

Subzones and Variants of the BG Zone in the Cariboo Forest Region

Two subzones of the BG Zone, each represented by a single variant, are present in the Cariboo Forest Region:

BGxh - Very Dry Hot BG Subzone

BGxh3 - Fraser Variant

BGxw - Very Dry Warm BG Subzone

BGxw2 - Alkali Variant

These two subzones correspond approximately to the lower and middle grasslands of the Cariboo Forest Region described by Nicholson and Hamilton (1984).

BGxh3 Variant The BGxh3 includes the driest, warmest, and lowest-elevation grasslands of the Region. It is a relatively small biogeoclimatic unit (269 km²) that occurs primarily below 650 m on lower slopes and terraces of the Fraser River valley. Climax vegetation on zonal sites is distinguished by prominent big sagebrush and a herb layer dominated by bluebunch wheatgrass and junegrass. Relatively few vascular species are present and a crust of lichens, mosses, and cyanobacteria comprises a significant proportion of the soil cover in climax vegetation. This variant is not present in any other Region, although the BGxh subzone occurs in the Kamloops and Nelson regions.

BGxw2 Variant The BGxw2 occurs at elevations above the BGxh3 (approximately 650–900 m) on middle and upper slopes of the Fraser and lower Chilcotin river valleys. It is slightly larger (627 km²) than the BGxh3 and is distinguished from the BGxh3 by having little or no big sagebrush, a greater total vascular plant cover, and a greater diversity of vascular plant species on zonal sites. In addition, porcupine grass is common on moist lower slopes and in shallow depressions. On zonal sites, the vegetation is dominated by bluebunch wheatgrass, needle-and-thread grass, junegrass, umber pussytoes, and a well-developed lichen crust dominated by *Cladonia* lichens. Douglas-fir forests are common on lower slopes, north aspects, and in draws within the BGxw2.

BGxw2

BUNCHGRASS VERY DRY WARM SUBZONE ALKALI VARIANT

The BGxw2 is a relatively small (627 km²) variant, which is included entirely within the Cariboo Forest Region. It occurs on middle and upper valley slopes and terraces of the Fraser River valley from Sheep Creek south to about the boundary of the Kamloops Forest Region. It also occurs in the lower Chilcotin River valley east of Hanceville. At its northern and western limits, the BGxw2 occurs from valley bottoms to middle-elevation slopes. Elevations are approximately 650–900 m in most areas.

Distinguishing Adjacent Units from the BGxw2

The **BGxh3** occurs below the BGxw2 throughout most of its distribution except where the BGxw2 extends to valley bottoms. The **IDFxm** occurs above the BGxw2 on upper valley slopes and the adjacent plateau throughout the range of the BGxw2.

In the **BGxh3**, climax vegetation on zonal sites has:

- big sagebrush and more abundant prickly pear cactus;
- greater relative cover of junegrass;
- smaller relative cover of needle-and-thread grass;
- lower total vascular plant cover and species diversity.

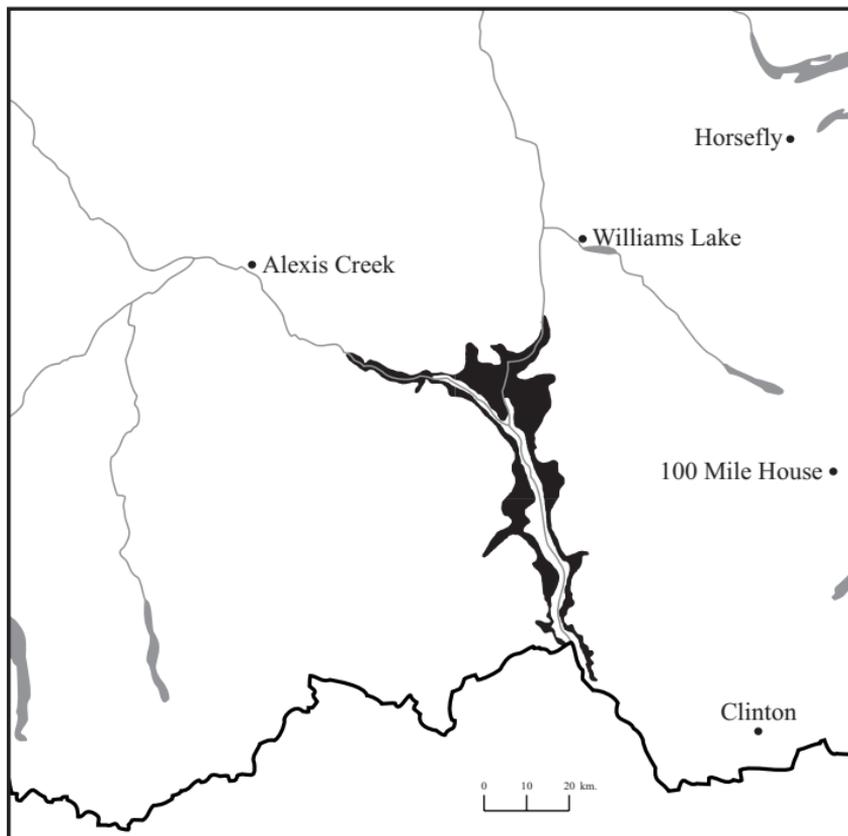
moist sites have:

- little or no porcupine grass or spreading needlegrass.

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

- Douglas-fir forests as climax vegetation;
- common pinegrass.

Distribution of BGxw2 Variant in the Cariboo Forest Region



Site Units of the BGxw2

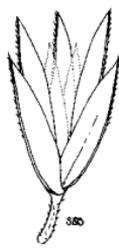
A classification of forested sites in the BGxw2 is not available at the present time but will be prepared for incorporation into this guide in the near future.

Zonal Sites Zonal sites include level to gently sloping sites on all aspects and on some steeper east and northwest aspects. The vegetation is dominated by bluebunch wheatgrass and needle-and-thread grass, with a combined cover of 35–75%. Several other herbaceous species are present and include pasture sage, junegrass, meadow salsify, brittle prickly-pear cactus, Holboell's rockcress, western blue flax, large-fruited desert-parsley, and pale comandra. The lichen community on late-seral and climax zonal sites is usually diverse and forms a well-developed (25–70% cover) crust on the soil, covering most of the ground not occupied by vascular plants. Principal lichen species are *Cladonia pyxidata* and *C. cariosa*.

Drier Sites Sites drier than those of the zonal site series are relatively common in the BGxw2 on hill crests, shallow soils over bedrock, steep slopes, moderate south- and west-facing slopes, and sandy soils. The vegetation includes many of the same species found on zonal sites but they are less abundant. Common species include pasture sage, pussy-toes, prickly-pear cactus, junegrass, large-fruited desert-parsley, and needle-and-thread grass. Total cover of mosses, lichens, and algae varies from 15 to 90%. Although these sites are predominantly grasslands, they frequently include scattered Douglas-fir and occasionally have open forests.

Wetter Sites Sites wetter than the zonal site series include moist gullies, depressions, streamside riparian sites, and moderate to steep north and east aspects. They are frequently forested. Moist draws and ravines and sites along larger watercourses often have a Douglas-fir-dominated forest with a shrubby undergrowth that often includes Douglas maple, common snowberry, rose, water birch, scattered forbs and grasses, and relatively high cover of mosses. Black cottonwood forests with a shrubby undergrowth are scattered on some incised drainages. Steep north- and east-facing slopes are often vegetated by moderately open Douglas-fir forests and generally contain moderate to high covers of bluebunch wheatgrass as well as spike-like goldenrod, nodding onion, junegrass, and yarrow, and a relatively high cover of mosses and ground lichens.

SITE UNITS



Junegrass
Koeleria macrantha



Needle-and-thread grass
Stipa comata

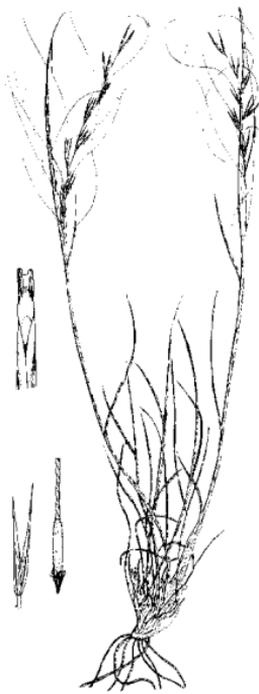


TABLE A1.1. Site units (shaded) in the Cariboo Forest Region and their precorrelation equivalents (unshaded).

Current (correlated) BEC unit code												
BEC Unit		Site unit										
		/01	/02	/03	/04	/05	/06	/07	/08	/09	/10	/11
Equivalent precorrelation code												
BEC Unit		Ecosystem unit										
AT	AT	(site units not yet described)										
BGxh3	PPBGg	(see Iverson and Coupé 1996a)										
BGxw2	PPBGe	(see Iverson and Coupé 1996b)										
CWHds1	CWHc	see Guide for Vancouver Region (Green and Klinka 1994)										
ESSFdc2	ESSFe1	see Guide for Kamloops Forest Region (Lloyd et al. 1990)										
ESSFwc3	ESSFh2	/01	/02	/03								
ESSFwk1	ESSFh1	/01	/02	/03	/05	/04	/07 in part	/07 in part				
ESSFxc	ESSFd	see Guide for Kamloops Forest Region (Lloyd et al. 1990)										
ESSF xv1	ESSFg, ESSF undif	npe	npe	npe	npe	npe	npe	npe	npe	npe		
ESSF xv2	ESSFg, ESSF undif	npe	npe	npe	npe	npe	npe	npe	npe			
ICHdk	ICHe3	/01	/02	/03	/04	/05	/06	/07	/08	/09		
ICHmk3	ICHe2	/01,/04	/02	/03	/05	/06	/07	/08				
ICHmw3	ICHm1	see Guide for Kamloops Forest Region (Lloyd et al. 1990)										
ICHwk2	ICHh1	/01,/05	/02	/03	/04	/06 in part	/06 in part	/07	/08			
ICHwk4	ICHh2	/01,/06	/02	/03	/04	/05	/07	/08	/09			
IDFdk3	IDFb2	/01	/03	/02	/05	/04	/06	/07	/08	/09, /10		
IDFdk4	IDFb5	/01	/02	/03	/04	/05	/06	/07	/08	/09	/10	
IDFdw	IDFundiff.	npe	npe	npe	npe	npe	npe	npe	npe			
IDFmw2	IDFj1	see Guide for Kamloops Forest Region (Lloyd et al. 1990)										
IDFxm	IDFa4	/01	/02	/03	/04	/05	/06	/07	/08	/09		
IDF xw	IDFa2	/01,/05,/07	/02	/03	/04	/06	/08	/09				

^aNo previous equivalent (npe)

APPENDIX 5
ACTUAL SOIL MOISTURE REGIME
RELATIONSHIP TO RELATIVE SOIL MOISTURE
REGIME AND BIOGEOCLIMATIC UNIT

BEC unit	Relative soil moisture regime							7
	0	1	2	3	4	5	6	
BGxh3	ED	ED	ED	ED	ED	SD	M	W
BGxw2	ED	ED	ED	ED	ED	SD	M	W
IDFxw	ED	ED	VD	VD	MD	SD	M	W
IDFxm	ED	ED	VD	VD	MD	SD	M	W
SBPSxc	ED	ED	VD	VD	MD	SD	M	W
SBPSdc	ED	ED	VD	MD	SD	F	M-VM	W
SBPSmk	ED	VD	VD	MD	SD	F	M-VM	W
IDFdk3	ED	VD	VD	VD	MD	F	M	W
IDFdk4	ED	VD	VD	VD	MD	F	M	W
IDFdw	ED	VD	VD	MD	MD	F	VM	W
IDFmw2	VD	VD	VD	MD	SD	F	VM	W
MSxk	VD	VD	VD	VD	MD	F	M	W
MSxv	VD	VD	VD	MD	SD	F	VM	W
SBPSmc	VD	VD	VD	MD	SD	F	M-VM	W
SBSdw1	VD	MD	MD	SD	SD	F	M	W
SBSdw2	VD	MD	MD	SD	SD	F	M	W
SBSmh	VD	MD	MD	SD	SD	M	VM	W
SBSmw	VD	MD	MD	SD	F	M	VM	W
SBSmc1	VD	MD	MD	SD	F	M	VM	W
SBSmc2	VD	MD	MD	SD	F	M	VM	W
SBSwk1	VD	MD	SD	F	F	M	VM	W
ICHdk	VD	VD	VD	MD	SD	M	VM	W
ICHmk3	VD	MD	MD	SD	F	M	VM	W
ICHwk2	VD	MD	SD	F	F	M	VM	W
ICHwk4	VD	MD	SD	F	F	M	VM	W
ESSFxv	VD	VD	MD	MD	SD	F	M	W
ESSFdc2	VD	MD	MD	SD	SD-F	M	VM	W
ESSFwk1	MD	MD	SD	F	M	M	VM	W
ESSFwc3	MD	MD	SD	F	M	M	VM	W

Actual Moisture Regime Codes:

ED=extremely dry; VD=very dry; MD=moderately dry; SD=slightly dry;
 F=fresh; M=moist; VM=very moist; W=wet

TABLE 5.3.1 Distribution of Marsh Site Associations by biogeoclimatic zone

	BG PP	BWBS SWB	ESSF	ICH	IDF	MS	SBPS SBS	CDF	CWH	MH
Wm01 Beaked sedge – Water sedge	x	xx	x	xxx	xxx	xx	xx		x	
Wm02 Swamp horsetail – Beaked sedge		x		x	x	x	xx			
Wm03 Awned sedge	x				x					
Wm04 Common spike-rush	x	x		xx	x	x	xx		x	
Wm05 Cattail	xxx	x		xx	xx	x	xx	xx	x ^s	
Wm06 Great bulrush	xxx	x		x	xx	xx	x	x	x	
Wm07 Baltic rush	x				xx					
Wm50 Sitka sedge – Hemlock-parsley								xx	xx	
Wm51 Three-way sedge				x				x	x	

x = incidental; < 5% of wetlands

xx = minor; 5–25% of wetlands

xxx = major; >25% of wetlands

s = southern subzones only

TABLE 5.3.2 Marsh Species Importance Table

Species		Wm01	Wm02	Wm03	Wm04	Wm05
Herbs and Dwarf Shrubs	<i>Carex utriculata</i>					
	<i>Carex aquatilis</i>					
	<i>Equisetum fluviatile</i>					
	<i>Comarum palustre</i>					
	<i>Sium suave</i>					
	<i>Carex exsiccata</i>					
	<i>Carex atherodes</i>					
	<i>Polygonum amphibium</i>					
	<i>Eleocharis palustris</i>					
	<i>Potamogeton richardsonii</i>					
	<i>Typha latifolia</i>					
	<i>Schoenoplectus acutus</i>					
	<i>Menyanthes trifoliata</i>					
	<i>Utricularia macrorhiza</i>					
	<i>Juncus balticus</i>					
	<i>Hordeum jubatum</i>					
	<i>Potentilla anserina</i>					
	<i>Calamagrostis canadensis</i>					
	<i>Cicuta douglasii</i>					
	<i>Lysichiton americanus</i>					
	<i>Oenanthe sarmentosa</i>					
	<i>Galium trifidum</i>					
	<i>Spiraea douglasii</i>					
	<i>Carex sitchensis</i>					
	<i>Nuphar lutea</i> ssp. <i>polysepala</i>					
	<i>Dulichium arundinaceum</i>					
Mosses	<i>Drepanocladus</i> spp.					
	<i>Wamstorfia</i> spp.					

Carex atherodes

General Description

The Awned sedge Marsh Site Association is uncommon and restricted to dry climates of the Central Interior at low to middle elevations. These marshes are generally small and occur most



commonly in small potholes surrounded by forest, where water levels are shallow and relatively constant.



Sites are always dominated by *Carex atherodes*, but infrequently other species, such as *Drepanocladus aduncus*, *Myriophyllum verticillatum*, *Alopecurus aequalis*, or *Carex utriculata*, occur in abundance.

Standing water is slightly alkaline; rooting substrates are fine-textured mineral or shallow sedge-derived peat. Common soil types are Humisols and Humic Gleysols.

Characteristic Vegetation

- Tree layer** (0 - 0 - 0)
- Shrub layer** (0 - 0 - 4)
- Herb layer** (55 - 90 - 100)
- Carex atherodes*
- Moss layer** (0 - 0 - 95)
- Drepanocladus aduncus*

Comments

This unit is similar to the *Wm01* but is much more limited in distribution and seems to be favoured by more alkaline waters. In the BG zone, Woolly sedge marshes occur on sites similar to the *Wm03* (see additional units).

Wm03 sites often occupy entire basins but they are also found in small patches within some larger *Wm01* or *Wm08* marshes.

The distribution of *Wm03* is primarily within rangelands and *C. atherodes* is palatable; many sites experience some level of grazing pressure.

Wetland Edatopic Grid

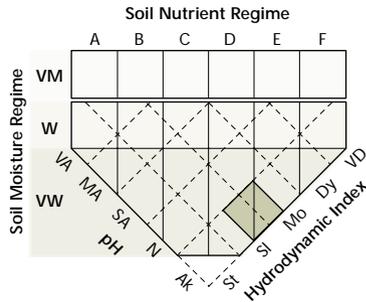


TABLE 5.3.1 Distribution of Marsh Site Associations by biogeoclimatic zone

	BG PP	BWBS SWB	ESSF	ICH	IDF	MS	SBPS SBS	CDF	CWH	MH
Wm01 Beaked sedge – Water sedge	x	xx	x	xxx	xxx	xx	xx		x	
Wm02 Swamp horsetail – Beaked sedge		x		x	x	x	xx			
Wm03 Awned sedge	x				x					
Wm04 Common spike-rush	x	x		xx	x	x	xx		x	
Wm05 Cattail	xxx	x		xx	xx	x	xx	xx	x ^s	
Wm06 Great bulrush	xxx	x		x	xx	xx	x	x	x	
Wm07 Baltic rush	x				xx					
Wm50 Sitka sedge – Hemlock-parsley								xx	xx	
Wm51 Three-way sedge				x				x	x	

x = incidental; < 5% of wetlands

xx = minor; 5–25% of wetlands

xxx = major; >25% of wetlands

s = southern subzones only

TABLE 5.3.2 Marsh Species Importance Table

Species		Wm01	Wm02	Wm03	Wm04	Wm05
Herbs and Dwarf Shrubs	<i>Carex utriculata</i>					
	<i>Carex aquatilis</i>					
	<i>Equisetum fluviatile</i>					
	<i>Comarum palustre</i>					
	<i>Sium suave</i>					
	<i>Carex exsiccata</i>					
	<i>Carex atherodes</i>					
	<i>Polygonum amphibium</i>					
	<i>Eleocharis palustris</i>					
	<i>Potamogeton richardsonii</i>					
	<i>Typha latifolia</i>					
	<i>Schoenoplectus acutus</i>					
	<i>Menyanthes trifoliata</i>					
	<i>Utricularia macrorhiza</i>					
	<i>Juncus balticus</i>					
	<i>Hordeum jubatum</i>					
	<i>Potentilla anserina</i>					
	<i>Calamagrostis canadensis</i>					
	<i>Cicuta douglasii</i>					
	<i>Lysichiton americanus</i>					
	<i>Oenanthe sarmentosa</i>					
	<i>Galium trifidum</i>					
	<i>Spiraea douglasii</i>					
	<i>Carex sitchensis</i>					
	<i>Nuphar lutea</i> ssp. <i>polysepala</i>					
	<i>Dulichium arundinaceum</i>					
Mosses	<i>Drepanocladus</i> spp.					
	<i>Wamstorfia</i> spp.					

TABLE 5.3.1 Distribution of Marsh Site Associations by biogeoclimatic zone

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Wm01 Beaked sedge – Water sedge	x	xx	x	xxx	xxx	xx	xx		x	
Wm02 Swamp horsetail – Beaked sedge		x		x	x	x	xx			
Wm03 Awned sedge	x				x					
Wm04 Common spike-rush	x	x		xx	x	x	xx		x	
Wm05 Cattail	xxx	x		xx	xx	x	xx	xx	x ^s	
Wm06 Great bulrush	xxx	x		x	xx	xx	x	x	x	
Wm07 Baltic rush	x				xx					
Wm50 Sitka sedge – Hemlock-parsley								xx	xx	
Wm51 Three-way sedge				x				x	x	

x = incidental; < 5% of wetlands

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xxx = major; >25% of wetlands

s = southern subzones only

TABLE 5.3.2 Marsh Species Importance Table

Species		Wm01	Wm02	Wm03	Wm04	Wm05
Herbs and Dwarf Shrubs	<i>Carex utriculata</i>					
	<i>Carex aquatilis</i>					
	<i>Equisetum fluviatile</i>					
	<i>Comarum palustre</i>					
	<i>Sium suave</i>					
	<i>Carex exsiccata</i>					
	<i>Carex atherodes</i>					
	<i>Polygonum amphibium</i>					
	<i>Eleocharis palustris</i>					
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	<i>Galium trifidum</i>					
	<i>Spiraea douglasii</i>					
	<i>Carex sitchensis</i>					
	<i>Nuphar lutea</i> ssp. <i>polysepala</i>					
	<i>Dulichium arundinaceum</i>					
Mosses	<i>Drepanocladus</i> spp.					
	<i>Wamstorfia</i> spp.					

Wm06	Wm07	Wm50	Wm51	Common Name
				beaked sedge
				water sedge
				swamp horsetail
				marsh cinquefoil
				hemlock water-parsnip
				inflated sedge
				awned sedge
				water smartweed
				common spike-rush
				Richardson's pondweed
				common cattail
				great bulrush
				buckbean
				greater bladderwort
				Baltic rush
				foxtail barley
				common silverweed
				bluejoint
				Douglas' water-hemlock
				skunk cabbage
				Pacific water-parsley
				small bedstraw
				pink spirea
				Sitka sedge
				yellow pond-lily
				three-way sedge
				hook-mosses: intermediate
				hook-mosses: poor

Schoenoplectus acutus**General Description**

Great bulrush marshes occur widely in subzones with warm and dry summers. Wave-exposed lake embayments with significant water movements, and grassland potholes with occasional substrate exposure (conditions that provide abundant aeration and limit organic accumulations), are the most common locations for this Site Association.

Plant diversity is low; typically, *Schoenoplectus acutus* is the only species with significant cover. Bulrush marshes are usually adjacent

to open water in wetland mosaics and can sometimes be found in complex with the **Wm05**.

Floodwaters to 1.5 m depth in the spring are typical, with significant growing-season drawdown occurring in potholes. Great bulrush is tolerant of alkali soils and often dominates in brackish potholes. Soils are mostly Gleysols and Humic Gleysols, though Terric Humisols occasionally occur.

**Characteristic Vegetation**

Tree layer (0 - 0 - 0)

Shrub layer (0 - 0 - 5)

Herb layer (10 - 70 - 100)

Schoenoplectus acutus

Moss layer (0 - 0 - 60)

Comments

The **Wm06** includes marshes dominated by *S. tabernaemontani* (soft-stemmed bulrush). On wave-exposed lake shorelines or where sites are more brackish, *S. acutus* is more frequent, while in protected waters and potholes with mucky substrates, *S. tabernaemontani* is typical.

Site conditions for **Wm05** and **Wm06** overlap. *S. acutus* dominates on sites with alkaline mineral soils, greater wave exposure, or pronounced surface drying. Where marshes are heavily grazed by Muskrat, *S. acutus* is often favoured over *Typha latifolia* because it stores nutrients in the root mass and recovers more rapidly from grazing.

Wetland Edatopic Grid