Moerman 1986). The tiny red berries were gathered at the same time as *Vaccinium caespitosum*, and usually eaten fresh. See Turner (1997) for detailed reference.

Wildlife Uses Provides food and cover many wildlife species. Browse species for elk, mule deer, moose, and Rocky Mountain goats. Its fruit is a valuable food source for many birds and mammals. *Vaccinium* species are an extremely important food source for grizzly and black bears. Seeds are widely dispersed by birds and mammals.

Wildlife Cover Value Provides hiding and thermal cover for small birds and mammals. *Vaccinium scoparium* habitat types provide resting sites for deer, elk, moose, and grizzly bears.

Nutritional Value *Vaccinium* foliage is relatively high in carotene and energy content. *Vaccinium* species fruit are typically sweet and contain high concentrations of mono- and di-saccharides. Berries tend to be high in vitamin C but contain little fat. *Vaccinium scoparium* fruit is high in energy value.

Other Uses Fruits are edible, although small. Berries may be eaten fresh, cooked, or made into jam and wine.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
VERAVIR	<i>Veratrum viride</i>	Indian hellebore

VITAL ATTRIBUTE DATA

Regeneration	V, D	Establishment	T
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Life History

Selected Species Type	DT	Species Group	Avoider, Endurer
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Notes Robust perennial, from a short, stout rhizome. Widespread and most abundant at subalpine elevations, on wet seepage sites in moist and wet forests, openings and clearings (Parish *et al.* 1996).

Successional Status No entry

Fire Response No entry

Fire Source Hitchcock *et al.* 1955-69.

ADDITIONAL INFORMATION

Aboriginal Uses Widely used for medicinal purposes. See Moerman (1998) and Turner (1997) for detailed reference. Stem fibres were used to weave wallets, bags, and pouches (Turner 1998).

Wildlife Uses No entry

Wildlife Cover Value No entry

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
VERBTHA	<i>Verbascum thapsus</i>	great mullein

VITAL ATTRIBUTE DATA

Regeneration	D, V	Establishment I
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Life History

Selected Species Type	VI	Species Group	Invader, Endurer
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Notes Coarse, taprooted biennial, broadly egg-shaped capsules, with many minute seeds. Widespread and common at low to mid elevations in disturbed, often gravelly sites, fields and pastures (Parish *et al.* 1996).

Successional Status	No entry
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Fire Response	No entry
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Fire Source	Hitchcock <i>et al.</i> 1955-69.
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ADDITIONAL INFORMATION

Aboriginal Uses	Very widely used for medicinal purposes. See Moerman (1998) for detailed reference. Some First Peoples smoked the leaves like tobacco. See Turner (1997) for detailed reference.
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Wildlife Uses	No entry
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Wildlife Cover Value	No entry
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Nutritional Value	No entry
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Other Uses	No entry
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APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
VIBUEDU	<i>Viburnum edule</i>	highbush-cranberry

VITAL ATTRIBUTE DATA

Regeneration V, S, D Establishment I

Life History p, m~5,

Selected Species Type ST Species Group Endurer, Evader

Notes *Viburnum edule* roots in the organic layer and is rhizomatous. Low severity fires stimulate germination of seeds stored in the soil. Moderate to high severity fires which remove soil organic layers may kill roots, underground stems, and buried seeds.

Successional Status Moderately shade tolerant, and is important component of early, midseral, and climax postfire communities.

Fire Response Sprouts from the stump, roots, or underground stems; soil-stored seed

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Used for medicinal purposes. See Moerman (1998) for detailed reference. All BC interior groups used highbush cranberry fruit wherever they were available. See Turner (1997) for detailed reference. Different parts of the plant used in technologies. See Turner (1998) for detailed reference.

Wildlife Uses Highbush cranberries are eaten by many small mammals, songbirds, and game birds (spruce grouse and ruffed grouse). Foliage is browsed by beaver, rabbit, and snowshoe hare. Low to moderate important browse for Roosevelt elk, Rocky Mountain elk, mountain goat, bighorn sheep, black-tail deer, mule deer, white-tailed deer, caribou, and moose. Highbush cranberries are a major food of grizzly bears. Black bears feed on highbush cranberries in the fall.

Wildlife Cover Value Provides cover for small mammals and birds.

Nutritional Value No entry

Other Uses Highbush cranberries are edible and make excellent jams, jellies, and sauces if picked before fully mature.

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
XEROTEN	<i>Xerophyllum tenax</i>	bear-grass

VITAL ATTRIBUTE DATA

Regeneration V Establishment I

Life History p, m~3

Selected Species Type VI Species Group Endurer

Notes Vegetative reproduction is by offshoots of the rhizomes. Understory dominant in subalpine zone forests. Two important factors in bear-grass recovery appear to be the impact of the fire on the soil surface and the suitability of the site for beargrass. In Montana's subalpine fir/bear-grass habitat, bear-grass increases after light broadcast fires.

Successional Status Moderately shade tolerant. In forest openings it grows vigorously and blooms profusely. Occurs in high frequency in early and mid-seral communities.

Fire Response Sprouts from rhizomes

Fire Source Fischer *et al.* 1996.

ADDITIONAL INFORMATION

Aboriginal Uses Only the Ktunaxa and Washington groups had access to bear-grass, thus a common trade item. Its tough leaves were used in basketry (Turner 1998).

Wildlife Uses Bear-grass flower stalks are a delicacy for deer and elk and are eaten by other big game animals as well. Thick mats of bear-grass and sedge species provide excellent feeding sites for pocket gophers and other rodents. Sometimes grizzly bears use bear-grass leaves as nesting material in their winter dens.

Wildlife Cover Value Provides fair cover for small mammals.

Nutritional Value No entry

Other Uses No entry

APPENDIX I KTUNAXA PLANTS DATABASE

Prov. Veg. Code	Scientific Name	Common Name
ZIGAVEN	<i>Zigadenus venenosus</i>	meadow death-camas

VITAL ATTRIBUTE DATA

Regeneration	V, D	Establishment	I
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Life History	p, m~2-3
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Selected Species Type	VI	Species Group	Endurer, Invader
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Notes	Death-camas increases with grazing. Repeated annual burning from mid-spring to mid-summer greatly reduces or eliminates death-camas populations.
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Successional Status	No entry
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Fire Response	New growth from deep, underground bulbs
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Fire Source	Fischer <i>et al.</i> 1996.
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ADDITIONAL INFORMATION

Aboriginal Uses	Applied as a poultice for medicinal purposes (Moerman 1986). The Okanagan mashed the bulbs to make an arrow poison (Turner 1998).
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Wildlife Uses	Seeds, bulbs, leaves, and stems of death-camas are poisonous to livestock and wildlife.
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Wildlife Cover Value	No entry
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Nutritional Value	Rated poor in energy and protein values.
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Other Uses

APPENDIX II KTUNAXA PLANTS IN ZONAL PLOTS

Ktunaxa plants by species groups, species types, and lifeform in zonal plots of thirteen Biogeoclimatic units

BEC Unit	Species Group	Species Type	Scientific Name	Common Name	Lifeform	
ESSFdk	Evader2	CI	<i>Pinus contorta</i>	lodgepole pine	coniferous tree	
	Invader	DI	<i>Pinus albicaulis</i>	whitebark pine	coniferous tree	
	Invader	DI	<i>Sorbus scopulina</i>	western mountain-ash	deciduous shrub	
	Invader	DI	<i>Sorbus sitchensis</i>	Sitka mountain-ash	deciduous shrub	
	Avoider	DR	<i>Abies lasiocarpa</i>	subalpine fir	coniferous tree	
	Avoider	DR	<i>Chimaphila umbellata</i>	prince's-pine	dwarf woody plant	
	Avoider	DR	<i>Goodyera oblongifolia</i>	rattlesnake-plantain	forb	
	Avoider	DR	<i>Picea engelmannii</i>	Engelmann spruce	coniferous tree	
	Avoider	DT	<i>Arnica cordifolia</i>	heart-leaved arnica	forb	
	Avoider	DT	<i>Lonicera involucrata</i>	black twinberry	deciduous shrub	
	Avoider	DT	<i>Lonicera utahensis</i>	Utah honeysuckle	deciduous shrub	
	Avoider	DT	<i>Streptopus amplexifolius</i>	clasping twistedstalk	forb	
	Avoider	DT	<i>Veratrum viride</i>	Indian hellebore	forb	
	Evader1	SI	<i>Fragaria virginiana</i>	wild strawberry	forb	
	Evader2	ST	<i>Ribes lacustre</i>	black gooseberry	deciduous shrub	
	Endurer1	VI	<i>Rubus parviflorus</i>	thimbleberry	deciduous shrub	
	Endurer1	VI	<i>Rubus pedatus</i>	five-leaved bramble	forb	
	Endurer1	VI	<i>Xerophyllum tenax</i>	bear-grass	forb	
	Endurer2	VT	<i>Calamagrostis rubescens</i>	pinegrass	graminoid	
	Endurer2	VT	<i>Erythronium grandiflorum</i>	yellow glacier lily	forb	
	Endurer2	VT	<i>Spiraea betulifolia</i>	birch-leaved spirea	deciduous shrub	
	Endurer2	VT	<i>Vaccinium caespitosum</i>	dwarf blueberry	dwarf woody plant	
	Endurer2	VT	<i>Vaccinium membranaceum</i>	black huckleberry	deciduous shrub	
	Endurer2	VT	<i>Vaccinium myrtillus</i>	low bilberry	dwarf woody plant	
	Endurer2	VT	<i>Vaccinium scoparium</i>	grouseberry	dwarf woody plant	
	ESSFwc1	Evader2	CI	<i>Pinus contorta</i>	lodgepole pine	coniferous tree
		Invader	DI	<i>Pinus monticola</i>	western white pine	coniferous tree
Invader		DI	<i>Sorbus scopulina</i>	western mountain-ash	deciduous shrub	
Invader		DI	<i>Sorbus sitchensis</i>	Sitka mountain-ash	deciduous shrub	
Avoider		DR	<i>Abies lasiocarpa</i>	subalpine fir	coniferous tree	
Avoider		DR	<i>Chimaphila umbellata</i>	prince's-pine	dwarf woody plant	
Avoider		DR	<i>Dicranum scoparium</i>	broom moss	moss	
Avoider		DR	<i>Goodyera oblongifolia</i>	rattlesnake-plantain	forb	
Avoider		DR	<i>Oplopanax horridus</i>	devil's club	deciduous shrub	
Avoider		DR	<i>Picea engelmannii</i>	Engelmann spruce	coniferous tree	
Avoider		DT	<i>Arnica cordifolia</i>	heart-leaved arnica	forb	
Avoider		DT	<i>Linnaea borealis</i>	twinflower	dwarf woody plant	
Avoider		DT	<i>Lonicera involucrata</i>	black twinberry	deciduous shrub	
Avoider		DT	<i>Lonicera utahensis</i>	Utah honeysuckle	deciduous shrub	
Avoider		DT	<i>Smilacina racemosa</i>	false Solomon's-seal	forb	
Avoider		DT	<i>Smilacina stellata</i>	star-flowered false Solomon's-seal	forb	
Avoider		DT	<i>Streptopus amplexifolius</i>	clasping twistedstalk	forb	
Avoider		DT	<i>Thuja plicata</i>	western redcedar	coniferous tree	
Avoider		DT	<i>Veratrum viride</i>	Indian hellebore	forb	
Evader2		ST	<i>Ribes lacustre</i>	black gooseberry	deciduous shrub	
Endurer1		VI	<i>Lilium columbianum</i>	tiger lily	forb	
Endurer1		VI	<i>Rubus parviflorus</i>	thimbleberry	deciduous shrub	
Endurer1		VI	<i>Rubus pedatus</i>	five-leaved bramble	forb	
Endurer2		VT	<i>Athyrium filix-femina</i>	lady fern	ferns or fern-ally	
Endurer2		VT	<i>Ligusticum canbyi</i>	Canby's lovage	forb	
Endurer2		VT	<i>Vaccinium membranaceum</i>	black huckleberry	deciduous shrub	

APPENDIX II KTUNAXA PLANTS IN ZONAL PLOTS

Ktunaxa plants by species groups, species types, and lifeform in zonal plots of thirteen Biogeoclimatic units (.. *Continued*)

BEC Unit	Species Group	Species Type	Scientific Name	Common Name	Lifeform	
ESSFwc1	Endurer2	VT	<i>Vaccinium scoparium</i>	grouseberry	dwarf woody plant	
	Resister	WI	<i>Pseudotsuga menziesii</i>	Douglas-fir	coniferous tree	
ESSFwc4	Evader2	CI	<i>Pinus contorta</i>	lodgepole pine	coniferous tree	
	Invader	DI	<i>Castilleja miniata</i>	scarlet paintbrush	forb	
	Invader	DI	<i>Epilobium angustifolium</i>	fireweed	forb	
	Invader	DI	<i>Sorbus scopulina</i>	western mountain-ash	deciduous shrub	
	Invader	DI	<i>Sorbus sitchensis</i>	Sitka mountain-ash	deciduous shrub	
	Avoider	DR	<i>Abies lasiocarpa</i>	subalpine fir	coniferous tree	
	Avoider	DR	<i>Dicranum scoparium</i>	broom moss	moss	
	Avoider	DR	<i>Goodyera oblongifolia</i>	rattlesnake-plantain	forb	
	Avoider	DR	<i>Oplopanax horridus</i>	devil's club	deciduous shrub	
	Avoider	DR	<i>Picea engelmannii</i>	Engelmann spruce	coniferous tree	
	Avoider	DR	<i>Sphagnum</i> sp.	peat moss	moss	
	Avoider	DT	<i>Arnica cordifolia</i>	heart-leaved arnica	forb	
	Avoider	DT	<i>Lonicera involucrata</i>	black twinberry	deciduous shrub	
	Avoider	DT	<i>Lonicera utahensis</i>	Utah honeysuckle	deciduous shrub	
	Avoider	DT	<i>Smilacina racemosa</i>	false Solomon's-seal	forb	
	Avoider	DT	<i>Streptopus amplexifolius</i>	clasping twistedstalk	forb	
	Avoider	DT	<i>Thuja plicata</i>	western redcedar	coniferous tree	
	Avoider	DT	<i>Veratrum viride</i>	Indian hellebore	forb	
	Evader1	SI	<i>Sambucus racemosa</i>	red elderberry	deciduous shrub	
	Evader2	ST	<i>Ribes lacustre</i>	black gooseberry	deciduous shrub	
	Endurer1	VI	<i>Lilium columbianum</i>	tiger lily	forb	
	Endurer1	VI	<i>Rubus idaeus</i>	red raspberry	deciduous shrub	
	Endurer1	VI	<i>Rubus parviflorus</i>	thimbleberry	deciduous shrub	
	Endurer1	VI	<i>Rubus pedatus</i>	five-leaved bramble	forb	
	Endurer2	VT	<i>Athyrium filix-femina</i>	lady fern	ferns or fern-ally	
	Endurer2	VT	<i>Equisetum arvense</i>	common horsetail	ferns or fern-ally	
	Endurer2	VT	<i>Ligusticum canbyi</i>	Canby's lovage	forb	
	Endurer2	VT	<i>Vaccinium membranaceum</i>	black huckleberry	deciduous shrub	
	Endurer2	VT	<i>Vaccinium scoparium</i>	grouseberry	dwarf woody plant	
	ESSFwm	Invader	DI	<i>Epilobium angustifolium</i>	fireweed	forb
		Invader	DI	<i>Sorbus scopulina</i>	western mountain-ash	deciduous shrub
		Invader	DI	<i>Sorbus sitchensis</i>	Sitka mountain-ash	deciduous shrub
Avoider		DR	<i>Abies lasiocarpa</i>	subalpine fir	coniferous tree	
Avoider		DR	<i>Chimaphila umbellata</i>	prince's-pine	dwarf woody plant	
Avoider		DR	<i>Goodyera oblongifolia</i>	rattlesnake-plantain	forb	
Avoider		DR	<i>Oplopanax horridus</i>	devil's club	deciduous shrub	
Avoider		DR	<i>Picea engelmannii</i>	Engelmann spruce	coniferous tree	
Avoider		DT	<i>Arnica cordifolia</i>	heart-leaved arnica	forb	
Avoider		DT	<i>Lonicera involucrata</i>	black twinberry	deciduous shrub	
Avoider		DT	<i>Lonicera utahensis</i>	Utah honeysuckle	deciduous shrub	
Avoider		DT	<i>Smilacina racemosa</i>	false Solomon's-seal	forb	
Avoider		DT	<i>Streptopus amplexifolius</i>	clasping twistedstalk	forb	
Avoider		DT	<i>Thuja plicata</i>	western redcedar	coniferous tree	
Avoider		DT	<i>Veratrum viride</i>	Indian hellebore	forb	
Evader1		SI	<i>Fragaria virginiana</i>	wild strawberry	forb	
Evader2		ST	<i>Ribes lacustre</i>	black gooseberry	deciduous shrub	
Endurer1		VI	<i>Rubus parviflorus</i>	thimbleberry	deciduous shrub	
Endurer1		VI	<i>Rubus pedatus</i>	five-leaved bramble	forb	
Endurer1		VI	<i>Xerophyllum tenax</i>	bear-grass	forb	

APPENDIX II KTUNAXA PLANTS IN ZONAL PLOTS

Ktunaxa plants by species groups, species types, and lifeform in zonal plots of thirteen Biogeoclimatic units (.. *Continued*)

BEC Unit	Species Group	Species Type	Scientific Name	Common Name	Lifeform
ESSFwm	Endurer2	VT	<i>Athyrium filix-femina</i>	lady fern	ferns or fern-ally
	Endurer2	VT	<i>Equisetum arvense</i>	common horsetail	ferns or fern-ally
	Endurer2	VT	<i>Ligusticum canbyi</i>	Canby's lovage	forb
	Endurer2	VT	<i>Lupinus sericeus</i>	silky lupine	forb
	Endurer2	VT	<i>Symphoricarpos albus</i>	common snowberry	deciduous shrub
	Endurer2	VT	<i>Vaccinium membranaceum</i>	black huckleberry	deciduous shrub
	Endurer2	VT	<i>Vaccinium scoparium</i>	grouseberry	dwarf woody plant
ICHdw	Evader2	CI	<i>Pinus contorta</i>	lodgepole pine	coniferous tree
	Invader	DI	<i>Betula papyrifera</i>	paper birch	broad-leaved tree
	Invader	DI	<i>Castilleja miniata</i>	scarlet paintbrush	forb
	Invader	DI	<i>Epilobium angustifolium</i>	fireweed	forb
	Invader	DI	<i>Heuchera cylindrica</i>	round-leaved alumroot	forb
	Invader	DI	<i>Mahonia aquifolium</i>	tall Oregon-grape	evergreen shrub
	Invader	DI	<i>Pinus albicaulis</i>	whitebark pine	coniferous tree
	Invader	DI	<i>Pinus monticola</i>	western white pine	coniferous tree
	Invader	DI	<i>Sorbus scopulina</i>	western mountain-ash	deciduous shrub
	Invader	DI	<i>Sorbus sitchensis</i>	Sitka mountain-ash	deciduous shrub
	Invader	DI	<i>Taraxacum officinale</i>	common dandelion	forb
	Avoider	DR	<i>Abies lasiocarpa</i>	subalpine fir	coniferous tree
	Avoider	DR	<i>Chimaphila umbellata</i>	prince's-pine	dwarf woody plant
	Avoider	DR	<i>Clematis occidentalis</i>	Columbia clematis	deciduous shrub
	Avoider	DR	<i>Dicranum scoparium</i>	broom moss	moss
	Avoider	DR	<i>Goodyera oblongifolia</i>	rattlesnake-plantain	forb
	Avoider	DR	<i>Juniperus communis</i>	common juniper	evergreen shrub
	Avoider	DR	<i>Juniperus scopulorum</i>	Rocky Mountain juniper	coniferous tree
	Avoider	DR	<i>Oplopanax horridus</i>	devil's club	deciduous shrub
	Avoider	DR	<i>Picea engelmannii</i>	Engelmann spruce	coniferous tree
	Avoider	DR	<i>Rhytidiadelphus triquetrus</i>	electrified cat's-tail moss	moss
	Avoider	DR	<i>Taxus brevifolia</i>	western yew	coniferous tree
	Avoider	DT	<i>Abies grandis</i>	grand fir	coniferous tree
	Avoider	DT	<i>Arnica cordifolia</i>	heart-leaved arnica	forb
	Avoider	DT	<i>Linnaea borealis</i>	twinflower	dwarf woody plant
	Avoider	DT	<i>Lonicera involucrata</i>	black twinberry	deciduous shrub
	Avoider	DT	<i>Lonicera utahensis</i>	Utah honeysuckle	deciduous shrub
	Avoider	DT	<i>Smilacina racemosa</i>	false Solomon's-seal	forb
	Avoider	DT	<i>Smilacina stellata</i>	star-flowered false Solomon's-seal	forb
	Avoider	DT	<i>Streptopus amplexifolius</i>	clasping twistedstalk	forb
	Avoider	DT	<i>Thuja plicata</i>	western redcedar	coniferous tree
	Evader1	SI	<i>Ceanothus sanguineus</i>	redstem ceanothus	deciduous shrub
	Evader1	SI	<i>Fragaria vesca</i>	wood strawberry	forb
	Evader1	SI	<i>Fragaria virginiana</i>	wild strawberry	forb
	Evader1	SI	<i>Sambucus racemosa</i>	red elderberry	deciduous shrub
	Evader2	ST	<i>Viburnum edule</i>	highbush-cranberry	deciduous shrub
Endurer1	VI	<i>Apocynum androsaemifolium</i>	spreading dogbane	forb	
Endurer1	VI	<i>Apocynum cannabinum</i>	hemp dogbane	forb	
Endurer1	VI	<i>Arctostaphylos uva-ursi</i>	kinnikinnick	dwarf woody plant	
Endurer1	VI	<i>Corylus cornuta</i>	beaked hazelnut	deciduous shrub	

APPENDIX II KTUNAXA PLANTS IN ZONAL PLOTS

Ktunaxa plants by species groups, species types, and lifeform in zonal plots of thirteen Biogeoclimatic units (.. *Continued*)

BEC Unit	Species Group	Species Type	Scientific Name	Common Name	Lifeform	
ICHdw	Endurer1	VI	<i>Lilium columbianum</i>	tiger lily	forb	
	Endurer1	VI	<i>Lithospermum ruderale</i>	lemonweed gromwell	forb	
	Endurer1	VI	<i>Philadelphus lewisii</i>	mock-orange	deciduous shrub	
	Endurer1	VI	<i>Populus balsamifera</i> ssp. <i>trichocarpa</i>	black cottonwood	broad-leaved tree	
	Endurer1	VI	<i>Populus tremuloides</i>	trembling aspen	broad-leaved tree	
	Endurer1	VI	<i>Pteridium aquilinum</i>	bracken fern	ferns or fern-ally	
	Endurer1	VI	<i>Rosa acicularis</i>	prickly rose	deciduous shrub	
	Endurer1	VI	<i>Rosa woodsii</i>	prairie rose	deciduous shrub	
	Endurer1	VI	<i>Rubus parviflorus</i>	thimbleberry	deciduous shrub	
	Endurer1	VI	<i>Rubus pedatus</i>	five-leaved bramble	forb	
	Endurer1	VI	<i>Xerophyllum tenax</i>	bear-grass	forb	
	Endurer2	VT	<i>Acer glabrum</i>	Douglas maple	deciduous shrub	
	Endurer2	VT	<i>Amelanchier alnifolia</i>	saskatoon	deciduous shrub	
	Endurer2	VT	<i>Aralia nudicaulis</i>	wild sarsaparilla	forb	
	Endurer2	VT	<i>Athyrium filix-femina</i>	lady fern	ferns or fern-ally	
	Endurer2	VT	<i>Calamagrostis rubescens</i>	pinegrass	graminoid	
	Endurer2	VT	<i>Erythronium grandiflorum</i>	yellow glacier lily	forb	
	Endurer2	VT	<i>Holodiscus discolor</i>	oceanspray	deciduous shrub	
	Endurer2	VT	<i>Shepherdia canadensis</i>	soopolallie	deciduous shrub	
	Endurer2	VT	<i>Spiraea betulifolia</i>	birch-leaved spirea	deciduous shrub	
	Endurer2	VT	<i>Symphoricarpos albus</i>	common snowberry	deciduous shrub	
	Endurer2	VT	<i>Vaccinium membranaceum</i>	black huckleberry	deciduous shrub	
	Endurer2	VT	<i>Vaccinium myrtillus</i>	low bilberry	dwarf woody plant	
	Endurer2	VT	<i>Vaccinium scoparium</i>	grouseberry	dwarf woody plant	
	Resister	WI	<i>Larix occidentalis</i>	western larch	coniferous tree	
	Resister	WI	<i>Pinus ponderosa</i>	ponderosa pine	coniferous tree	
	Resister	WI	<i>Pseudotsuga menziesii</i>	Douglas-fir	coniferous tree	
	ICHmk1	Evader2	CI	<i>Pinus contorta</i>	lodgepole pine	coniferous tree
		Invader	DI	<i>Betula papyrifera</i>	paper birch	broad-leaved tree
		Invader	DI	<i>Epilobium angustifolium</i>	fireweed	forb
		Invader	DI	<i>Mahonia aquifolium</i>	tall Oregon-grape	evergreen shrub
Invader		DI	<i>Pinus monticola</i>	western white pine	coniferous tree	
Invader		DI	<i>Sorbus scopulina</i>	western mountain-ash	deciduous shrub	
Invader		DI	<i>Sorbus sitchensis</i>	Sitka mountain-ash	deciduous shrub	
Avoider		DR	<i>Abies lasiocarpa</i>	subalpine fir	coniferous tree	
Avoider		DR	<i>Chimaphila umbellata</i>	prince's-pine	dwarf woody plant	
Avoider		DR	<i>Clematis occidentalis</i>	Columbia clematis	deciduous shrub	
Avoider		DR	<i>Dicranum scoparium</i>	broom moss	moss	
Avoider		DR	<i>Goodyera oblongifolia</i>	rattlesnake-plantain	forb	
Avoider		DR	<i>Juniperus communis</i>	common juniper	evergreen shrub	
Avoider		DR	<i>Letharia vulpina</i>	common wolf lichen	lichen	
Avoider		DR	<i>Oplopanax horridus</i>	devil's club	deciduous shrub	
Avoider		DR	<i>Picea engelmannii</i>	Engelmann spruce	coniferous tree	
Avoider		DR	<i>Picea glauca</i>	white spruce	coniferous tree	
Avoider		DR	<i>Rhytidiadelphus triquetrus</i>	electrified cat's-tail moss	moss	
Avoider		DR	<i>Taxus brevifolia</i>	western yew	coniferous tree	
Avoider		DT	<i>Arnica cordifolia</i>	heart-leaved arnica	forb	
Avoider		DT	<i>Linnaea borealis</i>	twinflower	dwarf woody plant	
Avoider		DT	<i>Lonicera involucrata</i>	black twinberry	deciduous shrub	
Avoider		DT	<i>Lonicera utahensis</i>	Utah honeysuckle	deciduous shrub	

APPENDIX II KTUNAXA PLANTS IN ZONAL PLOTS

Ktunaxa plants by species groups, species types, and lifeform in zonal plots of thirteen Biogeoclimatic units (.. *Continued*)

BEC Unit	Species Group	Species Type	Scientific Name	Common Name	Lifeform
ICHmk1	Avoider	DT	<i>Smilacina racemosa</i>	false Solomon's-seal	forb
	Avoider	DT	<i>Smilacina stellata</i>	star-flowered false Solomon's-seal	forb
	Avoider	DT	<i>Streptopus amplexifolius</i>	clasping twistedstalk	forb
	Avoider	DT	<i>Thuja plicata</i>	western redcedar	coniferous tree
	Evader1	SI	<i>Fragaria vesca</i>	wood strawberry	forb
	Evader1	SI	<i>Fragaria virginiana</i>	wild strawberry	forb
	Evader2	ST	<i>Ribes lacustre</i>	black gooseberry	deciduous shrub
	Evader2	ST	<i>Viburnum edule</i>	highbush-cranberry	deciduous shrub
	Endurer1	VI	<i>Allium cernuum</i>	nodding onion	forb
	Endurer1	VI	<i>Arctostaphylos uva-ursi</i>	kinnikinnick	dwarf woody plant
	Endurer1	VI	<i>Corylus cornuta</i>	beaked hazelnut	deciduous shrub
	Endurer1	VI	<i>Lilium columbianum</i>	tiger lily	forb
	Endurer1	VI	<i>Philadelphus lewisii</i>	mock-orange	deciduous shrub
	Endurer1	VI	<i>Populus tremuloides</i>	trembling aspen	broad-leaved tree
	Endurer1	VI	<i>Pteridium aquilinum</i>	bracken fern	ferns or fern-ally
	Endurer1	VI	<i>Rosa acicularis</i>	prickly rose	deciduous shrub
	Endurer1	VI	<i>Rubus parviflorus</i>	thimbleberry	deciduous shrub
	Endurer1	VI	<i>Rubus pedatus</i>	five-leaved bramble	forb
	Endurer1	VI	<i>Salix scouleriana</i>	Scouler's willow	broad-leaved tree
	Endurer2	VT	<i>Acer glabrum</i>	Douglas maple	deciduous shrub
	Endurer2	VT	<i>Amelanchier alnifolia</i>	saskatoon	deciduous shrub
	Endurer2	VT	<i>Aralia nudicaulis</i>	wild sarsaparilla	forb
	Endurer2	VT	<i>Calamagrostis rubescens</i>	pinegrass	graminoid
	Endurer2	VT	<i>Equisetum arvense</i>	common horsetail	ferns or fern-ally
	Endurer2	VT	<i>Erythronium grandiflorum</i>	yellow glacier lily	forb
	Endurer2	VT	<i>Ledum glandulosum</i>	trapper's tea	evergreen shrub
	Endurer2	VT	<i>Lupinus sericeus</i>	silky lupine	forb
	Endurer2	VT	<i>Shepherdia canadensis</i>	soopolallie	deciduous shrub
	Endurer2	VT	<i>Spiraea betulifolia</i>	birch-leaved spirea	deciduous shrub
	Endurer2	VT	<i>Symphoricarpos albus</i>	common snowberry	deciduous shrub
	Endurer2	VT	<i>Vaccinium membranaceum</i>	black huckleberry	deciduous shrub
	Endurer2	VT	<i>Vaccinium scoparium</i>	grouseberry	dwarf woody plant
	Resister	WI	<i>Larix occidentalis</i>	western larch	coniferous tree
	Resister	WI	<i>Pinus ponderosa</i>	ponderosa pine	coniferous tree
	Resister	WI	<i>Pseudotsuga menziesii</i>	Douglas-fir	coniferous tree
	Evader2	CI	<i>Pinus contorta</i>	lodgepole pine	coniferous tree
	Invader	DI	<i>Betula papyrifera</i>	paper birch	broad-leaved tree
	Invader	DI	<i>Mahonia aquifolium</i>	tall Oregon-grape	evergreen shrub
	Invader	DI	<i>Pinus albicaulis</i>	whitebark pine	coniferous tree
	Invader	DI	<i>Pinus monticola</i>	western white pine	coniferous tree
	Invader	DI	<i>Rhamnus purshiana</i>	casacara	broad-leaved tree
	Invader	DI	<i>Sorbus scopulina</i>	western mountain-ash	deciduous shrub
	Invader	DI	<i>Sorbus sitchensis</i>	Sitka mountain-ash	deciduous shrub
	Avoider	DR	<i>Abies lasiocarpa</i>	subalpine fir	coniferous tree
	Avoider	DR	<i>Chimaphila umbellata</i>	prince's-pine	dwarf woody plant
	Avoider	DR	<i>Goodyera oblongifolia</i>	rattlesnake-plantain	forb
	Avoider	DR	<i>Oplopanax horridus</i>	devil's club	deciduous shrub
Avoider	DR	<i>Picea engelmannii</i>	Engelmann spruce	coniferous tree	
Avoider	DR	<i>Rhytidadelphus triquetrus</i>	electrified cat's-tail moss	moss	
Avoider	DR	<i>Taxus brevifolia</i>	western yew	coniferous tree	

APPENDIX II KTUNAXA PLANTS IN ZONAL PLOTS

Ktunaxa plants by species groups, species types, and lifeform in zonal plots of thirteen Biogeoclimatic units (.. *Continued*)

BEC Unit	Species Group	Species Type	Scientific Name	Common Name	Lifeform	
ICHmk1	Avoider	DT	<i>Linnaea borealis</i>	twinflower	dwarf woody plant	
ICHmw1	Avoider	DT	<i>Lonicera involucrata</i>	black twinberry	deciduous shrub	
	Avoider	DT	<i>Lonicera utahensis</i>	Utah honeysuckle	deciduous shrub	
	Avoider	DT	<i>Smilacina racemosa</i>	false Solomon's-seal	forb	
	Avoider	DT	<i>Smilacina stellata</i>	star-flowered false Solomon's-seal	forb	
	Avoider	DT	<i>Streptopus amplexifolius</i>	clasping twistedstalk	forb	
	Avoider	DT	<i>Thuja plicata</i>	western redcedar	coniferous tree	
	Evader1	SI	<i>Fragaria virginiana</i>	wild strawberry	forb	
	Evader2	ST	<i>Ribes lacustre</i>	black gooseberry	deciduous shrub	
	Evader2	ST	<i>Viburnum edule</i>	highbush-cranberry	deciduous shrub	
	Endurer1	VI	<i>Corylus cornuta</i>	beaked hazelnut	deciduous shrub	
	Endurer1	VI	<i>Populus tremuloides</i>	trembling aspen	broad-leaved tree	
	Endurer1	VI	<i>Pteridium aquilinum</i>	bracken fern	ferns or fern-ally	
	Endurer1	VI	<i>Rosa woodsii</i>	prairie rose	deciduous shrub	
	Endurer1	VI	<i>Rubus idaeus</i>	red raspberry	deciduous shrub	
	Endurer1	VI	<i>Rubus parviflorus</i>	thimbleberry	deciduous shrub	
	Endurer1	VI	<i>Rubus pedatus</i>	five-leaved bramble	forb	
	Endurer2	VT	<i>Acer glabrum</i>	Douglas maple	deciduous shrub	
	Endurer2	VT	<i>Amelanchier alnifolia</i>	saskatoon	deciduous shrub	
	Endurer2	VT	<i>Aralia nudicaulis</i>	wild sarsaparilla	forb	
	Endurer2	VT	<i>Athyrium filix-femina</i>	lady fern	ferns or fern-ally	
	Endurer2	VT	<i>Spiraea betulifolia</i>	birch-leaved spirea	deciduous shrub	
	Endurer2	VT	<i>Symphoricarpos albus</i>	common snowberry	deciduous shrub	
	Endurer2	VT	<i>Vaccinium membranaceum</i>	black huckleberry	deciduous shrub	
	Endurer2	VT	<i>Vaccinium myrtillus</i>	low bilberry	dwarf woody plant	
	Endurer2	VT	<i>Vaccinium scoparium</i>	grouseberry	dwarf woody plant	
	Resister	WI	<i>Pseudotsuga menziesii</i>	Douglas-fir	coniferous tree	
	ICHmw2	Evader2	CI	<i>Pinus contorta</i>	lodgepole pine	coniferous tree
		Invader	DI	<i>Betula papyrifera</i>	paper birch	broad-leaved tree
		Invader	DI	<i>Epilobium angustifolium</i>	fireweed	forb
		Invader	DI	<i>Mahonia aquifolium</i>	tall Oregon-grape	evergreen shrub
		Invader	DI	<i>Pinus monticola</i>	western white pine	coniferous tree
		Invader	DI	<i>Rhamnus purshiana</i>	casacara	broad-leaved tree
Invader		DI	<i>Sorbus scopulina</i>	western mountain-ash	deciduous shrub	
Invader		DI	<i>Sorbus sitchensis</i>	Sitka mountain-ash	deciduous shrub	
Avoider		DR	<i>Abies lasiocarpa</i>	subalpine fir	coniferous tree	
Avoider		DR	<i>Chimaphila umbellata</i>	prince's-pine	dwarf woody plant	
Avoider		DR	<i>Dicranum scoparium</i>	broom moss	moss	
Avoider		DR	<i>Goodyera oblongifolia</i>	rattlesnake-plantain	forb	
Avoider		DR	<i>Oplopanax horridus</i>	devil's club	deciduous shrub	
Avoider		DR	<i>Picea engelmannii</i>	Engelmann spruce	coniferous tree	
Avoider		DR	<i>Rhytidiadelphus triquetrus</i>	electrified cat's-tail moss	moss	
Avoider		DR	<i>Taxus brevifolia</i>	western yew	coniferous tree	
Avoider		DT	<i>Abies grandis</i>	grand fir	coniferous tree	
Avoider		DT	<i>Linnaea borealis</i>	twinflower	dwarf woody plant	
Avoider		DT	<i>Lonicera involucrata</i>	black twinberry	deciduous shrub	
Avoider		DT	<i>Lonicera utahensis</i>	Utah honeysuckle	deciduous shrub	
Avoider		DT	<i>Smilacina racemosa</i>	false Solomon's-seal	forb	
Avoider		DT	<i>Smilacina stellata</i>	star-flowered false Solomon's-seal	forb	

APPENDIX II KTUNAXA PLANTS IN ZONAL PLOTS

Ktunaxa plants by species groups, species types, and lifeform in zonal plots of thirteen Biogeoclimatic units (.. *Continued*)

BEC Unit	Species Group	Species Type	Scientific Name	Common Name	Lifeform
ICHmw2	Avoider	DT	<i>Streptopus amplexifolius</i>	clasping twistedstalk	forb
	Avoider	DT	<i>Thuja plicata</i>	western redcedar	coniferous tree
	Evader1	SI	<i>Fragaria vesca</i>	wood strawberry	forb
	Evader1	SI	<i>Fragaria virginiana</i>	wild strawberry	forb
	Evader1	SI	<i>Sambucus racemosa</i>	red elderberry	deciduous shrub
	Evader2	ST	<i>Ribes lacustre</i>	black gooseberry	deciduous shrub
	Evader2	ST	<i>Viburnum edule</i>	highbush-cranberry	deciduous shrub
	Endurer1	VI	<i>Apocynum androsaemifolium</i>	spreading dogbane	forb
	Endurer1	VI	<i>Corylus cornuta</i>	beaked hazelnut	deciduous shrub
	Endurer1	VI	<i>Lilium columbianum</i>	tiger lily	forb
	Endurer1	VI	<i>Populus balsamifera ssp. trichocarpa</i>	black cottonwood	broad-leaved tree
	Endurer1	VI	<i>Populus tremuloides</i>	trembling aspen	broad-leaved tree
	Endurer1	VI	<i>Pteridium aquilinum</i>	bracken fern	ferns or fern-ally
	Endurer1	VI	<i>Rosa acicularis</i>	prickly rose	deciduous shrub
	Endurer1	VI	<i>Rosa woodsii</i>	prairie rose	deciduous shrub
	Endurer1	VI	<i>Rubus idaeus</i>	red raspberry	deciduous shrub
	Endurer1	VI	<i>Rubus parviflorus</i>	thimbleberry	deciduous shrub
	Endurer1	VI	<i>Rubus pedatus</i>	five-leaved bramble	forb
	Endurer1	VI	<i>Xerophyllum tenax</i>	bear-grass	forb
	Endurer2	VT	<i>Acer glabrum</i>	Douglas maple	deciduous shrub
	Endurer2	VT	<i>Amelanchier alnifolia</i>	saskatoon	deciduous shrub
	Endurer2	VT	<i>Aralia nudicaulis</i>	wild sarsaparilla	forb
	Endurer2	VT	<i>Athyrium filix-femina</i>	lady fern	ferns or fern-ally
	Endurer2	VT	<i>Calamagrostis rubescens</i>	pinegrass	graminoid
	Endurer2	VT	<i>Erythronium grandiflorum</i>	yellow glacier lily	forb
	Endurer2	VT	<i>Shepherdia canadensis</i>	soopolallie	deciduous shrub
	Endurer2	VT	<i>Spiraea betulifolia</i>	birch-leaved spirea	deciduous shrub
	Endurer2	VT	<i>Symphoricarpos albus</i>	common snowberry	deciduous shrub
	Endurer2	VT	<i>Vaccinium membranaceum</i>	black huckleberry	deciduous shrub
	Endurer2	VT	<i>Vaccinium myrtillus</i>	low bilberry	dwarf woody plant
	Endurer2	VT	<i>Vaccinium scoparium</i>	grouseberry	dwarf woody plant
	Resister	WI	<i>Larix occidentalis</i>	western larch	coniferous tree
	Resister	WI	<i>Pseudotsuga menziesii</i>	Douglas-fir	coniferous tree
	ICHwk1	Invader	DI	<i>Betula papyrifera</i>	paper birch
Invader		DI	<i>Epilobium angustifolium</i>	fireweed	forb
Invader		DI	<i>Mahonia aquifolium</i>	tall Oregon-grape	evergreen shrub
Invader		DI	<i>Pinus monticola</i>	western white pine	coniferous tree
Invader		DI	<i>Sorbus scopulina</i>	western mountain-ash	deciduous shrub
Invader		DI	<i>Sorbus sitchensis</i>	Sitka mountain-ash	deciduous shrub
Avoider		DR	<i>Abies lasiocarpa</i>	subalpine fir	coniferous tree
Avoider		DR	<i>Chimaphila umbellata</i>	prince's-pine	dwarf woody plant
Avoider		DR	<i>Dicranum scoparium</i>	broom moss	moss
Avoider		DR	<i>Goodyera oblongifolia</i>	rattlesnake-plantain	forb
Avoider		DR	<i>Oplopanax horridus</i>	devil's club	deciduous shrub
Avoider		DR	<i>Picea engelmannii</i>	Engelmann spruce	coniferous tree
Avoider		DR	<i>Picea glauca</i>	white spruce	coniferous tree
Avoider		DR	<i>Rhytidadelphus triquetrus</i>	electrified cat's-tail	moss
Avoider		DR	<i>Sphagnum sp.</i>	peat moss	moss
Avoider		DR	<i>Taxus brevifolia</i>	western yew	coniferous tree

APPENDIX II KTUNAXA PLANTS IN ZONAL PLOTS

Ktunaxa plants by species groups, species types, and lifeform in zonal plots of thirteen Biogeoclimatic units (.. *Continued*)

BEC Unit	Species Group	Species Type	Scientific Name	Common Name	Lifeform	
ICHwk1	Avoider	DT	<i>Linnaea borealis</i>	twinflower	dwarf woody plant	
	Avoider	DT	<i>Lonicera involucrata</i>	black twinberry	deciduous shrub	
	Avoider	DT	<i>Lonicera utahensis</i>	Utah honeysuckle	deciduous shrub	
	Avoider	DT	<i>Smilacina racemosa</i>	false Solomon's-seal	forb	
	Avoider	DT	<i>Smilacina stellata</i>	star-flowered false Solomon's-seal	forb	
	Avoider	DT	<i>Streptopus amplexifolius</i>	clasping twistedstalk	forb	
	Avoider	DT	<i>Thuja plicata</i>	western redcedar	coniferous tree	
	Evader1	SI	<i>Sambucus cerulea</i>	blue elderberry	deciduous shrub	
	Evader2	ST	<i>Ribes lacustre</i>	black gooseberry	deciduous shrub	
	Evader2	ST	<i>Viburnum edule</i>	highbush-cranberry	deciduous shrub	
	Endurer1	VI	<i>Corylus cornuta</i>	beaked hazelnut	deciduous shrub	
	Endurer1	VI	<i>Populus tremuloides</i>	trembling aspen	broad-leaved tree	
	Endurer1	VI	<i>Pteridium aquilinum</i>	bracken fern	ferns or fern-ally	
	Endurer1	VI	<i>Rubus idaeus</i>	red raspberry	deciduous shrub	
	Endurer1	VI	<i>Rubus parviflorus</i>	thimbleberry	deciduous shrub	
	Endurer1	VI	<i>Rubus pedatus</i>	five-leaved bramble	forb	
	Endurer2	VT	<i>Acer glabrum</i>	Douglas maple	deciduous shrub	
	Endurer2	VT	<i>Amelanchier alnifolia</i>	saskatoon	deciduous shrub	
	Endurer2	VT	<i>Aralia nudicaulis</i>	wild sarsaparilla	forb	
	Endurer2	VT	<i>Athyrium filix-femina</i>	lady fern	ferns or fern-ally	
	Endurer2	VT	<i>Spiraea betulifolia</i>	birch-leaved spirea	deciduous shrub	
	Endurer2	VT	<i>Symphoricarpos albus</i>	common snowberry	deciduous shrub	
	Endurer2	VT	<i>Vaccinium membranaceum</i>	black huckleberry	deciduous shrub	
	Resister	WI	<i>Pseudotsuga menziesii</i>	Douglas-fir	coniferous tree	
	ICHxw	Evader2	CI	<i>Pinus contorta</i>	lodgepole pine	coniferous tree
		Invader	DI	<i>Betula papyrifera</i>	paper birch	broad-leaved tree
		Invader	DI	<i>Bromus carinatus</i>	California brome	graminoid
		Invader	DI	<i>Cirsium vulgare</i>	bull thistle	forb
		Invader	DI	<i>Epilobium angustifolium</i>	fireweed	forb
		Invader	DI	<i>Mahonia aquifolium</i>	tall Oregon-grape	evergreen shrub
Invader		DI	<i>Pinus monticola</i>	western white pine	coniferous tree	
Invader		DI	<i>Sorbus scopulina</i>	western mountain-ash	deciduous shrub	
Invader		DI	<i>Sorbus sitchensis</i>	Sitka mountain-ash	deciduous shrub	
Invader		DI	<i>Taraxacum officinale</i>	common dandelion	forb	
Avoider		DR	<i>Abies lasiocarpa</i>	subalpine fir	coniferous tree	
Avoider		DR	<i>Chimaphila umbellata</i>	prince's-pine	dwarf woody plant	
Avoider		DR	<i>Clematis occidentalis</i>	Columbia clematis	deciduous shrub	
Avoider		DR	<i>Goodyera oblongifolia</i>	rattlesnake-plantain	forb	
Avoider		DR	<i>Rhytidadelphus triquetrus</i>	electrified cat's-tail moss	moss	
Avoider		DR	<i>Taxus brevifolia</i>	western yew	coniferous tree	
Avoider		DT	<i>Abies grandis</i>	grand fir	coniferous tree	
Avoider		DT	<i>Arnica cordifolia</i>	heart-leaved arnica	forb	
Avoider		DT	<i>Linnaea borealis</i>	twinflower	dwarf woody plant	
Avoider		DT	<i>Lonicera utahensis</i>	Utah honeysuckle	deciduous shrub	
Avoider		DT	<i>Smilacina racemosa</i>	false Solomon's-seal	forb	
Avoider		DT	<i>Smilacina stellata</i>	star-flowered false Solomon's-seal	forb	
Avoider		DT	<i>Thuja plicata</i>	western redcedar	coniferous tree	
Evader1		SI	<i>Fragaria vesca</i>	wood strawberry	forb	
Evader1		SI	<i>Fragaria virginiana</i>	wild strawberry	forb	

APPENDIX II KTUNAXA PLANTS IN ZONAL PLOTS

Ktunaxa plants by species groups, species types, and lifeform in zonal plots of thirteen Biogeoclimatic units (.. *Continued*)

BEC Unit	Species Group	Species Type	Scientific Name	Common Name	Lifeform	
ICHxw	Evader1	SI	<i>Oxytropis sp.</i>	locoweed	forb	
	Evader1	SI	<i>Sambucus racemosa</i>	red elderberry	deciduous shrub	
	Evader2	ST	<i>Ribes lacustre</i>	black gooseberry	deciduous shrub	
	Endurer1	VI	<i>Achillea millefolium</i>	yarrow	forb	
	Endurer1	VI	<i>Apocynum androsaemifolium</i>	spreading dogbane	forb	
	Endurer1	VI	<i>Corylus cornuta</i>	beaked hazelnut	deciduous shrub	
	Endurer1	VI	<i>Philadelphus lewisii</i>	mock-orange	deciduous shrub	
	Endurer1	VI	<i>Populus tremuloides</i>	trembling aspen	broad-leaved tree	
	Endurer1	VI	<i>Pteridium aquilinum</i>	bracken fern	ferns or fern-ally	
	Endurer1	VI	<i>Rubus idaeus</i>	red raspberry	deciduous shrub	
	Endurer1	VI	<i>Rubus parviflorus</i>	thimbleberry	deciduous shrub	
	Endurer2	VT	<i>Acer glabrum</i>	Douglas maple	deciduous shrub	
	Endurer2	VT	<i>Amelanchier alnifolia</i>	saskatoon	deciduous shrub	
	Endurer2	VT	<i>Aralia nudicaulis</i>	wild sarsaparilla	forb	
	Endurer2	VT	<i>Calamagrostis rubescens</i>	pinegrass	graminoid	
	Endurer2	VT	<i>Holodiscus discolor</i>	oceanspray	deciduous shrub	
	Endurer2	VT	<i>Spiraea betulifolia</i>	birch-leaved spirea	deciduous shrub	
	Endurer2	VT	<i>Symphoricarpos albus</i>	common snowberry	deciduous shrub	
	Endurer2	VT	<i>Vaccinium membranaceum</i>	black huckleberry	deciduous shrub	
	Resister	WI	<i>Larix occidentalis</i>	western larch	coniferous tree	
	Resister	WI	<i>Pinus ponderosa</i>	ponderosa pine	coniferous tree	
	Resister	WI	<i>Pseudotsuga menziesii</i>	Douglas-fir	coniferous tree	
	IDFdm2	Evader2	CI	<i>Pinus contorta</i>	lodgepole pine	coniferous tree
		Invader	DI	<i>Agoseris glauca</i>	short-beaked agoseris	forb
		Invader	DI	<i>Betula papyrifera</i>	paper birch	broad-leaved tree
		Invader	DI	<i>Bromus tectorum</i>	cheatgrass	graminoid
		Invader	DI	<i>Epilobium angustifolium</i>	fireweed	forb
		Invader	DI	<i>Gaillardia aristata</i>	brown-eyed Susan	forb
Invader		DI	<i>Heuchera cylindrica</i>	round-leaved alumroot	forb	
Invader		DI	<i>Lappula redowskii</i>	western stickseed	forb	
Invader		DI	<i>Mahonia aquifolium</i>	tall Oregon-grape	evergreen shrub	
Invader		DI	<i>Phleum pratense</i>	common timothy	graminoid	
Invader		DI	<i>Taraxacum officinale</i>	common dandelion	forb	
Avoider		DR	<i>Abies lasiocarpa</i>	subalpine fir	coniferous tree	
Avoider		DR	<i>Chimaphila umbellata</i>	prince's-pine	dwarf woody plant	
Avoider		DR	<i>Clematis occidentalis</i>	Columbia clematis	deciduous shrub	
Avoider		DR	<i>Dicranum scoparium</i>	broom moss	moss	
Avoider		DR	<i>Goodyera oblongifolia</i>	rattlesnake-plantain	forb	
Avoider		DR	<i>Juniperus communis</i>	common juniper	evergreen shrub	
Avoider		DR	<i>Juniperus scopulorum</i>	Rocky Mountain juniper	coniferous tree	
Avoider		DR	<i>Picea engelmannii</i>	Engelmann spruce	coniferous tree	
Avoider		DR	<i>Picea glauca</i>	white spruce	coniferous tree	
Avoider		DR	<i>Rhytidiadelphus triquetrus</i>	electrified cat's-tail moss	moss	
Avoider		DT	<i>Arnica cordifolia</i>	heart-leaved arnica	forb	
Avoider		DT	<i>Linnaea borealis</i>	twinflower	dwarf woody plant	
Avoider		DT	<i>Lonicera involucrata</i>	black twinberry	deciduous shrub	
Avoider		DT	<i>Lonicera utahensis</i>	Utah honeysuckle	deciduous shrub	
Avoider		DT	<i>Smilacina racemosa</i>	false Solomon's-seal	forb	

APPENDIX II KTUNAXA PLANTS IN ZONAL PLOTS

Ktunaxa plants by species groups, species types, and lifeform in zonal plots of thirteen Biogeoclimatic units (.. *Continued*)

BEC Unit	Species Group	Species Type	Scientific Name	Common Name	Lifeform
IDFdm2	Avoider	DT	<i>Streptopus amplexifolius</i>	clasping twistedstalk	forb
	Evader1	SI	<i>Ceanothus velutinus</i>	snowbrush	evergreen shrub
	Evader1	SI	<i>Fragaria vesca</i>	wood strawberry	forb
	Evader1	SI	<i>Fragaria virginiana</i>	wild strawberry	forb
	Evader2	ST	<i>Purshia tridentata</i>	antelope-brush	deciduous shrub
	Evader2	ST	<i>Ribes lacustre</i>	black gooseberry	deciduous shrub
	Endurer1	VI	<i>Achillea millefolium</i>	yarrow	forb
	Endurer1	VI	<i>Allium cernuum</i>	nodding onion	forb
	Endurer1	VI	<i>Apocynum androsaemifolium</i>	spreading dogbane	forb
	Endurer1	VI	<i>Arctostaphylos uva-ursi</i>	kinnikinnick	dwarf woody plant
	Endurer1	VI	<i>Calochortus apiculatus</i>	three-spot mariposa lily	forb
	Endurer1	VI	<i>Lilium philadelphicum</i>	wood lily	forb
	Endurer1	VI	<i>Lithospermum ruderale</i>	lemonweed gromwell	forb
	Endurer1	VI	<i>Populus tremuloides</i>	trembling aspen	broad-leaved tree
	Endurer1	VI	<i>Prunus virginiana</i>	choke cherry	broad-leaved tree
	Endurer1	VI	<i>Rosa acicularis</i>	prickly rose	deciduous shrub
	Endurer1	VI	<i>Rosa woodsii</i>	prairie rose	deciduous shrub
	Endurer1	VI	<i>Rubus parviflorus</i>	thimbleberry	deciduous shrub
	Endurer1	VI	<i>Salix scouleriana</i>	Scouler's willow	broad-leaved tree
	Endurer2	VT	<i>Acer glabrum</i>	Douglas maple	deciduous shrub
	Endurer2	VT	<i>Amelanchier alnifolia</i>	saskatoon	deciduous shrub
	Endurer2	VT	<i>Aralia nudicaulis</i>	wild sarsaparilla	forb
	Endurer2	VT	<i>Calamagrostis rubescens</i>	pinegrass	graminoid
	Endurer2	VT	<i>Holodiscus discolor</i>	oceanspray	deciduous shrub
	Endurer2	VT	<i>Lupinus sericeus</i>	silky lupine	forb
	Endurer2	VT	<i>Shepherdia canadensis</i>	soopolallie	deciduous shrub
	Endurer2	VT	<i>Spiraea betulifolia</i>	birch-leaved spirea	deciduous shrub
	Endurer2	VT	<i>Symphoricarpos albus</i>	common snowberry	deciduous shrub
	Endurer2	VT	<i>Vaccinium caespitosum</i>	dwarf blueberry	dwarf woody plant
	Endurer2	VT	<i>Vaccinium membranaceum</i>	black huckleberry	deciduous shrub
	Endurer2	VT	<i>Vaccinium myrtillus</i>	low bilberry	dwarf woody plant
	Endurer2	VT	<i>Vaccinium scoparium</i>	grouseberry	dwarf woody plant
	Resister	WI	<i>Larix occidentalis</i>	western larch	coniferous tree
	Resister	WI	<i>Pinus ponderosa</i>	ponderosa pine	coniferous tree
	Resister	WI	<i>Pseudotsuga menziesii</i>	Douglas-fir	coniferous tree
MSdk	Evader2	CI	<i>Pinus contorta</i>	lodgepole pine	coniferous tree
	Invader	DI	<i>Betula papyrifera</i>	paper birch	broad-leaved tree
	Invader	DI	<i>Epilobium angustifolium</i>	fireweed	forb
	Invader	DI	<i>Mahonia aquifolium</i>	tall Oregon-grape	evergreen shrub
	Invader	DI	<i>Pinus albicaulis</i>	whitebark pine	coniferous tree
	Invader	DI	<i>Sorbus scopulina</i>	western mountain-ash	deciduous shrub
	Invader	DI	<i>Sorbus sitchensis</i>	Sitka mountain-ash	deciduous shrub
	Invader	DI	<i>Taraxacum officinale</i>	common dandelion	forb
	Avoider	DR	<i>Abies lasiocarpa</i>	subalpine fir	coniferous tree
	Avoider	DR	<i>Chimaphila umbellata</i>	prince's-pine	dwarf woody plant
	Avoider	DR	<i>Clematis occidentalis</i>	Columbia clematis	deciduous shrub
	Avoider	DR	<i>Dicranum scoparium</i>	broom moss	moss
	Avoider	DR	<i>Goodyera oblongifolia</i>	rattlesnake-plantain	forb
	Avoider	DR	<i>Juniperus communis</i>	common juniper	evergreen shrub

APPENDIX II KTUNAXA PLANTS IN ZONAL PLOTS

Ktunaxa plants by species groups, species types, and lifeform in zonal plots of thirteen Biogeoclimatic units (.. *Continued*)

BEC Unit	Species Group	Species Type	Scientific Name	Common Name	Lifeform
MSdk	Avoider	DR	<i>Juniperus scopulorum</i>	Rocky Mountain juniper	coniferous tree
	Avoider	DR	<i>Oplopanax horridus</i>	devil's club	deciduous shrub
	Avoider	DR	<i>Picea engelmannii</i>	Engelmann spruce	coniferous tree
	Avoider	DR	<i>Rhytidiadelphus triquetrus</i>	electrified cat's-tail moss	moss
	Avoider	DR	<i>Taxus brevifolia</i>	western yew	coniferous tree
	Avoider	DT	<i>Arnica cordifolia</i>	heart-leaved arnica	forb
	Avoider	DT	<i>Linnaea borealis</i>	twinflower	dwarf woody plant
	Avoider	DT	<i>Lonicera involucrata</i>	black twinberry	deciduous shrub
	Avoider	DT	<i>Lonicera utahensis</i>	Utah honeysuckle	deciduous shrub
	Avoider	DT	<i>Smilacina racemosa</i>	false Solomon's-seal	forb
	Avoider	DT	<i>Smilacina stellata</i>	star-flowered false Solomon's-seal	forb
	Avoider	DT	<i>Streptopus amplexifolius</i>	clasping twistedstalk	forb
	Avoider	DT	<i>Thuja plicata</i>	western redcedar	coniferous tree
	Avoider	DT	<i>Veratrum viride</i>	Indian hellebore	forb
	Evader1	SI	<i>Fragaria vesca</i>	wood strawberry	forb
	Evader1	SI	<i>Fragaria virginiana</i>	wild strawberry	forb
	Evader1	SI	<i>Geranium viscosissimum</i>	sticky purple geranium	forb
	Evader1	SI	<i>Sambucus racemosa</i>	red elderberry	deciduous shrub
	Evader2	ST	<i>Ribes lacustre</i>	black gooseberry	deciduous shrub
	Evader2	ST	<i>Viburnum edule</i>	highbush-cranberry	deciduous shrub
	Endurer1	VI	<i>Achillea millefolium</i>	yarrow	forb
	Endurer1	VI	<i>Allium cernuum</i>	nodding onion	forb
	Endurer1	VI	<i>Arctostaphylos uva-ursi</i>	kinnikinnick	dwarf woody plant
	Endurer1	VI	<i>Populus balsamifera ssp. trichocarpa</i>	black cottonwood	broad-leaved tree
	Endurer1	VI	<i>Populus tremuloides</i>	trembling aspen	broad-leaved tree
	Endurer1	VI	<i>Rosa acicularis</i>	prickly rose	deciduous shrub
	Endurer1	VI	<i>Rubus idaeus</i>	red raspberry	deciduous shrub
	Endurer1	VI	<i>Rubus parviflorus</i>	thimbleberry	deciduous shrub
	Endurer1	VI	<i>Rubus pedatus</i>	five-leaved bramble	forb
	Endurer1	VI	<i>Salix scouleriana</i>	Scouler's willow	broad-leaved tree
	Endurer1	VI	<i>Xerophyllum tenax</i>	bear-grass	forb
	Endurer2	VT	<i>Acer glabrum</i>	Douglas maple	deciduous shrub
	Endurer2	VT	<i>Amelanchier alnifolia</i>	saskatoon	deciduous shrub
	Endurer2	VT	<i>Aralia nudicaulis</i>	wild sarsaparilla	forb
	Endurer2	VT	<i>Athyrium filix-femina</i>	lady fern	ferns or fern-ally
	Endurer2	VT	<i>Calamagrostis rubescens</i>	pinegrass	graminoid
	Endurer2	VT	<i>Equisetum arvense</i>	common horsetail	ferns or fern-ally
	Endurer2	VT	<i>Equisetum hyemale</i>	scouring-rush	ferns or fern-ally
	Endurer2	VT	<i>Equisetum pratense</i>	meadow horsetail	ferns or fern-ally
	Endurer2	VT	<i>Erythronium grandiflorum</i>	yellow glacier lily	forb
	Endurer2	VT	<i>Ledum groenlandicum</i>	Labrador tea	evergreen shrub
	Endurer2	VT	<i>Ligusticum canbyi</i>	Canby's lovage	forb
	Endurer2	VT	<i>Lupinus sericeus</i>	silky lupine	forb
	Endurer2	VT	<i>Shepherdia canadensis</i>	soopolallie	deciduous shrub
	Endurer2	VT	<i>Spiraea betulifolia</i>	birch-leaved spirea	deciduous shrub
	Endurer2	VT	<i>Symphoricarpos albus</i>	common snowberry	deciduous shrub
	Endurer2	VT	<i>Vaccinium caespitosum</i>	dwarf blueberry	dwarf woody plant
	Endurer2	VT	<i>Vaccinium membranaceum</i>	black huckleberry	deciduous shrub

APPENDIX II KTUNAXA PLANTS IN ZONAL PLOTS

Ktunaxa plants by species groups, species types, and lifeform in zonal plots of thirteen Biogeoclimatic units (.. *Continued*)

BEC Unit	Species Group	Species Type	Scientific Name	Common Name	Lifeform
MSdk	Endurer2	VT	<i>Vaccinium myrtillus</i>	low bilberry	dwarf woody plant
	Endurer2	VT	<i>Vaccinium scoparium</i>	grouseberry	dwarf woody plant
	Resister	WI	<i>Larix occidentalis</i>	western larch	coniferous tree
	Resister	WI	<i>Pseudotsuga menziesii</i>	Douglas-fir	coniferous tree
PPdh2	Invader	DI	<i>Agoseris glauca</i>	short-beaked agoseris	forb
	Invader	DI	<i>Bromus tectorum</i>	cheatgrass	graminoid
	Invader	DI	<i>Dodecatheon conjugens</i>	slimpod shootingstar	forb
	Invader	DI	<i>Epilobium angustifolium</i>	fireweed	forb
	Invader	DI	<i>Gaillardia aristata</i>	brown-eyed Susan	forb
	Invader	DI	<i>Heuchera cylindrica</i>	round-leaved alumroot	forb
	Invader	DI	<i>Taraxacum officinale</i>	common dandelion	forb
	Avoider	DR	<i>Juniperus communis</i>	common juniper	evergreen shrub
	Avoider	DR	<i>Juniperus scopulorum</i>	Rocky Mountain juniper	coniferous tree
	Avoider	DT	<i>Arnica cordifolia</i>	heart-leaved arnica	forb
	Avoider	DT	<i>Smilacina stellata</i>	star-flowered false Solomon's-seal	forb
	Evader1	SI	<i>Fragaria virginiana</i>	wild strawberry	forb
	Evader2	ST	<i>Purshia tridentata</i>	antelope-brush	deciduous shrub
	Endurer1	VI	<i>Achillea millefolium</i>	yarrow	forb
	Endurer1	VI	<i>Allium cernuum</i>	nodding onion	forb
	Endurer1	VI	<i>Arctostaphylos uva-ursi</i>	kinnikinnick	dwarf woody plant
	Endurer1	VI	<i>Calochortus apiculatus</i>	three-spot mariposa lily	forb
	Endurer1	VI	<i>Fritillaria pudica</i>	yellow bell	forb
	Endurer1	VI	<i>Lithospermum ruderale</i>	lemonweed gromwell	forb
	Endurer1	VI	<i>Prunus virginiana</i>	choke cherry	broad-leaved tree
	Endurer1	VI	<i>Rosa woodsii</i>	prairie rose	deciduous shrub
	Endurer2	VT	<i>Amelanchier alnifolia</i>	saskatoon	deciduous shrub
	Endurer2	VT	<i>Balsamorhiza sagittata</i>	arrow-leaved balsamroot	forb
	Endurer2	VT	<i>Calamagrostis rubescens</i>	pinegrass	graminoid
	Endurer2	VT	<i>Lupinus sericeus</i>	silky lupine	forb
	Endurer2	VT	<i>Shepherdia canadensis</i>	soopolallie	deciduous shrub
	Endurer2	VT	<i>Spiraea betulifolia</i>	birch-leaved spirea	deciduous shrub
	Endurer2	VT	<i>Symphoricarpos albus</i>	common snowberry	deciduous shrub
	Resister	WI	<i>Pinus ponderosa</i>	ponderosa pine	coniferous tree
	Resister	WI	<i>Pseudotsuga menziesii</i>	Douglas-fir	coniferous tree