

DOUGLAS-FIR/SNOWBERRY/BALSAMROOT

Pseudotsuga menziesii/Symphoricarpos albus/Balsamorhiza sagittata

Original prepared by W.R. Erickson

Plant Community Information

Description

This plant community is characterized by open or savannah type stands of Douglas-fir (*Pseudotsuga menziesii*) and ponderosa pine (*Pinus ponderosa*), with a herb layer dominated by bluebunch wheatgrass (*Pseudoroegneria spicata*), arrow-leaved balsamroot (*Balsamorhiza sagittata*), and Idaho fescue (*Festuca idahoensis*). Pinegrass (*Calamagrostis rubescens*) grows on some sites, usually where tree cover is denser or in more protected positions. The shrub layer is generally sparse and may include snowberry (*Symphoricarpos albus*), saskatoon (*Amelanchier alnifolia*), antelope-brush (*Purshia tridentata*), kinnickinnick (*Arctostaphylos uva-ursi*), common juniper (*Juniperus communis*), Rocky mountain juniper (*Juniperus scopulorum*), soopolallie (*Shepherdia canadensis*), or wood rose (*Rosa woodsii*).

The herb layer may include a low cover of slender hawksbeard (*Crepis atribarba*), dogbane (*Apocynum androsaemifolium*), needlegrasses (*Achnatherum* spp.), fescues (*Festuca* spp.), timber milkvetch (*Astragalus miser*), rosy pussytoes (*Antennaria microphylla*), junegrass (*Koeleria macrantha*), yarrow (*Achillea millefolium*), strawberry (*Fragaria virginiana*), fern-leaved desert parsley (*Lomatium triternatum*), and nodding onion (*Allium cernuum*). Occasionally, moss cover (*Tortula ruralis*, and *Peltigera rufescens*) and lichen cover (*Cladonia* spp.) is relatively well developed (Braumandl and Curran [compilers and editors] 1992).

Distribution is restricted to ridges and upper to mid-slopes on warm aspects. It occurs on a variety of parent materials. Soils can vary, but are often loamy

and classified into Chernozemic, Brunisolic, or Luvisolic soil orders. Soil moisture classes have been assigned as subxeric to submesic (Braumandl and Curran [compilers and editors] 1992). These soils tend to be rich, as melanization by root decomposition is important, along with periodic reductions in surface litter from repeated fire.

Distribution

Global

Unknown.

British Columbia

The range of this plant community in British Columbia is very limited. It is restricted to valley bottoms and adjacent slopes in the lower Rocky Mountain Trench, occurring south of the Blaeberry River to the international border.

Forest region and district

Southern Interior: Rocky Mountain

Ecoprovince and ecosection

SIM: EKT

Biogeoclimatic units

IDF: dm2/03

MS: dk

PP: dh2/00

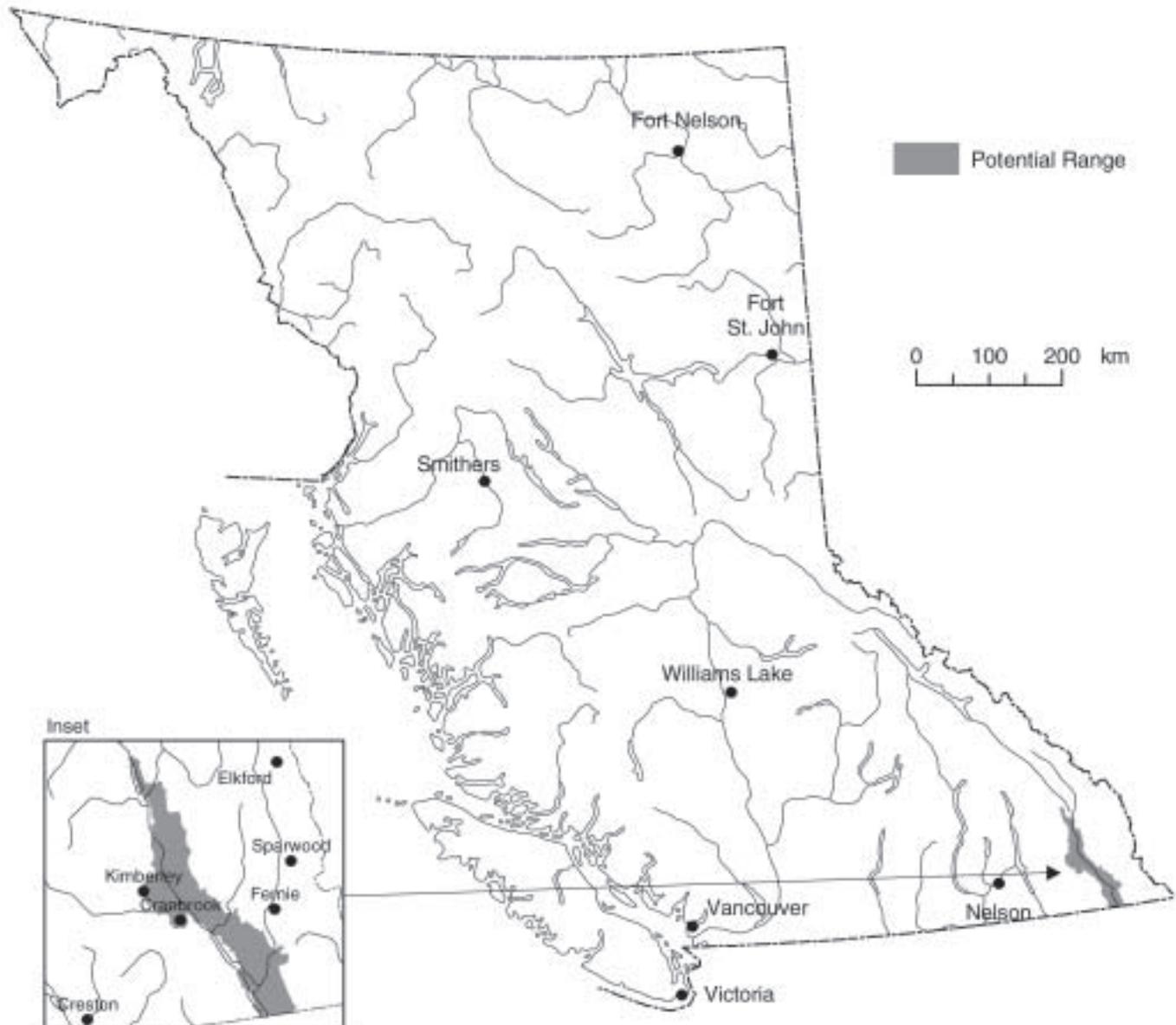
Broad ecosystem units

DP, PP

Elevation

~700–1500 m

Douglas-fir / Snowberry / Balsamroot
(*Pseudotsuga menziesii* / *Symphoricarpos albus*
/ *Balsamorhiza sagittata*)



Note: This map represents the potential area where this plant community may be found. The map is based on the Ecoregion and Biogeoclimatic ecosystem classifications as well as current knowledge of the distribution of the plant community. This plant community occurs as localized areas within the range represented.

Plant Community Characteristics

Structural stage

6 and 7 with open savannah characteristics

Natural disturbance regime

Frequent stand-maintaining fires (NDT4) (MOF and MELP 1995b). Periodic fire, grazing and browsing, and insect outbreaks are among the historic natural disturbances for this community (Youtie et al. 1988; MOF and MELP 1995a; Rondeau 2001; Univ. Wyoming, n.d.; D. Johnson, pers. comm.). Collectively these disturbances would maintain more open forest and understorey stands, but provide renewal or replacement opportunities where plant growth or vigour was stagnated due to density, low light conditions, and competition.

Conditioning of the vegetation by native ungulates is part of the natural ecosystem processes of this community. The subzone variant area supports large populations of mule deer, white-tailed deer, elk, and bighorn sheep, especially as winter range. The understorey species of this community are generally adapted to and resilient to disturbance. An exception is the susceptibility of bluebunch wheatgrass and Idaho fescue to spring defoliation by herbivores (McLean and Marchand 1968). Evidence suggests that the current composition may represent the impacts of grazing pressure with more dominance by snowberry and balsamroot, and less by Idaho fescue and bluebunch wheatgrass (McLean and Marchand 1968; Youtie et al. 1988; Williams et al. 1995; Thompson et al. 1998; Harrison 2000; Thompson, n.d.). There most likely have been exchanges in dominance for these last two species on late seral sites. Increased grazing pressure has resulted in conversion of this plant community to pussytoes species, needlegrasses, weedy forbs, and invaders such as cheatgrass (McLean and Marchand 1968).

On many sites, considerable changes have resulted from the lack of natural disturbance regimes over the last 150 years (Gayton 1996). These include increasing tree densities, invasion of pinegrass and

moss, deep accumulations of litter and woody debris, elimination of understorey, and changes in soil forming processes.

Fragility

Moderately fragile on coarse soils and steeper slopes. Vegetation can recover after forest harvesting, but could take a long time to return to old-growth condition in the dry hot climate with occasional periods of drought. Once vegetation is removed and soils exposed, early succession will probably be dominated by invasive species that will persist. These ecosystems are very susceptible to the introduction and spread of invasive species.

Conservation and Management

Status

The Douglas-fir/snowberry/balsamroot plant community is on the provincial *Red List* in British Columbia. It is ranked S2 in British Columbia. Its global status is unknown. No comparable community has yet been identified in adjacent jurisdictions.

Trends

Assessed as declining in British Columbia, and there are estimated to be <20 remaining viable occurrences in good condition (i.e., large stands of old open forest, relatively undisturbed—not logged, not or lightly grazed by domestic livestock, without invasive species, and free of the dense coniferous ingrowth that results from fire exclusion). It is expected to continue to decline due to fire prevention and suppression, forest harvesting, rural development, poor range practices, and the spread of invasive species. There have probably been gains with changing range practices, but the overall decline is not likely to reverse without control of invasive species, forest encroachment and ingrowth.

Threats

Forest encroachment and ingrowth due to fire suppression, livestock and wildlife grazing/browsing impacts, spread of invasive species, harvesting of older stands and probably climate change threaten the long-term viability of this plant community.

Habitat has been and continues to be lost to urbanization, impoundments, golf course development, and intensive agriculture. Outdoor recreation (e.g., trail bikes), extensive livestock grazing and wildlife grazing/browsing can increase soil exposure, increasing the spread of invasive species. Overuse also impacts native plant vigour and composition and ecosystem stability.

Classic studies by McLean and Marchand (1968) in related habitats indicate the long period of recovery required from an early seral state. Many of these sites may be stalled in a state with Kentucky bluegrass (*Poa pratensis*), cheatgrass (*Bromus tectorum*), or needlegrass dominance and may require management treatments for recovery (Westoby et al. 1989).

Legal Protection and Habitat Conservation

There is no legal protection for plant communities except for those occurring within protected areas and parks.

There are several small protected areas or managed areas within the biogeoclimatic subzone variants in which this community occurs but it is not known if these areas include this community. Roughly 2500 ha is in 15 small protected areas. This community does occur in Kikomun Park as well as Sheep Mountain and Premier Ridge wildlife management areas. It may also occur in other wildlife management areas and in other provincial parks, particularly Premier Lake and Norbury Lake.

Occurrences of this community could be protected through the establishment of old growth management areas (OGMAs) under the *Forest and Range Practices Act*. No areas have been designated to date.

Old growth guidelines have not been applied to open savannah stands, but should be relevant to this community. This is an upland community to which riparian management guidelines do not apply. Range use planning may address this community through implementation of similar recommendations as outlined below in “General wildlife measures.”

Identified Wildlife Provisions

Sustainable resource management and planning recommendations

This small to large patch community once occurred more commonly over the landscape. It is recommended to:

- ❖ re-establish periodic understorey fire as an ecological factor conditioning stands;
- ❖ control forest ingrowth and encroachment;
- ❖ maintain or recover at least 20 occurrences in good condition across the range of the plant community;
- ❖ maintain or restore occurrences to as close to natural condition as possible and practical; and
- ❖ wherever possible, protect remaining occurrences through placement of old growth management areas.

Wildlife habitat area

Goal

Maintain or recover known occurrences.

Feature

Establish WHAs at occurrences that have been confirmed by a registered professional in consultation with the B.C. Conservation Data Centre or Ministry of Forests regional ecologists. Priority for WHAs should be any old or mature (structural stage 6 and 7) occurrences of this community that are >10 ha and in a relatively natural state. As a lower priority, establish WHAs within younger forests (stage 5) originating from natural disturbance events) where the key species of the community (balsamroot, bunchgrasses, snowberry) are present in small patches, to recover community to climax condition.

Select areas that are (in order of priority):

- the oldest, most structurally complex secondary forests available, ideally stands containing a component of veteran ponderosa pine and Douglas-fir;
- relatively lightly damaged and can be expected to recover to a more natural state;
- part of a network of reserve areas; and
- adjacent to natural occurrences of other plant communities.

Size

The size of the WHA should be based on the extent of the community occurrence. This plant community tends to occur as small to medium patches. WHAs will be ~50 ha when in relatively pure composition, or where recovery is the main objective. However, WHAs may be larger (~200 ha) when the understorey community or tree layer has a patchy distribution or when the community occurs in complexes with other at-risk plant communities.

Design

The WHA should include the entire occurrence of the plant community plus ~100 m around the perimeter of the occurrence. Wherever possible use geographic or topographic boundaries. If boundaries are limited due to some artificial barrier such as roads, rights of way, developed areas, then increase the size at other sections of the boundaries. Minimize edge, unless occurrences are narrow, such as along ridge tops. In these cases, include occurrence plus 200 m around the perimeter of the plant community occurrence.

General wildlife measures

Goal

1. Maintain or restore plant community to a natural state (i.e., same species composition, physical structure, and ecological processes as natural examples of the plant community) (see Brayshaw 1970; McLean 1970; Braumandl and Curran [compilers and editors] 1992).
2. Maintain or enhance open old forest structure (i.e., some large old trees, range of tree sizes, large snags, down logs) (Spies 1998).

3. The recommended Desired Plant Community is as follows: open savannah canopy cover 2–35%, widely, spaced large Douglas-fir and ponderosa pine, herb layer dominated by >5%, preferably >15% cover of at least two of bluebunch wheatgrass, arrow-leaved balsamroot, or Idaho fescue.
4. Manage to maintain and increase the species named above as the Desired Plant Community.
5. Maintain a diversity of natural disturbance regimes.
6. Allow for the processes of litter accumulation, renewal, and microbotic crust development.
7. Maintain a diversity of understorey species composition (e.g., *Festuca* spp.). Maintain or restore native grass-dominated ground cover.
8. Prevent physical disturbance, especially of the soil.
9. Avoid or minimize access.
10. Minimize introduction and spread of invasive species.

Measures

Access

- Do not build roads or trails.

Harvesting and silviculture

- Do not harvest or salvage except to support restoration measures with silvicultural treatments. Retain widely spaced, large, older trees and snags.
- Do not remove non-timber forest products.

Pesticides

- Do not use pesticides.

Range

- Plan livestock grazing (i.e., timing, distribution, and level of use) to meet goals described above. Fencing could be required by the statutory decision maker to meet goals, to recover community, or for restoration treatments.
- Do not place livestock attractants within WHA.

Recreation

- Do not develop recreational sites, trails, or facilities.

Additional Management Considerations

Minimize impacts to vegetation, soils, and hydrology when operating adjacent to a WHA, particularly during road development and maintenance.

This community is part of broader fire-maintained ecosystems, which have been subject to fire suppression and consequent forest encroachment and ingrowth (Arno et al. 1995; Gayton 1996; Hardy and Arno [editors] 1996; RMTER 2000). Key to restoring this community is to emulate the effects of this former natural fire regime by establishing restoration silvicultural treatments (such as limbing to prevent surface fires from crowning) and light intensity, prescribed burns in fall (Thomson 1988; Arno et al. 1995; Zlatnik 1999a, 1999b). Maintain and restore saskatoon, bluebunch wheatgrass, Idaho fescue, and balsamroot cover; cycles of litter and biotic crust accumulation and light intensity natural fire renewal. Increase cover and diversity of other native species (e.g., forbs, rough fescue) and maintain open savannah to open forest structure (e.g., 15–30% cover) of older (e.g., >150 year old) ponderosa pine and Douglas-fir trees.

Light to moderate grazing/browsing and periodic renewal are necessary as part of the disturbance regime for this community, but higher levels can cause the loss of the community through shifts in competition-mediated shifts in composition and species invasions (McLean and Marchand 1968; Ross 1997). In addition, the key species of the community still have susceptibilities to higher burn intensities in different seasons (Thomson 1988; Zlatnik 1999a, 1999b). Using light intensity prescribed burns in fall is a compromise between these susceptibilities and the difficulties of a spring burn window before the onset of bunchgrass growth. Burns should be able to be carried out under a regular burn plan, plus species-level monitoring, without the need for a specific site management plan. Silvicultural treatments should leave older trees and snags, which have an important role for wildlife of open savannah and open forests.

Information Needs

1. Further inventory and confirmation of classification to clarify the extent of this community.
2. Review guidelines for old growth and open savannah stands, and apply them in the management of a pilot project area.
3. Monitor for recovery trends in relation to site factors and restorations treatments, and for the relationship between specific community types currently encompassed within this community.

Cross References

Lewis's Woodpecker

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