

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 For., Research Branch, Victoria, B.C. Unpublished report.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.



SBSmc3 Variant Summary

4.5 Kluskus Moist Cold Sub-Boreal Spruce¹⁴

Location

The SBSmc3 occurs on the plateau area between the Nulki Hills in the north and the Naglico Hills in the south. It occurs above either the SBSdw3 or SBSdk. At its upper limits it is bordered by a thin band of SBSmc2 on warm aspects and the ESSFmv1 on cool aspects.

Elevation range

975 - 1200 m

Climate

The SBSmc3 has the coldest and shortest growing season of all the SBS biogeoclimatic units in the guide area. This is mostly due to its position on a relatively high plateau in the lee of the Coast Mountains. It is intermediate in precipitation, with a high proportion falling as snow (Table 8).

Soils, geology, and landforms

Bedrock types in this subzone include Mesozoic intrusives, volcanics, and sediments, and younger Tertiary volcanics. Parent materials are dominantly morainal, with gravelly loam and clay loam textures. The associated soils are Gray Luvisols, including Brunisolic Gray Luvisols. Colluvial materials are less widespread, and have Dystric Brunisols and Humo-Ferric Podzols with coarser textures (gravelly sandy loam and loamy sand).

Distinguishing the SBSmc3 from adjoining biogeoclimatic units

SBSdk has:

- trembling aspen but no subalpine fir in the canopy; and
- purple peavine but no five-leaved bramble in the herb layer.

SBSdw3 has:

- Douglas-fir but less subalpine fir in the canopy;
- saskatoon in the shrub layer; and
- false sarsaparilla but less palmate coltsfoot in the herb layer.

SBSmc2 has:

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

Forests

Climax forests are dominated by hybrid white spruce and subalpine fir. Lodgepole pine dominates on drier sites. Black spruce occurs in wetlands, and on upland sites with poor soils in combination with lodgepole pine. Black cottonwood occurs along streams and rivers and is often associated with hybrid white spruce.

Wildlife

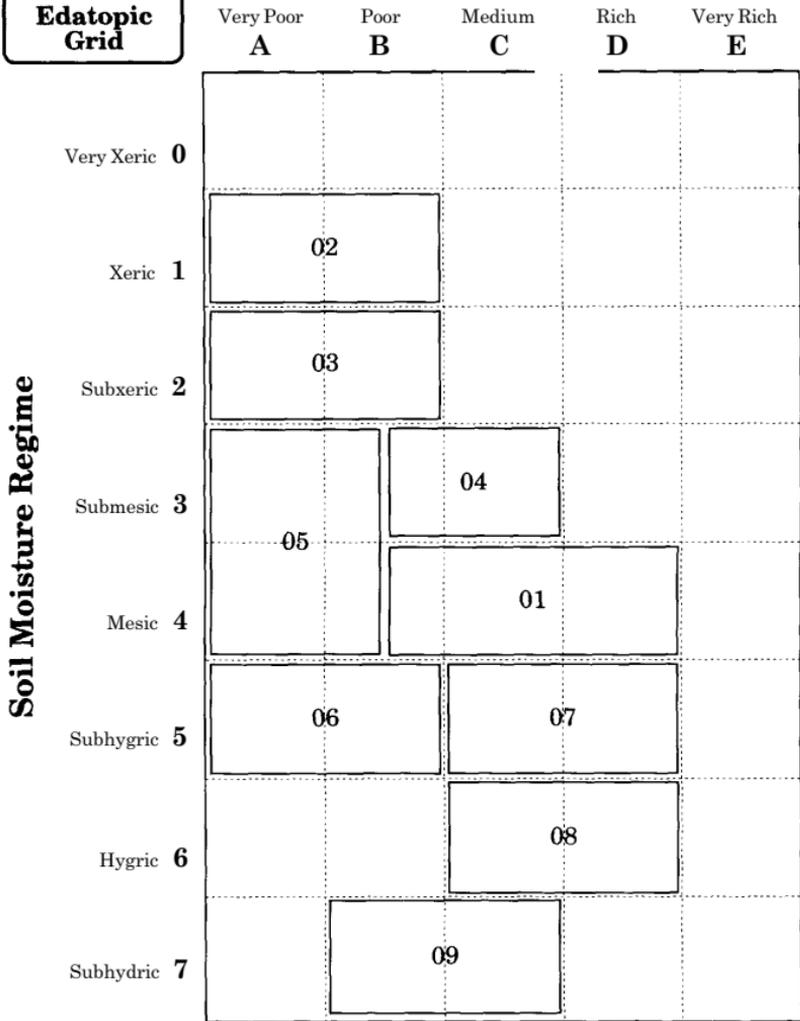
Dry pine-dominated sites east of the Fawnie Mountain Range provide critical winter habitat for woodland caribou. Shrub-dominated wetlands below 1000 m elevation provide important winter habitat for moose. This wetland habitat also

¹⁴ Formerly SBSi

supports furbearers such as beaver, muskrat, mink, and otter. Sub-boreal coniferous forests are used by moose, mule deer, grizzly bear, black bear, white-tailed deer, spruce grouse, and furbearers, such as wolverine, marten, and red squirrel.

SBSmc3
Edatopic
Grid

Soil Nutrient Regime



- | | |
|------------------------------------|--------------------------------|
| 01 Sxw - Huckleberry | 05 Sb - Huckleberry - Spirea |
| 02 Pl- Juniper - Dwarf blueberry | 06 SbPl - Feathermoss |
| 03 P1- Feathermoss - Cladina | 07 Sxw - Twinberry |
| 04 Sxw - Huckleberry - Soopolallie | 08 Sxw - Horsetail |
| | 09 SbSxw - Scrub birch - Sedge |

FIGURE 17. Edatopic grid displaying site units in the SBSmc3 variant.

Site Units		02	03	04	05	01	06	07	08	09		
Trees	<i>Pinus contorta</i>	■	■	■	■	■	■	■		■	lodgepole pine	
	<i>Picea mariana</i>			■	■		■	■	■	■	black spruce	
	<i>Picea glauca x engelmannii</i>			■	■	■	■	■	■	■	hybrid white spruce	
Shrubs	<i>Rosa acicularis</i>	■	■	■	■	■	■	■	■		prickly rose	
	<i>Juniperus communis</i>	■	■	■			■	■			common juniper	
	<i>Shepherdia canadensis</i>	■	■	■	■	■	■	■			soopolallie	
	<i>Vaccinium membranaceum</i>			■			■	■	■	■	black huckleberry	
	<i>Lonicera involucrata</i>					■	■	■	■		black twinberry	
	<i>Ledum groenlandicum</i>						■			■	Labrador tea	
Herbs and Dwarf Shrubs	<i>Cornus canadensis</i>	■	■	■	■	■	■	■	■	■	bunchberry	
	<i>Arctostaphylos uva-ursi</i>	■	■	■							kinnikinnick	
	<i>Oryzopsis asperifolia</i>	■	■	■							rough-leaved ricegrass	
	<i>Aster conspicuus</i>			■	■			■	■		showy aster	
	<i>Petasites frigidus</i> var. <i>palmatus</i>			■	■	■	■	■	■		palmate coltsfoot	
	<i>Empetrum nigrum</i>				■		■				crowberry	
	<i>Aster ciliolatus</i>					■	■	■			fringed aster	
	<i>Equisetum arvense</i>								■	■	common horsetail	
	<i>Carex</i> spp.									■	■	sedges
Mosses and Lichens	<i>Hylocomium splendens</i>			■	■	■	■	■	■	■	step moss	
	<i>Cladina</i> spp.	■	■	■							cladina lichens	
	<i>Mnium</i> spp.							■	■	■	leafy mosses	
	<i>Sphagnum</i> spp.									■	■	sphagnum mosses

FIGURE 18. SBSmc3 vegetation table.

Prominence class: ■ 1 ■ 2 ■ 3 ■ 4 ■ 5

SBSmc3
Site Series Key

- 1a Black spruce present; poor tree productivity; *Empetrum nigrum* (p. 79)¹⁵ or *Salix* spp. (pp. 63-77) present.
- 2a Canopy dominated by black spruce; on wet organic soils; moss layer dominated by *Sphagnum* spp. (p. 312)
SBSmc3/09
- 2b Canopy dominated by lodgepole pine or hybrid white spruce; on mineral soils; moss layer dominated by feathermosses.
- 3a Seepage water often present; *Ledum groenlandicum* (p. 40) generally moderate cover (> 3%).
SBSmc3/06
- 3b Seepage water never present; *Ledum groenlandicum* rare or absent.
SBSmc3/05
- 1b Black spruce absent; moderate tree productivity; *Empetrum nigrum* or *Salix* spp. rare or absent.
- 4a Generally midslope to toe or level; if level, seepage water often present; *Lonicera involucrata* (p. 48) and *Petasites frigidus* var. *palmatus* (p. 114) present.
- 5a Water table generally present within 50 cm; *Equisetum* spp. (p. 280) abundant (> 15%).
SBSmc3/08
- 5b Water table absent; *Equisetum* spp. low cover (< 1%) or absent.
- 6a Generally midslope or level; *Lonicera involucrata* generally low cover (< 3%) or absent.
SBSmc3/01
- 6b Generally mid- to lower slope; *Lonicera involucrata* moderate (> 3%) to high cover.
SBSmc3/07
- 4b Mid- to upper slope or level; if level, seepage water never present; *Lonicera involucrata* and *Petasites frigidus* var. *palmatus* generally rare or absent.
- 7a Shrub layer dominated by *Juniperus communis* (p. 51); on shallow soils over bedrock.
SBSmc3/02
- 7b *Juniperus communis* low cover or absent; soils reasonably deep (> 50 cm).

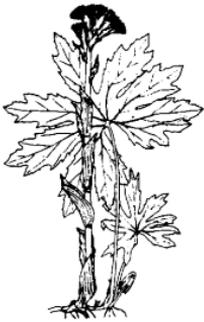
¹⁵ Page numbers refer to the publication *Plants of Northern British Columbia* (MacKinnon et al. 1992)

8a Upper slope to crest or level; *Arctostaphylos uva-ursi*
(p. 82) abundant.

SBSmc3/03

8b Generally midslope on south aspects; *Arctostaphylos*
uva-ursi rare or absent.

SBSmc3/04

*Rosa acicularis**Petasites frigidus*
var. *palmatus**Ptilium crista-castrensis*

VEGETATION

Tree Layer: 40% cover
hybrid white spruce, lodgepole pine

Shrub Layer: 30% cover
Rosa acicularis (prickly rose)
Lonicera involucrata (black twinberry)
Vaccinium membranaceum (black huckleberry)
Viburnum edule (highbush-cranberry)
Spiraea betulifolia (birch-leaved spirea)
hybrid white spruce
subalpine fir

Herb Layer: 40% cover
Cornus canadensis (bunchberry)
Petasites frigidus
var. *palmatus* (palmate coltsfoot)
Arnica cordifolia (heart-leaved arnica)
Linnaea borealis (twinflower)
Orthilia secunda (one-sided wintergreen)
Calamagrostis canadensis (bluejoint)
Rubus pubescens (trailing raspberry)
Vaccinium caespitosum (dwarf blueberry)
Epilobium angustifolium (fireweed)

Moss Layer: 95% cover
Ptilium crista-castrensis (knight's plume)
Pleurozium schreberi (red-stemmed feathermoss)
Hylocomium splendens (step moss)
Peltigera aphthosa (freckle lichen)

SOIL AND SITE

Moisture Regime: 4 (m)
Nutrient Regime: B-D (p-r)
Slope Gradient (%): 0-37
* Slope Position: mid or level
Parent Material: morainal; occasionally
glaciofluvial
* Soil Texture: medium - moderately coarse
Coarse Fragments (%): 10-90

COMMENTS: this association dominates the landscape, especially long basal till (morainal) slopes

DISTRIBUTION: very common, widespread and often large

Sxw - Huckleberry (SBSmc3/01)

INTERPRETATIONS

- Site limitations: - cold soils will limit root growth, especially on sites with humus layers >10 cm deep; **plant on naturally or artificially raised microsites.**
- Silviculture system: - see Section 5.1
- Site preparation: - see Section 5.2
- minimize or align large slash accumulations when logging to help meet site preparation objectives and reduce fire hazard.
- harvest fine-textured moraines during the dry part of the summer or in winter.
- Species choice: - Pl, Sx, **Bl**
- Vegetation potential: - low
- Reforestation: - attempt to regenerate naturally if potential exists.
- if natural regeneration is not feasible, plant a mixture of Pl and Sx.
- young Bl regeneration (< 3 m tall) may be susceptible to heavy browsing by moose.
- help maintain stand diversity in areas to be planted with Pl by mapping aspen patches prior to harvest and planting these areas to spruce.
- 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.**
- 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)**
- sites within this unit with thick organic horizons 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.**

VEGETATION

Tree Layer: 15% cover
lodgepole pine

Shrub Layer: 60% cover

Juniperus communis (common juniper)
Rosa acicularis (prickly rose)
Amelanchier alnifolia (saskatoon)
[paper birch]

Herb Layer: 25% cover

Vaccinium caespitosum (dwarf blueberry)
Linnaea borealis (twinflower)
Arctostaphylos uva-ursi (kinnikinnick)
Fragaria virginiana (wild strawberry)
[*Cornus canadensis* (bunchberry)]

Moss Layer: 35% cover

Pleurozium schreberi (red-stemmed feathermoss)
Dicranum polysetum (wavy-leavedmoss)

SOIL AND SITE

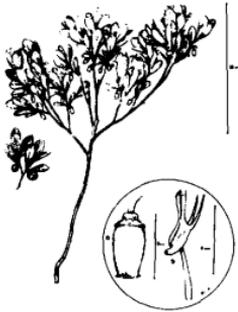
Moisture Regime: 1 (x)
Nutrient Regime: A-B (vp-p)
Slope Gradient (%): 20-40
Slope Position: upper
* Parent Material: variable, but bedrock usually close to surface
* Soil Texture: coarse
* Coarse Fragments (%): 70-90

COMMENTS: this association occurs on shallow soils over bedrock

DISTRIBUTION: rare



Juniperus communis



Vaccinium caespitosum



Pleurozium schreberi

Pl - Juniper - Dwarf huckleberry (SBSmc3/02)

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.***
- Silviculture system: - avoid logging

VEGETATION

Tree Layer: 30% cover
lodgepole pine

Shrub Layer: 15% cover
Shepherdia canadensis (bunchberry)
Rosa acicularis (prickly rose)
Juniperus communis (common juniper)
Spiraea betulifolia (birch-leaved spirea)
Shepherdia canadensis (soopolallie)
 lodgepole pine
 subalpine fir
 hybrid white spruce

Herb Layer: 35% cover
Arctostaphylos uva-ursi (kinnikinnick)
Linnaea borealis (twinflower)
Cornus canadensis (bunchberry)
Vaccinium caespitosum (dwarf blueberry)
Oryzopsis asperifolia (rough-leaved ricegrass)
Fragaria virginiana (wild strawberry)
Galium boreale (northern bedstraw)
Pyrola chlorantha (green wintergreen)

Moss Layer: 80% cover
Pleurozium schreberi (red-stemmed feathermoss)
Peltigera aphthosa (freckle lichen)
Peltigera malacea (apple pelt)
Dicranum polysetum (wavy-leaved moss)
Dicranum fuscescens (curly heron's-bill moss)
Cladina rangiferina (grey reindeer lichen)
Cladina mitis (green reindeer lichen)
Cladonia gracilis (black foot cladonia)
Cladonia chlorophaea (fairy cup lichen)
Stereocaulon tomentosum (woolly coral lichen)
Polytrichum commune

SOIL AND SITE

Moisture Regime: 2 (sx)
 Nutrient Regime: A-B (vp-p)
 Slope Gradient (%): 0-15 (usually 0)
 * Slope Position: upper slope - crest, or level
 * Parent Material: glaciofluvial
 * Soil Texture: coarse
 Coarse Fragments (%): 45-70

DISTRIBUTION: common on coarse-textured fluvial or glaciofluvial terraces



Arctostaphylos uva-ursi



Pleurozium schreberi



Cladina rangiferina

P1 - Feathermoss - Cladina (SBSmc3/03)

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 P1 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:
- light scarification for seedbed preparation or summer logging with no site preparation.
- Species choice:
- P1, (Sx)
- Vegetation potential:
- low
- Reforestation:
- attempt to regenerate naturally if potential exists.
 - if natural regeneration is not feasible, plant P1.
 - Sx is less productive than P1 on these sites.
- 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.***

VEGETATION

Tree Layer: 40% cover
lodgepole pine, hybrid white spruce

Shrub Layer: 50% cover
Shepherdia canadensis (soopolallie)
Spiraea betulifolia (birch-leaved spirea)
Rosa acicularis (prickly rose)
Viburnum edule (highbush-cranberry)
Vaccinium membranaceum (black huckleberry)
Alnus crispa ssp. *sinuata* (Sitka alder)
 hybrid white spruce

Herb Layer: 55% cover
Aster conspicuus (showy aster)
Cornus canadensis (bunchberry)
Arnica cordifolia (heart-leaved arnica)
Epilobium angustifolium (fireweed)
Linnaea borealis (twinflower)
Orthilia secunda (one-sided wintergreen)
Vaccinium caespitosum (dwarf blueberry)
Fragaria virginiana (wild strawberry)
Calamagrostis canadensis (bluejoint)

Moss Layer: 85% cover
Pleurozium schreberi (red-stemmed feathermoss)
Ptilium crista-castrensis (knight's plume)
Peltigera aphthosa (freckle lichen)
Dicranum polysetum (wavy-leaved moss)
Dicranum fuscescens (curly heron's-bill moss)

SOIL AND SITE

Moisture Regime: 3 (sm)
 Nutrient Regime: B-C (p-m)
 * Aspect: usually SE - SW
 * Slope Gradient (%): 2-55
 * Slope Position: mid - upper
 Parent Material: glaciofluvial, occasionally morainal or lacustrine
 Soil Texture: variable
 Coarse Fragments (%): 0-85

DISTRIBUTION: common on warm aspects



Shepherdia canadensis



Aster conspicuus



Arnica cordifolia

Sxw - Huckleberry - Soopolallie (SBSmc3/04)

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.***
- Silviculture system: - see Section 5.1
- Site preparation: - light scarification for seedbed preparation or summer logging with no site preparation
- Species choice: - Pl, Sx, (Bl)
- Vegetation potential: - low
- Reforestation: - attempt to regenerate naturally if potential exists.
- if natural regeneration is not feasible, plant Pl.
- plant Sx and Bl only on moister microsites.
- young Bl regeneration (< 3 m tall) may be susceptible to heavy browsing by moose.
- 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 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.***
- mountain pine beetle may cause mortality in large-diameter lodgepole pine stands of age class > 7.

VEGETATION

Tree Layer: 40% cover
lodgepole pine, black spruce, hybrid white spruce

Shrub Layer: 40% cover

Rosa acicularis (prickly rose)
Vaccinium membranaceum (black huckleberry)
Shepherdia canadensis (soopolallie)
Spiraea betulifolia (birch-leaved spirea)
hybrid white spruce
subalpine fir
black spruce

Herb Layer: 35% cover

Vaccinium caespitosum (dwarf blueberry)
Cornus canadensis (bunchberry)
Arnica cordifolia (heart-leaved arnica)
Linnaea borealis (twinflower)
Empetrum nigrum (crowberry)
Epilobium angustifolium (fireweed)

Moss Layer: 85% cover

Pleurozium schreberi (red-stemmed feathermoss)
Peltigera aphthosa (freckle lichen)
Cladina rangiferina (grey reindeer lichen)
Cladina mitis (green reindeer lichen)

SOIL AND SITE

Moisture Regime: 3-4 (sm-m)
Nutrient Regime: A-B (vp-p)
* Aspect: north-facing if sloping
Slope Gradient (%): 0-5
* Slope Position: upper or level
Parent Material: morainal, glacio(fluvial)
Soil Texture: coarse - medium
Coarse Fragments (%): 0-65, generally > 40

COMMENTS: these sites are similar to, but slightly drier than, the SBSmc3/06

DISTRIBUTION: common, widespread and often large



Rosa acicularis



Empetrum nigrum



Cladina rangiferina

Sb - Huckleberry - Spirea (SBSmc3/05)

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.***
 - cold soils will limit root growth, especially on sites with humus layers >10 cm deep; ***plant on naturally or artificially raised microsites.***
- Silviculture system:
- see Section 5.1
 - minimize or align large slash accumulations when logging to help meet site preparation objectives and reduce fire hazard.
 - harvest fine-textured moraines during the dry part of the summer or in winter.
- 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 less productive than Pl on these sites.
- 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).***
 - sites within this unit with fine-textured soils are vulnerable to compaction under wet conditions; ***restrict traffic to winter operations or dry soil conditions.***
 - 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: 40% cover
lodgepole pine, black spruce, hybrid white spruce

Shrub Layer: 40% cover
Lonicera involucrata (black twinberry)
Rosa acicularis (prickly rose)
Ledum groenlandicum (Labrador tea)
Shepherdia canadensis (soopolallie)
Vaccinium membranaceum (black huckleberry)
hybrid white spruce
black spruce
subalpine fir

Herb Layer: 35% cover
Cornus canadensis (bunchberry)
Vaccinium caespitosum (dwarf blueberry)
Petasites frigidus
var. *palmatus* (palmate coltsfoot)
Empetrum nigrum (crowberry)
Linnaea borealis (twinflower)
Aster ciliolatus (fringed aster)

Moss Layer: 95% cover
Pleurozium schreberi (red-stemmed feathermoss)
Ptilium crista-castrensis (knight's plume)
Cladina rangiferina (grey reindeer lichen)
[Hylocomium splendens (stepmoss)]

SOIL AND SITE

Moisture Regime: 5 (shg)
Nutrient Regime: A-B (vp-p)
* Aspect: north-facing if sloping
Slope Gradient (%): 0-7
* Slope Position: lower or level
Parent Material: morainal, glacio(fluvial)
Soil Texture: coarse - medium
Coarse Fragments (%): 30-60
* Seepage Water: occasionally present

COMMENTS: these sites are slightly poorer than the SBSmc3/07 and have more lodgepole pine in the canopy

DISTRIBUTION: uncommon, and usually associated with wetlands

*Lonicera involucrata**Ledum groenlandicum**Empetrum nigrum*

SbPl - Feathermoss (SBSmc3/06)

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.***
 - 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 large slash accumulations when logging to help meet site preparation objectives and reduce fire hazard.
 - harvest fine-textured moraines during the dry part of the summer or in winter.
- 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 less productive than Pl on these sites.
- 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)***
 - sites within this unit with fine-textured soils are vulnerable to compaction under wet conditions; ***restrict traffic to winter operations or dry soil conditions.***
 - 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.***

*Lonicera involucrata**Rosa acicularis**Rubus pubescens*

VEGETATION

Tree Layer: 40% cover
hybrid white spruce, lodgepole pine

Shrub Layer: 35% cover
Lonicera involucrata (black twinberry)
Rosa acicularis (prickly rose)
Ribes lacustre (black gooseberry)
Vaccinium membranaceum (black huckleberry)
Viburnum edule (highbush-cranberry)
hybrid white spruce

Herb Layer: 60% cover
Cornus canadensis (bunchberry)
Rubus pubescens (trailing raspberry)
Petasites frigidus
var. *palmatus* (palmate coltsfoot)
Fragaria virginiana (wild strawberry)
Linnaea borealis (twinflower)
Mitella nuda (common mitrewort)
Aster ciliolatus (fringed aster)
Arnica cordifolia (heart-leaved arnica)
Epilobium angustifolium (fireweed)
Galium boreale (northern bedstraw)

Moss Layer: (75% cover)
Hylocomium splendens (step moss)
Pleurozium schreberi (red-stemmed feathermoss)
Ptilium crista-castrensis (knight's plume)
Peltigera aphthosa (freckle lichen)

SOIL AND SITE

Moisture Regime: 5 (shg)
Nutrient Regime: C-D(m-r)
* Slope Gradient (%): 0-22
* Slope Position: mid - toe (occasionally level)
Parent Material: morainal, (glacio)fluvial
Soil Texture: variable
Coarse Fragments (%): 15-80
* Seepage Water: occasionally present

DISTRIBUTION: common, especially on lower slope positions

Sxw - Twinberry (SBSmc3/07)

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, **Bl**
- Vegetation potential: - very high (fireweed, black twinberry)
- Reforestation: - if vigorous advance 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.
- help maintain stand diversity in areas 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.**
- 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.**
- possible windthrow hazard if effective rooting depth < 30 cm.
- 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

Shrub Layer: 35% cover

Lonicera involucrata (black twinberry)
Ribes lacustre (black gooseberry)
Ribes triste (red swamp currant)
Viburnum edule (highbush-cranberry)
Rosa acicularis (prickly rose)
hybrid white spruce

Herb Layer: 90% cover

Equisetum arvense (common horsetail)
Cornus canadensis (bunchberry)
Rubus pubescens (trailing raspberry)
Petasites frigidus
var. *palmatus* (palmate coltsfoot)
Mitella nuda (common mitrewort)
Linnaea borealis (twinflower)
Cicuta douglasii (Douglas' water-hemlock)
Aster ciliolatus (fringed aster)
Epilobium angustifolium (fireweed)
Galium triflorum (sweet-scented bedstraw)
Galium boreale (northern bedstraw)
Platanthem obtusata (one-leaved rein-orchid)
Fragaria virginiana (wild strawberry)

Moss Layer: 80% cover

Hylocomium splendens (stepmoss)
Pleurozium schreberi (red-stemmed feathermoss)
Mnium spp. (leafy mosses)
Ptilium crista-castrensis (knight's plume)
Peltigera aphthosa (freckle lichen)

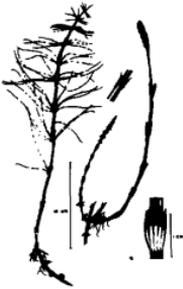
SOIL AND SITE

Moisture Regime: 6(hg)
Nutrient Regime: C-D (m-r)
Slope Gradient (%): 0-7
* Slope Position: toe, depression or level
* Parent Material: fluvial
Soil Texture: coarse - medium
Coarse Fragments (%): 20-65
* Seepage Water: generally present

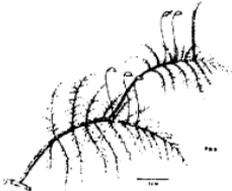
DISTRIBUTION: common, but small in size and associated with streams or rivers



Lonicera involucrata



Equisetum arvense



Hylocomium splendens

Sxw - Horsetail (SBSMc3/08)

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, [Bl, Pl]**
- Vegetation potential:
- high to very high (black twinberry, prickly rose, fireweed)
- 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:
- these units may represent important wildlife habitat, so prescription should be discussed with fish and wildlife personnel.
 - 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 within this unit 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.**
 - water table will likely rise above the ground surface in the spring, causing seedling mortality.
 - this association is critical to the control of runoff and streamflow.

VEGETATION

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

Shrub Layer: 50% cover
Viburnum edule (highbush-cranberry)
Salix spp. (willows)
Betula glandulosa (scrub birch)
 [*Lonicera involucrata* (black twinberry)]
 [*Spiraea douglasii* ssp. *menziesii* (pink spirea)]
 [*Ledum groenlandicum* (Labrador tea)]
 [black spruce]

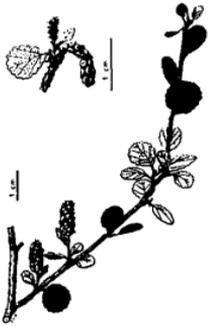
Herb Layer: 70% cover
Carex spp. (sedges)
Cornus canadensis (bunchberry)
Calamagrostis canadensis (bluejoint)
 [*Equisetum arvense* (common horsetail)]
 [*Oxycoccus oxycoccus* (bog cranberry)]

Moss Layer: 65% cover
Sphagnum spp. (sphagnums)
Tomenthypnum nitens (golden fuzzy fen moss)
Aulacomnium palustre (glow moss)
Mnium spp. (leafy mosses)
 [*Drepanocladus* spp. (drepanocladus mosses)]

SOIL AND SITE

Moisture Regime: 7 (shd)
 Nutrient Regime: B-C (p-m)
 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 (SBSmc3/09)

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_{Se}1	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_{Se}2	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