Wetland Series

This is the fourth installment in a series of papers introducing wetlands titled *Wetlands – shedding some light into their murky waters*. This installment introduces vascular and non-vascular plant communities of the dominant wetland classes in western continental Canada.

Part 4: Western Continental Wetland Plant Communities

*by David A. Locky and Markus N. Thormann**

Introduction

Wetland classifications are by definition static categorizations of dynamic systems. Hydrological regimes and plant communities can vary markedly as wetlands develop over time. Using hydrophytic plants to indicate wetland boundaries is useful in delineating boundaries. Using species assemblages assists in classification a site. Plants are easy to collect and plant remains can be found throughout the year. However, once a site has been identified as a wetland it may still be difficult to properly classify that wetland into one of the five wetland classes (bog, fen, marsh, shallow open water, and swamp) (NWWG 1997). One example is the classification of open fens and marshes. Many fens are sedge dominated and appear to be very similar floristically to sedge dominated marshes. This separation is particularly troublesome in regions where fens and marshes are common, *e.g*., in the southern boreal forest. It may also be difficult to separate the different fen types from one another, *e.g*., moderate-rich from extreme-rich fens, because this separation is based on the number of rich fen indicator species. Rich fen indicators, the physical manifestation of extreme minerotrophy, often remain at a fen long after that site has developed into a moderate-rich or even poor fen.

Wetlands, although distinct entities unto themselves (*i.e*., not intergrades between aquatic and upland systems), need to be described using both boundaries (*e.g*., wetland and upland) and gradients. Using plant species alone will not always guarantee indicators of a particular wetland class. More realistically and preferred, one should take into consideration the suite of plant species in addition to the chemical variables (vegetation, soil, and/or surface water) at the site to classify the wetland into class and form, *e.g*., class 'fen' and form 'riparian fen' (Mewhort 2000).

That said, plants are still the most important element of wetland classification at the finest scale, i.e., wetland type. Reading a description of every plant species in *The Flora of Alberta by E.H. Moss* (Packer 1983) would reveal that of the 1,775 vascular plants in Alberta, nearly 250 (14%) grow in wetlands (Vitt et al. 1996). This number would undoubtedly increase if the floras of other provinces and territories in Canada as well as non-vascular plants (mosses, liverworts, hornworts, and lichens) were included. More research is required to (a) complete the list of wetland plants in Canada and (b) gain a better understanding of the factors controlling the distribution of specific plants in different ecosystems, including wetlands. Some work has been done on peatland moss (Gignac and Vitt 1990, Gignac 1992, Belland and Vitt 1995, Vitt and Belland 1995, Gignac et al. 1998, Beilman 2001, Locky unpubl.) and vascular plant (Kenkel 1987, Jeglum and He 1995, Beilman 2001, Locky unpubl.) communities in Canada. However, these studies are relatively uncommon, despite the ubiquity of wetlands in Canada.

The purpose of this installment is to provide a list of plant species (Table 1) one would likely encounter on a visit to western continental wetlands (Manitoba, Saskatchewan, and Alberta). It is not intended to be a complete list or the last word in wetland plant indicators. We used our own experience and information from a wide variety of sources for the list. Readers are encouraged to consult references in our bibliography for further information.

Most species in the list are common, but we also included some rare species. In some cases, only genera are listed. Keep in mind that most wetland plants are not restricted to a specific class of wetlands (Table 1). For example, black spruce, *Picea mariana*, grows in bogs, fens, and swamps, while the big red stem moss, *Pleurozium schreberi*, can be found in many types of fens and bogs. To add to the confusion, both of these plants grow in non-wetland ecosystems as well. Conversely, some of the plants can occur redominantly in one wetland class (using water chemistry, e.g., pH, calcium, as modifier of

continued on page 4

wetland site type). For example, *Scorpidium scorpioides*, scorpion feather moss, is found almost exclusively in extreme-rich fens. Additionally, many species of pondweed, *Potamogeton*, grow almost exclusively in shallow open water wetlands. The degree of shading at a site can dictate species assemblages. Prostrate sedge, *Carex chordorrhiza,* is found in rich fens but only in habitats with little tree or shrub cover. Whether or not a particular plant occurs in more than one wetland class or is "restricted" to a specific wetland class depends on a variety of factors, including primarily water level (moisture), shade, peat depth, acidity, nutrient concentrations, geography, and climate.

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Surface water replenished in Wagner this spring!
Photo: Patsy Cotterill

Wetlands (4) *continued*

Table 1**: Vegetation by Wetland Type**

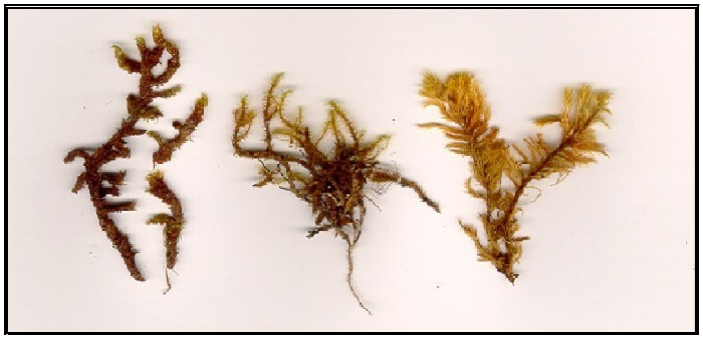
Vascular and non-vascular plants of western continental wetlands in Canada. "Mod R" = moderate-rich fens; "Ext R" = Extreme-rich fens; "Min" (swamp) = mineral swamps; "SWW" = shallow water wetlands; "x" = common in that wetland class; "-" = present in that wetland class; "Sph" = *Sphagnum* moss; "FM" = feather moss; "BM" = brown moss. Nomenclature is according to Packer (1983) for vascular plants and according to Anderson (1990) and Anderson et al. (1990) for non-vascular plants.

Plants		**Bog**	**Fen**			**Swamp**		**Marsh**	**SWW**
Common Name	**Latin Name**		**Poor**	**Mod R**	**Ext R**	**Peat**	**Min**		
Trees									
Black spruce	*Picea mariana*	x	x	x	x	x			
Jack pine	*Pinus banksiana*	-	-	-	-	-			
Tamarack	*Larix laricina*	-	x	x	x	-			
Balsam Fir	*Abies balsamea*			-		-			
Tall Shrubs									
Willows	*Salix* spp.	x	x	x	x	x	x	-	
Dwarf Birch	*Betula pumila*	-	-	x	x	x	-		
Alder-leaved Buckthorn	*Rhamnus alnifolia*			x		-	x		
Low Shrubs									
Labrador Tea	*Ledum groenlandicum*	x	x	x	x	x			
Leatherleaf	*Chamaedaphne calyculata*	x	x	-					
Northern Bog-laurel	*Kalmia polifolia*	x	x	-					
Dwarf Bog-rosemary	*Andromeda polifolia*	-	x	x					
Small Bog Cranberry	*Oxycoccus microcarpus*	x	x	x	-	-			
Bog Cranberry/Lingonberry	*Vaccinium vitis-idaea*	x	x	x	-	-			
Cloudberry	*Rubus chamaemorus*	x	x	-					
Currants and Gooseberries	*Ribes* spp.			x	-	x			
Herbs									
Three-leaved False Solomon's Seal	*Smilacina trifolia*	x	x	x	x	-			
Buckbean	*Menyanthes trifoliata*		-	x	x				
Pitcher Plant	*Sarracenia purpurea*	x			x				
Sundews	*Drosera* spp.	x	x	x	x				
Grass-of-Parnassus	*Parnassia palustris*			x	x				
Seaside Arrow-grass	*Triglochin maritima*			x	x				
Northern Green Bog Orchid	*Habenaria hyperborea*			x	x	-			
Round-leaved Orchid	*Orchis rotundifolia*			x	x	-			
Sticky False Asphodel	*Tofieldia glutinosa*				x				
Bedstraw	*Galium* spp.			x	x	x	x	x	
Tufted Loosestrife	*Lysimachia thrysifolia*			-			x	x	
Nodding Beggarticks	*Bidens cernua*			-			x	x	
Northern Water Hore-hound	*Lycopus uniflorus*						x	x	
Marsh Scullcap	*Scutellaria galericulata*			x			x	x	
Marsh Speedwell	*Veronica scutellaria*						x	x	
Narrow-leaved Emergents									
Horsetails	*Equisetum* spp.	x	x	x	x	x	x	x	x
Tall Cottongrass	*Eriophorum angustifolium*		-	x	-				
Sheathed Cottongrass	*Eriophorum vaginatum*	x	x	-					
Prostrate Sedge	*Carex chordorrhiza*		-	x	-				
Northern Bog Sedge	*Carex gynocrates*	-	x	x	-	-			
Hairy-fruited Sedge	*Carex lasiocarpa*		-	x	-				
Shore Sedge	*Carex limosa*			x	x				
Lakeshore Sedge	*Carex lacustris*			x				x	
Water Sedge	*Carex aquatilis*		x	x	x	-	-	x	
Awned Sedge	*Carex atherodes*		x	x	x			x	-
Two-stamened Sedge	*Carex diandra*		-	x	-				

continued on page 6

Table 1. Vegetation by Wetland Type *(continued)*

Rushes	*Juncus* spp.			x	x			x	-
Bluejoint Grasses	*Calamagrostis* spp.			x	-	-	-	x	
Burreeds	*Sparganium* spp.							x	x
Reed Canary Grass	*Phalaris arundinacea*							x	
Common Mare's-tail	*Hippuris vulgaris*							x	x
Bryophytes									
Sph - Rusty Peat Moss	*Sphagnum fuscum*	x	x	x	-				
Sph - Poor Fen Peat Moss	*Sphagnum angustifolium*	x	x	x	-	-			
Sph - Small Red Peat Moss	*Sphagnum capillifolium*	x	x	x	-	-			
Sph - Midway Peat Moss	*Spagnum magellanicum*	x	x	x	-	-			
Sph - Warnstorf's Peat Moss	*Sphagnum warnstorfii*		-	x	x	-			
FM - Big Red-stem Moss	*Pleurozium schreberi*	x	x	x	-	x			
FM - Stair-step Moss	*Hylocomium splendens*	-	-	-	-	x			
FM - Knight's Plume Moss	*Ptilium crista-castrensis*	-	-	-	-	x			
BM - Yellow Star Moss	*Campyllium stellatum*		-	x	x	-			
BM - Red Hook Moss	*Drepanocladus revolvens*		-	x	-				
BM - Hook Moss	*Drepanocladus vernicosus*			-	x				
BM - Scorpion Feather Moss	*Scorpidium scorpioides*			-	x				
BM - Common Hook Moss	*Drepanocladus aduncus*			x	-	-	x	x	
Golden Fuzzy Fen Moss	*Tomenthypnum nitens*		-	x	x	-			
Three-angled Thread Moss	*Meesia triquetra*			x	x				
Glow Moss	*Aulacomnium palustre*	-	x	x	x	x			
Common Tree Moss	*Climacium dendroides*			x		-	x		
Hard Scale Liverwort	*Mylia anomala*	x	-						
Robust Emergents									
Bulrushes	*Scirpus* spp.			x	x			x	-
Cattail	*Typha latifolia*						-	x	x
Broad-leaved Emergents									
Water Plantain	*Alisma plantago-aquatica*						x	x	x
Water Arum	*Calla palustris*							x	x
Arrowheads	*Sagittaria* spp.							x	x
Floating Plants									
Duckweed	*Lemna* spp.						x	x	x
Yellow Water-lily	*Nuphar variegatum*							-	x
Pondweeds	*Potamogeton* spp.							x	x
Water Smartweed	*Polygonum amphibium*							x	x
Submerged Plants									
Bladderworts	*Utricularia* spp.				x			-	x
Stoneworts	*Chara* spp.				x			-	x
Pondweeds	*Potamogeton* spp.							-	x
Coontail	*Ceratodon demersum*							-	x
Water-milfoil	*Myriophyllum* spp.							-	x



Common mosses of Wagner, from left: *Scorpidium scorpioides*, found in and around the edges of marl ponds; *Campylium stellatum*, common fen species; *Tomenthypnum nitens*, species of fen edges and black-spruce-tamarack treed fens. All these are brown mosses. About ½ life size.