

TABLE 8. Summary of climate data for biogeoclimatic units <sup>a</sup>

Climatic Characteristics		Biogeoclimatic Unit						
		SBSdk	SBSdw2	SBSdw3	SBSmk1	SBSmc2	SBSmc3	SBPSmc
Annual Precipitation (mm)	Mean	480.6	552.9	494.4	727.4	574.4	505.6	N/A
	Range	415.9 - 586.3	427.0 - 648.5	N/A	628.3 - 838.2	460.1	N/A	N/A
Growing Season Precipitation (mm)	Mean	211.0	274.8	259.4	272.6	229.4	261.4	195.9
	Range	167.4 - 323.0	248.0 - 296.3	224.1 - 298.4	196.8 - 432.0	139.4 - 348.9	242.8 - 288.7	156.0 - 235.5
Annual Snowfall (cm)	Mean	188.1	204.1	204.2	306.3	237.1	197.1	N/A
	Range	121.9 - 265.2	169.8 - 225.8	N/A	241.7 - 355.5	177.3 - 264.0	N/A	N/A
Annual Temperature (°C)	Mean	2.1	3.4	2.6	1.5	1.5	0.6	0.8
	Range	0.8 - 3.5	2.0 - 4.4	1.3 - 3.5	-0.2 - 3.3	-0.7 - 3.6	N/A	0.7 - 0.8
Growing Degree-days (>5°C)	Mean	1028	1224	1089	975	947	N/A	N/A
	Range	884 - 1145	1072 - 1409	N/A	751 - 1198	844 - 1012	N/A	N/A
Frost-free Period (days)	Mean	70	105	83	73	116	18	N/A
	Range	39 - 103	94 - 122	N/A	43 - 92	106 - 125	N/A	N/A

<sup>a</sup> Reynolds, G. 1989. Climatic data summaries for the biogeoclimatic zones of British Columbia. B.C. Min. For., Research Branch, Victoria, B.C. Unpublished report.

TABLE 9. Some important wildlife species that use biogeoclimatic units in the West Central guide area

Species	Occurrence in Variants							
	SBSdk	SBSdw2	SBSdw3	SBSmc2	SBSmc3	SBSmk1	SBPSmc	ESSFmv1
Moose (winter range)	*	*	*		*	*	*	
Mule Deer (winter range)	*	*	*	*	*		*	
White-tailed Deer	*		*		*	*		
Elk			*					
Caribou <sup>a</sup>	*				*		*	*
Grizzly Bear <sup>a</sup>	*	*	*	*	*	*	*	*
Furbearers	*	*	*	*	*	*	*	*

<sup>a</sup> Denotes species "blue listed" in 1989 by the Ministry of Environment. Because of major declines in their populations, they are considered sensitive and/or deserving of management attention.



## SBSdw2 Variant Summary

### 4.2 Blackwater Dry Warm Sub-Boreal Spruce <sup>7</sup>

#### Location

In the Prince George Forest Region the SBSdw2 occurs from just north of the Chilako River, where it borders the SBSdw3, south to the southern boundary of the region at the Blackwater River (Figure 1). Its western limit is Tatuk Lake, where it borders the SBSmc3 and its eastern boundary is the Fraser River, where it borders the SBSmh (previously SBS1) (B.C. Ministry of Forests, Cariboo Forest Region 1987). The SBSdw2 reaches its northern limit in the Prince George Region, but extends south of the Blackwater River in the Cariboo Forest Region.

#### Elevation Range

750 to 1100 m

#### Climate

The SBSdw2 is dry and warm relative to other biogeoclimatic units in this guide and in the region. The SBSdw2 has the warmest climate of all the variants described in the guide (see Table 8). The warmth of this variant reflects its southern position and lower elevation with respect to the other variants. Winter precipitation is relatively low for the region, with snowpacks generally accumulating up to about 2 m in depth. Climatic growth-limiting factors are drought on drier sites and frost on frost-prone sites.

#### Soils, geology, and landforms

Bedrock types consist mostly of Palaeozoic sedimentary rocks in the western portion of this subzone and lower Mesozoic volcanic rocks in the eastern portion. Morainal parent materials with gravelly loam and clay loam textures are predominant in this subzone and are associated with Gray Luvisols, including Brunisolic Gray Luvisols. These morainal landscapes also include components of soils formed on organic deposits (Mesisols), colluvium (Brunisolic Gray Luvisols with gravelly loam and sandy loam textures), and glaciofluvial deposits (Dystric Brunisols with gravelly sand textures). Lacustrine deposits with subdued topography occur in the eastern portion of this subzone. Gray Luvisols are associated with the finer textures (silty clay, silty clay loam), while Dystric Brunisols occur on the coarser (loamy sand) lacustrine materials.

#### Distinguishing the SBSdw2 from adjoining subzones/variants

SBSdw3 has:

- no pinegrass on mesic sites; and
- queen's cup on mesic and wetter sites.

SBSmc2 has:

- more subalpine fir but no Douglas-fir in the canopy;
- more black huckleberry but no saskatoon in the shrub layer; and
- five-leaved bramble in the herb layer but no pinegrass or wild sarsaparilla.

SBSmc3 has:

- no Douglas-fir or trembling aspen, but more subalpine fir in the canopy;
- less saskatoon but more black huckleberry in the shrub layer; and
- no pinegrass or wild sarsaparilla in the herb layer.

<sup>7</sup> Formerly SBSk2

SBSmw has:

- more subalpine fir in the canopy;
- no pinegrass but occasional five-leaved bramble on mesic sites; and
- three-leaved foamflower on moist to wet sites.

SBSmh has:

- infrequent occurrence of lodgepole pine in the canopy;
- beaked hazelnut in the shrub layer; and
- Hooker's fairybells but no pinegrass in the herb layer.

### **Forests**

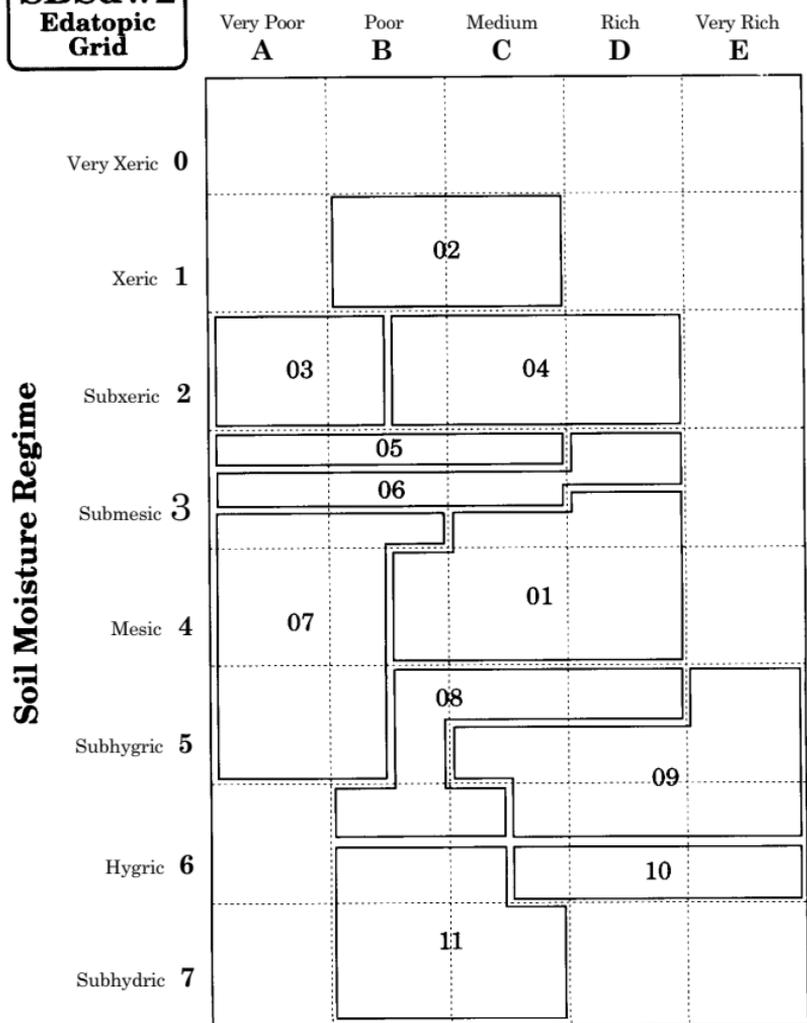
The forests of the SBSdw2 are some of the most diverse in the region. Coniferous forests in this unit tend to be mixtures of lodgepole pine, Douglas-fir, and hybrid white spruce with lodgepole pine and/or Douglas-fir dominating on drier sites and hybrid white spruce dominating on wetter sites. Subalpine fir is uncommon at low elevations but increases in abundance at the higher reaches. Black spruce occurs both in wetlands as well as in combination with lodgepole pine on poorer upland sites associated with compact morainal or lacustrine soils. Upland deciduous forests are dominated by trembling aspen, and black cottonwood is common along rivers and streams.

### **Wildlife**

Douglas-fir stands in the SBSdw2 provide important winter habitat for mule deer and are used by black bear, coyote, gray wolf, and cougar. White spruce - lodgepole pine forests are used by mule deer in the summer, and are also used by moose, grizzly bear, black bear, gray wolf, wolverine, fisher, marten, and spruce grouse. Shrub-dominated wetlands below 900 m elevation provide winter habitat for moose. These wetlands also support furbearers such as beaver, muskrat, mink, and otter. Deciduous thickets and scattered open woodlands along the southern edges of this variant support a small population of sharp-tailed grouse.

**SBSdw2**  
**Edatopic**  
**Grid**

**Soil Nutrient Regime**



- |  |  |
|--|--|
| 01 SxwFd - Pinegrass                   | 07 PISb - Feathermoss                  |
| 02 FdPl - Cladonia                     | 08 Sxw - Twinberry                     |
| 03 Pl- Kinnikinnick - Wavy-leaved moss | 09 Sxw - Devil's club - Knight's plume |
| 04 Fd - Pinegrass - Alder              | 10 Sxw - Horsetail                     |
| 05 SxwFd - Cat's-tailmoss              | 11 Sb - Soft-leaved sedge - Sphagnum   |
| 06 Pl- Pinegrass - Feathermoss         |  |

FIGURE 11. Edatopic grid displaying site units in the SBSdw2 variant.

Site Units	02	03	04	05	06	07	01	08	09	10	11	
<b>Trees</b>												
<i>Pseudotsuga menziesii</i>	■		■	■	■		■		■			Douglas-fir
<i>Picea mariana</i>						■	■				■	black spruce
<i>Picea glauca x engelmannii</i>	■			■	■	■	■	■	■	■	■	hybrid white spruce
<b>Shrubs</b>												
<i>Juniperus communis</i>	■	■	■									common juniper
<i>Vaccinium myrtilloides</i>		■			■	■	■					velvet-leaved blueberry
<i>Amelanchier alnifolia</i>		■	■	■	■		■	■				saskatoon
<i>Shepherdia canadensis</i>		■	■	■	■	■	■					soopolallie
<i>Spiraea betulifolia</i>	■	■		■	■	■	■					birch-leaved spirea
<i>Rosa acicularis</i>		■	■	■	■	■	■		■	■	■	prickly rose
<i>Lonicera involucrata</i>						■	■	■	■	■	■	black twinberry
<i>Viburnum edule</i>							■	■		■		highbush-cranberry
<i>Oplopanax horridus</i>									■	■		devil's club
<i>Ribes triste</i>											■	red swamp currant
<i>Ledum groenlandicum</i>											■	Labrador tea
<b>Herbs and Dwarf Shrubs</b>												
<i>Oryzopsis pungens</i>	■	■										short-awned ricegrass
<i>Arctostaphylos uva-ursi</i>		■	■		■							kinnikinnick
<i>Calamagrostis rubescens</i>	■	■	■		■	■	■					pinegrass
<i>Aster conspicuus</i>			■	■			■					showy aster
<i>Aralia nudicaulis</i>				■			■	■	■			false sarsaparilla
<i>Vaccinium caespitosum</i>	■				■	■						dwarf blueberry
<i>Aster ciliolatus</i>						■		■				fringed aster

FIGURE 12. SBSdw2 vegetation table.

Prominence class: ■ 1 ■ 2 ■ 3 ■ 4 ■ 5

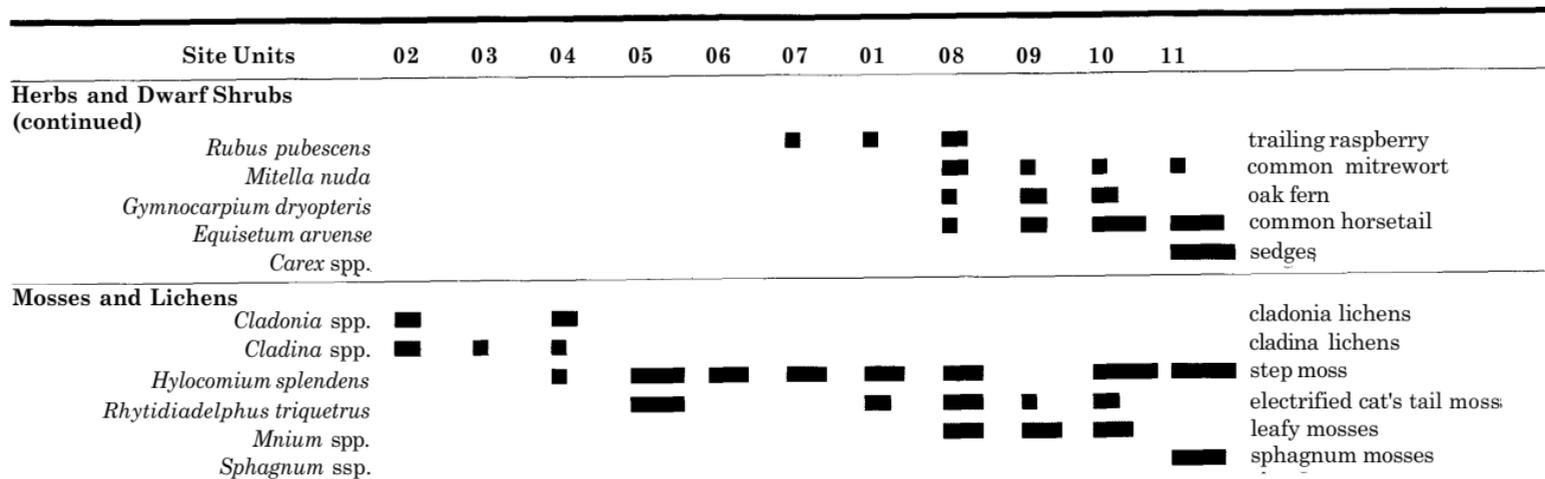


FIGURE 12. SBSdw2 vegetation table (continued).

Prominence class: ■ 1 ■ 2 ■ 3 ■ 4 ■ 5

**SBSdw2**  
**Site Series Key**

- 1 a Mid- to upper slope or crest, or level; canopy dominated by lodgepole pine, Douglas-fir, or lodgepole pine - black spruce.
- 2 a On crests of slopes; soils shallow (usually < 50 cm); herb layer sparse (usually < 10%).  
**SBSdw2/02**
- 2 b Mid- to upper slope, or level; soils deep (> 1 m); herb layer well developed (> 20%).
- 3 a Canopy of lodgepole pine - black spruce; often on level sites.  
**SBSdw2/07**
- 3 b Black spruce absent from canopy; slope position variable.
- 4 a Douglas-fir absent from canopy; aspect usually southerly to easterly.  
**SBSdw2/03**
- 4 b Douglas-fir present in canopy; aspect variable.
- 5 a Aspect southerly; canopy dominated by Douglas-fir, sometimes with minor lodgepole pine; *Juniperus communis* (p. 51)<sup>s</sup> usually present.  
**SBSdw2/04**
- 5 b Aspect variable; canopy not as above; *Juniperus communis* usually absent.
- 6 a *Vaccinium myrtilloides* (p. 43) present and generally low to moderate cover (> 2%); hybrid white spruce a minor component of the canopy, or absent.  
**SBSdw2/06**
- 6 b *Vaccinium myrtilloides* low cover (< 1%) or absent; hybrid white spruce often a major component of the canopy.

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<sup>s</sup> Page numbers refer to the publication *Plants of Northern British Columbia* (MacKinnon et al. 1992).

7a Upper slope; *Lonicera involucrata* (p. 48) usually absent, *Betula papyrifera* (paper birch) (p. 24) usually present.

**SBSdw2/05**

7b Mid- to upper slope or level; *Lonicera involucrata* usually present, *Betula papyrifera* usually absent.

**SBSdw2/01**

1b Mid-slope to toe, or level; canopy dominated by hybrid white spruce, or black spruce (but not black spruce - lodgepole pine).

8a Level sites; soils organic or mineral; bogs.

**SBSdw2/11**

8b Sites level or on a slope; soils mineral.

9a Canopy of hybrid white spruce and subalpine fir; seepage water present; *Equisetum* spp. (pp. 281-284) moderate to high cover (>10%).

**SBSdw2/10**

9b Subalpine fir low cover or absent in canopy; seepage water present or absent; *Equisetum* spp. low cover (< 5%), or absent.

10a *Oplomanax horridus* (p. 36) present; seepage water usually present.

**SBSdw2/09**

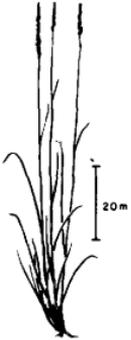
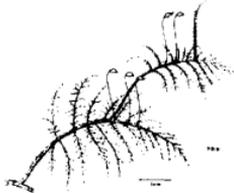
10b *Oplomanax horridus* absent; seepage water present or absent.

11a Usually toe of slope, or level; Douglas-fir and lodgepole pine, if present, only minor components of the canopy.

**SBSdw2/08**

11b Mid- to lower slope; Douglas-fir and lodgepole pine often major components of the canopy.

**SBSdw2/01**

*Rosa acicularis**Calamagrostis rubescens**Hylocomium splendens*

## VEGETATION

Tree Layer: 45% cover  
lodgepole pine, Douglas-fir, hybrid white spruce

Shrub Layer: 30% cover

<i>Rosa acicularis</i>	(prickly rose)
<i>Spiraea betulifolia</i>	(birch-leaved spirea)
<i>Lonicera involucrata</i>	(black twinberry)
<i>Alnus crispa</i> ssp. <i>sinuata</i>	(Sitka alder)
<i>Amelanchier alnifolia</i>	(saskatoon)
<i>Rubus parviflorus</i>	(thimbleberry)
Douglas-fir	
hybrid white spruce	

Herb Layer: 50% cover

<i>Calamagrostis rubescens</i>	(pinegrass)
<i>Linnaea borealis</i>	(twinflower)
<i>Cornus canadensis</i>	(bunchberry)
<i>Arnica cordifolia</i>	(heart-leaved arnica)
<i>Orthilia secunda</i>	(one-sided wintergreen)
<i>Aralia nudicaulis</i>	(wild sarsaparilla)
<i>Fragaria virginiana</i>	(wild strawberry)
<i>Epilobium angustifolium</i>	(fireweed)

Moss Layer: 80% cover

<i>Pleurozium schreberi</i>	(red-stemmed feathermoss)
<i>Ptilium crista-castrensis</i>	(knight's plume)
<i>Dicranum polysetum</i>	(wavy-leaved moss)
<i>Hylocomium splendens</i>	(step moss)
<i>Peltigera aphthosa</i>	(freckle lichen)
<i>Rhytidiadelphus triquetrus</i>	(electrified cat's-tail moss)

## SOIL AND SITE

Moisture Regime:	3-4 (sm-m)
Nutrient Regime:	B-D (p-r)
Slope Gradient (%):	0-38
Slope Position:	lower - upper, occasionally level
Parent Material:	morainal or (glacio)fluvial; occasionally lacustrine
Soil Texture:	medium - very coarse
Coarse Fragments (%):	0-95

**DISTRIBUTION:** very common, widespread, and often large

## SxwFd - Pinegrass(SBSdw2/01)

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### INTERPRETATIONS

- Site limitations: - sites within this unit with medium- to fine-textured lacustrine soils often have poor soil structure, leading to poor root growth; **plant stock that will achieve better lateral root development (eg., Cu-treated), prescribe natural regeneration, or protect advance regeneration.**
- Silviculture system: - see Section 5.1  
- minimize or align large slash piles when logging to help meet site preparation objectives and reduce fire hazard.
- Site preparation: - see Section 5.2
- Species choice: - Pl, Sx, **Fd**
- Vegetation potential: - moderate (pinegrass, fireweed, prickly rose)
- Reforestation: - manage to maintain Fd component.  
- attempt natural regeneration if potential exists; if infeasible, plant a mixture of Pl and Fd or Pl and Sx.  
- if Fd stems are present, conduct a stand evaluation to assess if a partial cutting system is feasible.  
- if a partial cutting system is used and abundant advance Fd regeneration is present, attempt to log in a manner that protects this regeneration.  
- fill-planting may be required with partial cuts.  
- help maintain stand diversity on sites to be planted with Pl by mapping aspen patches prior to harvest and planting these areas to spruce.
- Concerns: - full tree harvesting will lead to nutrient depletion and seriously reduce cones; **woody debris and cones should be distributed across these sites (ie., lop and scatter)**  
- site conditions may lead to frost damage of Fd regeneration, especially in any naturally occurring or artificially created depression; **leaving a partial canopy and/or choosing a frost-resistant species (eg., Pl) is advised.**  
- comandra blister rust may cause cankers on pine if bastard toad-flax (*Geocaulon lividum*) occurs nearby.  
- mountain pine beetle may cause mortality in large-diameter lodgepole pine stands of age class > 7.  
- Warren's root collar weevil can cause mortality in young stands, especially where duff layers are thick.

*Spiraea betulifolia**Pleurozium schreberi**Cladina rangiferina*

## VEGETATION

Tree Layer: 25% cover  
lodgepole pine, Douglas-fir

Shrub Layer: 15% cover  
*Spiraea betulifolia* (birch-leaved spirea)  
*Rosa acicularis* (prickly rose)  
[*Juniperus communis*] (common juniper)  
Douglas-fir

Herb Layer: 5% cover  
*Calamagrostis rubescens* (pinegrass)  
*Oryzopsis pungens* (short-awned ricegrass)  
*Antennaria neglecta* (field pussytoes)

Moss Layer: 70% cover  
*Pleurozium schreberi* (red-stemmed feathermoss)  
*Polytrichum juniperinum* (juniper haircap moss)  
*Dicranum polysetum* (wavy-leaved moss)  
*Cladina* spp. (cladina lichens)  
*Cladonia* spp. (cladonia lichens)

## SOIL AND SITE

Moisture Regime: 1 (x)  
Nutrient Regime: B-C(p-m)  
Slope Gradient (%): 0  
\* Slope Position: crest  
\* Parent Material: fluvial or morainal veneers  
over bedrock  
Soil Texture: medium  
Coarse Fragments (%): 30-80

COMMENTS: based on limited data

DISTRIBUTION: uncommon, small, and usually associated with bedrock outcrops or very coarse soils

## FdPl - Cladonia (SBSdw2/02)

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### INTERPRETATIONS

- Site limitations:
- site and soil conditions of this unit result in marginal forest productivity; **serious consideration should be given to excluding logging from this unit.**
  - sites within this unit with high coarse fragment content (> 70%) will have significantly reduced soil moisture retention and will be extremely difficult to plant; **attempt to regenerate naturally by retaining Pl cones and/or leaving Fd seed-trees on site.**
- Silviculture system:
- see Section 5.1
  - leave enough Fd stems on site to provide shade; this reduces drying and heating of the upper soil horizons.
- Site preparation:
- light scarification for seedbed preparation if not located on xeric, crest veneer soils, or summer logging with no site preparation.
- Species choice:
- Fd, Pl
- Vegetation potential:
- low
- Reforestation:
- manage to maintain Fd component.
  - if disturbance during logging does not expose some mineral soil, then natural Pl and Fd regeneration should be promoted by either light scarification or spot screefing.
  - fill-planting may be required to meet stocking requirements.
- Concerns:
- avoid clearcutting; stand establishment will be difficult because of high surface soil temperatures and drought.
  - these units may represent important early season range for wildlife, so prescription should be discussed with wildlife personnel.
  - site and soil conditions of this unit result in drought hazard for a significant portion of the growing season; **leaving a shelterwood overstory can reduce the severity of the drought hazard.**
  - sites with shallow and/or coarse-textured soils are vulnerable to nutrient deficiency if forest floors are reduced; **site preparation methods that reduce forest floor thickness, such as slashburning or brushblading, must be avoided.**
  - comandra blister rust may cause cankers on pine if bastard toad-flax (*Geocaulon lividum*) occurs nearby.

## VEGETATION

Tree Layer: 30% cover  
lodgepole pine, [hybrid white spruce]

Shrub Layer: 45% cover  
*Vaccinium myrtilloides* (velvet-leaved blueberry)  
*Amelanchier alnifolia* (saskatoon)  
*Spiraea betulifolia* (birch-leaved spirea)  
*Rosa acicularis* (prickly rose)  
*Shepherdia canadensis* (soopolallie)  
lodgepole pine

Herb Layer: 60% cover  
*Arctostaphylos uva-ursi* (kinnikinnick)  
*Linnaea borealis* (twinflower)  
*Fragaria virginiana* (wild strawberry)  
*Aster ciliolatus* (fringed aster)  
*Calamagrostis rubescens* (pinegrass)  
*Cornus canadensis* (bunchberry)  
*Epilobium angustifolium* (fireweed)

Moss Layer: 90% cover  
*Pleurozium schreberi* (red-stemmed feathermoss)  
*Dicranum polysetum* (wavy-leaved moss)  
*Peltigera aphthosa* (freckle lichen)  
*Cladina rangiferina* (grey reindeer lichen)  
*Ptilium crista-castrensis* (knight's plume)  
*Hylocomium splendens* (step moss)

## SOIL AND SITE

Moisture Regime: 2 (sx)  
Nutrient Regime: A-B (vp-p)  
Slope Gradient (%): 10-35  
Slope Position: mid-crest or level  
\* Aspect: southerly to easterly  
Parent Material: glaciofluvial  
\* Soil Texture: coarse  
Coarse Fragments (%): 45-54

**DISTRIBUTION:** common adjacent to larger rivers on upper terraces or on old glacial meltwater channels with deposits of coarse soils

*Vaccinium myrtilloides**Arctostaphylos uva-ursi**Pleurozium schreberi*

## Pl - Kinnikinnick - Wavy-leaved moss (SBSdw2/03)

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### INTERPRETATIONS

- Site limitations: - site and soil conditions of this unit result in marginal forest productivity; ***serious consideration should be given to excluding logging from this unit.***
- Silviculture system: - see Section 5.1  
- minimize or align large slash accumulations when logging to help meet site preparation objectives and reduce fire hazard.
- Site preparation: - light scarification for seedbed preparation, or summer logging with no site preparation.
- Species choice: - Pl, *Fd*
- Vegetation potential: - low
- Reforestation: - attempt to regenerate naturally if potential exists.  
- if natural regeneration is not feasible, plant Pl.  
- *Fd* may be planted on moister microsites.
- Concerns: - full tree harvesting will lead to nutrient depletion and seriously reduce cones; ***woody debris and cones should be distributed across these sites (ie., lop and scatter)***  
- site and soil conditions of this unit result in drought hazard for a significant portion of the growing season; ***natural regeneration is generally more adapted to surviving these conditions, especially during establishment.***  
- sites with shallow and/or coarse-textured soils are vulnerable to nutrient deficiency if forest floors are reduced; ***site preparation methods that reduce forest floor thickness, such as slashburning or brushblading, must be avoided.***  
- comandra blister rust may cause cankers on pine if bastard toad-flax (*Geocaulon lividum*) occurs nearby.

## VEGETATION

Tree Layer: 30% cover  
Douglas-fir, [lodgepole pine]

Shrub Layer: 20% cover  
*Shepherdia canadensis* (soopolallie)  
*Rosa acicularis* (prickly rose)  
*Amelanchier alnifolia* (saskatoon)  
*Juniperus communis* (common juniper)  
Douglas-fir

Herb Layer: 35% cover  
*Achillea millefolium* (yarrow)  
*Calamagrostis rubescens* (pinegrass)  
*Arctostaphylos uva-ursi* (kinnikinnick)  
*Solidago spathulata* (spike-like goldenrod)  
*Fragaria virginiana* (wild strawberry)  
*Lathyrus ochroleucus* (creamy peavine)  
*Aster conspicuus* (showy aster)  
*Galium boreale* (northern bedstraw)  
*Vicia americana* (American vetch)  
*Disporum trachycarpum* (rough-fruited fairy bells)

Moss Layer: 15% cover  
*Pleurozium schreberi* (red-stemmed feathermoss)  
*Dicranum polysetum* (wavy-leaved moss)  
*Peltigera* spp. (peltigera lichens)

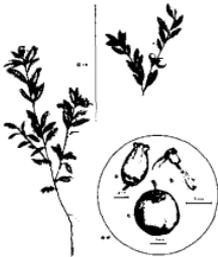
## SOIL AND SITE

Moisture Regime: 2 (sx)  
Nutrient Regime: B-D(p-r)  
\* Slope Gradient (%): 33-104  
\* Slope Position: mid - upper  
Parent Material: glaciofluvial - colluvial  
Soil Texture: medium to coarse  
Coarse Fragments (%): 30-54  
\* Aspect: southerly (SE-SW)

**DISTRIBUTION:** uncommon, generally small, on moderate to very steep warm aspects



*Shepherdia canadensis*



*Arctostaphylos uva-ursi*



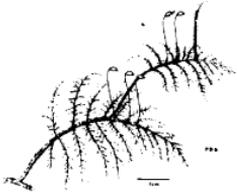
*Dicranum polysetum*

## Fd - Pinegrass - Aster (SBSdw2/04)

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### INTERPRETATIONS

- Site limitations: - sites within this unit with high coarse fragment content (> 70%) will have significantly reduced soil moisture retention and will be extremely difficult to plant; ***attempt to regenerate naturally by retaining Pl cones and/or leaving Fd seed-trees on site.***
- Silviculture system: - see Section 5.1  
- enough Fd stems should be left to provide shade to the site, thereby reducing excessive drying and heating of the upper soil horizons.  
- if a partial cutting system is used, refer to Cariboo Region mule deer guidelines (Land Management Handbook #13).
- Site preparation: - light scarification for seedbed preparation, or summer logging with no site preparation.
- Species choice: - Fd, Pl
- Vegetation potential: - low
- Reforestation: - manage to maintain Fd component.  
- if disturbance during logging does not expose some mineral soil, then natural Pl and Fd regeneration should be promoted by light scarification or spot sereefing.  
- fill-planting may be required to meet stocking requirements.
- Concerns: - these units may represent important early season range for wildlife, so prescription should be discussed with wildlife personnel.  
- site and soil conditions of this unit result in drought hazard for a significant portion of the growing season; ***leaving a shelterwood overstory can reduce the severity of the drought hazard.***

*Rosa acicularis**Hylocomium splendens**Rhytidiadelphus triquetrus*

## VEGETATION

Tree Layer: 45% cover

Douglas-fir, hybrid white spruce, lodgepole pine, paper birch

Shrub Layer: 15% cover

<i>Rosa acicularis</i>	(prickly rose)
<i>Spiraea betulifolia</i>	(birch-leaved spirea)
<i>Amelanchier alnifolia</i>	(saskatoon)
<i>Viburnum edule</i>	(highbush-cranberry)
Douglas-fir	

Herb Layer: 20% cover

<i>Linnaea borealis</i>	(twinflower)
<i>Orthilia secunda</i>	(one-sided wintergreen)
<i>Aralia nudicaulis</i>	(wild sarsaparilla)
<i>Cornus canadensis</i>	(bunchberry)
<i>Arnica cordifolia</i>	(heart-leaved arnica)
<i>Fragaria virginiana</i>	(wild strawberry)
<i>Geocaldon lividum</i>	(bastard toad-flax)
<i>Mitella nuda</i>	(common mitrewort)

Moss Layer: 90% cover

<i>Pleurozium schreberi</i>	(red-stemmed feathermoss)
<i>Hylocomium splendens</i>	(step moss)
<i>Ptilium crista-castrensis</i>	(knight's plume)
<i>Rhytidiadelphus triquetrus</i>	(electrified cat's-tail moss)
<i>Peltigera aphthosa</i>	(freckle lichen)
<i>Dicranum polysetum</i>	(wavy-leaved moss)

## SOIL AND SITE

Moisture Regime:	3 (sm)
Nutrient Regime:	A-C (vp-m)
* Slope Gradient (%):	55-68
* Slope Position:	upper
Parent Material:	colluvial, morainal, or glaciofluvial
Soil Texture:	medium - very coarse
Coarse Fragments (%):	9-50
* Aspect:	usually northerly

COMMENTS: based on limited data

DISTRIBUTION: uncommon, on moderate to steep cool aspects

## SxwFd - Cat's-tail moss (SBSdw2/05)

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### INTERPRETATIONS

- Site limitations: - sites within this unit with high coarse fragment content (> 70%) will have significantly reduced soil moisture retention and will be extremely difficult to plant; ***attempt to regenerate naturally by retaining Pl cones and/or leaving Fd seed-trees on site.***
- Silviculture system: - see Section 5.1  
- if a partial cutting system is used, refer to Cariboo Region mule deer guidelines (Land Management Handbook #13).
- Site preparation: - see Section 5.2
- Species choice: - Fd, Pl
- Vegetation potential: - low
- Reforestation: - manage to maintain Fd component.  
- retain enough Fd stems to provide seed to as much of the site as possible.  
- natural Pl and Fd regeneration should be promoted by light scarification or spot screening.  
- fill-planting may be required to meet stocking requirements.
- Concerns: - site and soil conditions of this unit result in drought hazard for a significant portion of the growing season; ***leaving a shelterwood overstory can reduce the severity of the drought hazard.***  
- comandra blister rust may cause cankers on pine if bastard toad-flax (*Geocaulon lividum*) occurs nearby.

## VEGETATION

Tree Layer: 15% cover  
lodgepole pine, Douglas-fir

Shrub Layer: 45% cover  
*Vaccinium myrtilloides* (velvet-leaved blueberry)  
*Rosa acicularis* (prickly rose)  
*Spiraea betulifolia* (birch-leaved spirea)  
*Alnus crispa* ssp. *sinuata* (Sitka alder)  
*Amelanchier alnifolia* (saskatoon)  
 Douglas-fir  
 trembling aspen

Herb Layer: 60% cover  
*Calamagrostis rubescens* (pinegrass)  
*Linnaea borealis* (twinflower)  
*Arctostaphylos uva-ursi* (kinnikinnick)  
*Epilobium angustifolium* (fireweed)  
*Chimaphila umbellata* (prince's pine)  
*Fragaria virginiana* (wild strawberry)  
*Achillea millefolium* (yarrow)  
*Cornus canadensis* (bunchberry)  
*Orthilia secunda* (one-sided wintergreen)

Moss Layer: 80% cover  
*Pleurozium schreberi* (red-stemmed feathermoss)  
*Dicranum polysetum* (wavy-leaved moss)  
*Ptilium crista-castrensis* (knight's plume)  
*Hylocomium splendens* (step moss)  
*Peltigera aphthosa* (freckle lichen)

## SOIL AND SITE

Moisture Regime: 3 (sm)  
 Nutrient Regime: A-D (p-r)  
 Slope Gradient (%): 0-65  
 Slope Position: mid - upper slope,  
 occasionally level  
 Parent Material: morainal, lacustrine, or  
 (glacio)fluvial; occasionally  
 colluvial  
 Soil Texture: medium - very coarse  
 Coarse Fragments (%): 0-75

**DISTRIBUTION:** common, widespread, and often large



*Vaccinium myrtilloides*



*Arctostaphylos uva-ursi*



*Pleurozium schreberi*

## PI - Pinegrass-Feathermoss (SBSdw2/06)

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### INTERPRETATIONS

- Site limitations: - sites within this unit with high coarse fragment content (> 70%) will have significantly reduced soil moisture retention and will be extremely difficult to plant; ***attempt to regenerate naturally by retaining Pl cones and/or leaving Fd seed-trees on site.***
- Silviculture system: - see Section 5.1  
- minimize or align large slash accumulations when logging to help meet site preparation objectives and reduce fire hazard.  
- if a partial cutting system is used, refer to Cariboo Region mule deer guidelines (Land Management Handbook #13).
- Site preparation: - light scarification for seedbed preparation or summer logging with no site preparation
- Species choice: - Pl, ***Fd, Sx***
- Vegetation potential: - low to moderate (pinegrass, fireweed, prickly rose)
- Reforestation: - attempt to regenerate naturally if potential exists.  
- if natural regeneration is not feasible, plant Pl.  
- if Fd stems are present, conduct a stand evaluation to assess if a partial cutting system is feasible.  
- if abundant advance regeneration is present, attempt to log in a manner that protects this regeneration.  
- fill-planting may be required to meet stocking requirements if a partial cutting system is used.  
- Sx may be planted on moister microsites.
- Concerns: - full tree harvesting will lead to nutrient depletion and seriously reduce cones; ***woody debris and cones should be distributed across these sites (ie., lop and scatter).***  
- site conditions may lead to frost damage of Fd regeneration, especially in any naturally occurring or artificially created depression; ***leaving a partial canopy and/or choosing a frost-resistant species (eg., Pl) is advised.***  
- comandra blister rust may cause cankers on pine if bastard toad-flax (*Geocaulon lividum*) occurs nearby.  
- mountain pine beetle may cause mortality in large-diameter lodgepole pine stands of age class > 7.

## VEGETATION

Tree Layer: 25% cover

lodgepole pine, black spruce, hybrid white spruce

Shrub Layer: 60% cover

*Vaccinium myrtilloides* (velvet-leaved blueberry)*Rosa acicularis* (prickly rose)*Spiraea betulifolia* (birch-leaved spirea)

black spruce

lodgepole pine

hybrid white spruce

Herb Layer: 55% cover

*Calamagrostis rubescens* (pinegrass)*Cornus canadensis* (bunchberry)*Epilobium angustifolium* (fireweed)*Linnaea borealis* (twinflower)*Geocalum lividum* (bastard toad-flax)*Fragaria virginiana* (wild strawberry)*Vaccinium caespitosum* (dwarf blueberry)*Aster ciliolatus* (fringed aster)*Arnica cordifolia* (heart-leaved arnica)

Moss Layer: 95% cover

*Pleurozium schreberi* (red-stemmed feathermoss)*Ptilium crista-castrensis* (knight's plume)*Hylocomium splendens* (step moss)*Dicranum polysetum* (wavy-leaved moss)*Peltigera aphthosa* (freckle lichen)

## SOIL AND SITE

Moisture Regime: 3-5 (sm-shg)

Nutrient Regime: A-B (vp-p)

\* Slope Gradient (%): 0-4 (usually 0)

\* Slope Position: level or mid-slope

Parent Material: lacustrine, morainal or

glaciofluvial

Soil Texture: fine - medium - coarse

Coarse Fragments (%): 0-30

**DISTRIBUTION:** uncommon, often in areas of cold air accumulation or with poor air drainage and cold soils*Vaccinium myrtilloides**Geocalum lividum**Pleurozium schreberi*

## PISb - Feathermoss (SBSdw2/07)

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### INTERPRETATIONS

- Site limitations: - compact soil layers and/or low aeration porosity associated with fine-textured soils will have a reduced root zone and decreased productivity over a rotation; **regenerate naturally whenever possible.**
- soils are saturated in the spring, but may experience drought in summer, both resulting in poor root development; **the poor productivity resulting from these limitations should dictate a limited intensive silvicultural investment.**
- Silviculture system: - see Section 5.1
- minimize or align large slash accumulations when logging to help meet site preparation objectives and reduce fire hazard.
- Site preparation: - see Section 5.2
- Species choice: - Pl, (*Sx*, *Sb*)
- Vegetation potential: - low
- Reforestation: - attempt to regenerate naturally if potential exists.
- if natural regeneration is not feasible, plant Pl.
- *Sx* and *Sb* are generally significantly less productive than Pl on this unit.
- Concerns: - full tree harvesting will lead to nutrient depletion and seriously reduce cones; **woody debris and cones should be distributed across these sites (ie., lop and scatter).**
- site conditions may lead to frost damage of *Sx* regeneration, especially in any naturally occurring or artificially created depression; **leaving a partial canopy and/or choosing a frost-resistant species (eg., Pl) is advised.**
- comandra blister rust may cause cankers on pine if bastard toad-flax (*Geocaulon lividum*) occurs nearby.
- mountain pine beetle may cause mortality in large-diameter lodgepole pine stands of age class > 7.
- Warren's root collar weevil can cause mortality in young stands, especially where duff layers are thick.

## VEGETATION

Tree Layer: 40% cover  
hybrid white spruce, [trembling aspen]

Shrub Layer: 35% cover  
*Lonicera involucrata* (black twinberry)  
*Rosa acicularis* (prickly rose)  
*Viburnum edule* (highbush-cranberry)  
*Ribes lacustre* (black gooseberry)  
*Amelanchier alnifolia* (saskatoon)  
hybrid white spruce

Herb Layer: 50% cover  
*Cornus canadensis* (bunchberry)  
*Rubus pubescens* (trailing raspberry)  
*Mitella nuda* (common mitrewort)  
*Osmorhiza chilensis* (mountain sweet-cicely)  
*Petasites frigidus* (palmate coltsfoot)  
var. *palmatus* (twinflower)  
*Linnaea borealis* (common horsetail)  
*Equisetum arvense* (common horsetail)  
*Aralia nudicaulis* (wild sarsaparilla)  
*Pyrola asarifolia* (pink wintergreen)  
*Aster ciliolatus* (fringed aster)

Moss Layer: 75% cover  
*Rhytidiadelphus triquetrus* (electrified cat's-tail moss)  
*Pleurozium schreberi* (red-stemmed feathermoss)  
*Ptilium crista-castrensis* (knight's plume)  
*Hylocomium splendens* (stepmoss)  
*Mnium* spp. (leafy mosses)

## SOIL AND SITE

Moisture Regime: 5-6 (shg-hg)  
Nutrient Regime: B-D (p-r)  
\* Slope Gradient (%): 0-65 (usually < 10)  
\* Slope Position: (mid) - toe or level  
Parent Material: variable  
Soil Texture: (coarse -) medium - fine  
Coarse Fragments (%): 0-64  
Seepage Water: sometimes present

**DISTRIBUTION:** common, generally small, and often associated with streams



*Lonicera involucrata*



*Rubus pubescens*



*Petasites frigidus*  
var. *palmatus*

## Sxw - Twinberry (SBSdw2/08)

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### INTERPRETATIONS

- Site limitations:
- sites within this unit with medium- to fine-textured lacustrine soils often have poor soil structure, leading to poor root growth; **plant stock that will achieve better lateral root development (eg., Cu-treated), prescribe natural regeneration, or protect advance regeneration.**
  - sites within this unit with saturated soils are poorly aerated, which slows root development; **plant seedlings on naturally or artificially raised microsites.**
- Silviculture system: - see Section 5.1
- Site preparation: - see Section 5.2
- Species choice: - Pl, Sx, Fd, [Bl]
- Vegetation potential: - moderate (black twinberry, fireweed)
- Reforestation:
- preserve vigorous advance Fd or Sx regeneration when feasible.
  - plant sturdy stock as soon after harvesting as possible.
  - fill-planting will likely be required if stand is partially cut.
  - help maintain stand diversity on sites to be planted with Pl by mapping aspen patches prior to harvest and planting these areas to spruce.
  - young Bl regeneration (< 3 m tall) may be susceptible to heavy browsing by moose.
- Concerns:
- site conditions may lead to frost damage of Fd, Sx, and Bl regeneration, especially in any naturally occurring or artificially created depression; **leaving a partial canopy and/or choosing a frost-resistant species (eg., Pl) is advised.**
  - sites within this unit with silty soils are susceptible to frost-heaving; **bareroot stock will likely resist frost-heaving better than plug stock.**
  - sites within this unit with fine-textured soils are vulnerable to compaction under wet conditions; **restrict traffic to winter operations or dry soil conditions.**
  - Warren's root collar weevil can cause mortality in young stands, especially where duff layers are thick.

*Oplopanax horridus**Gymnocarpium dryopteris**Dryopteris expansa*

## VEGETATION

## Tree Layer: 15% cover

hybrid white spruce, Douglas-fir, lodgepole pine, subalpine fir

## Shrub Layer: 25% cover

*Oplopanax horridus* (devil's club)  
*Ribes lacustre* (black gooseberry)  
*Lonicera involucrata* (black twinberry)  
*Alnus tenuifolia* (mountain alder)  
*Rosa acicularis* (prickly rose)  
*Acer glabrum* (Douglas maple)  
*Ribes triste* (red swamp currant)  
 subalpine fir  
 hybrid white spruce

## Herb Layer: 30% cover

*Gymnocarpium dryopteris* (oak fern)  
*Dryopteris expansa* (spiny wood fern)  
*Streptopus amplexifolius* (clasping twistedstalk)  
*Galium triflorum* (sweet-scented bedstraw)  
*Mitella nuda* (common mitrewort)  
*Athyrium filix-femina* (lady fern)  
*Cornus canadensis* (bunchberry)  
*Rubus pedatus* (five-leaved bramble)

## Moss Layer: 40% cover

*Ptilium crista-castrensis* (knight's plume)  
*Mnium* spp. (leafy mosses)  
*Pleurozium schreberi* (red-stemmed feathermoss)  
*Rhytidiadelphus triquetrus* (electrified cat's-tail moss)  
*Peltigera* spp. (peltigeralichens)

## SOIL AND SITE

Moisture Regime: 5-6 (shg-hg)  
 Nutrient Regime: C-E (m-vr)  
 Slope Gradient (%): 2-28  
 \* Slope Position: (mid) - toe  
 Parent Material: fluvial or morainal  
 Soil Texture: fine - medium  
 Coarse Fragments (%): 13-26  
 \* Seepage Water: usually present

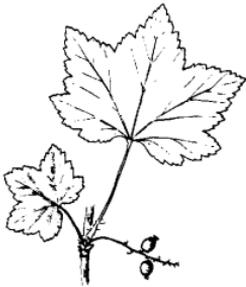
**DISTRIBUTION:** rare, generally small, and found on cool (north) seepage slopes

## Sxw - Devil's club - Knight's plume (SBSdw2/09)

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### INTERPRETATIONS

- Site limitations: - sites within this unit with saturated soils are poorly aerated, which slows root development; **plant seedlings on naturally or artificially raised microsites.**
- Silviculture system: - see Section 5.1
- Site preparation: - see Section 5.2
- Species choice: - Pl, Sx, Fd, [Bl]
- Vegetation potential: - high (black twinberry, fireweed, mountain alder)
- Reforestation:
- preserve vigorous advance Fd or Sx regeneration when feasible.
  - plant sturdy stock as soon after harvesting as possible.
  - plant Fd on raised microsites if water table within 50 cm of surface.
  - young Bl regeneration (<3 m tall) may be susceptible to heavy browsing by moose.
  - fill-planting will likely be required if stand is partially cut.
- Concerns:
- site conditions may lead to frost damage of Fd, Sx, and Bl regeneration, especially in any naturally occurring or artificially created depression; **leaving a partial canopy and/or choosing a frost-resistant species (eg., Pl) is advised.**
  - sites within this unit with silty soils are susceptible to frost-heaving; **bareroot stock will likely resist frost-heaving better than plug stock.**
  - sites within this unit with fine-textured soils are vulnerable to compaction under wet conditions; **restrict traffic to winter operations or dry soil conditions.**
  - sites within this unit with high water tables, combined with thick organic horizons (> 10 cm), increase the windthrow hazard; **block layouts must have windfirm boundaries, or a wide buffer of standing timber must be left around such sites.**
  - Warren's root collar weevil can cause mortality in young stands, especially where duff layers are thick.

*Lonicera involucrata**Ribes triste**Equisetum arvense*

## VEGETATION

Tree Layer: 30% cover  
hybrid white spruce, subalpine fir

Shrub Layer: 30% cover  
*Lonicera involucrata* (black twinberry)  
*Rosa acicularis* (prickly rose)  
*Ribes triste* (red swamp currant)  
*Ribes lacustre* (black gooseberry)  
*Viburnum edule* (highbush-cranberry)  
*Cornus stolonifera* (red-osier dogwood)  
hybrid white spruce

Herb Layer: 80% cover  
*Cornus canadensis* (bunchberry)  
*Petasites frigidus*  
var. *palmatus* (palmate coltsfoot)  
*Linnaea borealis* (twinflower)  
*Mitella nuda* (common mitrewort)  
*Galium triflorum* (sweet-scented bedstraw)  
*Equisetum arvense* (common horsetail)  
*Equisetum palustre* (marsh horsetail)  
*Equisetum sylvaticum* (wood horsetail)  
*Rubus pubescens* (trailing raspberry)  
*Gymnocarpium dryopteris* (oak fern)  
*Heracleum lanatum* (cow-parsnip)  
*Streptopus amplexifolius* (clasping twistedstalk)  
*Osmorhiza chilensis* (mountain sweet-cicely)

Moss Layer: 85% cover  
*Pleurozium schreberi* (red-stemmed feathermoss)  
*Hylocomium splendens* (step moss)  
*Ptilium crista-castrensis* (knight's plume)  
*Rhytidiadelphus triquetrus* (electrified cat's-tail moss)  
[*Mnium* spp. (leafy mosses)]

## SOIL AND SITE

Moisture Regime: 6 (hg)  
Nutrient Regime: C-E (m-vr)  
\* Slope Gradient (%): 0-8  
\* Slope Position: toe - level  
\* Parent Material: fluvial  
Soil Texture: variable, usually fine  
Coarse Fragments (%): 0-5  
\* Seepage Water: present

**DISTRIBUTION:** common; associated with watercourses

## Sxw - Horsetail (SBSdw2/10)

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### INTERPRETATIONS

- Site limitations:
- very difficult sites to manage; ***serious consideration should be given to managing these sites as wildlife corridors.***
  - sites within this unit with saturated soils are poorly aerated, which slows root development; ***plant seedlings on naturally or artificially raised microsites.***
- Silviculture system:
- see Section 5.1
- Site preparation:
- see Section 5.2
  - creating an excessive number of mounds (eg., >300/ha) should be avoided, especially on sites within this unit with a water table < 30 cm from the surface.
- Species choice:
- ***Sx, [Pl, Bl]***
- Vegetation potential:
- high (black twinberry, fireweed, bluejoint)
- Reforestation:
- advance regeneration should be preserved.
  - supplement advance regeneration by planting sturdy stock in groups, using available raised microsites.
  - young Bl regeneration (< 3 m tall) may be susceptible to heavy browsing by moose.
- Concerns:
- site conditions may lead to frost damage of Sx and Bl regeneration, especially in any naturally occurring or artificially created depression; ***leaving a partial canopy and/or choosing a frost-resistant species (eg., Pl) is advised.***
  - sites within this unit with fine-textured soils are vulnerable to compaction under wet conditions; ***restrict traffic to winter operations or dry soil conditions.***
  - sites within this unit with high water tables, combined with thick organic horizons (> 10 cm), increase the windthrow hazard; ***block layouts must have windfirm boundaries, or a wide buffer of standing timber must be left around such sites.***
  - these units may represent important wildlife habitat; discuss prescription with wildlife personnel.
  - water table will likely rise above the ground surface in the spring, causing seedling mortality.
  - this association is critical to the control of runoff streamflow.
  - Warren's root collar weevil can cause mortality in young stands, especially where duff layers are thick.

## VEGETATION

Tree Layer: 5% cover  
black spruce, hybrid white spruce

Shrub Layer: 25% cover  
*Ledum groenlandicum* (Labrador tea)  
*Lonicera involucrata* (black twinberry)  
*Rosa acicularis* (prickly rose)  
*Salix* spp. (willows)  
*Ribes hudsonianum* (northern black currant)  
*Ribes lacustre* (black gooseberry)  
*Ribes triste* (red swamp currant)

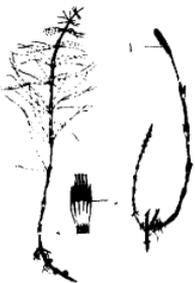
Herb Layer: 90% cover  
*Carex leptalea* (bristle-stalked sedge)  
*Carex disperma* (soft-leaved sedge)  
*Equisetum arvense* (common horsetail)  
*Equisetum scirpoides* (dwarf scouring-rush)  
*Cornus canadensis* (bunchberry)  
*Mitella nuda* (common mitrewort)  
*Linnaea borealis* (twinflower)  
*Petasites frigidus* var. *palmatus* (palmate coltsfoot)  
*Epilobium angustifolium* (fireweed)  
*Geocaulon lividum* (bastard toad-flax)

Moss Layer: 95% cover  
*Hylocomium splendens* (step moss)  
*Ptilium crista-castrensis* (knight's plume)  
*Sphagnum* spp. (sphagnums)  
*Pleurozium schreberi* (red-stemmed feathermoss)  
*Rhytidiadelphus triquetrus* (electrified cat's-tail moss)  
*Mnium* spp. (leafy mosses)  
*Aulacomnium palustre* (glow moss)

## SOIL AND SITE

Moisture Regime: 6-7 (hg-shd)  
Nutrient Regime: B-C (p-m)  
Slope Gradient (%): 0-1  
\* Slope Position: toe, level, or depression  
\* Parent Material: fluvial or organic  
Soil Texture: medium or organic  
Coarse Fragments (%): 0-34  
\* Seepage Water: present, near the surface

**DISTRIBUTION:** common, in wet, cold air accumulation sites

*Ledum groenlandicum**Carex disperma**Equisetum arvense*

## Sb - Soft-leaved sedge - Sphagnum (SBSdw2/11)

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### INTERPRETATIONS

Site limitations: - site and soil conditions of this unit result in marginal forest productivity; ***serious consideration should be given to excluding logging from this unit.***

Silviculture system: - avoid logging

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