

Supplement to

A FIELD GUIDE TO FOREST SITE IDENTIFICATION AND INTERPRETATION FOR THE CARIBOO FOREST REGION

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The following supplements to the original (1997) field guide are available:

- Supplement 1 (2001) - ESSFxv2 site series classification (6•12)
- Supplement 2 (2002) - SBSmw site series expanded classification (6•40)

SBSmw
SUB-BOREAL SPRUCE
MOIST WARM SUBZONE

The SBSmw is in the northeast portion of the Cariboo Forest Region and adjacent portions of the Prince George Forest Region. In the Cariboo Forest Region (1374 km²), it extends eastward from the Quesnel River across the gently rolling landscapes of the Fraser Plateau to the western edge of the Quesnel Highland. It also occurs along the east side of the Fraser River north of the confluence of the Fraser and Cottonwood rivers. Elevations range from about 700 to 1000 m.

Distinguishing Adjacent Units from the SBSmw

The **SBSwk1** occurs at higher elevations along most of the eastern boundary of the SBSmw where precipitation is greater and temperatures are cooler. The **SBSmh** occurs along the western boundary of the SBSmw in the Quesnel and Fraser river valleys where mean annual temperatures are warmer. A small area of the **SBSdw1** borders the SBSmw near Ten Mile Lake, north of Quesnel. The **ICHmk3** shares a short border with the SBSmw, south of Quesnel Forks, and the **ICHwk2** borders a very small section of the SBSmw boundary near the west end of Quesnel Lake.

In the **SBSwk1**, zonal sites have:

- abundant oak fern, three-leaved foamflower, and five-leaved bramble;
- little or no Douglas-fir.

In the **SBSmh**, zonal sites have:

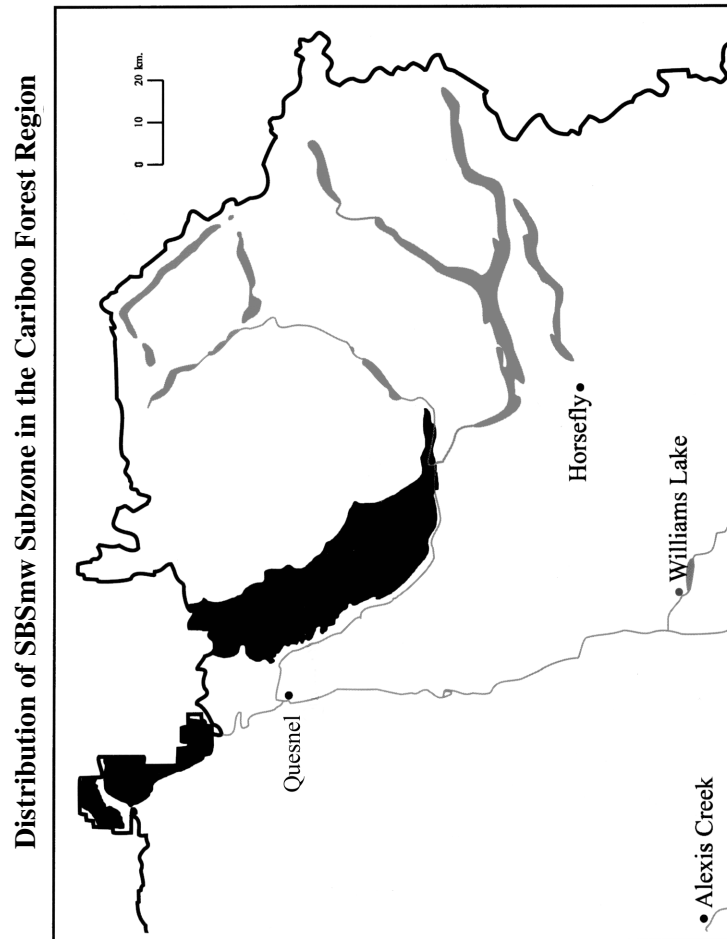
- beaked hazelnut;
- common Douglas maple and red-osier dogwood;
- little or no foamflower, rosy twistedstalk, lodgepole pine, queen's cup, or black huckleberry.

In the **SBSdw1**, zonal sites have:

- pinegrass or blue wildrye;
- no rosy twistedstalk or one-leaved foamflower.

In the **ICHmk3**, zonal sites have:

- western redcedar and five-leaved bramble;
- no western mountain-ash, showy aster, or trailing raspberry.



In the **ICHwk2**, zonal sites have:

- western redcedar and western hemlock;
- common oak fern, three-leaved foamflower, and five-leaved bramble.

Site Units of the SBSmw

Zonal Site Series 01 SxwFd - Falsebox Site Series is the predominant site unit of the SBSmw on gentle to moderately steep, lower to upper slope positions and level sites with medium-textured soils. The climax forest canopy is dominated by hybrid white spruce and subalpine fir, although Douglas-fir is common as a long-lived seral species. Due to past fires, seral lodgepole pine and Douglas-fir stands are common. In all stands, subalpine fir is the most abundant species of tree regeneration. The undergrowth vegetation has a moderate cover of low shrubs, especially black huckleberry, falsebox, and thimbleberry. The herbaceous layer has few grasses but a moderate cover of forbs, including bunchberry, twinflower, queen's cup, wild sarsaparilla, and heart-leaved arnica. Moss cover is nearly continuous and dominated by red-stemmed feathermoss, knight's plume, step moss, and electrified cat's-tail moss.

Drier Sites Sites drier than the zonal site series are moderately common, occurring on ridge tops, shallow soils, sandy soils, and steep south-facing slopes. Lichens and juniper haircap moss are more abundant than on mesic sites, but moist site species such as black twinberry, foamflower, star-flowered Solomon's-seal, and trailing raspberry are uncommon.

02 FdBI - Huckleberry Site Series occurs on upper slopes and ridge tops where soils are very shallow (<20 cm) over bedrock. Sites are mostly small, and the vegetation is distinguished by abundant lichens and *Dicranum* mosses. The mature forest canopy is typically dominated by short Douglas-fir and lodgepole pine. Low shrubs, especially black huckleberry, are abundant. Several herbaceous species are present but none is abundant, and total herb cover is sparse to moderate. Mosses, principally red-stemmed feathermoss, wavy-leaved moss, and juniper haircap moss, cover about 50% of the surface.

03 PI - Huckleberry - Velvet-leaved blueberry Site Series is common on level to gently sloping, dry sandy soils, usually glaciofluvial terraces and outwash. Soil gravel contents are usually very high. The

mature forest canopy is typically dominated by lodgepole pine with an understory of subalpine fir and hybrid white spruce. In areas of cold air accumulation, black spruce is occasional. The undergrowth vegetation is distinguished by the presence of velvet-leaved blueberry, which, together with black huckleberry, bunchberry, and twinflower, typically dominates the undergrowth. In contrast to the /02 site series, feathermosses are abundant, and cladonia and cladina lichens cover only a very small portion of the surface.

04 SxwFd - Knight's plume Site Series occurs on moderate to steep (>30%) south- and west-facing upper slopes. Soils are medium-textured but have a high gravel content. This site series is also present on broad ridge tops and gentler upper slopes where soils are shallow (<50 cm) to bedrock, but deeper and more continuous than in the /02 site series. The mature forest canopy is typically dominated by Douglas-fir and occasionally by lodgepole pine. Tree regeneration is typically dense and predominantly subalpine fir. The undergrowth vegetation has a sparse to moderate cover of low shrubs (especially falsebox, saskatoon, and black huckleberry), and a sparse cover of herbaceous species. Mosses, especially red-stemmed feathermoss and knight's plume, typically cover 50% or more of the surface. The vegetation is distinguished from other dry sites by abundant mosses, few or no cladonia and cladina lichens, and little or no velvet-leaved blueberry.

Wetter Sites Sites wetter than the /01 site series are common on lower slopes, valley-bottom flats, and riparian areas, and in small depressions. The vegetation is distinguished from /01 and drier sites by black gooseberry, lady fern, oak fern, bluejoint, and pink spirea.

05 Sxw - Pink spirea Site Series is common in the Sundberg Lake and Umiti Creek areas on moist lower slopes, shallow depressions and poorly drained flats where cold air accumulates, primarily adjacent to wetlands and in low-relief basins. Summer frost is frequent, and soils are relatively cold. The mature forest canopy is dominated by lodgepole pine or occasionally by hybrid white spruce. Tree regeneration is generally sparse. The undergrowth vegetation is distinguished by its vigorous shrub layer dominated by pink spirea, willows, and black twinberry. Labrador tea is also frequently present. Common herbs and dwarf shrubs include bluejoint, creeping-snowberry, palmate coltsfoot, and twinflower. Moss cover is nearly continuous and often includes sphagnum mosses.

06 Sxw - Oak fern Site Series is common on lower and toe slope positions where soils are moistened by intermittent, low-volume seepage water from upslope areas. The mature forest canopy is typically dominated by hybrid white spruce, lodgepole pine, and subalpine fir, and the understory layers by relatively dense subalpine fir regeneration. Low shrubs are moderately abundant; principal species are black huckleberry, black twinberry, and black gooseberry. The herbaceous layer includes abundant oak fern, which, together with the low abundance of black twinberry and devil's club, distinguishes the vegetation from other site series.

07 Sxw - Twinberry - Oak fern Site Series occurs on moist lower and toe slope positions, primarily along stream channels. Persistent seepage water or a water table is usually evident within 50–100 cm of the surface, and sites are mostly in cold air accumulation areas. The mature forest canopy is dominated by widely spaced hybrid white spruce trees over a subcanopy of subalpine fir. The shrub layer is usually dense and dominated by black twinberry and thimbleberry. Abundant black twinberry distinguishes these sites. The herbaceous layer includes many low and medium-sized forbs with moderate cover. Oak fern and lady fern are usually abundant.

08 Sxw - Devil's club Site Series is common on lower and toe slope positions where soils are moistened by persistent seepage. Subsoils are usually strongly mottled and often gleyed. In contrast to the /07 unit, the /08 unit does not occur on sites with substantial cold air accumulations. The mature forest canopy is dominated by a mixture of hybrid white spruce and subalpine fir. The undergrowth is dominated by and distinguished by abundant devil's club and ferns, including lady fern, spiny wood fern, and oak fern.

09 Sxw - Horsetail Site Series occurs on gentle toe slopes and in depressions with a persistent near-surface (<50 cm) water table. Soils are typically Organics or Gleysols with thick surface organic horizons. The mature forest canopy is predominantly widely spaced hybrid white spruce with a small component of subalpine fir. Trees are often rooted on raised microsites. The undergrowth is distinguished by an abundant (>5%) cover of horsetail species. Several other wet-site species, such as mountain alder, lady fern, great northern aster, soft-leaved sedge, and leafy mosses, are also common.

10 SbSxw - Scrub birch - Sedge Site Series occurs in wet depressions where a water table is near the surface (<50 cm). These are primarily forested wetlands that have organic soils. The mature forest canopy is relatively open and dominated by black spruce and often includes lesser amounts of hybrid white spruce and lodgepole pine. The undergrowth is distinguished by a significant (>5%) cover of sphagnum moss, as well as other typical bog species, including scrub birch, Labrador tea, bog willow, bog cranberry, and a variety of sedges.

Since initially publishing this field guide in 1997, the site series classification of the SBSmw has been revised to include previously unclassified site series. These include additional ecosystems occurring in the Sundberg Lake and Umiti Creek areas that are very prone to growing-season frosts. Also added to the classification are very wet, sparsely treed sites with nutrient-rich soils.

11 Pl - Huckleberry - Knight's plume Site Series occurs primarily on the low-relief terrain in the Sundberg Lake and Umiti Creek areas. This site series is similar to the /01 site series except that these sites are very prone to growing-season frosts. The site series occurs most commonly on level to gently sloping sites with mesic or near-mesic moisture regimes. Soils are predominantly medium-textured and are occasionally compacted at depth. The mature forest canopy is dominated by lodgepole pine with scattered hybrid white spruce and subalpine fir. Tree regeneration is predominantly hybrid white spruce and subalpine fir. The undergrowth vegetation has a moderate cover of low shrubs, especially black huckleberry, prickly rose, and birch-leaved spirea. On some sites, soopolallie forms the dominant shrub cover. Common herbs and dwarf shrubs include bunchberry, twinflower, dwarf blueberry, and stiff clubmoss. Pinegrass is occasionally present with low cover. Moss cover is nearly continuous and dominated by red-stemmed feathermoss and knight's plume. These sites are differentiated from the /01 site series by their lack of Douglas-fir, thimbleberry, queen's cup, and prince's pine.

12 Sxw - Pink spirea - Sphagnum Site Series occurs on wet lower and toe slope positions in low-relief topography. A water table remains near the surface throughout the growing season. Vegetation on these sites is strongly influenced by cold air accumulation and cold soils.

The mature forest canopy is dominated by lodgepole pine and hybrid white spruce. The undergrowth is distinguished by a high cover of pink spirea, low to moderate cover of Labrador tea and creeping snowberry, and the presence of sphagnum moss and common haircap moss.

13 Sxw - Mountain alder - Lady fern Site Series occurs on gentle toe slopes and in depressions with free water commonly present at the soil surface. Soils are typically Gleysols with moderately thick, well decomposed surface organic horizons. The mature forest canopy is predominantly widely spaced hybrid white spruce and subalpine fir, commonly on raised microsites. The undergrowth is distinguished by an abundant cover of mountain alder and other wet-site shrubs, including devil's club, black twinberry, thimbleberry, and red elderberry. Lady fern, oak fern, and cow parsnip are usually abundant. The moss layer is generally poorly developed and consists primarily of leafy mosses.

Non-forested Sites Wetlands are common in depressions in gently rolling terrain and along low-gradient streams. Fens are the predominant wetland type, although bogs and swamps are also present.

KEY TO SITE UNITS OF THE SBSmw

1a. Soils <50 cm deep over bedrock and no evidence of seepage water; usually crest or upper slope position; bedrock outcrops often present.

2a. Soils extremely shallow, mostly <20 cm to bedrock; moisture regime very xeric or xeric; combined cover of cladonia and cladina lichens >2%; bedrock usually exposed.

SBSmw/02 FdBI - Huckleberry

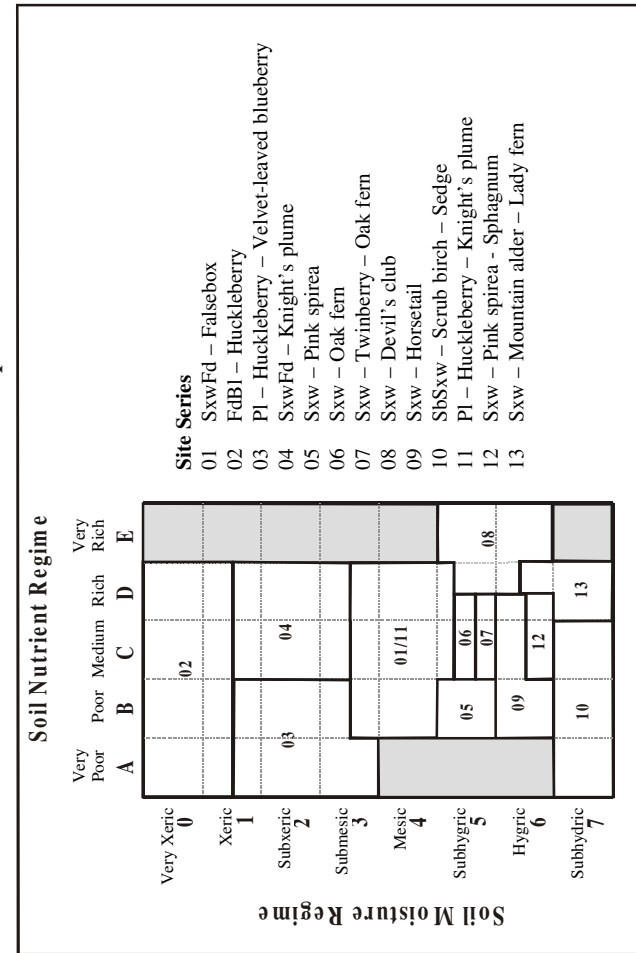
2b. Soils mostly 20–50 cm deep; moisture regime xeric or subxeric; combined cover of cladonia and cladina lichens <2%; bedrock may or may not be exposed.

SBSmw/04 SxwFd - Knight's plume

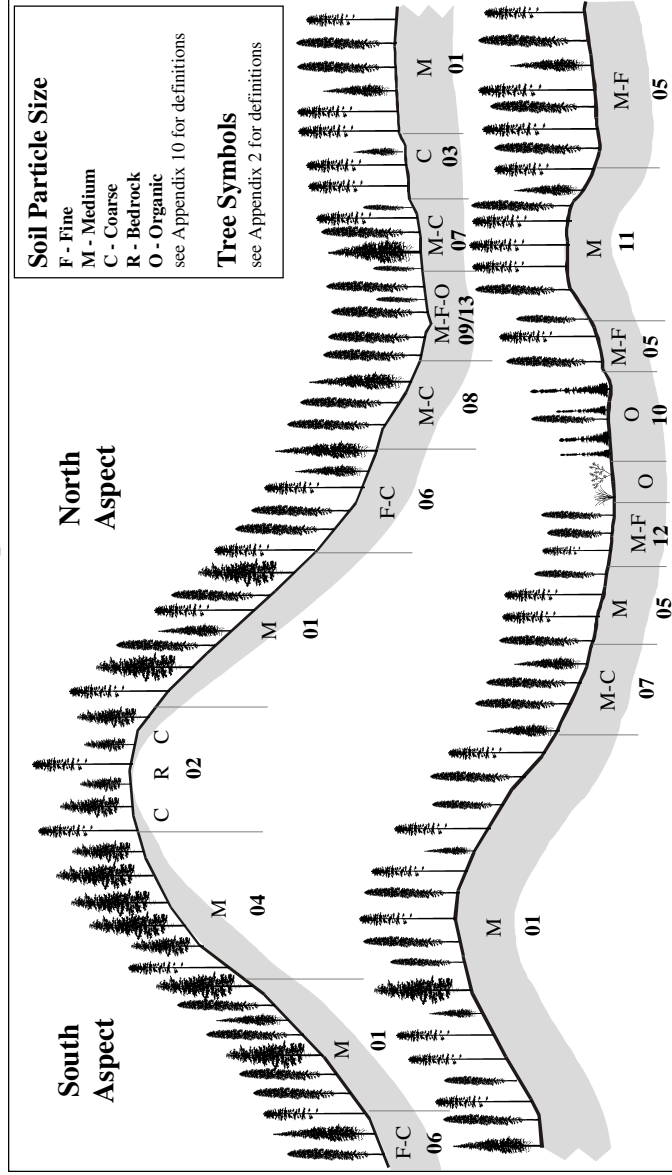
- 1b. Soils deeper, or evidence of near-surface seepage water present; slope position various; bedrock outcrops seldom present.
- 3a. Soil texture sand or loamy sand and no persistent seepage water or water table within 100 cm of surface; mostly level or gently sloping fluvial or glaciofluvial parent materials.
- 4a. Velvet-leaved blueberry common (5–50% ground cover) and oak fern absent or incidental; slope position generally level or mid and moisture regime submesic.
SBSmw/03 Pl - Huckleberry - Velvet-leaved blueberry
- 4b. Velvet-leaved blueberry absent or incidental and oak fern cover >10%; slope position generally lower, and moisture regime mesic to subhygric.
SBSmw/06 Sxw - Oak fern
- 3b. Soils not sandy or, if so, then persistent seepage or water table within 100 cm of surface; slope position various.
- 5a. Slope gradient 30% or greater **and** slope aspect SE, S, SW, or W.
SBSmw/04 SxwFd - Knight's plume
- 5b. Slope gradient <30% or, if steeper, then aspect NW, N, NE, or E.
- 6a. Moisture regime submesic, mesic, or subhygric; no persistent seepage or water table within 50 cm of surface.
- 7a. Oak fern cover >10%; moisture regime mesic or subhygric.
SBSmw/06 Sxw - Oak fern
- 7b. Oak fern cover <10%; moisture regime predominantly submesic or mesic.
- 8a. Douglas-fir, sarsaparilla, rattlesnake-plantain, and tall Oregon grape usually present; creeping snowberry and five-leaved bramble absent or incidental.
SBSmw/01 SxwFd - Falsebox
- 8b. Douglas-fir, sarsaparilla, rattlesnake-plantain, and tall Oregon grape absent or incidental; creeping snowberry and five-leaved bramble usually present (sites most commonly associated with large cold air accumulation basins).
SBSmw/11 Pl - Huckleberry - Knight's plume
- 6b. Moisture regime subhygric or wetter; evidence of seepage water inputs or water table within 50 cm of surface.
- 9a. Moisture regime subhygric; no water table within 50 cm of surface; slope position lower or toe.
- 10a. Pink spirea cover $\geq 5\%$; oak fern absent or incidental; predominantly in cold air accumulation basins.
SBSmw/05 Sxw - Pink spirea
- 10b. Pink spirea cover <5%; oak fern usually abundant; site variable but not in cold air accumulation basin (/07 often occurring in valley-bottom cold air accumulation sites).
- 11a. Devil's club cover $\geq 5\%$ in mature forest; cover of black twinberry and thimbleberry each <5%; lower and toe slope positions without significant cold air accumulation.
SBSmw/08 Sxw - Devil's club
- 11b. Devil's club cover <5%; black twinberry or thimbleberry cover >5%; predominantly toe slope positions along stream channels; cold air accumulation sites.
SBSmw/07 Sxw - Twinberry - Oak fern

- 9b. Moisture regime hygric or wetter; persistent water table within 50 cm of soil surface; slope position lower, toe, or depression.
- 12a. Labrador tea, creeping snowberry, and sphagnum moss present; devil's club, clasping twistedstalk, large-leaved avens, and ragged mosses absent or incidental.
- 13a. Surface organic layers ≥ 50 cm over mineral soil; mature forest canopy dominated by black spruce.
SBSmw/10 SbSxw - Scrub birch - Sedge
- 13b. Surface organic layers < 50 cm (mostly < 20 cm) over mineral soil; mature forest canopy dominated by hybrid white spruce or lodgepole pine.
SBSmw/12 Sxw - Pink spirea - Sphagnum
- 12b. Labrador tea, creeping snowberry, and sphagnum moss absent or incidental; devil's club, clasping twistedstalk, large-leaved avens, or ragged mosses present.
- 14a. Feathermosses common (at least on raised microsites); sweet-scented bedstraw present; mountain alder $< 5\%$ cover.
- 15b. Devil's club cover $\geq 5\%$ and horsetail cover $< 3\%$.
SBSmw/08 Sxw - Devil's club
- 15a. Devil's club $< 5\%$ cover and horsetail cover $\geq 10\%$.
SBSmw/09 Sxw - Horsetail
- 14b. Feathermosses and sweet-scented bedstraw absent or incidental and mountain alder abundant ($> 15\%$ cover).
SBSmw/13 Sxw - Mountain alder - Lady fern

SBSmw Edatopic Grid



SBSmw Landscape Profile



Site Features of SBSmw Site Series

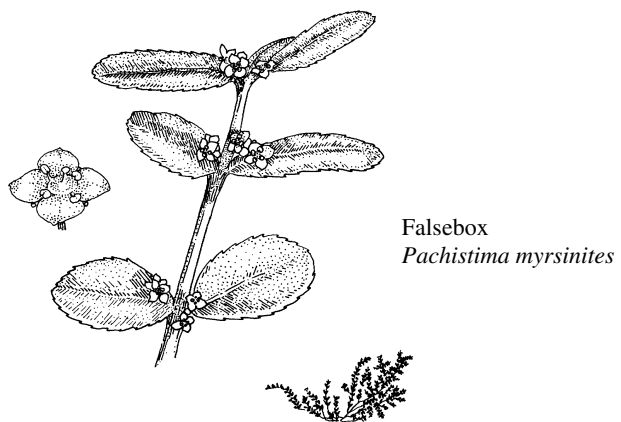
Site Series	01	02	03	04	05
Key Features	zonal and other gently to steeply sloping sites with mesic or near mesic moisture regime.	dry crests and upper slopes with very thin (< 20 cm) soils over bedrock; bedrock usually exposed	gently sloping and level sites with dry sandy soils; no evidence of seepage input or water table.	predominantly steep upper slopes; also gentle upper slopes or crests with shallow (21 - 50 cm) soils on NW to E aspects	moist sites in cold air accumulation basins, intermittent seepage or water table below 50 cm; often adjacent to wetlands
Soil Moisture / Nutrient Regimes	mesic, (submesic - subhygric) / poor - rich	very xeric, xeric / very poor - rich	xeric - submesic / very poor, poor	xeric - submesic / medium, rich	subhygric / poor
Slope Position	mid (upper - lower)	crest	level	crest, upper	toe, lower, level
Aspect	all	all	N/A	all	all
Slope Grade (%)	0 - 30 (70)	0 - 30	0 - 10	0 - 70	< 10
Soil Texture	gravelly loamy, sand, silty,	gravelly loamy, sand	sand, gravelly sand	gravelly loamy	loamy, gravelly loamy
Humus Form and Thickness (cm)	Hemimor, Hemihumimor 3 - 8	Xeromor 1 - 3	Hemimor 2 - 5	Xeromor, Hemimor 2 - 8	Hemihumimor, Hydromor 6 - 16
Occurrence / Size / Distribution	predominant / large / wide	uncommon / small / wide	common / medium / wide	uncommon / small / wide	locally common / small - large / Sundberg Lake and Umiti Creek areas

Site Features of SBSmw Site Series (continued)

Site Series	06	07	08	09	10
Key Features	moist lower and toe slope positions with intermittent seepage; also on some moist level areas with silty or clayey soils	moist lower and toe slope positions with seepage or water table below 50 cm; often in valley bottoms and along streams where cold air accumulates	moist lower slope positions with significant seepage inputs and better cold air drainage than /07; moist, rich, very productive sites	wet, level to gently sloping sites with near-surface (< 50 cm) water table and less than 50 cm of organic material over mineral soil	wet, level to gently sloping sites with near-surface (< 50 cm) water table and 50 cm or more of organic materials over mineral soil
Soil Moisture / Nutrient Regimes	subhygric / medium, rich	subhygric / medium, rich	subhygric / rich, very rich	hygric / poor - rich	subhydric / poor, medium
Slope Position	lower, level	lower, toe (middle)	lower, toe	toe, depression	depression
Aspect	all	all	all but predominantly north	all	N/A
Slope Grade (%)	0 - 20	0 - 20 (40)	5 - 50 (70)	0 - 5	0 - 5
Soil Texture	gravelly sand, loamy, silty, clayey	gravelly sand, loamy, silty	gravelly loamy, sand	loamy, silty	organic
Humus Form and Thickness (cm)	Hemimor, 3 - 12	Hemihumimor, Hydromoder 5 - 13	Hemihumimor, Hydromoder 6 - 15	Hydromoder, Histomoder 5 - 50	Organic soils
Occurrence / Size / Distribution	common / medium / wide	common / medium / wide	common / medium - large / wide	uncommon / small - medium / wide	common / small / wide

Site Features of SBSmw Site Series (continued)

Site Series	11	12	13
Key Features	mesic and near-mesic sites in large, cold air basins	wet, level to gently sloping sites with near-surface (< 50 cm) water table in areas of significant cold air accumulation	wet, nutrient-rich, lower and toe slope sites with near surface (< 50 cm) water table; commonly adjacent to streams
Soil Moisture / Nutrient Regimes	mesic, (submesic, subhygric) / poor - rich	hygric / medium, rich	hygric, subhydric / rich
Slope Position	mid, lower and level	lower, toe	lower, toe
Aspect	all (commonly SE, S, Sw, W)	all	N/A
Slope Grade (%)	< 15	0 - 10	0 - 5
Soil Texture	loamy, sandy	loamy, silty	loamy (sandy)
Humus Form and Thickness (cm)	Hemimor, Mormoder 4 - 10	Hydromoder 5 - 16	Mormoder, Mullimoder, Vermimull 6 - 15 (30)
Occurrence / Size / Distribution	uncommon / small - medium / observed only in Maude Lake and Umiti Creek areas	uncommon / small - medium / observed only in Maude Lake and Umiti Creek areas	uncommon / small / wide



Queen's cup
Clintonia uniflora

