

TABLE 8. Summary of climate data for biogeoclimatic units ^a

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

^a 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 For., Research Branch, Victoria, B.C. Unpublished report.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 ^a	*				*		*	*
Grizzly Bear ^a	*	*	*	*	*	*	*	*
Furbearers	*	*	*	*	*	*	*	*

^a 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.



SBSmc2 Variant Summary

4.4 Babine Moist Cold Sub-Boreal Spruce ¹¹

Location

The SBSmc2 occurs in the western portion of the guide area, generally at elevations between 900 and 1200 m. Over most of the guide area it is bordered at lower elevations by the SBSdk and at its upper limits by the ESSFmv1 (Figure 1). In the southwestern portion of the guide area it occurs as a thin band on warm aspects above the SBSmc3 and below the ESSFmv1.

Elevation range

850 - 1350 m

Climate

The SBSmc2 has the wettest and snowiest climate of the SBS biogeoclimatic units in the guide area (Table 8). Not only does it snow more, but the snowpack also comes earlier and lasts longer than all the other units except the SBSmc3 and ESSFmv1.

Soils, geology, and landforms

Bedrock geology in this subzone is diverse, and includes Palaeozoic sedimentary rocks, Palaeozoic to Mesozoic intrusive rocks (diorite), and Tertiary volcanics (basalt, andesite, and dacite). Parent materials are dominantly morainal, with gravelly loam and clay loam textures. The associated soils are Brunisolic Gray Luvisols. Dystric Brunisols and Humo-Ferric Podzols have formed on coarser colluvial and glaciofluvial materials (gravelly sandy loam and sand).

Distinguishing the SBSmc2 from adjoining biogeoclimatic units

SBSdk has:

- no subalpine fir in the canopy;
- more prickly rose but less black huckleberry in the shrub layer;
- purple peavine but almost no five-leaved bramble in the herb layer; and
- devil's club and oakfern commonly occurring on moister sites.

SBSdw3 has:

- Douglas-fir but less subalpine fir in the canopy;
- saskatoon but less black huckleberry in the shrub layer; and
- false sarsaparilla but less five-leaved bramble in the herb layer.

SBSmc3 has:

- more palmate coltsfoot but less five-leaved bramble; and
- more fringed aster but less devil's club and oak fern on wetter sites.

SBSwk3 has:

- devil's club but less prickly rose in the shrub layer on mesic sites; and
- oakfern abundant on mesic sites.

ESSFmv1 has:

- white-flowered rhododendron but no prickly rose on mesic and wetter sites; and
- no devil's club and little to no oakfern on wetter sites.

¹¹ Formerly SBSs1

Forests

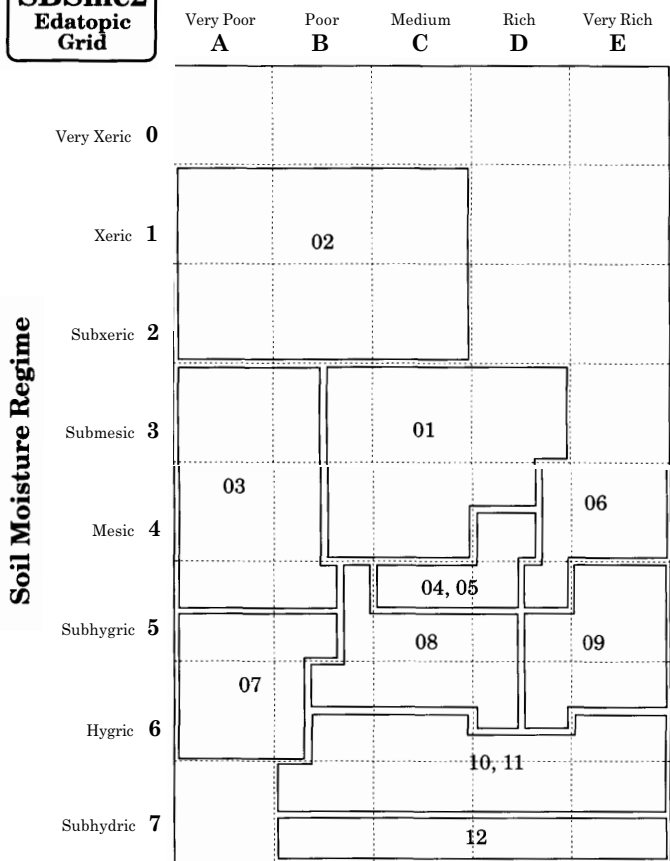
Climax forests are dominated by hybrid white spruce and subalpine fir. Lodgepole pine is common on all sites but tends to dominate on drier sites. Black spruce occurs in wetlands and also on upland sites on poor soils in combination with lodgepole pine. Black cottonwood occurs along streams and rivers and is often associated with hybrid white spruce. Forest productivity is moderate but is limited by the relatively short growing season.

Wildlife

Moist sites provide habitat for moose. Open forested wetlands provide important spring forage for black bear and grizzly bear. Coniferous sub-boreal forests are used by marten, red squirrel, and spruce grouse.

SBSmc2
Edatopic
Grid

Soil Nutrient Regime



- | | |
|---|---------------------------------------|
| 01 Sxw - Huckleberry | 07 Sxw - Scrub birch -
Feathermoss |
| 02 Pl - Huckleberry - Cladonia | 08 Sxw - Twinberry - Oak fern |
| 03 SbPl - Feathermoss | 09 Sxw - Devil's club |
| 04 Sxw - Huckleberry - Dwarf
blueberry | 10 Sxw - Horsetail |
| 05 Sxw - Twinberry - Coltsfoot | 11 Sxw - Horsetail - Glow moss |
| 06 Sxw - Oak fern | 12 SbSxw - Scrub birch - Sedge |

FIGURE 15. Edatopic grid displaying site units in the SBSmc2 variant.

Site Units		02	03	04	01	05	06	07	08	09	10	11	12		
Trees															
	<i>Pinus cotorta</i>	■	■	■	■	■	■	■	■	■	■	■	■	■	lodgepole pine
	<i>Picea glauca x engelmannii</i>	■	■	■	■	■	■	■	■	■	■	■	■	■	hybrid white spruce
	<i>Populus tremuloides</i>	■			■	■	■							■	trembling aspen
	<i>Picea mariana</i>		■					■				■	■		black spruce
Shrubs															
	<i>Vaccinium membranaceum</i>	■	■	■	■	■	■	■		■	■	■			black huckleberry
	<i>Alnus crispa ssp. sinuata</i>			■	■	■	■			■		■			Sitka alder
	<i>Rubus parviflorus</i>				■	■	■			■	■	■			thimbleberry
	<i>Ribes lacustre</i>				■	■	■			■	■	■			black gooseberry
	<i>Lonicera involucrata</i>			■	■	■	■	■	■	■	■	■			black twinberry
	<i>Oplopanax horridus</i>					■	■			■	■				devil's club
	<i>Alnus tenuifolia</i>						■		■	■	■		■		mountain alder
	<i>Salix spp. (glauca, barclayi)</i>							■						■	willows
	<i>Betula glandulosa</i>							■						■	scrub birch
	<i>Ledum groenlandicum</i>		■					■						■	Labrador tea
Herbs and Dwarf Shrubs															
	<i>Arctostaphylos uva-ursi</i>	■	■		■			■							kinnikinnick
	<i>Vaccinium caespitosum</i>	■	■	■	■			■			■				dwarf blueberry
	<i>Rubus pedatus</i>		■	■	■	■	■		■	■	■	■			five-leaved bramble
	<i>Rubus pubescens</i>			■	■	■	■		■	■	■	■	■		trailing raspberry
	<i>Gymnocarpium dryopteris</i>				■	■	■	■	■	■	■	■	■		oak fern
	<i>Equisetum sylvaticum</i>					■	■	■	■	■	■	■	■		wood horsetail
	<i>Gaultheria hispidula</i>		■											■	creeping-snowberry
	<i>Equisetum arvense</i>					■	■	■	■	■	■	■	■		common horsetail

FIGURE 16 SBSmc2 vegetation table.

Prominence class: ■ 1 ■ 2 ■ 3 ■ 4 ■ 5

Site Units 02 03 04 01 05 06 07 08 09 10 11 12

**Herbs and Dwarf Shrubs
(continued)**

Carex aquatilis

■ water sedge

Rubus chamaemorus

■ cloudberry

Mosses and Lichens

Cladonia spp.

■ cladonia lichens

Cladina spp.

■ cladina lichens

Pleurozium schreberi

■ red-stemmed feathermoss

Mnium spp.

■ leafy mosses

Aulacomnium palustre

■ glow moss

Sphagnum spp.

■ sphagnum

Tomenthypnum nitens

■ golden fuzzy fen moss

FIGURE 16 SBSmc2 vegetation table (continued)

Prominence class: ■ 1 ■ 2 ■ 3 ■ 4 ■ 5

SBSmc2
Site Series Key

- 1a Black spruce always present; poor tree productivity; *Ledum groenlandicum* (p. 40)¹² or *Betula glandulosa* (p. 39) abundant.
- 2a Canopy of stunted black spruce; on wet organic soils; moss layer dominated by *Sphagnum* spp. (p. 312).
SBSmc2/12
- 2b Canopy of lodgepole pine and black spruce; on mineral soils; moss layer dominated by feathermosses.
SBSmc2/03
- 1b Black spruce rare; variable tree productivity; *Ledum groenlandicum* and *Betula glandulosa* generally absent.
- 3a Sites with poor tree productivity; soil conditions either very dry or wet and nutrient poor; *Cladina* spp. (p. 334) or *Aulacomnium palustre* (p. 311) abundant (> 1% cover).
- 4a Canopy almost exclusively lodgepole pine; on well-drained, coarse-textured soils or shallow soils over bedrock; moss layer dominated by lichens.
SBSmc2/02
- 4b Mixed canopy of white spruce and lodgepole pine; on imperfectly drained soils; moss layer dominated by mosses.
SBSmc2/07
- 3b Sites with moderate or better tree productivity; soil conditions not as in 3a; *Cladina* spp. and *Aulacomnium palustre* low cover (< 1%), or absent.
- 5a Canopy dominated by white spruce; water table generally present within 50 cm of soil surface; *Oplopanax horridus* (p. 36) or *Equisetum* spp. (p. 280) abundant (> 10% cover).
- 6a Generally found in sloping topography on lower to toe slopes; *Oplopanax horridus* abundant.
SBSmc2/09
- 6b Found on flat or depressional topography adjacent to water courses or wetlands; *Oplopanax horridus* rare.
SBSmc2/10,11¹³

¹² Page numbers refer to the publication *Plants of Northern British Columbia* (MacKinnon et al. 1992).

¹³ Refer to descriptions for differentiation.

5b Canopy dominated by white spruce or lodgepole pine; water table generally absent; *Oplopanax horridus* and *Equisetum* spp. low cover (< 10%) or absent.

7a Canopy generally dominated by white spruce; evidence of periodic seepage (mottles) generally present; *Lonicera involucrata* (p. 48) and/or *Rubus parviflorus* (p. 36) abundant (> 5% cover).

8a More common on warm (southerly) aspects; shrub layer dominated by *Rubus parviflorus*; *Gymnocarpium dryopteris* (p. 293) absent.

SBSmc2/05

8b Found on all aspects; shrub layer generally not dominated by *Rubus parviflorus*; *Gymnocarpium dryopteris* present and abundant.

9a Slope position lower or depression; often in areas of cold air drainage; *Lonicera involucrata* abundant, *Oplopanax horridus* absent.

SBSmc2/08

9b Slope position variable; generally not in areas of cold air drainage; *Lonicera involucrata* not abundant, *Oplopanax horridus* generally present.

SBSmc2/06

7b Canopy often dominated by lodgepole pine; evidence of periodic seepage (mottles) generally lacking; *Lonicera involucrata* and *Rubus parviflorus* low cover (< 5%) or absent.

10a Generally mesic to subhygric moisture regime; *Rubus pubescens* (p. 91) or *Petasites frigidus* var. *palmatus* (p. 114) present.

SBSmc2/04

10b Generally mesic to submesic moisture regime; *Rubus pubescens* and *Petasites frigidus* var. *palmatus* generally low cover or absent.

SBSmc2/01

VEGETATION

Tree Layer: 55% cover
 lodgepole pine, subalpine fir, hybrid white spruce

Shrub Layer: 50% cover
Vaccinium membranaceum (black huckleberry)
 [*Rosa acicularis* (prickly rose)]
 [*Lonicera involucrata* (black twinberry)]
 subalpine fir

Herb Layer: 40% cover
Cornus canadensis (bunchberry)
Rubus pedatus (five-leaved bramble)
Linnaea borealis (twinline)
Arnica cordifolia (heart-leaved arnica)

Moas Layer: 75% cover
Pleurozium schreberi (red-stemmed feathermoss)
Ptilium crista-castrensis (knight's plume)
 [*Hylocomium splendens* (step moss)]

SOILAND SITE

Moisture Regime: 3-4 (sm-m)
 Nutrient Regime: B-D (p-r)
 Slope Gradient (%): 0-30
 Slope Position: all except crest
 Parent Material: morainal or glaciofluvial
 Soil Texture: variable
 Coarse Fragments (%): not available

DISTRIBUTION: common, widespread, and often large



Vaccinium membranaceum



Rubus pedatus

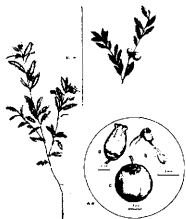
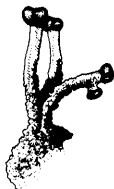


Pleurozium schreberi

Sxw - Huckleberry (SBSmc2/01)

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
- Site preparation: - see Section 5.2
- Species choice: - Pl, Sx, ***Bl***
- Vegetation potential: - moderate (trembling aspen, fireweed, thimbleberry)
- Reforestation:
- attempt to regenerate naturally if potential exists.
 - if natural regeneration is not feasible, plant a mix of Pl and Sx.
 - prefer Pl over Sx at drier end of this unit.
 - young Bl regeneration (< 3 m tall) may be susceptible to heavy browsing by moose.
 - try to preserve advance regeneration if it is abundant and likely to release and form an acceptable stand.
 - advance Bl regeneration should only be accepted if it is likely to reach management objective before it is 150 years old.
 - 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 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.***

*Shepherdia canadensis**Arctostaphylos
uva-ursi**Cladonia* spp.

VEGETATION

Tree Layer: 35% cover
lodgepole pine

Shrub Layer: 45% cover
Vaccinium membranaceum (black huckleberry)
Shepherdia canadensis (soopolallie)
[lodgepole pine]
[subalpine fir]

Herb Layer: 25% cover
Arctostaphylos uva-ursi (kinnikinnick)
Linnaea borealis (twinflower)
Cornus canadensis (bunchberry)
Vaccinium caespitosum (dwarf blueberry)

Moss Layer: 75% cover
Cladonia spp. (cladonia lichens)
Cladina spp. (cladina lichens)
Pleurozium schreberi (red-stemmed feathermoss)

SOIL AND SITE

Moisture Regime: 1-2 (x-sx)
Nutrient Regime: A-C (vp-m)
Slope Gradient (%): 0-30
* Slope Position: level, crest, and upper
Parent Material: (glacio)fluvial; colluvial or
morainal over bedrock
* Soil Texture: generally coarse
Coarse Fragments (%): not available

DISTRIBUTION: uncommon, except in areas of large
coarse-textured fluvial or glaciofluvial
terraces

Pl - Huckleberry - Cladonia (SBSmc2/02)

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.***
- 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:
- no site preparation
- Species choice:
- Pl
- Vegetation potential:
- low
- Reforestation:
- attempt to regenerate naturally if potential exists.
 - if natural regeneration is not feasible, plant Pl without site preparation.
- 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 within this unit 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.***

VEGETATION

Tree Layer: 45% cover

lodgepole pine, black spruce, hybrid white spruce

Shrub Layer: 30% cover

Ledum groenlandicum (Labrador tea)*Vaccinium membranaceum* (black huckleberry)

black spruce

hybrid white spruce

subalpine fir

Herb Layer: 60% cover

Cornua canadensis (bunchberry)*Vaccinium caespitosum* (dwarf blueberry)*Gaultheria hispidula* (creeping-snowberry)*Petasites frigidus*var. *palmaris*

(palmate coltsfoot)

Lycopodium annotinum

(stiff clubmoss)

Empetrum nigrum

(crowberry)

Moss Layer: 95% cover

Pleurozium schreberi

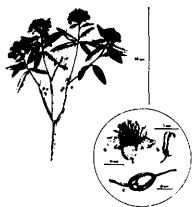
(red-stemmed feathermoss)

Ptilium crista-castrensis

(knight's plume)

Peltigera spp.

(peltigera lichens)

*Ledum groenlandicum**Gaultheria hispidula**Pleurozium schreberi*

SOIL AND SITE

Moisture Regime: 3-5 (sm-shg)

Nutrient Regime: A-B (vp-p)

* Slope Gradient (%): 0-5

* Slope Position: lower - level

Parent Material: morainal; occasional fluvial veneers

Soil Texture: medium - moderately coarse

Coarse Fragments (%): not available

DISTRIBUTION: uncommon; occurs mainly on cold northerly aspects

SbPl - Feathermoss (SBSmc2/03)

INTERPRETATIONS

- Site limitations:
- 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.***
 - compact soil layers and/or low aeration porosity associated with fine-textured soils will reduce rooting depth and decrease productivity over a rotation; ***regenerate naturally whenever possible.***
- 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, Bl***)
- Vegetation potential:
- low
- Reforestation:
- attempt to regenerate naturally if potential exists.
 - if natural regeneration is not feasible, plant Pl.
 - Sx and Sb are not as productive on these sites as Pl.
- 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 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.***

VEGETATION

Tree Layer: 35% cover
lodgepole pine, hybrid white spruce

Shrub Layer: 15% cover
Lonicera involucrata (black twinberry)
Vaccinium membranaceum (black huckleberry)
Rosa acicularis (prickly rose)
Spiraea betulifolia (birch-leaved spirea)
Alnus crispa ssp. *sinuata* (Sitka alder)
subalpine fir

Herb Layer: 25% cover
Cornus canadensis (bunchberry)
Linnaea borealis (twinline)
Mitella nuda (common mitrewort)
Arnica cordifolia (heart-leaved arnica)
Rubus pubescens (trailing raspberry)
Petasites frigidus
var. *palmatus* (palmate coltsfoot)
Epilobium angustifolium (fireweed)
Listera cordata (heart-leaved twayblade)
Rubus pedatus (five-leaved bramble)
Orthilia secunda (one-sided wintergreen)
Calamagrostis rubescens (pinegrass)
Vaccinium caespitosum (dwarf blueberry)
Osmorhiza chilensis (mountain sweet-cicely)

Moss Layer: 85% cover
Pleurozium schreberi (red-stemmed feathermoss)
Ptilium crista-castrensis (knight's plume)
Hylocomium splendens (step moss)
Peltigera aphthosa (freckle lichen)

SOIL AND SITE

Moisture Regime: 4-5 (m-shg)
Nutrient Regime: C-D (m-r)
* Slope Gradient (%): 0-25
* Slope Position: mid to lower or level
Parent Material: generally morainal
Soil Texture: variable, but generally medium to coarse
Coarse Fragments (%): 0-95

DISTRIBUTION: common, and widespread in the southern portion of guide area

*Lonicera involucrata**Vaccinium membranaceum**Rubus pubescens*

Sxw - Huckleberry - Dwarf blueberry (SBSmc2/04)

INTERPRETATIONS

- Site limitations:
- sites within this unit with colluvial soils may be difficult to plant; ***attempt to regenerate naturally or make use of advance regeneration.***
 - 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.***
- Silviculture system: - see Section 5.1
- Site preparation: - see Section 5.2
- Species choice: - Sx, Pl, ***Bl***
- Vegetation potential: - moderate (black twinberry, thimbleberry, fireweed)
- Reforestation:
- try to preserve advance regeneration if it is abundant and likely to release and form an acceptable stand.
 - advance Bl regeneration should only be accepted if it is likely to reach management objective before it is 150 years old.
 - fill-planting will likely be required if stand is partially cut.
 - young Bl regeneration (< 3 m tall) may be susceptible to heavy browsing by moose.
 - if advance regeneration is not acceptable, plant sturdy stock as soon after harvesting as possible.
- Concerns:
- sites within this unit with fine-textured soils are vulnerable to compaction under wet conditions; ***restrict traffic to winter operations or dry soil conditions.***

*Rubus parviflorus**Rubus pubescens**Pleurozium schreberi*

VEGETATION

Tree Layer: 55% cover

hybrid white spruce, trembling aspen, lodgepole pine,
[subalpine fir]

Shrub Layer: 60% cover

<i>Rubus parviflorus</i>	(thimbleberry)
<i>Viburnum edule</i>	(highbush-cranberry)
<i>Lonicera involucrata</i>	(black twinberry)
<i>Ribes lacustre</i>	(black gooseberry)
<i>Rosa acicularis</i>	(prickly rose)
<i>Cornus stolonifera</i>	(red-osier dogwood)
[hybrid white spruce]	
[subalpine fir]	

Herb Layer: 60% cover

<i>Rubus pubescens</i>	(trailing raspberry)
<i>Cornus canadensis</i>	(bunchberry)
<i>Epilobium angustifolium</i>	(fireweed)
<i>Arnica cordifolia</i>	(heart-leaved arnica)
<i>Osmorhiza chilensis</i>	(mountain sweet-cicely)
[<i>Smilacina racemosa</i>]	(false Solomon's-seal)]
[<i>Thalictrum occidentale</i>]	(western meadowrue)]

Moss Layer: 55% cover

<i>Pleurozium schreberi</i>	(red-stemmed feathermoss)
<i>Ptilium crista-castrensis</i>	(knight's plume)
<i>Hylocomium splendens</i>	(step moss)

SOIL AND SITE

Moisture Regime:	4-5 (m-shg)
Nutrient Regime:	C-D (m-r)
Slope Gradient (%):	2-49
* Slope Position:	mid, lower, and toe
Parent Material:	morainal, fluvial, and colluvial
Soil Texture:	variable
Coarse Fragments (%):	not available

DISTRIBUTION: common, except in southern portion of
Prince George Forest Region

Sxw - Twinberry - Coltsfoot (SBSmc2/05)

INTERPRETATIONS

- Site limitations: - sites within this unit with colluvial soils may be difficult to plant; **attempt to regenerate naturally or make use of advance regeneration.**
- Silviculture system: - see Section 5.1
- Site preparation: - see Section 5.2
- Species choice: - Sx, Pl, **Bl**
- Vegetation potential: - moderate to high (black twinberry, thimbleberry, fireweed)
- Reforestation:
- try to preserve advance regeneration if it is abundant and likely to release and form an acceptable stand.
 - advance Bl regeneration should only be accepted if it is likely to reach management objective before it is 150 years old.
 - young Bl regeneration (< 3 m tall) may be susceptible to heavy browsing by moose.
 - fill-planting will likely be required if a partial cutting silviculture system is used.
 - if advance regeneration is unacceptable, plant sturdy stock as soon after harvesting as possible.
 - planting of Sx in obvious frost pockets should be avoided unless risk can be reduced by providing cover.
 - 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:
- sites within this unit with fine-textured soils are vulnerable to compaction under wet conditions; **restrict traffic to winter operations or dry soil conditions.**
 - black army cutworm can cause severe defoliation on south-facing slopes that have been slashburned.

*Rubus parviflorus**Gymnocarpium dryopteris**Tiarella trifoliata*

VEGETATION

Tree Layer: 50% cover
hybrid white spruce, subalpine fir, [lodgepole pine]

Shrub Layer: 50% cover

<i>Ribes lacustre</i>	(black gooseberry)
<i>Rubus parviflorus</i>	(thimbleberry)
<i>Vaccinium membranaceum</i>	(black huckleberry)
<i>Oplopanax horridus</i>	(devil's club)
subalpine fir	

Herb Layer: 65% cover

<i>Gymnocarpium dryopteris</i>	(oak fern)
<i>Cornus canadensis</i>	(bunchberry)
<i>Rubus pedatus</i>	(five-leaved bramble)
<i>Tiarella trifoliata</i>	(three-leaved foamflower)
[<i>Streptopus amplexifolius</i>	(clasping twistedstalk)]

Moss Layer: 70% cover

<i>Pleurozium schreberi</i>	(red-stemmed feathermoss)
<i>Ptilium crista-castrensis</i>	(knight's plume)
<i>Barbilophozia lycopodioides</i>	(common leafy liverwort)
<i>Hylocomium splendens</i>	(step moss)
[<i>Brachythecium</i> spp.	(brachythecium mosses)]

SOIL AND SITE

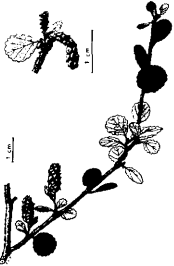
Moisture Regime:	4-5 (m-shg)
Nutrient Regime:	D-E (r-vr)
Slope Gradient (%):	3-60
Slope Position:	upper - toe
* Aspect:	generally northerly
Parent Material:	morainal, lacustrine or colluvial
Soil Texture:	variable
Coarse Fragments (%):	not available

DISTRIBUTION: common, especially on northerly aspects

Sxw - Oakfern (SBSmc2/06)

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 (e.g., Cu-treated), prescribe natural regeneration, or protect advance regeneration.***
 - sites within this unit with colluvial soils may be difficult to plant; ***attempt to regenerate naturally or make use of advance regeneration.***
- Silviculture system: - see Section 5.1
- Site preparation: - see Section 5.2
- Species choice: - Sx, Pl, ***Bl***
- Vegetation potential: - moderate (black twinberry, thimbleberry, fireweed)
- Reforestation:
- try to preserve advance regeneration if it is abundant and likely to release and form an acceptable stand.
 - advance Bl regeneration should only be accepted if it is likely to reach management objective before it is 150 years old.
 - young Bl regeneration (< 3 m tall) may be susceptible to heavy browsing by moose.
 - fill-planting will likely be required if a partial cutting silviculture system is used.
 - if advance regeneration is unacceptable, plant sturdy stock as soon after harvesting as possible.
 - planting of Sx in obvious frost pockets should be avoided unless risk can be reduced by providing cover.
- Concerns:
- 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.

*Lonicera involucrata**Betula glandulosa**Aulacomnium palustre*

VEGETATION

Tree Layer: 50% cover
lodgepole pine, hybrid white spruce, [trembling aspen]

Shrub Layer: 30% cover
Vaccinium membranaceum (black huckleberry)
Lonicera involucrata (black twinberry)
[Viburnum edule (highbush-cranberry)]
[Salix spp. (willows)]
[Betula glandulosa (scrub birch)]
 subalpine fir

Herb Layer: 80% cover
Cornus canadensis (bunchberry)
Lathyrus nevadensis (purple peavine)
Calamagrostis canadensis (bluejoint)
Arnica cordifolia (heart-leaved arnica)
Veratrum viride (Indian hellebore)

Moss Layer: 80% cover
Aulacomnium palustre (glow moss)
Mnium spp. (leafy mosses)
Pleurozium schreberi (red-stemmed feathermoss)

SOIL AND SITE

Moisture Regime: 5-6 (shg-hg)
 Nutrient Regime: A-B (vp-p)
 * Slope Gradient (%): 0-15
 * Slope Position: lower and toe
 Parent Material: glaciofluvial or morainal
 Soil Texture: variable
 Coarse Fragments (%): not available
 * Seepage Water: often present
 * Humus Depth: generally deep (>10 cm)

DISTRIBUTION: uncommon, and generally found along edges of wetlands

Sxw - Scrub birch - Feathermoss (SBSmc2/07)

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 saturated soils are poorly aerated, which slows root development; **plant seedlings on naturally or artificially raised microsites.**
- Silviculture system:
- see Section 5.1
 - minimize or align slash accumulations when logging to help meet site preparation objectives and reduce fire hazard.
- Site preparation:
- scarify to promote natural regeneration on drier sites; other sites see Section 5.2.
- Species choice:
- Pl, Sb, Sx
- Vegetation potential:
- low
- Reforestation:
- attempt to regenerate naturally if potential exists.
 - if natural regeneration is not feasible, plant Pl.
- 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 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 with fine-textured soils are vulnerable to compaction under wet conditions; **restrict traffic to winter operations or dry soil conditions.**

VEGETATION

Tree Layer: 25% cover
hybrid white spruce, subalpine fir, [lodgepole pine]

Shrub Layer: 18% cover
Lonicera involucrata (black twinberry)
Ribes lacustre (black gooseberry)
Rosa acicularis (prickly rose)
Rubus idaeus (red raspberry)
Viburnum edule (highbush-cranberry)
hybrid white spruce

Herb Layer: 45% cover
Gymnocarpium dryopteris (oak fern)
Equisetum arvense (common horsetail)
Cornus canadensis (bunchberry)
Rubus pubescens (trailing raspberry)
Actaea rubra (baneberry)
Galium triflorum (sweet-scented bedstraw)
Mitella nuda (common mitrewort)
Petasites fidigius
var. *palmatus* (palmate coltsfoot)
Rubus pedatus (five-leaved bramble)
Streptopus amplexifolius (clasping twistedstalk)
Tiarella trifoliata (three-leaved foamflower)
Equisetum sylvaticum (wood horsetail)
Calamagrostis canadensis (bluejoint)

Moss Layer: 50% cover
Pleurozium schreberi (red-stemmed feathermoss)
Hylocomium splendens (step moss)
Mnium spp. (leafy mosses)
Brachythecium spp. (brachythecium mosses)
Ptilium crista-castrensis (knight's plume)

SOIL AND SITE

Moisture Regime: 5-6 (shg-hg)
Nutrient Regime: B-D (p-r)
* Slope Gradient (%): 3-10
* Slope Position: lower or depression
* Parent Material: fluvial
Soil Texture: medium
Coarse Fragments (%): 0-70

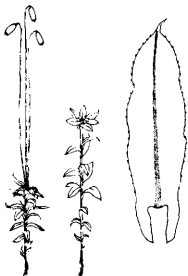
DISTRIBUTION: uncommon; often in areas of cold air accumulation; restricted to southern portion of guide area



Lonicera involucrata



Gymnocarpium dryopteris

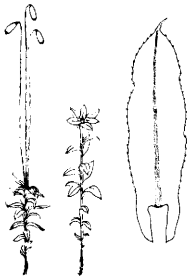


Mnium spp.

Sxw - Twinberry - Oakfern (SBSmc208)

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: - Sx, Pl, **Bl**
- Vegetation potential: - moderate to high (black twinberry, thimbleberry, fireweed)
- Reforestation: - if vigorous Sx regeneration is present, it should be preserved when feasible.
- plant sturdy stock as soon after harvesting as possible.
- young Bl regeneration (< 3 m tall) may be susceptible to heavy browsing by moose.
- Concerns: - 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.**
- 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 post-resistant species (eg., Pl) is advised.**
- Warren's root collar weevil can cause mortality in young stands, especially where duff layers are thick.

*Oplopanax horridus**Gymnocarpium dryopteris**Mnium* spp.

VEGETATION

Tree Layer: 50% cover
hybrid white spruce, subalpine fir

Shrub Layer 65% cover

<i>Oplopanax horridus</i>	(devil's club)
<i>Rubus parviflorus</i>	(thimbleberry)
<i>Ribes lacustre</i>	(black gooseberry)
[<i>Lonicera involucrata</i>	(black twinberry)]
subalpine fir	
[hybrid white spruce]	

Herb Layer: 60% cover

<i>Gymnocarpium dryopteris</i>	(oak fern)
<i>Cornus canadensis</i>	(bunchberry)
<i>Rubus pedatus</i>	(five-leaved bramble)
<i>Streptopus amplexifolius</i>	(clasping twistedstalk)
[<i>Galium triflorum</i>	(sweet-scented bedstraw)]
[<i>Tiarella trifoliata</i>	(three-leaved foamflower)]

Moss Layer: 50% cover

<i>Mnium</i> spp.	(leafy mosses)
<i>Brachythecium</i> spp.	(brachythecium mosses)
<i>Pleurozium schreberi</i>	(red-stemmed feathermoss)
<i>Ptilium crista-castrensis</i>	(knight's plume)
<i>Barbilophozia lycopodiodes</i>	(common leafyliverwort)

SOIL AND SITE

Moisture Regime:	5-6 (shg-hg)
Nutrient Regime:	D-E (r-vr)
Slope Gradient (%):	2-56
* Slope Position:	lower - toe
ParentMaterial:	variable
Soil Texture:	variable
CoarseFragments (%):	not available

DISTRIBUTION: common but localized; more common in northern portions of guide area

Sxw - Devil's club (SBSmc2/09)

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.**
 - 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
- Site preparation: - see Section 5.2
- Species choice: - Sx, [**Bl**, Pl]
- Vegetation potential: - high (black twinberry, thimbleberry, fireweed)
- Reforestation:
- try to preserve advance regeneration if it is abundant and likely to release and form an acceptable stand.
 - advance Bl regeneration should only be accepted if it is likely to reach management objective before it is 150 years old.
 - young Bl regeneration (< 3 m tall) may be susceptible to heavy browsing by moose.
 - fill-planting will likely be required if a partial cutting silviculture system is used.
 - if advance regeneration is unacceptable, plant sturdy stock as soon after harvesting as possible.
 - planting Sx in obvious frost pockets should be avoided unless risk can be reduced by providing cover.
- Concerns:
- sites with thick organic horizons (> 10 cm) and/or shallow (< 30 cm) effective rooting depth have increased windthrow hazard; **block layouts must have windfirm boundaries, or a wide buffer of standing timber must be left around such sites.**
 - site conditions may lead to frost damage of 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 with fine-textured soils are vulnerable to compaction under wet conditions; **restrict traffic to winter operations or dry soil conditions.**

*Lonicera involucrata**Equisetum arvense**Gymnocarpium dryopteris*

VEGETATION

Tree Layer: 50% cover
hybrid white spruce, subalpine fir, [lodgepole pine]

Shrub Layer: 50% cover
Lonicera involucrata (black twinberry)
Ribes lacustre (black gooseberry)
[*Alnus tenuifolia* (mountain alder)]
[*Viburnum edule* (highbush-cranberry)]
subalpine fir
[hybrid white spruce]

Herb Layer: 80% cover
Equisetum arvense (common horsetail)
Equisetum sylvaticum (wood horsetail)
Equisetum pratense (meadow horsetail)
Tiarella trifoliata (three-leaved foamflower)
Gymnocarpium dryopteris (oak fern)
Cornus canadensis (bunchberry)
Rubus pedatus (five-leaved bramble)
Streptopus amplexifolius (clasping twistedstalk)
Rubus pubescens (trailing raspberry)

Moss Layer: 70% cover
Pleurozium schreberi (red-stemmed feathermoss)
Ptilium crista-castrensis (knight's plume)
[*Brachythecium* spp. (brachythecium mosses)]
[*Mnium* spp. (leafy mosses)]

SOIL AND SITE

Moisture Regime: 6-7 (hg-shd)
Nutrient Regime: B-E (p-vr)
Slope Gradient (%): 0-10
Slope Position: toe and depressions
Parent Material: variable
Soil Texture: variable
Coarse Fragments (%): not available

DISTRIBUTION: common in northern portions of guide area

Sxw - Horsetail (SBSmc2/10)

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 on 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 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.**
 - these units may represent important wildlife and fish habitat, so prescription should be discussed with fish and 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.
 - sites within this unit with thick organic horizons (> 10 cm) have an extreme windthrow hazard; **block layouts must have windfirm boundaries, or a wide buffer of standing timber must be left around such sites.**

VEGETATION

Tree Layer: 20% cover
 hybrid white spruce, subalpine fir, lodgepole pine

Shrub Layer: 10% cover
Lonicera involucrata (black twinberry)
Ribes lacustre (black gooseberry)
Vaccinium membranaceum (black huckleberry)
Viburnum edule (highbush-cranberry)
 [*Rubus parviflorus* (thimbleberry)]
 [subalpine fir]
 [hybrid white spruce]

Herb Layer: 70% cover
Cornus canadensis (bunchberry)
Mitella nuda (common mitrewort)
Rubus pubescens (trailing raspberry)
Streptopus amplexifolius (clasping twistedstalk)
Listem cordata (heart-leaved twayblade)
Equisetum arvense (common horsetail)
Athyrium filix-femina (lady fern)
Carex disperma (soft-leaved sedge)
Aster foliaceus (leafy aster)
Calamagrostis canadensis (bluejoint)
Galium triflorum (sweet-scented bedstraw)
Senecio triangularis (arrow-leaved groundsel)

Moss Layer: 55% cover
Ptilium crista-castrensis (knight's plume)
Pleurozium schreberi (red-stemmed feathermoss)
Mnium spp. (leafy mosses)
 [*Hylocomium splendens* (step moss)]
 [*Aulacomnium palustre* (glowmoss)]

SOIL AND SITE

Moisture Regime: 6-7 (hg-shd)
 Nutrient Regime: B-E (p-vr)
 Slope Gradient (%): 0-30, usually < 10
 Slope Position: lower to toe, level, or depression
 Parent Material: variable
 Soil Texture: medium to fine
 Coarse Fragments (%): 0-55

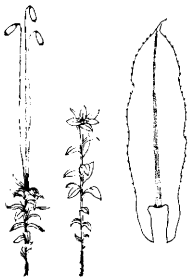
DISTRIBUTION: uncommon, and small in size



Lonicera involucrata



Equisetum arvense



Mnium spp.

Sxw - Horsetail - Glowmoss (SBSmc2/11)

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 on 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.***
 - these units may represent important wildlife and fish habitat, so prescription should be discussed with fish and 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.
 - sites within this unit with thick organic horizons (> 10 cm) have extreme windthrow hazard; ***block layouts must have windfirm boundaries, or a wide buffer of standing timber must be left around such sites.***

VEGETATION

Tree Layer: 20% cover
black spruce, hybrid white spruce, [subalpine fir]

Shrub Layer: 50% cover

<i>Viburnum edule</i>	(highbush-cranberry)
<i>Salix</i> spp.	(willows)
<i>Betula glandulosa</i>	(scrub birch)
[<i>Lonicera involucrata</i>	(black twinberry)]
[<i>Spiraea douglasii</i>	
ssp. <i>menziesii</i>	(pink spirea)]
[<i>Ledum groenlandicum</i>	(Labrador tea)]
[black spruce]	

Herb Layer: 70% cover

<i>Carex</i> spp.	(sedges)
<i>Cornus canadensis</i>	(bunchberry)
<i>Calamagrostis canadensis</i>	(bluejoint)
[<i>Equisetum arvense</i>	(common horsetail)]
[<i>Oxycoccus oxycoccus</i>	(bog cranberry)]

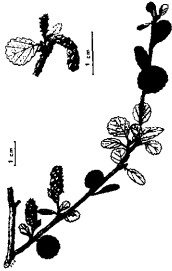
Moss Layer: 65% cover

<i>Sphagnum</i> spp.	(sphagnums)
<i>Tomenthypnum nitens</i>	(golden fuzzy fen moss)
<i>Aulacomnium palustre</i>	(glow moss)
<i>Mnium</i> spp.	(leafy mosses)
[<i>Drepanocladus</i> spp.	(drepanocladus mosses)]

SOIL AND SITE

Moisture Regime:	7 (shd)
Nutrient Regime:	B-E (p-vr)
Slope Gradient (%):	0
Slope Position:	level and depressions
Parent Material:	organic
Soil Texture:	organic
Coarse Fragments (%):	0

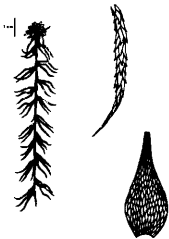
DISTRIBUTION: common at lower elevations; associated with depressional landscape



Betula glandulosa



Carex spp.



Sphagnum spp.

SbSxw - Scrub birch - Sedge (SBSmc2/12)

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

APPENDIX 1. (cont.)

Old Biogeoclimatic Units and Ecosystem Associations	New Biogeoclimatic Units and Site Series
SBS_e1	SBS_{mc}2
01 Mesic Bunchberry - Moss	01 Sxw - Huckleberry
02 Pine - Lichen	02 Pl - Huckleberry - Cladonia
03 Pine - Lichen - Moss	02 Pl - Huckleberry - Cladonia
04 Submesic Bunchberry - Moss	01 Sxw - Huckleberry
05 Pine - Black spruce	03 SbPl - Feathermoss
05 Huckleberry - Dwarf blueberry (Cariboo Region)	04 Sxw - Huckleberry - Dwarf blueberry
06 Moist Thimbleberry - Forb	05 Sxw - Twinberry - Coltsfoot
07 Oak fern	06 Sxw - Oak fern
08 Twinberry - Oak fern (Cariboo Region)	08 Sxw - Twinberry - Oak fern
08 Devil's club	09 Sxw - Devil's club
09 Horsetail Flat	10 Sxw - Horsetail
10 Moist Poor Spruce - Glow moss	07 Sxw - Scrubbirch - Feathermoss
11 Horsetail - Glow moss (Cariboo Region)	11 Sxw - Horsetail - Glow moss
11 Fen and Swamp Ecosystem	12 SbSxw - Scrub birch - Sedge
SBS_i	SBS_{mc}3
01 Prickly rose - Coltsfoot	01 Sxw - Huckleberry
02 Pine - Juniper	02 Pl - Juniper - Dwarf blueberry
03 Pine - Soopolallie	03 Pl - Feathermoss - Cladina
04 Soopolallie - Showy aster	04 Sxw - Huckleberry - Soopolallie
05 Prickly rose - Crowberry	05 Sb - Huckleberry - Spirea
06 Black twinberry - Crowberry	06 SbPl - Feathermoss
07 Black twinberry - Trailing raspberry	07 Sxw - Twinberry
08 Spruce - Horsetail	08 Sxw - Horsetail
not described	09 SbSxw - Scrub birch - Sedge
SBS_e2	SBS_{mk}1
01 Bunchberry - Moss	01 Sxw - Huckleberry - Highbush-cranberry
02 Soopolallie - Lichen	02 Pl - Cladina - Step moss
03 Kinnikinnick - Feathermoss	03 Pl - Feathermoss - Cladina
04 Douglas-fir - Subalpine fir	04 SxwFd - Knight's plume
05 Ricegrass - Moss	05 SxwFd - Toad-flax
06 Pine - Black spruce	06 Sb - Huckleberry - Spirea
07 Highbush-cranberry - Oak fern	07 Sxw - Oak fern
08 Devil's club - Lady fern	08 Sxw - Devil's club

