

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

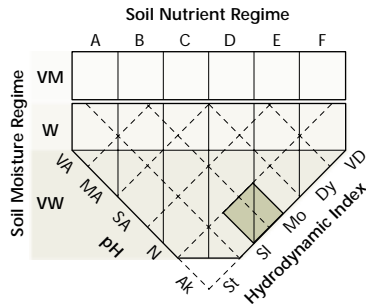


TABLE 5.3.1 Distribution of Marsh Site Associations by biogeoclimatic zone

	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.					

Typha latifolia

General Description

Cattail marshes are common throughout the Coast and Interior at low elevations in subzones with warm summers. They occur most commonly in protected lake embayments and potholes or even roadside ditches, where the surface substrate remains saturated for most of the growing season.

Typha latifolia dominates, often with few other rooted plants present, especially where nutrient levels are high and *T. latifolia* growth profuse. Occasionally there is significant cover of *Carex utriculata*, *Schoenoplectus acutus*, or *Lemna* spp.

These sites often have organic veneers of well-decomposed, odiferous muck. Soil types can be Humisols or Humic Gleysols. Water depths may be up to 1 m in the spring but recede in late summer, sometimes to the surface.



Characteristic Vegetation

- Tree layer (0 - 0 - 0)
- Shrub layer (0 - 0 - 10)
- Herb layer (40 - 80 - 100)
- Typha latifolia*
- Moss layer (0 - 0 - 90)

Comments

Typha latifolia effectively turns high nutrient levels (N and P) into biomass and often dominates wetlands experiencing nutrient loading. Addition of agricultural or human waste to most wetlands will lead to an increase and eventual dominance by *T. latifolia* if climatic conditions are favourable. Initial *T. latifolia* establishment requires substrate exposure for seedling establishment and germination, though once established it spreads extensively by rhizomes so that large stands may consist of only a few individual plants.

Similar sites with more dynamic hydrology or lower N and P are usually occupied by Wm06. Patches of *S. acutus* in Wm05 marshes can be a result of intensive grazing by Muskrat. *S. acutus* stores nutrients in the root mass and can more rapidly recover from removal of its stem than can *T. latifolia*.

Wetland Edatopic Grid

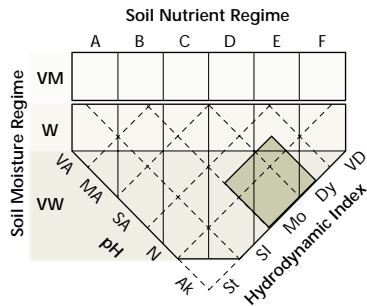


TABLE 5.3.1 Distribution of Marsh Site Associations by biogeoclimatic zone

	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.					

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.

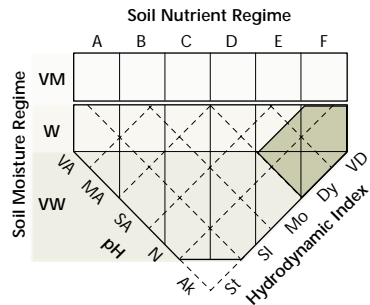
Wetland Edatopic Grid

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	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.					

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

Juncus balticus

General Description

Baltic rush saline meadows/marshes are common in the Chilcotin Plateau and uncommon in the dry climates of the Southern Interior and Southern Interior Mountains. The **Wm07** occurs in alkaline or saline potholes, primarily closed basins, where there is early-season inundation followed by gradual watertable drop to below the surface.



Juncus balticus is always dominant on **Wm07** sites. Other saline-tolerant species such as *Carex praegracilis*, *Potentilla anserina*, and *Puccinellia nuttalliana* may occur, especially on drier sites.

Soils are fine textured, and poorly to imperfectly drained, with up to 10 cm of surface organic accumulation. The upper horizons remain wet throughout most of the growing season. When these sites dry out, a salt or alkali crust is often evident.

Characteristic Vegetation

- Tree layer** (0 - 0 - 0)
- Shrub layer** (0 - 0 - 2)
- Herb layer** (15 - 70 - 100)
- Hordeum jubatum*, *Juncus balticus*, *Potentilla anserina*
- Moss layer** (0 - 5 - 20)

Comments

The **Wm07**, along with other communities of saline or alkaline soils conditions, requires site conditions that concentrate salts. These conditions are found in closed basins of semi-arid climates, where high evaporation rates and limited freshwater inflow lead to salt concentration. These same conditions also result in variable watertables within and between years, reflecting a changing balance of inflows and evaporation. Under these variable conditions the optimum environment for Site Associations changes location within the basin between years. *Juncus balticus* occupies those zones where flooding is shallow but soils do not completely dry out in the summer. **Wm07** can form extensive stands in seasonally flooded depressions or as peripheral communities in the drawdown zone around permanent ponds and **Wm06** marshes. Drier sites are **Gs03** or **Gs02**.

Wetland Edatopic Grid

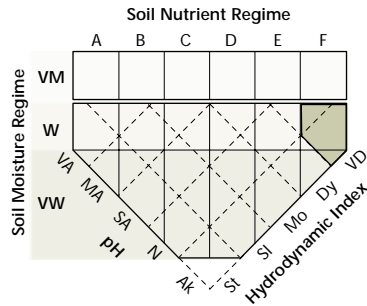


TABLE 5.4.1 Distribution of Swamp Site Associations by biogeoclimatic zone

	BG PP	BWBS SWB	ESSF	ICH	IDF	MS	SBPS SBS	CDF	CWH	MH
Ws01 Mountain alder – Skunk cabbage – Lady fern				XX			XX ^w			
Ws02 Mountain alder – Pink spirea – Sitka sedge		X	X	XX	X	X	X ^w		X	
Ws03 Bebb's willow – Bluejoint	X	XX					XX			
Ws04 Drummond's willow – Beaked sedge				X	X	X	XX			
Ws05 MacCalla's willow – Beaked sedge					X		X			
Ws06 Sitka willow – Sitka sedge				XX			X ^w			
Ws07 Spruce – Common horsetail – Leafy moss		XX	X	XX	XX	XX	XXX			
Ws08 Subalpine fir – Sitka valerian – Common horsetail			XX							
Ws09 Black spruce – Skunk cabbage – Peat-moss				XX			X ^w			
Ws10 Western redcedar – Spruce – Skunk cabbage				XX						
Ws11 Spruce – Subalpine fir – Skunk cabbage							X ^w			
Ws50 Pink spirea – Sitka sedge				X			X ^w	XXX	XX	
Ws51 Sitka willow – Pacific willow – Skunk cabbage				X				X	X	
Ws52 Red alder – Skunk cabbage								XX	XX	
Ws53 Western redcedar – Sword fern – Skunk cabbage								X	X ^x	
Ws54 Western redcedar – Western hemlock – Skunk cabbage								X	XX	
Ws55 Yellow-cedar – Mountain hemlock – Skunk cabbage										XX

x = incidental; < 5% of wetlands

w = wet subzones only

xx = minor; 5–25% of wetlands

x = very dry subzones only

xxx = major; >25% of wetlands

TABLE 5.4.2 Swamp Species Importance Table

Species		Ws03	Ws04	Ws05	Ws02	Ws06	Ws07	Ws08	Ws01
Trees	<i>Picea X</i>								
	<i>Picea mariana</i>								
	<i>Abies lasiocarpa</i>								
	<i>Tsuga heterophylla</i>								
	<i>Thuja plicata</i>								
	<i>Picea sitchensis</i>								
	<i>Alnus rubra</i>								
	<i>Acer macrophyllum</i>								
	<i>Chamaecyparis nootkatensis</i>								
	<i>Tsuga mertensiana</i>								
	<i>Abies amabilis</i>								
	Shrubs	<i>Salix bebbiana</i>							
<i>Salix drummondiana</i>									
<i>Salix maccalliana</i>									
<i>Alnus incana</i>									
<i>Lonicera involucrata</i>									
<i>Spiraea douglasii</i>									
<i>Cornus stolonifera</i>									
<i>Vaccinium alaskaense/ovalifolium</i>									
<i>Salix sitchensis</i>									
<i>Salix lucida</i>									
<i>Rubus spectabilis</i>									
<i>Sambucus racemosa</i>									
<i>Gaultheria shallon</i>									
<i>Ribes bracteosum</i>									
<i>Elliottia pyroliflorus</i>									
Herbs and Dwarf Shrubs	<i>Calamagrostis canadensis</i>								
	<i>Carex aquatilis/sitchensis</i>								
Shrubs	<i>Carex utriculata</i>								
	<i>Gymnocarpium dryopteris</i>								
	<i>Valeriana sitchensis</i>								
	<i>Scirpus microcarpus</i>								
	<i>Equisetum arvense</i>								
	<i>Lysichiton americanus</i>								
	<i>Athyrium filix-femina</i>								
	<i>Tiarella trifoliata</i>								
	<i>Streptopus lanceolatus</i>								
	<i>Maianthemum dilatatum</i>								
	<i>Oenanthe sarmentosa</i>								
	<i>Polystichum munitum</i>								
	<i>Equisetum telmateia</i>								
	<i>Blechnum spicant</i>								
	<i>Veratrum viride</i>								
	<i>Fauria crista-galli</i>								
Mosses and Lichens	<i>Drepanocladus spp.</i>								
	<i>Mnium spp.</i>								
	<i>Aulacomnium palustre</i>								
	<i>Sphagnum spp.</i>								
	<i>Hylocomium splendens</i>								
	<i>Pleurozium schreberi</i>								
	<i>Eurhynchium praelongum</i>								
	<i>Rhytidiadelphus loreus</i>								

Salix bebbiana – *Calamagrostis canadensis*

General Description

Bebb's willow – Bluejoint swamps are uncommon but widespread throughout the drier climates of the Interior at elevations below 1200 m. They occur on lake flats, pond margins, fluvial terraces, seasonal creeks, and palustrine basins where early-season shallow standing water draws down to very moist conditions by late growing season.



Salix bebbiana forms an open canopy, often with a significant component of *Alnus incana*. Scattered spruce trees can occur. Various other shrub species are common in the understorey. *Calamagrostis canadensis* is a constant dominant but usually occurs only on raised microsites. *Equisetum arvense* and other horsetails can also be prominent. A diversity of other forbs with low cover is typical. Sites often have distinct mounds created by fallen trees, interspersed with sparsely vegetated pools of water; however, some stands are drier and have a more continuous herbaceous understorey.



Soils are fine-textured Gleysols, often with veneers of woody peat.

Characteristic Vegetation

- Tree layer** (0 - 2 - 5)
- Shrub layer** (20 - 46 - 99)
- Alnus incana*, *Cornus stolonifera*, *Lonicera involucrata*, *Salix bebbiana*
- Herb layer** (6 - 56 - 90)
- Calamagrostis canadensis*, *Carex utriculata*, *Equisetum arvense*
- Moss layer** (0 - 19 - 75)
- Mnium* spp.

Comments

The Ws03 has soils and hydrology characteristic of wetland ecosystems but typically has low cover of obligate hydrophytes.

Wetland Edatopic Grid

