



Alberta Wetland Classification System **Field Guide**



ACKNOWLEDGMENTS

Ducks Unlimited Canada has developed this field guide with support from Alberta Environment and Parks and the Alberta North American Waterfowl Management Plan (NAWMP) Partnership.

Funding for this work was provided through a Water Innovation Program grant from Alberta Innovates, as well as funding through the Alberta NAWMP Partnership, Prairie Habitat Joint Venture and Ducks Unlimited Canada.



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ISBN 978-0-9812303-9-9

Ducks Unlimited Canada (2021). Alberta Wetland Classification System Field Guide. Edmonton, AB

Photos and illustrations by Ducks Unlimited Canada unless noted.

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INTRODUCTION

Purpose

This guide is intended to help users identify and classify wetlands in the field. It is based on the **Alberta Wetland Classification System** (AWCS; ESRD, 2021) and will assist users in identifying the five wetland classes (bog, fen, swamp, marsh, shallow open water), as well as their forms and types, using readily observable soil, vegetation and hydrology (water) characteristics.

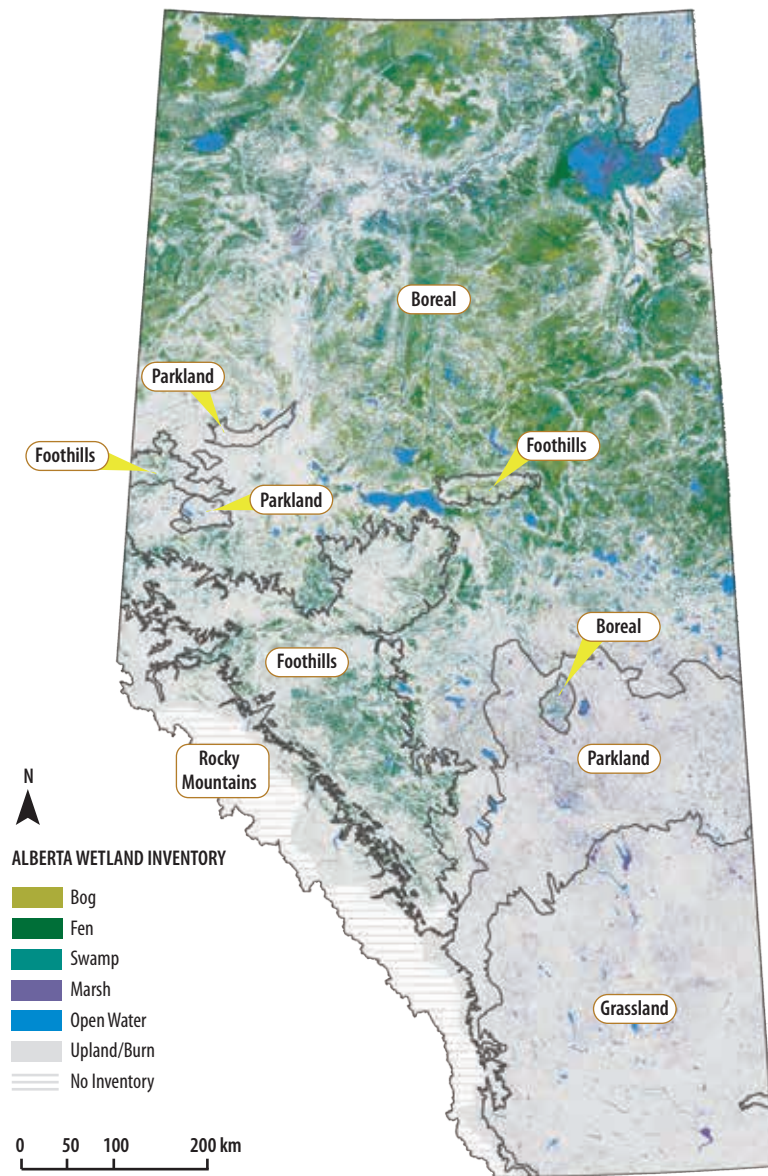


This guide is intended for:

- Anyone interested in identifying and classifying wetlands in Alberta.
- People whose decisions or actions impact wetlands or their functions.

This guide can be used as:

- A quick reference field guide to assist in identifying and classifying Alberta's wetlands and in understanding their functions and values.
- A resource for recognizing and describing soil and plant species characteristic of Alberta's wetlands.
- A support for extension activities related to community or industry knowledge exchange programs.



Distribution of Wetlands in Alberta.
Developed with data from the Alberta Merged Wetland Inventory (2020) and Natural Subregions of Alberta (2005).

Distribution of Wetland Classes in Alberta - Bogs, fens and swamps are the most common wetland classes in northern Alberta and cover vast expanses of the boreal region. Further south, marshes and shallow open water systems become more common as the province transitions into the parkland and grassland natural regions.

What is a Wetland?

“Land saturated with water long enough to promote formation of water altered soils, growth of water tolerant vegetation, and various kinds of biological activity that are adapted to a wet environment.”

- Alberta Wetland Policy 2013

Some wetlands are isolated, while others are highly interconnected along a landscape gradient. These interconnected wetlands are often referred to as wetland complexes and are particularly prevalent in the boreal region.



Marsh (in an agricultural area).



Fen (in the boreal region).



Wetland complex (in the boreal region).

Wetland Functions and Values

Wetland functions provide ecological, economic and cultural values to Albertans:

- Flood and drought mitigation by storing and slowly releasing water.
- Improved water quality by filtering nutrients and contaminants.
- Groundwater recharge.
- Carbon storage and sequestration to help regulate the climate.
- Highly productive ecosystems supporting a rich array of biodiversity.
- Economic benefits from resource industries such as horticulture, fur harvest, agriculture and forestry.
- Recreation and ecotourism opportunities (e.g., hunting, bird watching).
- Intrinsic values for First Nations and Métis culture, tradition and knowledge.



Waterfowl taking flight from a shallow open water wetland.



Hoping to catch sight of wetland wildlife.



Leopard frog.



Whooping crane.

Wetland Biodiversity - Wetlands support more than 600 species of plants in Alberta, some of which are rare or provincially listed as threatened or endangered. Wetlands provide critical habitat for waterfowl, other migratory birds and a diversity of other wildlife species. Examples include several species at risk such as the northern leopard frog, piping plover, trumpeter swan, whooping crane and woodland caribou¹.

1. Alberta ESRD, 2015

Impacts to Wetlands

Although wetland functions and values are now well-known, it was not until the latter part of the 20th century that the need for wetland protection and conservation was recognized. As a result, two thirds of wetlands have been lost in the settled areas of Alberta mainly due to agricultural drainage activities and urban development¹. Losses in the boreal region are more difficult to quantify and are associated with expanding resource extraction, agriculture and development activities.



Flooded road crossing a shallow open water wetland during a wet year.



Beaver dam constructed across a fen.



Peatland following wildfire disturbance.



Cultivated wetland in a wet spring.

Disturbed Wetlands - Wetlands that have been disturbed either by natural (e.g., beaver influence, wildfire) or human causes (e.g., cultivation, road construction, infilling or drainage) may exhibit atypical characteristics such as an altered water regime.

1. ESRD, 2013



HOW WETLANDS ARE CLASSIFIED

Major Soil Groups

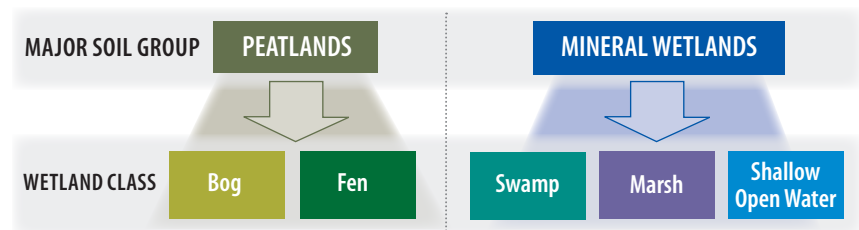
Wetlands are divided into two major soil groups: organic and mineral wetlands. Peatlands are characterized by thick layers of organic soil (peat) and are commonly referred to as muskegs, mires or lowland areas. Mineral wetlands are characterized by mineral soils (sand, silt and clay). If there is organic soil that is thick (more than 40 cm) it is classified as a peatland, and there is a thin layer of organic soil (less than 40 cm), or if it is absent, it is classified as a mineral wetland.



Von Post Decomposition Ratings - Von Post decomposition is a field test that estimates the degree of decomposition in a soil on a scale of 1 to 10 which may be used to help differentiate peatlands from mineral soil wetlands. See Appendix B: Von Post Decomposition Ratings (page 146)

Wetland Classes

There are 5 classes of wetlands in the AWCS: bog, fen, swamp, marsh and shallow open water. The peatlands are bog and fen, and the mineral wetlands are swamp, marsh and shallow open water.



Peatlands: Bogs and Fens

- Characterized by poorly decomposed organic soil (peat) deposits more than 40 cm deep that build up slowly due to wet, cool, oxygen-deprived conditions.
- Peat is partially decomposed bryophytes (mosses), herbaceous (non-woody) plants and woody debris, with a Von Post decomposition ranking of 5 or less.
- Tend to have permanently saturated (wet) soil and relatively stable water tables, at or near the surface in fens and further below the surface in bogs.
- The major factor that differentiates bogs and fens is their water source:
 - Bogs are ombrotrophic, receiving water from precipitation (rain or snow).
 - Fens are minerotrophic, receiving water from groundwater or surface water inflows in addition to precipitation, thereby accumulating minerals as the water interacts with soils and bedrock.



Bog. See Wetland Fact Sheets (page 38).



Fen. See Wetland Fact Sheets (page 44).

Peatland Swamps - Across the boreal region there are cases where coniferous swamps exist on deep (more than 40 cm) peat deposits. These systems can be distinguished from bogs or fens by a tall, dense tree canopy and less abundant *Sphagnum* and brown moss cover.

Mineral Wetlands: Swamps, Marshes and Shallow Open Water

- Characterized by having no organic soil or shallow organic deposits typically less than 40 cm deep, containing nutrient-rich soils and water.
- Some mineral wetlands (e.g., conifer swamps) have organic soils with highly decomposed plant materials and a Von Post ranking of more than 5 in the upper 40 cm of soil.
- Tend to have naturally fluctuating water levels, with water tables near, at or above the surface for variable periods during the year.
- Water level fluctuations increase decomposition rates, influence water chemistry, nutrient availability and plant community structure and composition.



Swamp. See Wetland Fact Sheets (page 50).



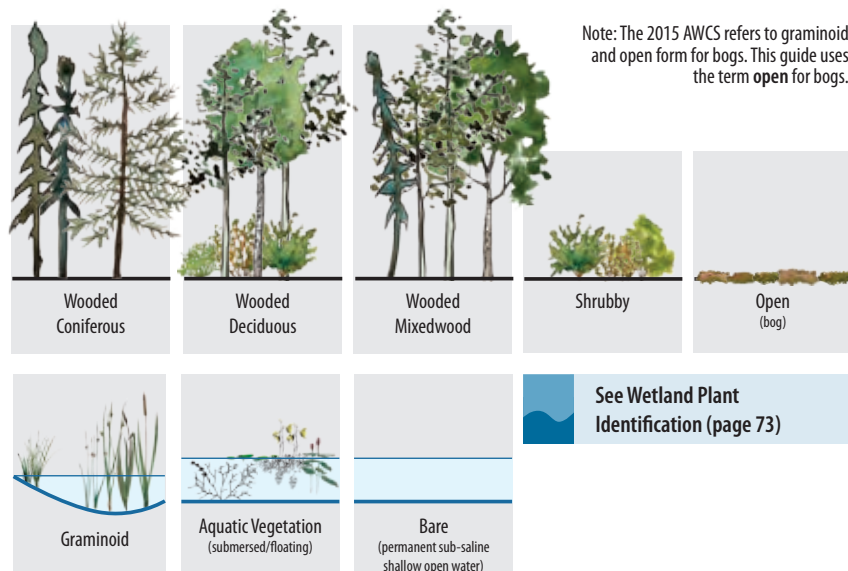
Marsh. See Wetland Fact Sheets (page 56).



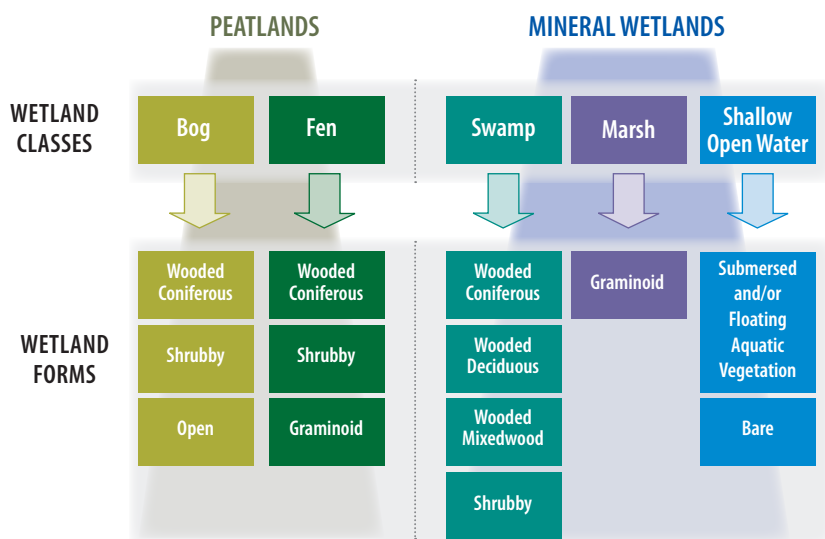
Shallow open water. See Wetland Fact Sheets (page 64).

Wetland Forms

Wetland **classes** are divided into **forms** using the predominant vegetation structure:



These subdivisions recognize the influence vegetation structure has on wetland processes and biodiversity. Some wetland classes have one wetland form (e.g., marshes are graminoid wetlands), others may have multiple wetland forms (e.g., fens may have graminoid, shrubby or wooded forms).

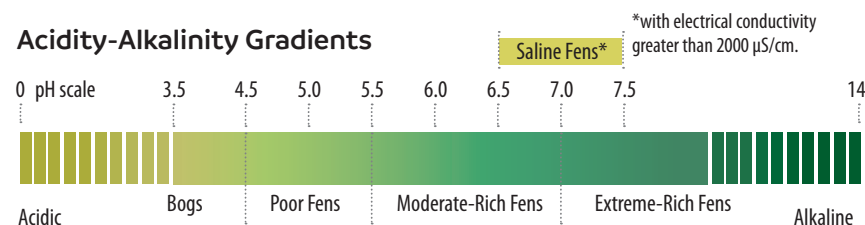


Wetland Types

Wetland forms are further subdivided into types based on acidity-alkalinity, water permanence and salinity (salt) gradients. Classifying a wetland to its type may be important for conserving or restoring specific wetland communities and functions.

See **STEP 3. WETLAND FACT SHEETS** (page 37) for extensive details on wetland types.

Acidity-Alkalinity Gradients



An important gradient in characterizing peatland types, acidity-alkalinity is measured as the pH of the surface or shallow groundwater. Acidity-alkalinity is not used to characterize swamp, marsh or shallow open water wetland types. All bogs are acidic, while fens are characterized by poor, moderate-rich, extreme-rich and saline types (see scale above).



Bog.



Poor fen.



Moderate-rich fen.



Extreme-rich fen.

Water Permanence and Vegetation Zones

Wetland types in marsh and shallow open water systems can be determined by the characteristic vegetation communities (or “zones”) occupying the deepest part of the wetland. Extending from the centre of the wetland outward, vegetation zones are organized along a water permanence gradient based on tolerance of various water levels. Marshes have 3 types of water permanence and shallow open waters have 4, ranging from surface water that is temporary to permanent. Marshes have graminoid species in the deepest portion of the wetland, and shallow open waters have aquatic species.

Marsh water permanence types:



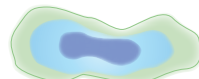
Temporary

Surface water is present for a short period of time after snowmelt or heavy rainfall.



Seasonal

Surface water is present through most of an average growing season, but wetland is dry by late summer.



Semi-permanent

Surface water is present for most or all of the year, except during drought years.

Vegetation zones:



wet meadow



shallow wetland



deep wetland

Shallow Open Water water permanence types:



Seasonal

Surface water is present through most of an average growing season, but wetland is dry by late summer.



Semi-permanent

Surface water is present for most or all of the year, except during drought years.



Permanent

Surface water up to 2 m deep is present throughout the year, even in drought conditions.



Intermittent

Alternates between saline open water and exposed bare soil (salt flats).

Vegetation zones:



wet meadow



shallow wetland



submersed/floating aquatic



submersed aquatic or open water



submersed alkali

Water permanence is not used to characterize peatland (bog and fen) or wooded swamp wetland types. Although shrubby swamps are characterized along a water permanence gradient, distinct vegetation community zones have not been described as they have for marsh and shallow open water classes.

The Stuart and Kantrud wetland classification system (1971) is a common wetland classification system used in Canada's prairie region. For more information, see Appendix A (page 143).



Wet meadow vegetation community of a temporary marsh in an agricultural area.



Submersed/floating aquatic vegetation community of a seasonal shallow open water.



Shallow wetland vegetation community of a seasonal marsh.



Graminoid vegetation community of a semi-permanent shallow open water.



Deep wetland vegetation community of a semi-permanent marsh.



Submersed aquatic or open water community of a permanent shallow open water.

Natural Fluctuations in Wetland Water Levels

Despite its advantages, using vegetation as an indicator to classify mineral wetland types has some drawbacks. Climatic cycles that influence water level fluctuations can cause changes in vegetation structure and composition from year to year. The time of visit to the field could mislead classification if conditions are unusually wet or dry. A single visit to a wetland provides one climatic snapshot of the wetland and may not result in accurate classification.



Salt flats of an intermittent shallow open water.

See Marsh (page 56) and Shallow Open Water (page 64) fact sheets for detailed information.

Salinity Gradients

Measured as *electrical conductivity (EC)* of surface water, salinity is also an important characteristic that influences a wetland's plant community composition. Salinity types in the AWCS range from fresh-water, with plant species that have a low tolerance for elevated salinity (e.g., most peatlands), to saline, where only extremely tolerant species can persist (e.g., salt flats).

When surface water is present, you can measure the EC using a salinity probe to estimate the salinity type. Alternatively, if there is no standing water during your field visit, salinity can be approximated by the plant community composition, including dominance of salt-tolerant communities.

Electrical Conductivity ($\mu\text{S}/\text{cm}$) (not to scale)	FRESH-WATER					SLIGHTLY BRACKISH		MODERATELY BRACKISH		BRACKISH	SUB-SALINE	SALINE
0						500	2000	2000	5000	15000	45000	
BOG												
ACIDIC	ACIDIC FRESH-WATER											
FEN												
POOR FEN	POOR FRESH-WATER											
MODERATE RICH FEN	MODERATE-RICH FRESH-WATER											
EXTREME RICH FEN	EXTREME-RICH FRESH-WATER TO SLIGHTLY BRACKISH											
SALINE FEN						MODERATELY BRACKISH TO SUB-SALINE						
SWAMP												
TEMPORARY	TEMPORARY FRESH-WATER					TEMPORARY SLIGHTLY BRACKISH						
SEASONAL	SEASONAL FRESH-WATER TO SLIGHTLY BRACKISH							SEASONAL MODERATELY BRACKISH TO SUB-SALINE				
Note: Salinity types are not applicable to wooded swamps due to a lack of available information.												
MARSH												
TEMPORARY	TEMPORARY FRESH-WATER					TEMPORARY SLIGHTLY BRACKISH						
SEASONAL	SEASONAL FRESH-WATER					SEASONAL SLIGHTLY BRACKISH		SEASONAL MODERATELY BRACKISH				
SEMI-PERMANENT	SEMI-PERMANENT FRESH-WATER					SEMI-PERMANENT SLIGHTLY BRACKISH		SEMI-PERMANENT MODERATELY BRACKISH		SEMI-PERMANENT BRACKISH		
SHALLOW OPEN WATER												
SEASONAL	SEASONAL FRESH-WATER					SEASONAL SLIGHTLY BRACKISH		SEASONAL MODERATELY BRACKISH				
SEMI-PERMANENT	SEMI-PERMANENT FRESH-WATER					SEMI-PERMANENT SLIGHTLY BRACKISH		SEMI-PERMANENT MODERATELY BRACKISH		SEMI-PERMANENT BRACKISH		
PERMANENT						PERMANENT SLIGHTLY BRACKISH		PERMANENT MODERATELY BRACKISH		PERMANENT BRACKISH		PERMANENT SUB-SALINE
INTERMITTENT												INTERMITTENT SALINE

Summary of Wetland Classes

SOIL	VEGETATION		WATER REGIME	CHEMISTRY	LANDSCAPE SETTING
BOG Wetland Fact Sheet (page 38)					
- More than 40 cm of poorly decomposed organic soil (peat) - Von Post of 5 or less	- Plants in bogs are adapted to low nutrients and high acidity, characterized by stunted black spruce, ericaceous shrubs such as Labrador tea and leatherleaf and a ground cover of <i>Sphagnum</i> mosses - Forms: WOODED CONIFEROUS SHRUBBY OPEN		- Water inputs primarily from precipitation - Relatively stable water table that is typically 40 cm below the ground surface - Stagnant to very slow water flow under normal conditions (when wet, significant flow is possible)	- Acidic - Fresh-water - Nutrient-poor	- Elevated (domed) above the surrounding terrain - Hummocky microtopography
FEN Wetland Fact Sheet (page 44)					
- More than 40 cm of poorly decomposed organic soil (peat) - Von Post of 5 or less	- Characterized by black spruce and tamarack trees, taller shrubs such as bog birch and willows with a variety of ground cover species including sedges, buck-bean, marsh cinquefoil, three-leaved Solomon's-seal, <i>Sphagnum</i> and brown mosses - Forms: WOODED CONIFEROUS SHRUBBY GRAMINOID		- Variety of water inputs (precipitation, surface water, groundwater) - Consistently high (near-surface) water table - Slow-moving flow, including both surface and subsurface water movement (when wet, significant flow is possible)	- Fresh-water to slightly brackish - Range of pH and nutrient statuses: - Poor - Moderate-rich - Extreme-rich - Saline	- Expansive systems in generally flat landscape positions, often integrated into larger wetland complexes - Hummocky microtopography
SWAMP Wetland Fact Sheet (page 50)					
- Mineral soils (clay, silt, sand) with less than 40 cm of organic soil (peat) - Von Post typically more than 5 - Peatland swamps in Alberta are rare, but some swamps will have more than 40 cm of organic soil	- Diverse systems characterized by either black spruce, tamarack and/or birch and poplar trees, taller shrubs such as alders, dogwood and willows and scattered bryophyte (e.g., moss) cover - Forms: WOODED CONIFEROUS WOODED MIXEDWOOD WOODED DECIDUOUS SHRUBBY		- Variety of water inputs (precipitation, surface water, groundwater) - Consistently high (near-surface) water table - Fluctuating water levels cause temporary to seasonal flooding	- Fresh-water to sub-saline - Nutrient-rich	- Common in forested floodplains or other transitions between wetlands, streams, lakes and uplands - Wooded forms may exhibit hummocky microtopography
MARSH Wetland Fact Sheet (page 56)					
- Mineral soils (clay, silt, sand) and less than 40 cm of organic soil (peat) - Soils are wet (hydric), with indicators such as mottling and gleying - Von Post more than 5	- Predominantly herbaceous, giving rise to the single "graminoid" form - Characterized by water-tolerant grass and sedge species and/or emergent vegetation such as cattails and rushes - Form: GRAMINOID		- Variety of water inputs (precipitation, surface water, groundwater) - Dynamic systems with fluctuating water levels, temporarily to semi-permanently flooded	- Fresh-water to brackish - Nutrient-rich	- Common in prairie and parkland regions, often referred to as prairie potholes - Marshes adjacent to creeks and lakes are commonly referred to as riparian areas - Commonly found along margins of larger lakes across the province - Some marsh types are challenging to identify due to a lack of standing water in dry seasons or dry years
SHALLOW OPEN WATER Wetland Fact Sheet (page 64)					
- Mineral soils (clay, silt, sand) and less than 40 cm of organic soil (peat) - Soils are wet (hydric), with indicators such as mottling and gleying - Von Post more than 5	- Characterized by submersed and/or floating aquatic vegetation or bare (no vegetation) - Forms: SUBMERSED AND/OR FLOATING AQUATIC VEGETATION BARE		- Open water less than 2 m deep - Variety of water inputs (precipitation, surface water, groundwater) - Dynamic systems often with fluctuating water levels, seasonally to permanently flooded with some intermittent systems (e.g., salt flats)	- Fresh-water to saline - Nutrient-rich	Often referred to as prairie potholes in prairie and parkland regions

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HOW TO USE THIS FIELD GUIDE

This guide provides the following steps to help you classify a wetland:

1

Step 1. Is it a Wetland?

The first step in wetland classification is to determine if the area is a wetland. Start at **Step 1** (page 27) to review helpful wetland vegetation, soil and hydrology indicators.

2

Step 2. Classification Decision Key

Once the wetland determination is made, the **Classification Decision Key** (page 32) can be used to characterize the wetland class, form and, in the case of marsh and shallow open water wetlands, water permanence types. The key uses vegetation, soil and the presence and abundance of open water to guide classification.

3

Step 3. Wetland Fact Sheets

Wetland fact sheets can be used to verify the result you obtained from the **Classification Decision Key** and provide more detail about the typical characteristics of the wetland. **Wetland Fact Sheets** (page 37) are presented for each wetland class and form, as well as additional information needed to determine wetland types (based on water permanence, salinity and acidity-alkalinity gradients).

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Wetland practitioners identifying a moss sample.



Wetland practitioners measuring pH.



Wetland practitioners conducting a wetland assessment.

Field Resources - Remember to bring your vegetation identification guides and a soil auger or a shovel with you when you visit the wetland! For a list of recommended resources, see Appendix A (page 143). If you want to classify the wetland to type, a pH and salinity probe will be useful in verifying your classification.

Before You Go to the Field

Reviewing aerial imagery from multiple years and/or seasons can help provide useful context into the extent, frequency and duration of flooding and may allow you to apply a preliminary classification before you visit the wetland. In fact, wetland practitioners generally review aerial imagery from average, wet and dry years to inform classification. They will also review historic climate data from nearby weather stations to interpret the moisture conditions at the time of each aerial image, as well as the current conditions on the ground. This is especially important when classifying marsh and shallow open water wetlands which exhibit naturally fluctuating water levels.

If aerial imagery is not available, on the ground observations of the weather in recent weeks, weather station data from Environment Canada, or publicly available imagery (e.g., Google) is also valuable for informing wetland identification and classification.



Wetland in an agricultural area following spring snowmelt.



Aerial image (©Google Earth) indicating a wet area following rainfall in 2016.



Drone aerial imagery indicating a wet area which has since dried up.

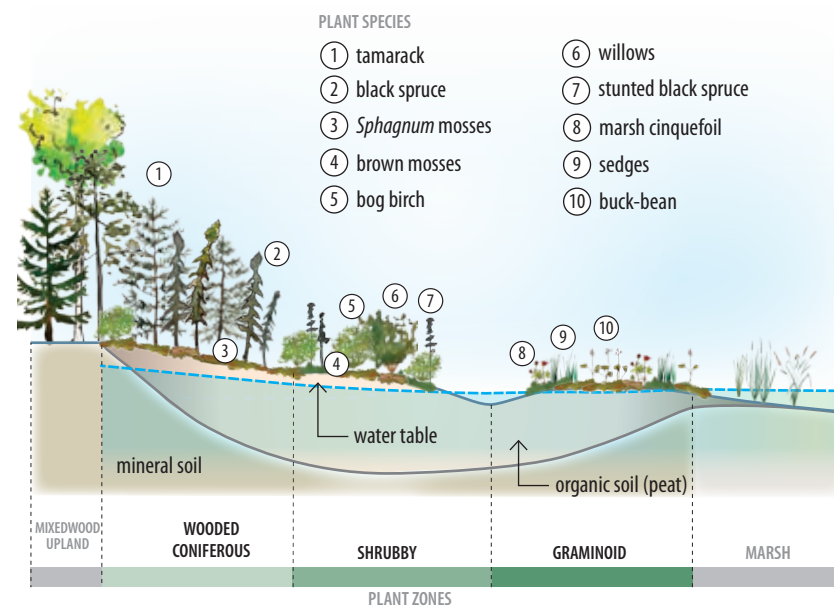


STEP 1. IS IT A WETLAND?

Vegetation Characteristics

Wetland plants are water tolerant (hydrophytic) and are adapted to saturated (wet) soils and periodic flooding. Cattails are an example of a plant species that prefers wet environments (referred to as hydrophytes), but not all species present in wetlands are unique to wet environments. Some plant species are adapted to wet conditions even though they do not favour them, such as black spruce. Different plant species are often organized into plant community zones along a moisture gradient based on their degree of water tolerance.

The illustrations found in this field guide at the start of each wetland class (fen example below) demonstrate this concept to inform wetland classification.



Vegetation and soil identification knowledge is further described in the following sections:
Wetland Plant Identification (page 73)
Appendix B: Von Post Decomposition Ratings (page 146)

Soil Characteristics

Soil characteristics develop over the long term and are generally stable wetland indicators. Soil indicators include the presence of organic soils or mottling and gleying in mineral soils. Hydric (wet) soils form as a result of the oxygen-deprived conditions associated with saturation or flooding, often reflecting the long-term hydrology of a site better than vegetation indicators.



Organic soil (peat) with visible fibrous plant materials.



A mottled mineral soil.



A gleyed mineral soil.



Mottling may be subtle and hard to identify in dark mineral soils.

Soil Redox Features - When mineral soils are saturated for a prolonged period, oxygen is depleted and metals such as iron are reduced, producing a distinct blue-grey colour in the soil known as "gleying." In contrast, these metals are oxidized when soils are exposed to oxygen, producing a distinct pattern of red or brown mottles (known as "mottling").



A further example of soil mottling taken from a hand augered soil sample.

See **Appendix B Von Post Decomposition Ratings (page 146)** for more information.

Water Regime

A wetland's water regime can be variable depending on the climate and landscape setting, with water levels and flows fluctuating throughout the growing season or in any given year due to differential water inputs (precipitation, surface runoff, infiltration) and outputs (outlets, evaporation, transpiration). Depending on the timing of your visit, the wetland may or may not be wet. This makes water regime an unreliable indicator to identify a wetland. To account for this, primary and/or secondary indicators can be used to confirm the presence of a wetland. One primary indicator or two secondary indicators are required to confirm hydrology for wetland identification. The primary and secondary indicators in this guide are adapted from US Army Corps of Engineers (2010).

Primary Indicators



Surface water.



Saturated soil (look for glistening soil surfaces).



Water marks, sediment or drift deposits on leaves, trees or objects.



Aquatic fauna.



Algal mats or crusts.



Salt crusts.



Surface iron deposits.



Marl deposits.



Hydrogen sulfide odour.



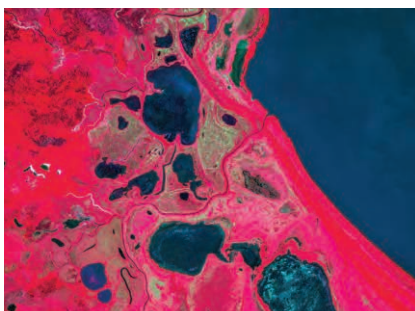
Oxidized root channels.



Sparse vegetation cover on a concave surface.



Inundation on aerial imagery (true colour image).



Inundation on aerial imagery (colour infrared image).

Secondary Indicators



Drainage patterns evident as eroded soils and bent vegetation.



Surface soil cracks.

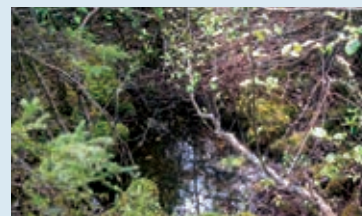


Stunted trees.

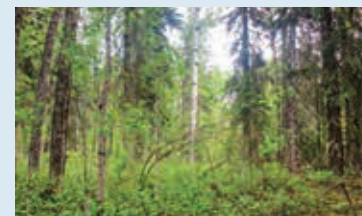


Hummocky microtopography.

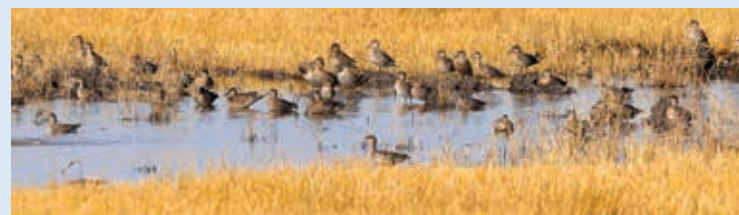
Wetlands Versus Uplands, Including Ephemeral Water Bodies - Vegetation, soils and water regimes are important for assessing if you are in a wetland vs. upland or an ephemeral water body. For example, wooded swamps may resemble upland spruce forests until the vegetation and soil are characterized. In contrast, land that appears saturated during a wet year may be an ephemeral water body.



Wooded coniferous swamp with an overstory of black spruce trees; note the hummock-hollow terrain characteristic of the ground surface.



White spruce upland; note the change in understory vegetation with more abundant deciduous shrubs.



Ephemeral water body in an agricultural area in the spring.

STEP 2. WETLAND CLASSIFICATION DECISION KEY

After confirming a wetland using the indicators in Step 1, use the following Wetland Classification Decision Key to determine the wetland classification.

CHECK 1 - TREES

Is tree cover more than 25%?

YES

Is more than 75% of the tree cover deciduous species? (*Alaska birch, white birch, balsam poplar*)

YES

WOODED DECIDUOUS SWAMP (page 53)

NO

Go to **CHECK 2** - page 33

Is the tree cover a mix of deciduous and coniferous, where neither represents more than 75%?

YES

WOODED MIXEDWOOD SWAMP (page 54)

NO

- Is tree cover almost entirely black spruce, typically less than 10 m tall? **AND**
- Does *Sphagnum* moss dominate? **AND**
- Is more than 40 cm of poorly decomposed peat present? (Von Post rating of 5 or less)

YES

WOODED CONIFEROUS BOG (page 40)

NO

- Is tree cover more than 5% tamarack trees, typically less than 10 m tall? **AND**
- Are fen species (*sedges, buck-bean, marsh cinquefoil, three-leaved Solomon's seal, Sphagnum moss or brown moss*) present? **AND**
- Is more than 40 cm of poorly decomposed peat present? (Von Post rating of 5 or less)

YES

WOODED CONIFEROUS FEN (page 46)

NO

- Is there a dense tree canopy, typically >10 m tall? **AND**
- Is the ground surface hummocky, characterized by swamp species (*bunchberry, dewberry and marsh grasses or sedges*) with only scattered bryophyte cover? **AND**
- Is less than 40 cm of poorly decomposed peat present? (Sometimes more, but with a Von Post rating greater than 5)

YES

WOODED CONIFEROUS SWAMP (page 52)

CHECK 2 - SHRUBS

Is shrub cover more than 25%?

YES

- Are the majority of shrubs ericaceous species, less than 1 m tall? (*Labrador tea and leatherleaf*) **AND**
- Does *Sphagnum* moss dominate? **AND**
- Is more than 40 cm of poorly decomposed peat present? (Von Post rating of 5 or less)

YES

SHRUBBY BOG (page 41)

NO

Go to **CHECK 3** - page 34

- Are the majority of shrubs fen species, typically more than 1 m tall? (*birch and willows*) **AND**
- Are fen species (*sedges, buck-bean, marsh cinquefoil, three-leaved Solomon's seal, Sphagnum moss or brown moss*) present? **AND**
- Is more than 40 cm of poorly decomposed peat present? (Von Post rating of 5 or less)

YES

SHRUBBY FEN (page 47)

NO

- Are the majority of shrubs swamp species, typically more than 2 m tall? (*alders and willows*) **AND**
- Are swamp species (*bunchberry, dewberry and marsh grasses or sedges*) present with only scattered bryophyte cover? **AND**
- Is less than 40 cm of poorly decomposed peat present? (Sometimes more, but with a Von Post rating greater than 5)

YES

SHRUBBY SWAMP (page 55)

Note: This key characterizes wetland classes, forms and, in the case of marsh and shallow open water wetlands, water permanence types. It uses vegetation, soil and the presence and abundance of open water to guide classification. Vegetation and soil identification information to support the use of this key is described in the corresponding sections:

Wetland Plant Identification (page 73)

Appendix B: Von Post Decomposition Ratings (page 146)

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CHECK 3 - GROUND COVER

- Do bryophyte species (*Sphagnum* and brown mosses) dominate the cover, intermixed with scattered graminoid cover? **AND**
- Is more than 40 cm of poorly decomposed peat present? (*Von Post* rating of 5 or less)



Are fen species (*sedges, buck-bean, marsh cinquefoil, three-leaved Solomon's seal, Sphagnum moss or brown moss*) present?



Is the ground cover dominated by *Sphagnum* moss?



GRAMINOID FEN
(page 48)

OPEN BOG
(page 42)



Is the cover dominated by graminoid vegetation (*sedges, grasses, cattails or rushes*) in the deepest portion of the wetland?



Go to **CHECK 4** - page 35

MARSH (page 56)

- Is surface water only present for a short period of time after snowmelt or heavy rainfall? **AND**
- Is the central vegetation zone characterized by wet meadow species? (*bluejoint, fowl bluegrass, foxtail barley or wire rush*)



TEMPORARY MARSH
(page 60)



- Is surface water present through most of an average growing season, but wetland is dry by late summer? **AND**
- Is the central vegetation zone characterized by shallow wetland species? (*reed canary grass, sloughgrass, awned sedge, needle spikerush, common waterparsnip or water hemlock*)



SEASONAL MARSH
(page 61)



- Is surface water present most of the year, except during drought years? **AND**
- Is the central vegetation zone characterized by deep wetland species (*cattail, great bulrush, three-square rush*) and occasional aquatic species? (*bladderwort, common duckweed and water smartweed*)



SEMI-PERMANENT MARSH
(page 62)

CHECK 4 - OPEN WATER

Is the open water less than 2 m deep and cover more than 75% of the wetland, often with submersed and/or floating aquatic vegetation?

**SHALLOW OPEN WATER** (page 64)

- Is surface water present through most of an average growing season, but wetland is dry by late summer? **AND**
- Is the central vegetation zone characterized by submersed and/or floating aquatic species? (*bladderwort, large-leaved white water crowfoot, brown mosses, pondweeds and water smartweed*)



SEASONAL SHALLOW OPEN WATER
(page 68)



- Is surface water present most of the year, except during drought years? **AND**
- Is the central vegetation zone characterized by submersed and/or floating aquatic species? (*bladderwort, pondweeds, hornworts, milfoils and algae*)



SEMI-PERMANENT SHALLOW OPEN WATER
(page 69)



- Is surface water up to 2 m deep present throughout the year, even in drought conditions? **AND**
- Is the central vegetation zone characterized by submersed aquatic species (*widgeon grass, large-sheath pondweed*) or is it simply open water?



PERMANENT SHALLOW OPEN WATER
(page 70)



- Does the wetland alternate between saline open water and exposed bare soil (salt flats)? **AND**
- Is the central vegetation zone characterized by submersed alkali plants (*widgeon grass*)?



INTERMITTENT (SALINE) SHALLOW OPEN WATER
(page 71)

Exceptions to Every Rule - If you are struggling with characterizing a wetland class or form, consider your location within the wetland and consider how multiple wetland classes may exist along a moisture gradient. Try to find a representative and uniform vegetation zone within which to conduct your classification. Also keep in mind that this **Wetland Classification Decision Key** represents generalizations to which there are always exceptions, such as sites regenerating from forest harvest, wildfire, severe drought, cultivation or other disturbances. Try using additional details in the **Wetland Fact Sheets** in the following section to confirm your keyed-out classification.



STEP 3. WETLAND FACT SHEETS

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THERE ARE THREE BOG FORMS:

- Wooded Coniferous
- Shrubby
- Open

SOIL

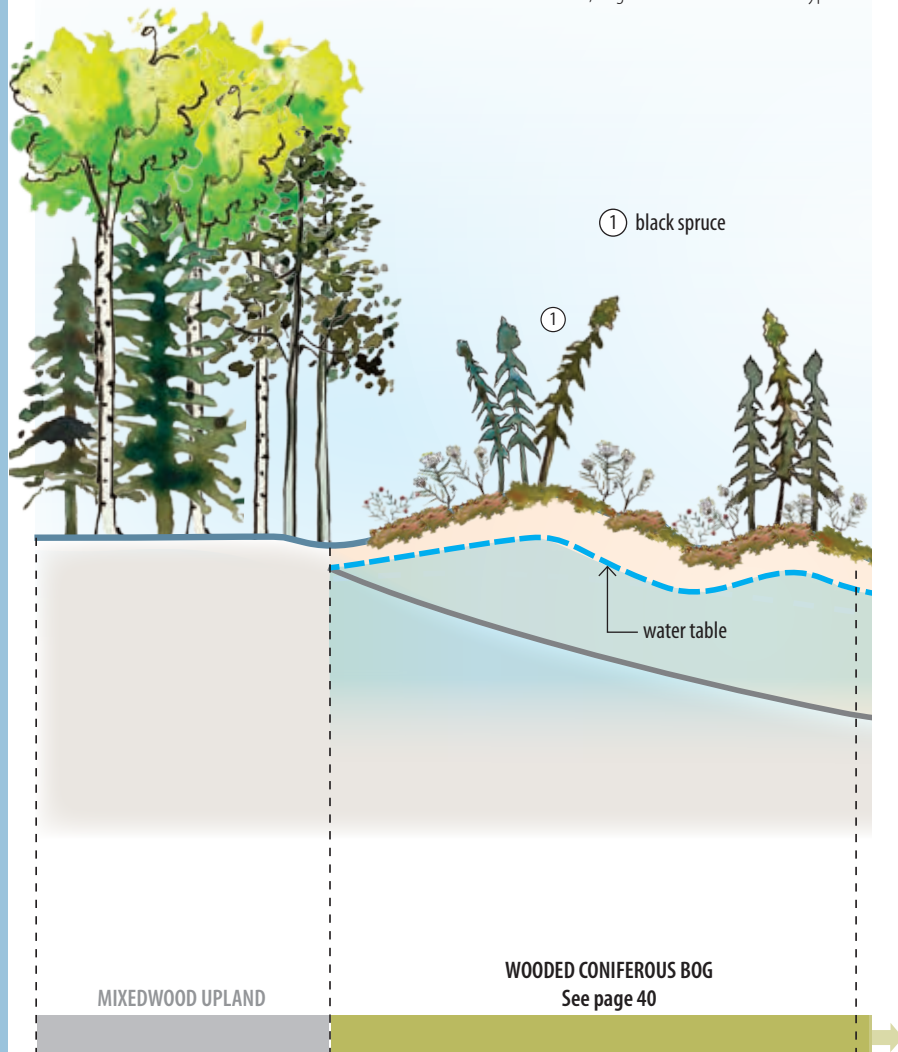
- More than 40 cm of poorly decomposed organic soil (peat)
- Von Post of 5 or less

WATER REGIME

- Water inputs primarily from precipitation
- Relatively stable water table that is typically 40 cm below the ground surface
- Stagnant to very slow water flow under normal conditions (when wet, significant flow is possible)

CHEMISTRY

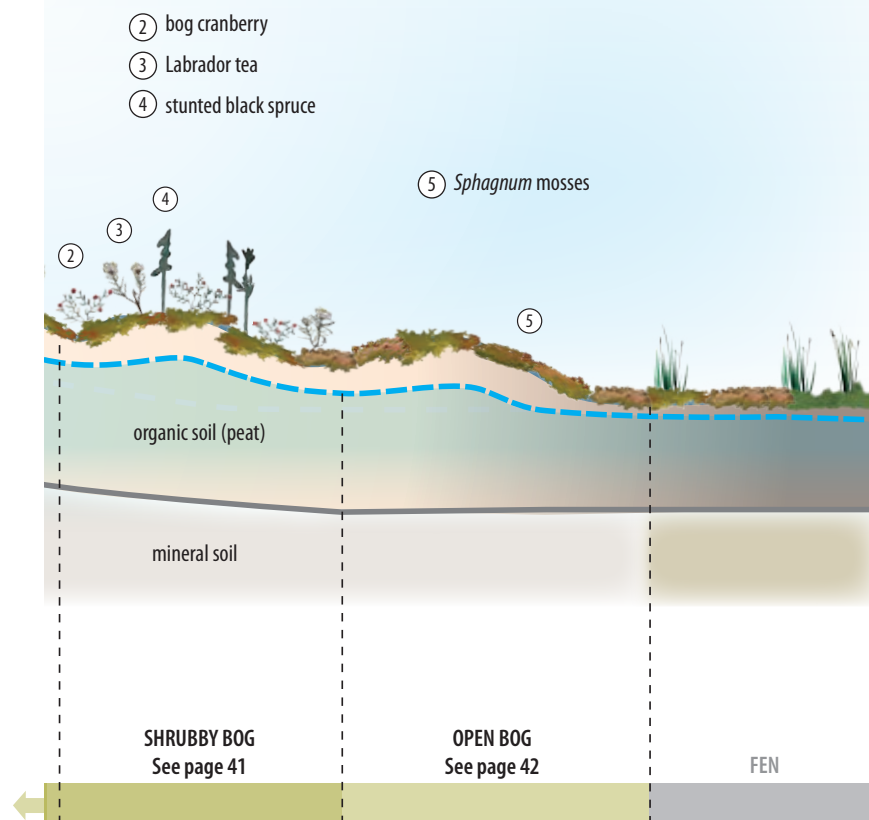
- Acidic (pH typically less than 4.5)
- Fresh-water (electrical conductivity less than 100 $\mu\text{S}/\text{cm}$)
- Nutrient-poor
- Unlike other wetland classes, bogs are not subdivided into types

**LANDSCAPE SETTING**

- Bogs are typically elevated or domed above the surrounding terrain due to peat accumulation or permafrost formation
- Characterized by hummocky microtopography due to *Sphagnum* moss differential growth

VEGETATION

- Trees, when present, dominated by black spruce, typically stunted in growth (less than 10 m tall)
- Ericaceous shrubs such as Labrador tea, leatherleaf and bog cranberry present
- Ground cover is dominated by *Sphagnum* mosses



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- Tree cover more than 25%, almost entirely black spruce
- Trees are typically stunted (less than 10 m tall)

CHARACTERISTIC SPECIES	
Trees	☐ black spruce
Shrubs	☐ Labrador tea ☐ bog cranberry ☐ small bog cranberry ☐ cloudberry ☐ bog rosemary ☐ leatherleaf ☐ northern laurel
Ground Cover	☐ <i>Sphagnum</i> mosses ☐ sheathed cottongrass ☐ round-leaved sundew ☐ scattered sedges ☐ scattered bryophytes (slender haircap moss and liverworts)



Understory cover of bogs - The top image shows the dominant *Sphagnum* moss cover along the ground layer. The bottom image shows lichens and feather mosses.



- Tree cover less than 25%, with typically stunted growth
- Shrub cover more than 25%, primarily ericaceous species less than 1 m tall

CHARACTERISTIC SPECIES	
Shrubs	☐ Labrador tea ☐ bog cranberry ☐ small bog cranberry ☐ cloudberry ☐ bog rosemary ☐ leatherleaf ☐ northern laurel
Ground Cover	☐ <i>Sphagnum</i> mosses ☐ sheathed cottongrass ☐ round-leaved sundew ☐ scattered sedges ☐ scattered bryophytes (slender haircap moss and liverworts)



Shrubby bog dominated by Labrador tea with trees less than 3 m tall.

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- Tree and shrub cover each less than 25%
- *Sphagnum* mosses dominate the ground cover

CHARACTERISTIC SPECIES

Ground Cover

- ☐ *Sphagnum* mosses
- ☐ sheathed cottongrass
- ☐ round-leaved sundew
- ☐ scattered sedges
- ☐ scattered bryophytes (slender haircap moss and liverworts)

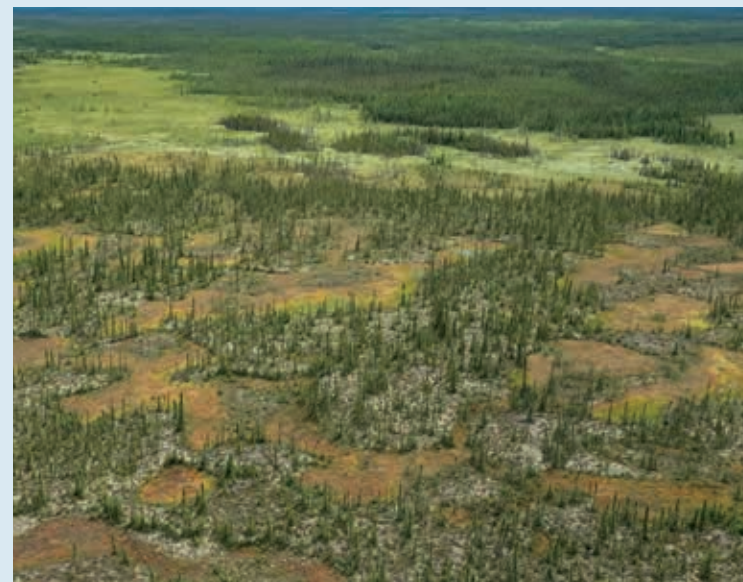


Boreal woodland caribou in an open bog.

Photo credit: Conrad Thiesen



Taken in mid summer, slivers of ice are still visible in permafrost-affected soils.



Permafrost Peatlands - In portions of northern Alberta, permafrost can form in peatlands where the ground remains perennially frozen, resulting in the formation of distinct patterns (e.g., permafrost plateaus and collapsed wetlands) identifiable in aerial imagery.

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THERE ARE THREE FEN FORMS:

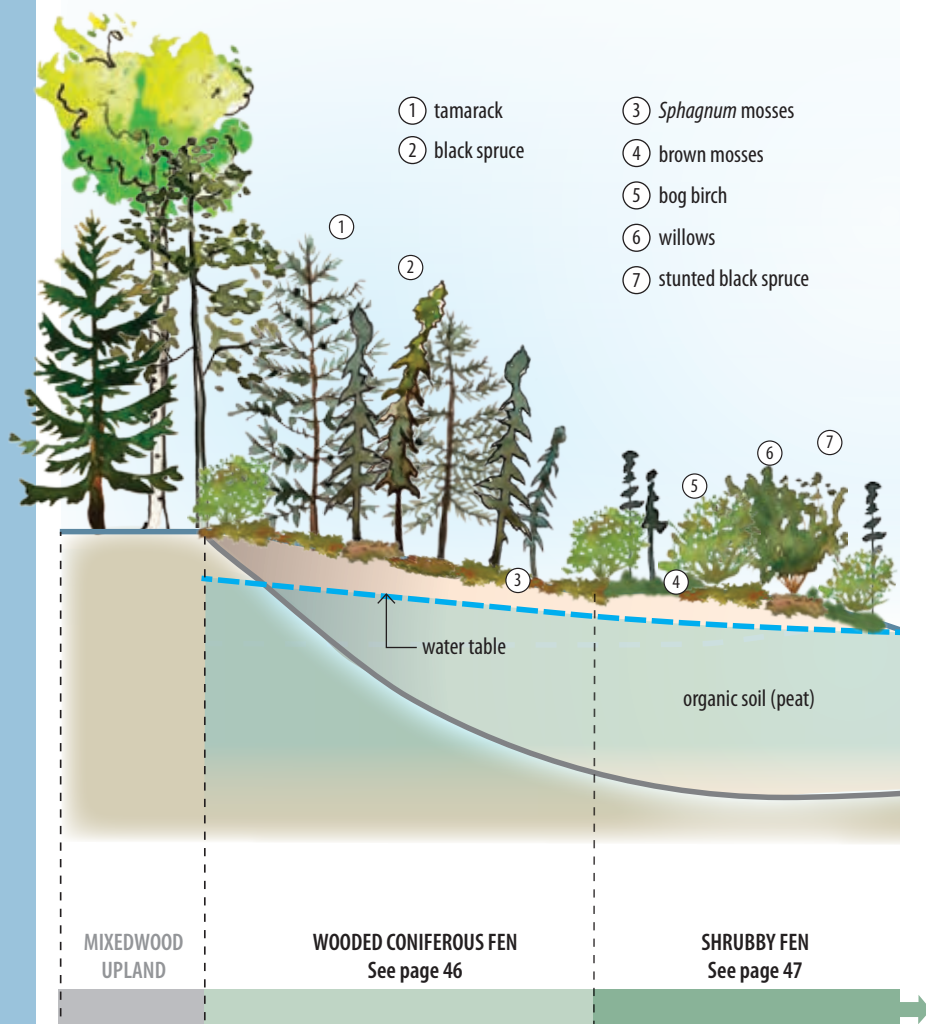
- Wooded Coniferous
- Shrubby
- Graminoid

SOIL

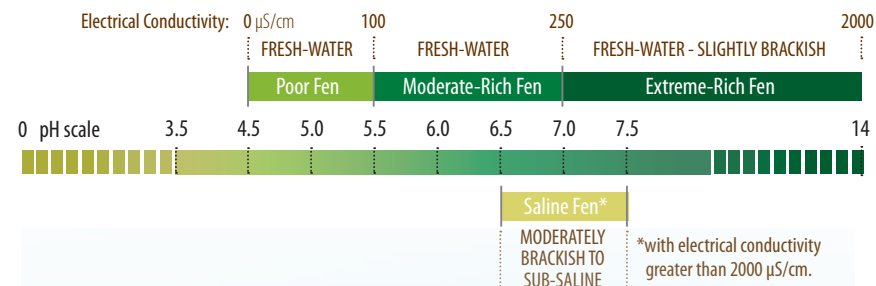
- Peatland with more than 40 cm of organic soil
- Poorly decomposed organic soil (moss and sedge peat) with Von Post rating of 5 or less

WATER REGIME

- Variety of water inputs (precipitation, surface water, groundwater)
- Consistently high (near-surface) water table, unless permafrost is present
- Slow-moving flow, including both surface and subsurface water movement (when wet, significant flow is possible)

**CHEMISTRY**

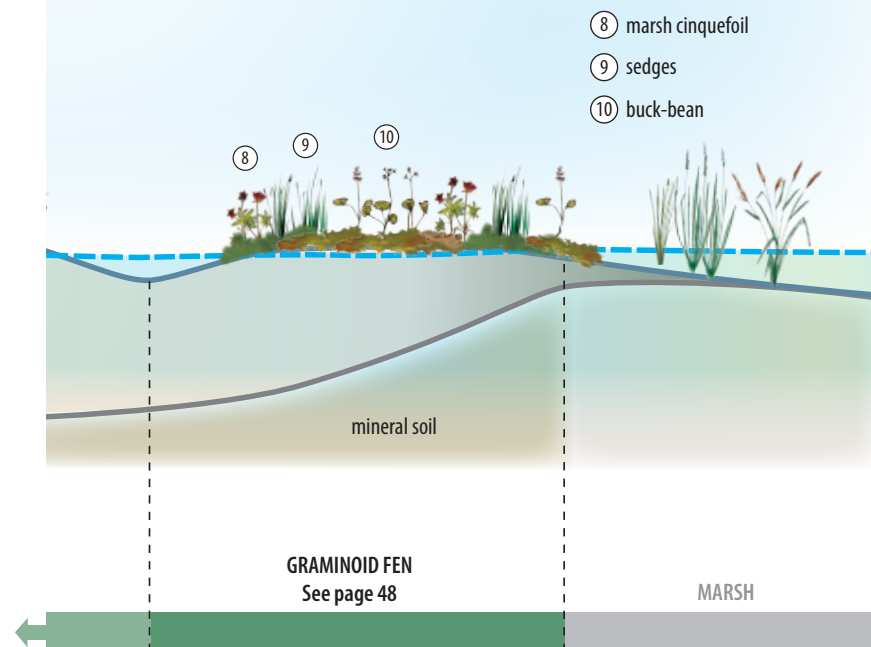
- Fen chemistry includes a range of salinity and acidity-alkalinity gradients, leading to four distinct types
- Fens typically have a pH greater than 4.5, however fens in northern landscapes may have a pH as low as 3.5
- Saline fens have a pH of 6.5 to 7.5 with and an electrical conductivity greater than 2000 $\mu\text{S}/\text{cm}$

**LANDSCAPE SETTING**

- Expansive systems in generally flat landscape positions, often integrated into larger wetland complexes
- Hummocky microtopography

VEGETATION

- Characterized by black spruce and tamarack trees as well as taller shrubs such as bog birch and willow 1-2 m in height
- Ground cover species are diverse, including sedges, buck-bean, marsh cinquefoil, three-leaved Solomon's-seal, *Sphagnum* and brown mosses



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Poor wooded coniferous fen.



Moderate-rich wooded coniferous fen.

- Tree cover more than 25%, with a mix of black spruce and tamarack (the latter becoming more dominant in richer sites)
- Water table typically 20 cm (or deeper) below the ground surface

CHARACTERISTIC SPECIES			
	POOR FEN pH less than 5.5	MODERATE-RICH FEN pH 5.5 to 7.0	EXTREME-RICH FEN pH more than 7.0
Trees	☐ black spruce dominates ☐ tamarack	☐ black spruce ☐ tamarack	☐ tamarack dominates ☐ black spruce
Shrubs	☐ bog birch ☐ dwarf birch	☐ bog willow ☐ hoary willow	☐ Labrador tea ☐ leatherleaf
Ground Cover	☐ <i>Sphagnum</i> mosses ☐ brown mosses ☐ liverworts ☐ sheathed cottongrass ☐ hairy-fruited sedge ☐ prostrate sedge ☐ bog muhly ☐ three-leaved Solomon's-seal ☐ cloudberry	☐ brown mosses ☐ <i>Sphagnum</i> mosses ☐ hairy-fruited sedge ☐ prostrate sedge ☐ three-seeded sedge ☐ two-stamened sedge ☐ water sedge ☐ buck-bean ☐ marsh cinquefoil ☐ pitcher plant ☐ three-leaved Solomon's-seal ☐ water arum	☐ brown mosses ☐ mud sedge ☐ buck-bean ☐ marsh cinquefoil ☐ pitcher plant ☐ seaside arrow grass ☐ tufted bulrush ☐ water arum ☐ flat-leaved bladderwort



Poor shrubby fen.



Moderate-rich shrubby fen.

- Tree cover less than 25%
- Shrub cover more than 25%, typically 1-2 m tall
- Water table typically 10 cm (or deeper) below the ground surface

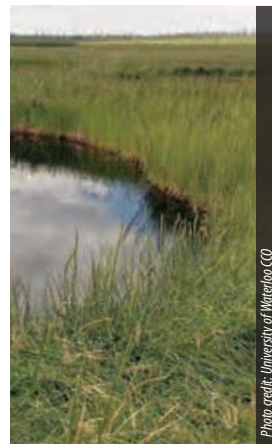
CHARACTERISTIC SPECIES			
	POOR FEN pH less than 5.5	MODERATE-RICH FEN pH 5.5 to 7.0	EXTREME-RICH FEN pH more than 7.0
Shrubs	☐ bog birch ☐ dwarf birch	☐ bog willow ☐ hoary willow	☐ Labrador tea ☐ leatherleaf
Ground Cover	☐ <i>Sphagnum</i> mosses ☐ brown mosses ☐ liverworts ☐ sheathed cottongrass ☐ hairy-fruited sedge ☐ prostrate sedge ☐ bog muhly ☐ three-leaved Solomon's-seal ☐ cloudberry	☐ brown mosses ☐ <i>Sphagnum</i> mosses ☐ hairy-fruited sedge ☐ prostrate sedge ☐ three-seeded sedge ☐ two-stamened sedge ☐ water sedge ☐ buck-bean ☐ marsh cinquefoil ☐ pitcher plant ☐ three-leaved Solomon's-seal ☐ water arum	☐ brown mosses ☐ mud sedge ☐ buck-bean ☐ marsh cinquefoil ☐ pitcher plant ☐ seaside arrow grass ☐ tufted bulrush ☐ water arum ☐ flat-leaved bladderwort



Poor graminoid fen.



Moderate-rich graminoid fen.

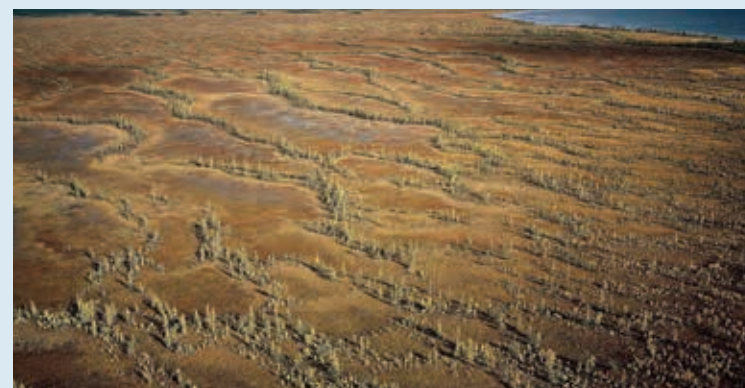


Saline fen.

Photo credit: University of Waterloo CDO

- Tree and shrub cover less than 25%
- Dominant ground cover of fen species, including *Sphagnum* and/or brown mosses (though infrequent in high salinity areas)
- In slightly brackish extreme-rich fens, water sedge, awned sedge and small bottle sedge are common and associated with a reduction in bryophyte cover
- Water table is typically at or near the ground surface

CHARACTERISTIC SPECIES				
	POOR FEN pH less than 5.5	MODERATE-RICH FEN pH 5.5 to 7.0	EXTREME-RICH FEN pH more than 7.0	SALINE FEN pH 6.5 to 7.5 EC greater than 2000 µS/cm
Ground Cover	☐ <i>Sphagnum</i> mosses ☐ brown mosses ☐ liverworts ☐ sheathed cottongrass ☐ hairy-fruited sedge ☐ prostrate sedge ☐ bog muhly ☐ three-leaved Solomon's-seal ☐ cloudberry	☐ brown mosses ☐ <i>Sphagnum</i> mosses ☐ hairy-fruited sedge ☐ prostrate sedge ☐ three-seeded sedge ☐ two-stamened sedge ☐ water sedge ☐ buck-bean ☐ marsh cinquefoil ☐ pitcher plant ☐ three-leaved Solomon's-seal ☐ water arum	☐ brown mosses ☐ mud sedge ☐ buck-bean ☐ marsh cinquefoil ☐ pitcher plant ☐ seaside arrow grass ☐ tufted bulrush ☐ water arum ☐ flat-leaved bladderwort	☐ seaside arrow grass ☐ narrow reed grass and reed grass ☐ few flowered spike rush ☐ Baltic rush ☐ Nuttall's alkali-grass ☐ sweetgrass Areas with very high salinity may be occupied by salt-tolerant plants: ☐ sea plantain ☐ samphire ☐ horned seablight



Patterned Fens - Groundwater is an important component of extreme-rich fens which are often associated with springs and the deposition of calcium-rich marl. In spring, snowmelt can move as sheet flow on the frozen surface of these fens and deposit organic debris. This leads to the development of patterned fens that have distinctive patterns of drier ridges called strings and wetter pools known as flarks.

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THERE ARE FOUR SWAMP FORMS:

- Wooded Coniferous
- Wooded Deciduous
- Wooded Mixedwood
- Shrubby

SOIL

- Mineral soils (clay, silt, sand) with less than 40 cm of organic soil (peat)
- Von Post typically more than 5
- Peatland swamps in Alberta are rare, but some swamps will have more than 40 cm of organic soil

WATER REGIME

- Variety of water inputs (precipitation, surface water, groundwater)
- Consistently high (near-surface) water table
- Slow-moving flow, including both surface and subsurface water movement (when wet, significant flow is possible)
- Fluctuating water levels cause temporary to seasonal flooding

CHEMISTRY

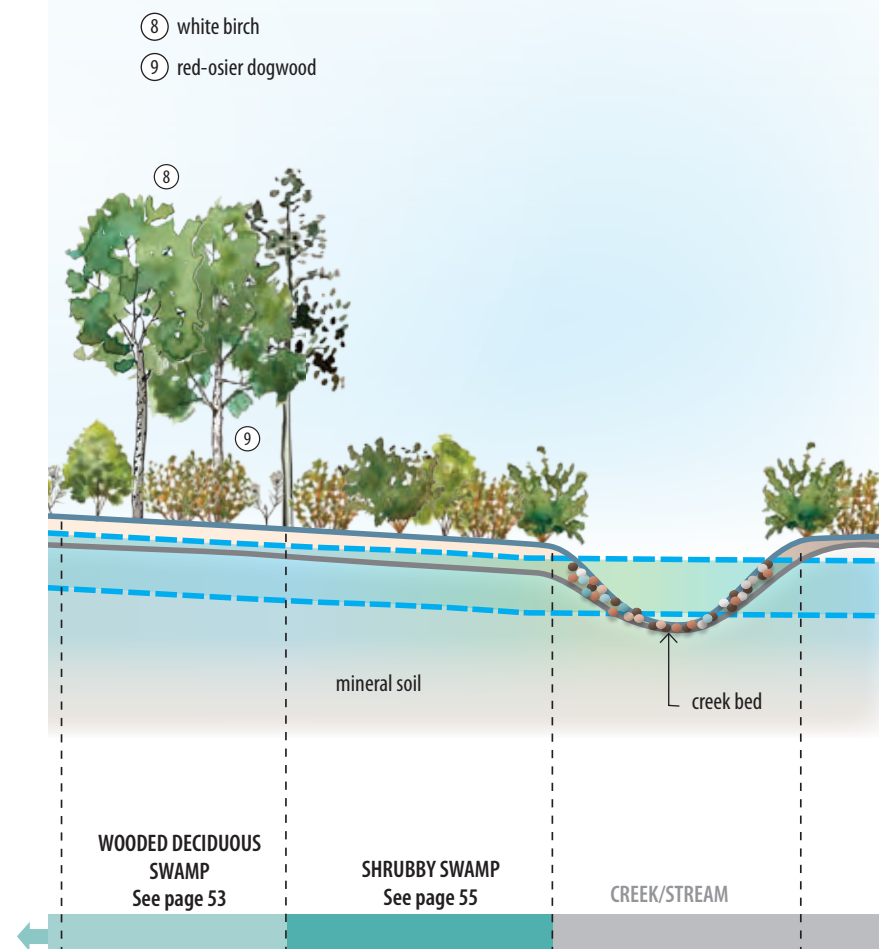
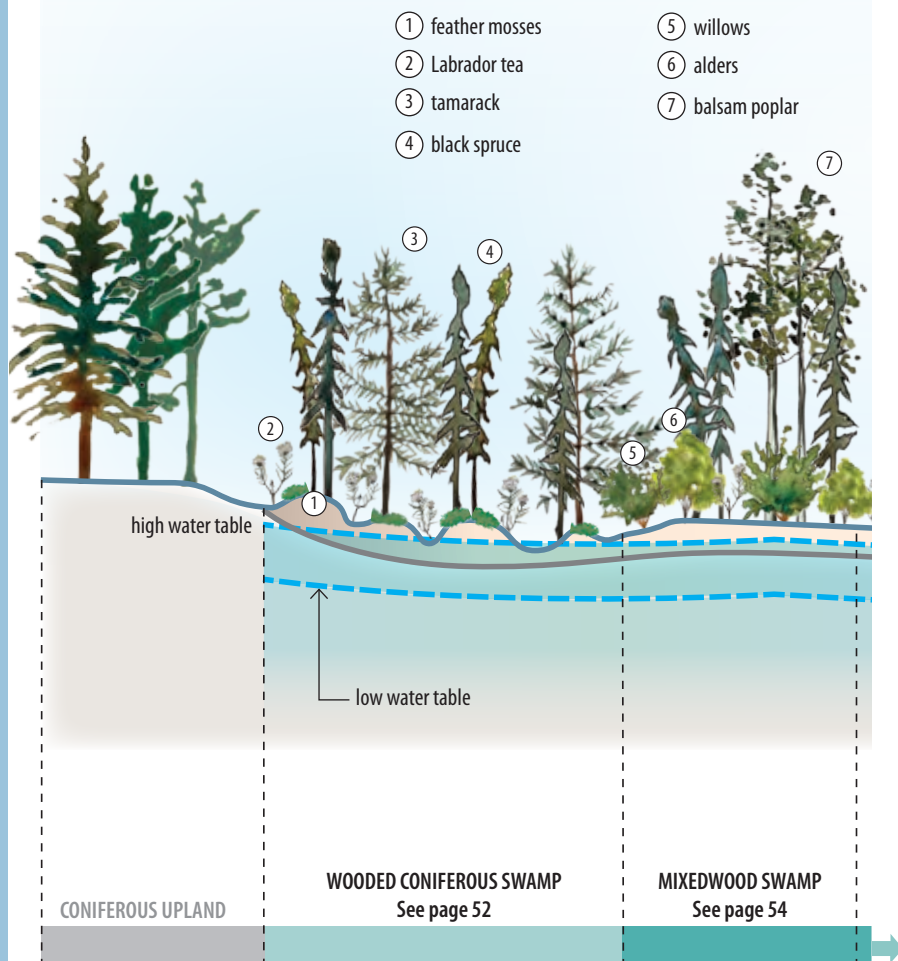
- Typically more nutrient-rich than peatlands
- Fresh-water to sub-saline surface water

LANDSCAPE SETTING

- Commonly found in forested floodplains or other transitional areas between wetlands, streams, lakes and uplands
- Wooded swamps are characterized by a hummocky ground surface, with depressions often filled with water in the spring

VEGETATION

- Tree and/or shrub cover is more than 25%
- Characterized by black spruce, tamarack and/or birch and balsam poplar trees
- Taller shrubs such as alders, willows and dogwood present
- Scattered bryophyte cover
- Swamps are divided into wooded (coniferous, deciduous and mixedwood) and shrubby forms, with the shrubby forms further divided into types



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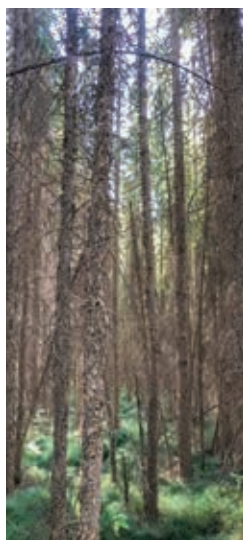
Black spruce wooded coniferous swamp.



Tamarack wooded coniferous swamp.

- Tree cover more than 25%, of which 75% is coniferous
- Dense, tall tree canopy (typically more than 10 m in height)
- May be underlain by mineral soil or shallow, highly decomposed organic soils (typically less than 40 cm in depth) with abundant woody debris
- Often present in transition areas between peatlands and upland forests
- Hummocky microtopography, allowing pools of standing water to accumulate around the base of trees during wet periods
- Bryophytes (including feather moss) more common where the tree canopy is less dense

CHARACTERISTIC SPECIES	
Trees	☐ black spruce ☐ tamarack ☐ occasional white spruce
Shrubs	☐ alders ☐ bog birch ☐ dwarf birch ☐ Labrador tea
Ground Cover	☐ bunchberry ☐ dewberry ☐ long-leaved chickweed ☐ northern starflower ☐ small bedstraw ☐ scattered bryophytes, including feather mosses



The dense, tall canopy associated with wooded coniferous swamps.



Typical understory hummock-hollow microtopography and bryophyte cover.



- Tree cover more than 25%, of which 75% is deciduous
- May be underlain by shallow organic soils or mineral soils with mottling present within the rooting zone

CHARACTERISTIC SPECIES	
Trees	☐ Alaska birch ☐ white birch ☐ balsam poplar <i>In southern Alberta river valleys:</i> ☐ plains cottonwood ☐ narrow-leaf cottonwood
Shrubs	☐ Manitoba maple ☐ red-osier dogwood ☐ alders ☐ beaked willow ☐ pussy willow ☐ Labrador tea ☐ skunk currant ☐ wild red currant
Ground Cover	☐ marsh marigold ☐ gold saxifrage ☐ kidney-leaved violet ☐ marsh violet ☐ sedges ☐ spotted touch-me-not ☐ narrow spinulose shield fern ☐ swamp horsetail ☐ arrow-leaved coltsfoot ☐ bunchberry ☐ dewberry ☐ long-leaved chickweed ☐ northern starflower ☐ small bedstraw ☐ scattered bryophytes



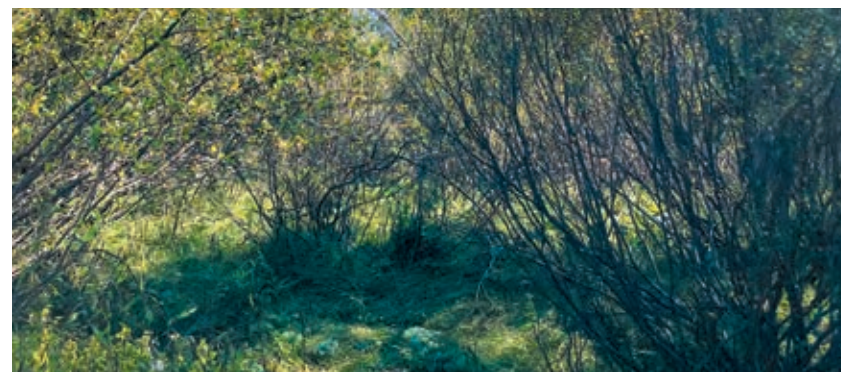
Typical canopy cover of a wooded deciduous swamp.



Typical understory cover.



- Tree cover more than 25%, including a mix of coniferous and deciduous species (neither dominate)
- May be underlain by shallow organic soils or mineral soils with mottling present within the rooting zone
- Often present in transition areas between peatlands and upland forests
- Hummocky microtopography may be present, allowing pools of standing water to accumulate around the base of trees during wet periods



- Tree cover less than 25%
- Shrub cover more than 25%, typically greater than 2 m tall
- Typically underlain by mineral soils (relatively little peat accumulation) with mottling present within the rooting zone
- Often present along the edge of marshes and shallow open water wetlands or along rivers and floodplains

SHRUBBY SWAMP TYPES

- Only shrubby swamps are classified to type due to a lack of information on wooded swamps.

CHARACTERISTIC SPECIES	
Trees	☐ Alaska birch ☐ balsam poplar ☐ black spruce ☐ occasional white spruce and tamarack
Shrubs	☐ alders ☐ beaked willow ☐ pussy willow ☐ Labrador tea ☐ skunk currant ☐ wild red currant
Ground Cover	☐ horsetails ☐ arrow-leaved coltsfoot ☐ bunchberry ☐ dewberry ☐ long-leaved chickweed ☐ northern starflower ☐ small bedstraw ☐ scattered bryophytes



Typical canopy cover of a wooded mixedwood swamp.

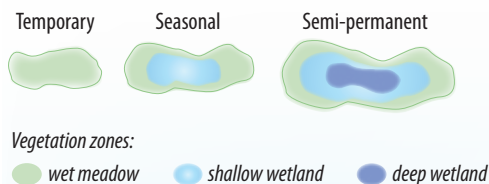


Typical understory cover.

CHARACTERISTIC SPECIES			
TEMPORARY Surface water is present for a short period of time after snowmelt or heavy rainfall		SEASONAL Surface water is present through most of an average growing season, but wetland is dry by late summer	
FRESH-WATER TO SLIGHTLY BRACKISH EC from 40 to 2,000 $\mu\text{S}/\text{cm}$		MODERATELY BRACKISH TO SUB-SALINE EC from 2,000 to 45,000 $\mu\text{S}/\text{cm}$	
Shrubs	☐ alders ☐ willows	☐ alders ☐ willows ☐ red-osier dogwood	☐ willows
Forbs	☐ common nettle ☐ small bedstraw	☐ waterparsnip	☐ alpine hedsysarum
Graminoids	☐ bluejoint ☐ fowl bluegrass ☐ slender wheatgrass ☐ sedges	☐ bluejoint ☐ common tall manna grass ☐ reed canary grass ☐ short-awned foxtail ☐ sloughgrass	☐ meadow sedge ☐ slender wheatgrass ☐ sloughgrass ☐ spangletop

Marshes are subdivided into types based on their water level permanence (often identified using vegetation community zones), as well as salinity.

THERE ARE THREE WATER PERMANENCE TYPES:



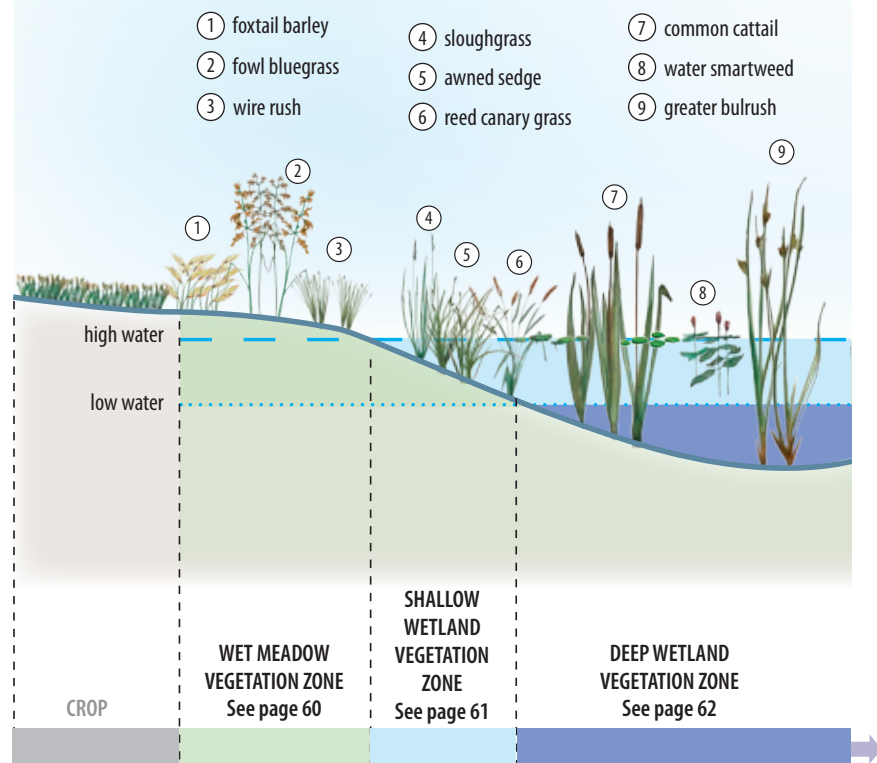
SOIL

- Mineral soils (clay, silt, sand) and less than 40 cm of organic soil (peat)
- Soils are wet (hydric), with indicators such as mottling and gleying
- Von Post more than 5

WATER REGIME

- Variety of water inputs (precipitation, surface water, groundwater)
- Fluctuating water levels, causing temporary to semi-permanent flooding

THIS CROSS-SECTION ILLUSTRATES A SEMI-PERMANENT MARSH TYPE:



CHEMISTRY

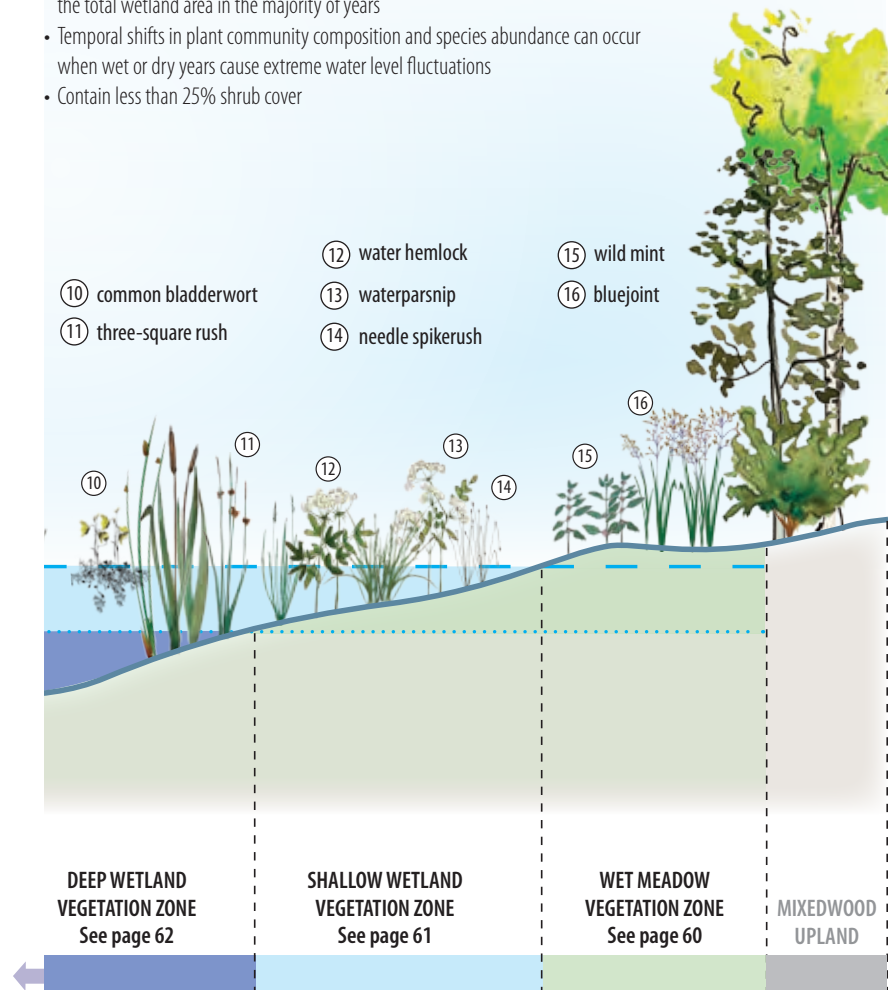
- Range of salinity types from fresh-water to brackish
- Nutrient-rich, with diverse species assemblages

LANDSCAPE SETTING

- Common in prairie and parkland regions, often referred to as prairie potholes
- Marshes adjacent to creeks and lakes are commonly referred to as riparian areas
- Commonly found along margins of larger lakes across the province
- Some marsh types are challenging to identify due to a lack of standing water in dry seasons or dry years

VEGETATION

- Graminoid species dominate the deepest portion of the wetland, occupying more than 25% of the total wetland area in the majority of years
- Temporal shifts in plant community composition and species abundance can occur when wet or dry years cause extreme water level fluctuations
- Contain less than 25% shrub cover

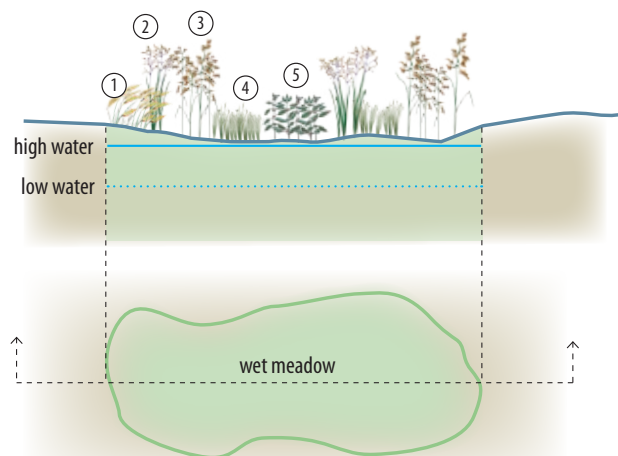


MARSH - TYPES

TEMPORARY

Surface water is present for a short period of time after snowmelt or heavy rainfall.

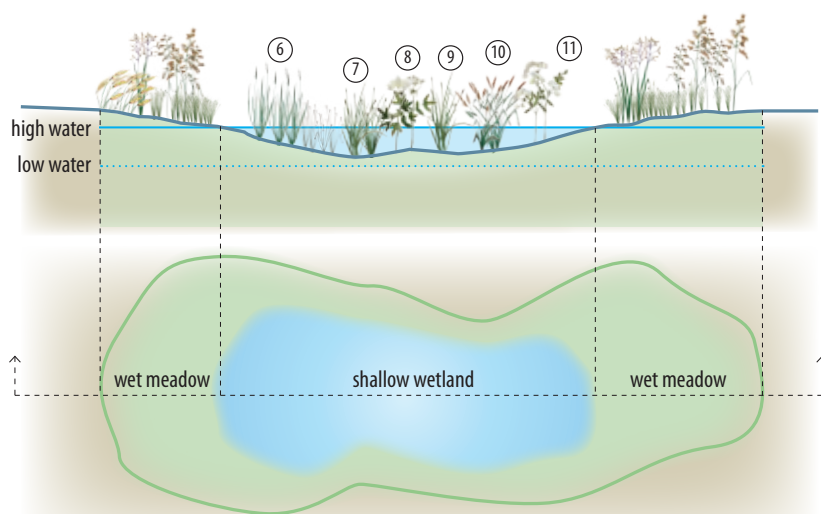
- ① foxtail barley ② bluejoint ③ fowl bluegrass
④ wire rush ⑤ wild mint



SEASONAL

Surface water is present through most of an average growing season, but wetland is dry by late summer.

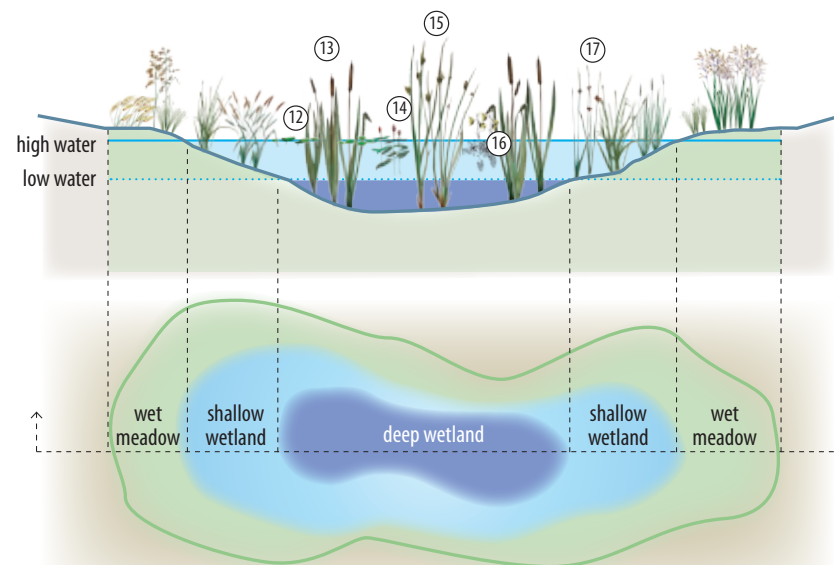
- ⑥ sloughgrass ⑦ needle spikerush ⑧ awned sedge
⑨ water hemlock ⑩ reed canary grass ⑪ waterparsnip



SEMI-PERMANENT

Surface water is present for most or all of the year, except during drought years.

- ⑫ common duckweed ⑬ common cattail ⑭ water smartweed
⑮ great bulrush ⑯ common bladderwort ⑰ three-square rush



Marsh in an agricultural area. In wet years, the water-loving (hydrophytic) vegetation will re-establish, and in dry years Temporary and Seasonal Marshes are more likely to be tilled and seeded for agricultural purposes.

Water Level Fluctuations in Marshes - Water levels in marshes fluctuate throughout the year and typically follow a pattern of high water levels after spring snowmelt or heavy rainfall followed by a decline in water level throughout the growing season. In particularly wet or dry years, this pattern may be disrupted and lead to changes in the plant community composition. *Remember to use the dominant vegetation in the deepest wetland zone to classify your wetland.*

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Main TOC

Classes

Key

Factsheets

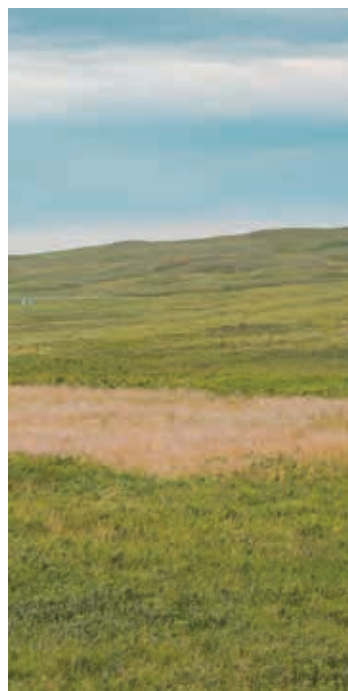
Plant ID

Plant Index



Standing water (typical of spring conditions).

CHARACTERISTIC SPECIES		
WET MEADOW VEGETATION ZONE		
	FRESH-WATER EC less than 500 $\mu\text{S}/\text{cm}$	SLIGHTLY BRACKISH EC 500 to 2,000 $\mu\text{S}/\text{cm}$
Graminoids	☐ bluejoint ☐ fowl bluegrass ☐ tufted hairgrass ☐ northern reed grass ☐ graceful sedge ☐ Sartwell's sedge	☐ foxtail barley ☐ bluejoint ☐ fowl bluegrass ☐ tufted hairgrass ☐ wire rush
Forbs	☐ small bedstraw ☐ western dock ☐ marsh skullcap ☐ wild mint	☐ western dock ☐ wild mint



Dry conditions (typical of summer).

- Surface water only present for a short period of time after snowmelt or heavy rainfall
- Hydric soil indicators, such as mottling and gleying, are usually visible within the rooting zone
- Deepest wetland vegetation zone is characterized by wet meadow species



Standing water (typical of spring and early summer conditions).



Late summer conditions.

- Surface water is present through most of an average growing season, but wetland is typically dry by late summer
- Hydric soil indicators such as mottling and gleying visible within rooting zone
- Highly decomposed organic soils are sometimes present (Von Post more than 5)
- Deepest wetland vegetation zone is characterized by shallow wetland species

CHARACTERISTIC SPECIES			
SHALLOW WETLAND VEGETATION ZONE			
	FRESH-WATER EC less than 500 $\mu\text{S}/\text{cm}$	SLIGHTLY BRACKISH EC 500 to 2,000 $\mu\text{S}/\text{cm}$	MODERATELY BRACKISH EC 2,000 to 5,000 $\mu\text{S}/\text{cm}$
Graminoids	☐ awned sedge ☐ small bottle sedge ☐ water sedge ☐ needle spikerush ☐ common tall manna grass ☐ reed canary grass ☐ sloughgrass ☐ short-awned foxtail	☐ awned sedge ☐ small bottle sedge ☐ water sedge ☐ needle spikerush ☐ reed canary grass ☐ sloughgrass ☐ spangletop ☐ short-awned foxtail	☐ needle spikerush ☐ Nuttall's salt-meadow grass ☐ sloughgrass ☐ spangletop ☐ short-awned foxtail
Forbs	☐ waterparsnip	☐ waterparsnip ☐ water hemlock ☐ water smartweed	

The margin of each seasonal marsh is composed of a wet meadow zone typical of temporary marshes (see page 60). For moderately brackish systems, characteristic species include:

- ☐ foxtail barley
- ☐ reed canary grass
- ☐ prairie cord grass
- ☐ wire rush

Seasonal marshes are not immune to agricultural tillage in dry years, often resulting in poor crop productivity. Typical species inhabiting cropped sites include needle spikerush in fresh-water and slightly brackish systems or quackgrass and red goosefoot in moderately brackish systems.



Agricultural Tillage - Temporary wetlands are particularly vulnerable to agricultural tillage as they are often dry during prime seeding time and can be challenging to identify. A variety of annuals, and sometimes invasive species, can be found in disturbed systems. A wetland practitioner should rely on historical aerial imagery coupled with climate data, as well as soil and hydrology indicators verified in the field, to identify and classify temporary marshes.

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MARSH - SEMI-PERMANENT



With standing water (typical spring conditions).



Standing water still present by late summer in a typical year.

- Surface water is present for most or all of the year, except during dry years
- Hydric soil indicators such as mottling and gleying usually visible within rooting zone
- Highly decomposed organic soils are often present (Von Post more than 5)
- Deepest wetland zone is characterized by deep wetland species

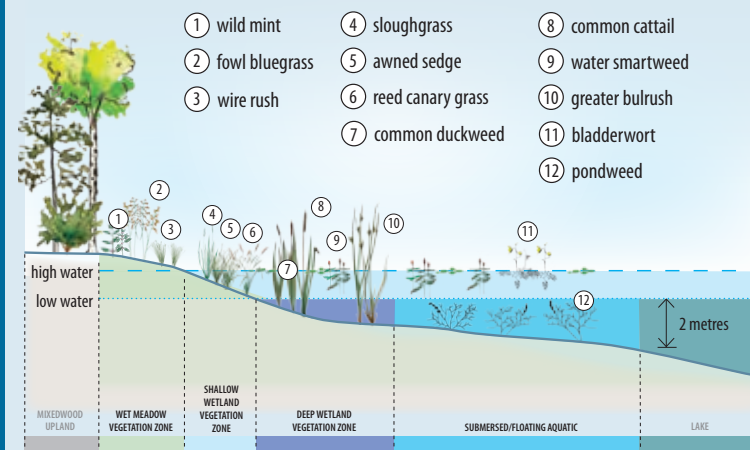
	CHARACTERISTIC SPECIES			
	DEEP WETLAND VEGETATION ZONE			
	FRESH-WATER EC less than 500 $\mu\text{S}/\text{cm}$	SLIGHTLY BRACKISH EC 500 to 2,000 $\mu\text{S}/\text{cm}$	MODERATELY BRACKISH EC 2,000 to 5,000 $\mu\text{S}/\text{cm}$	BRACKISH EC 5,000 to 15,000 $\mu\text{S}/\text{cm}$
Graminoids	☐ common cattail	☐ great bulrush ☐ three-square rush	☐ great bulrush ☐ three-square rush	☐ great bulrush ☐ three-square rush
Forbs	☐ marsh marigold			
Aquatics	☐ common bladderwort ☐ common duckweed	☐ water smartweed	☐ ivy-leaved duckweed	
Liverworts	☐ crystalwort ☐ purple-fringed heartwort			

The margin of each semi-permanent marsh is composed of shallow marsh and wet meadow zones typical of seasonal marshes (see page 61). For brackish systems, characteristic species include:

- ☐ creeping spike-rush
- ☐ samphire
- ☐ Nuttall's salt-meadow grass
- ☐ three-square rush



Photo credit: Catherine Brown



Marshes bordering lakes and rivers: Many marshes exist along the shores of larger lakes or river systems. In these cases, vegetation communities may include submersed and/or floating aquatic species in areas with less than 2 m of standing water; however, the overall wetland would be classified as a marsh. The water permanence types described here would not be applicable to these systems and this is the only mineral wetland where their deepest vegetation zone does not determine the overall wetland class, form and type.

Jump to:

Main TOC

Classes

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Factsheets

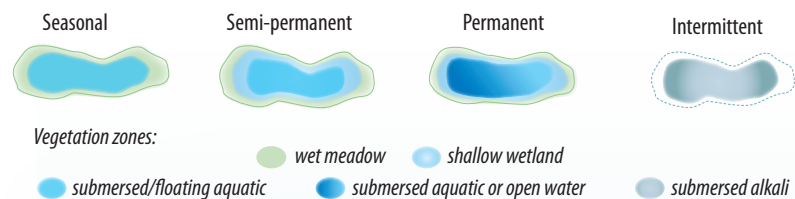
Plant ID

Plant Index

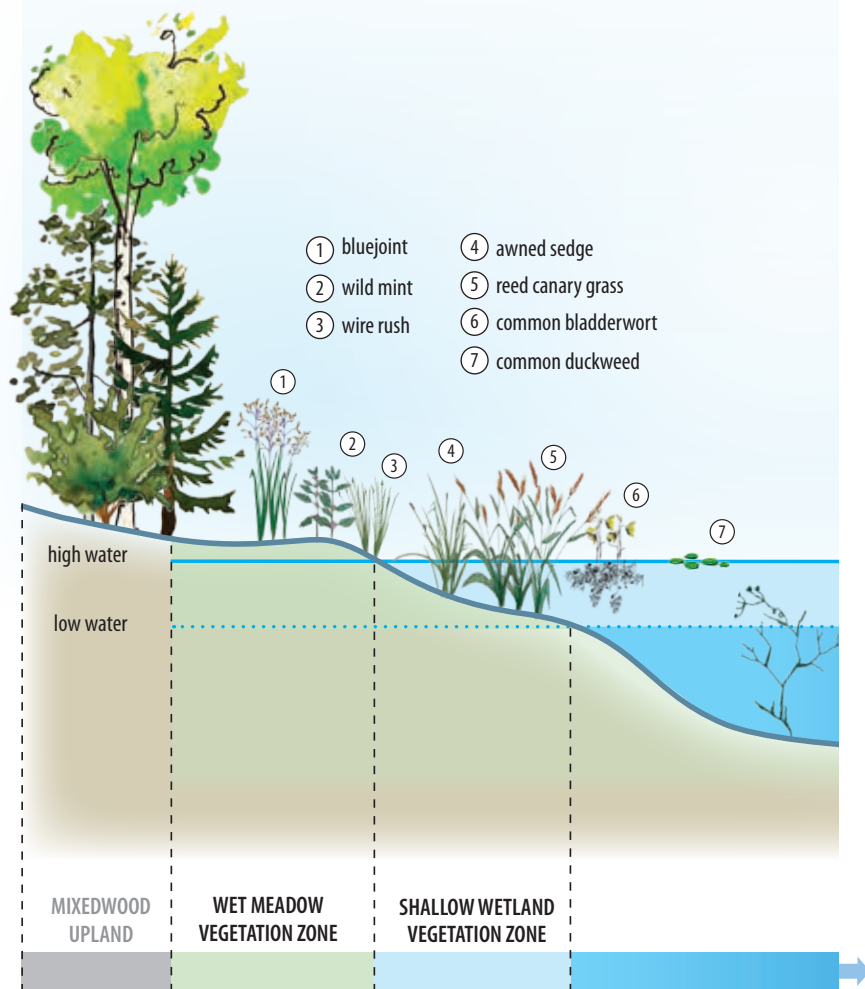
SHALLOW OPEN WATER

Shallow open water wetlands are subdivided into types based on their water level permanence and salinity by using characteristic vegetation community zones.

THERE ARE FOUR WATER PERMANENCE TYPES:



THIS CROSS-SECTION ILLUSTRATES A PERMANENT SHALLOW OPEN WATER TYPE:



SOIL

- Mineral soils (clay, silt, sand) and less than 40 cm of organic soil (peat)
- Soils are wet (hydric), with indicators such as mottling and gleying
- Von Post more than 5

CHEMISTRY

- Range of salinity types from fresh-water to saline
- Nutrient-rich, often subject to algae blooms

LANDSCAPE SETTING

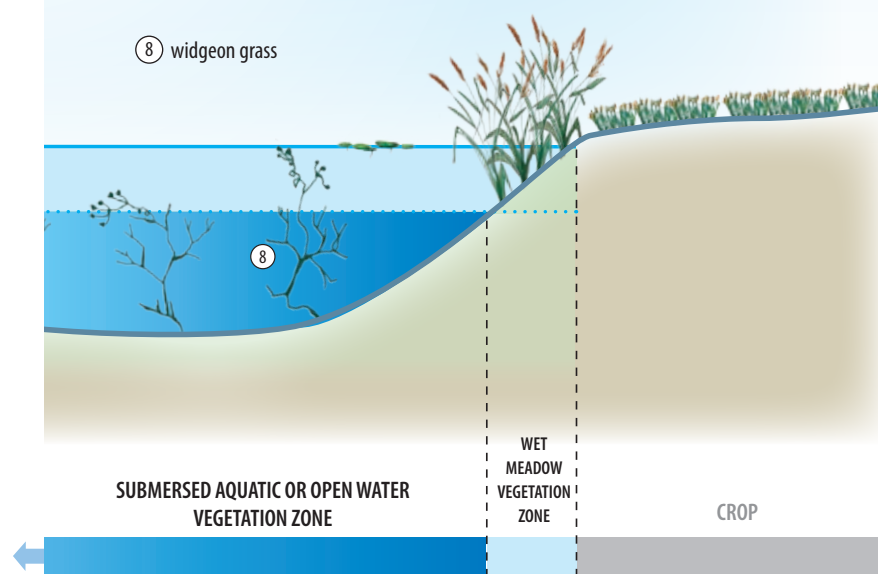
- Often referred to as prairie potholes in parkland and prairie regions

WATER REGIME

- Open water up to 2 m deep occupies more than 75% of the total wetland area in most years
- Variety of water inputs (precipitation, surface water, groundwater)
- Fluctuating water levels, causing seasonal to permanent flooding
- Occasionally, bare soil is exposed in intermittent systems such as salt flats

VEGETATION

- Submersed and/or floating aquatic vegetation present in the open water zone
- During times of water table drawdown, vegetation may be absent
- Temporal shifts in plant community composition and species abundance can occur when wet or dry years cause extreme water level fluctuations
- Graminoid communities often surround the open water zone

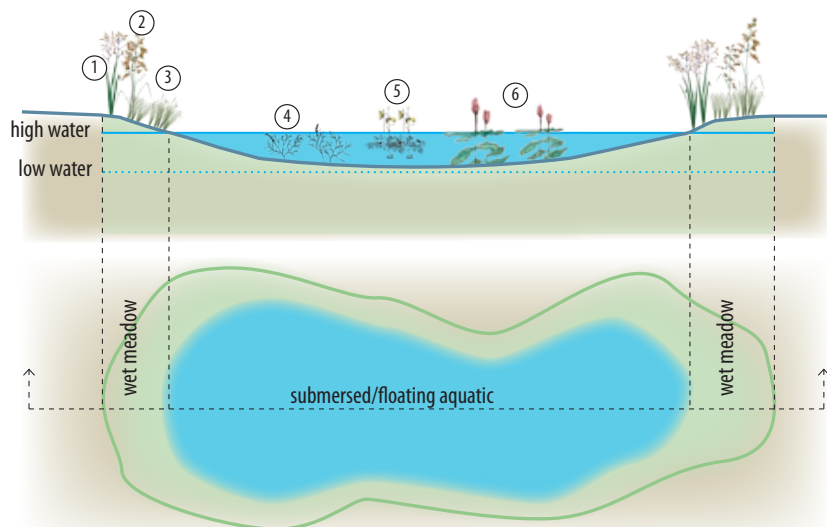


SHALLOW OPEN WATER - TYPES

SEASONAL

Surface water is present through most of an average growing season, but wetland is dry by late summer.

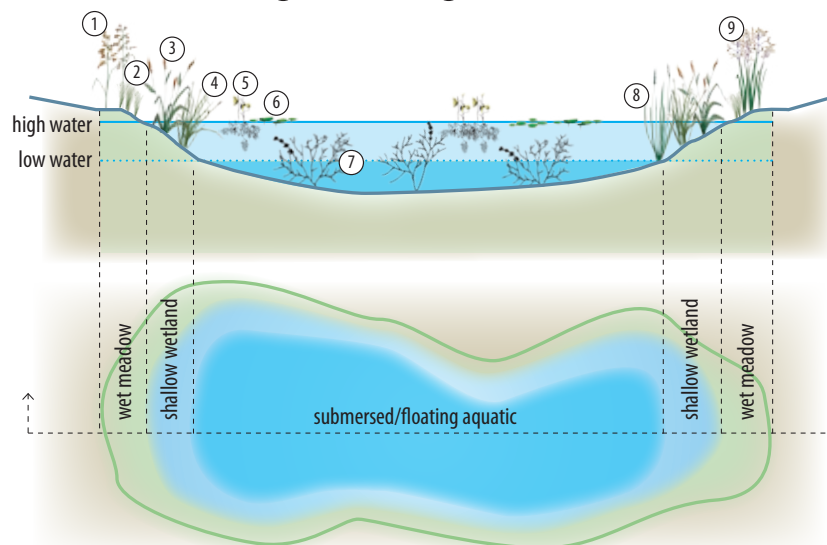
- ① bluejoint
- ② fowl bluegrass
- ③ wire rush
- ④ pondweeds
- ⑤ common bladderwort
- ⑥ water smartweed



SEMI-PERMANENT

Surface water is present for most or all of the year, except during drought years.

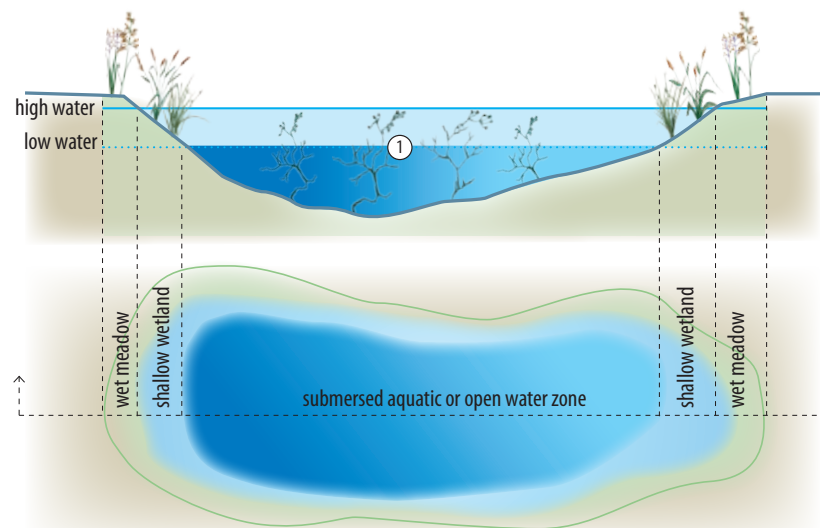
- ① fowl bluegrass
- ② wire rush
- ③ canary reed grass
- ④ awned sedge
- ⑤ bladderwort
- ⑥ common duckweed
- ⑦ pondweeds
- ⑧ sloughgrass
- ⑨ bluejoint



PERMANENT

Surface water up to 2 m deep is present throughout the year, even in drought conditions.

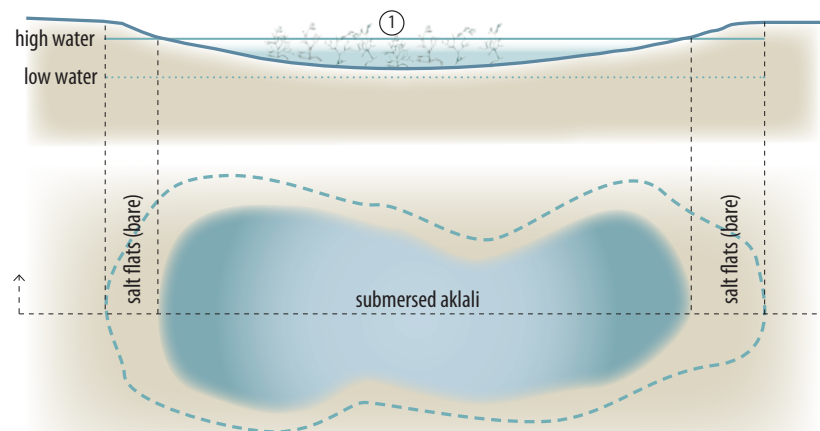
- ① widgeon grass



INTERMITTENT

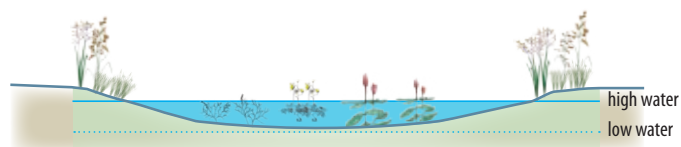
Alternates between saline open water and exposed bare soil (salt flats).

- ① widgeon grass

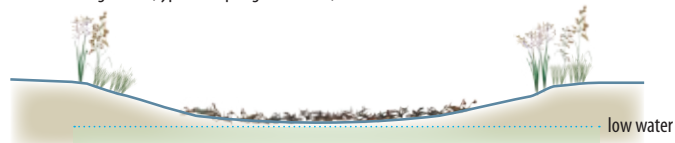


SHALLOW OPEN WATER - SEASONAL

SHALLOW OPEN WATER - SEMI-PERMANENT



With standing water (typical of spring conditions)



Without standing water (typical of late summer conditions)

- Surface water present through most of an average growing season, but typically dry by late summer
- Hydric soil indicators such as mottling and gleying visible within rooting zone
- Deepest wetland zone contains open water covering more than 75% of the wetland area in most years with a submersed and/or floating aquatic vegetation community

CHARACTERISTIC SPECIES			
SUBMERSED/FLOATING AQUATIC VEGETATION ZONE			
	FRESH-WATER EC less than 500 µS/cm	SLIGHTLY BRACKISH EC 500 to 2,000 µS/cm	MODERATELY BRACKISH EC 2,000 to 5,000 µS/cm
Aquatics	☐ common bladderwort ☐ various-leaved pondweed	☐ common bladderwort ☐ large-leaved white water crowfoot ☐ needle spikerush ☐ small-leaf pondweed ☐ water smartweed	☐ algae ☐ common bladderwort ☐ large-leaved white water crowfoot
Bryophytes		☐ brown mosses	☐ brown mosses
SPECIES ALONG THE MARGIN OF THE WETLAND			
Graminoids	☐ bluejoint ☐ fowl bluegrass ☐ tufted hairgrass ☐ northern reed grass ☐ graceful sedge ☐ Sartwell's sedge	☐ foxtail barley ☐ bluejoint ☐ fowl bluegrass ☐ tufted hairgrass ☐ wire rush	☐ foxtail barley ☐ reed canary grass ☐ prairie cord grass ☐ wire rush
Forbs	☐ small bedstraw ☐ western dock ☐ marsh skullcap ☐ wild mint	☐ western dock ☐ wild mint	



Standing water present throughout a typical year.



Dried-up conditions during a dry season/year.

- Surface water present for most or all of the year, except during drought years
- Hydric soil indicators such as mottling and gleying easily visible within rooting zone
- Deepest wetland zone contains open water covering more than 75% of the wetland area in most years with a submersed and/or floating aquatic vegetation community

CHARACTERISTIC SPECIES					
SUBMERSED/FLOATING AQUATIC VEGETATION ZONE					
	FRESH-WATER EC less than 500 µS/cm	SLIGHTLY BRACKISH EC 500 to 2,000 µS/cm	MODERATELY BRACKISH EC 2,000 to 5,000 µS/cm	BRACKISH EC 5,000 to 15,000 µS/cm	SUB-SALINE EC 15,000 to 45,000 µS/cm
Aquatics	☐ clasping-leaf pondweed ☐ common bladderwort ☐ hornwort ☐ large-leaved white water crowfoot ☐ small-leaf pondweed ☐ spike water-milfoil	☐ clasping-leaf pondweed ☐ common bladderwort ☐ hornwort ☐ large-leaved white water crowfoot ☐ small-leaf pondweed ☐ spike water-milfoil	☐ algae ☐ horned pondweed ☐ large-leaved white water crowfoot ☐ sago pondweed ☐ spike water-milfoil	☐ algae ☐ horned pondweed	☐ algae ☐ horned pondweed ☐ sago pondweed ☐ widgeon-grass
SPECIES ALONG THE MARGIN OF THE WETLAND					
Graminoids	☐ bluejoint ☐ fowl bluegrass ☐ tufted hairgrass ☐ northern reed grass ☐ graceful sedge ☐ Sartwell's sedge	☐ foxtail barley ☐ bluejoint ☐ fowl bluegrass ☐ tufted hairgrass ☐ wire rush	☐ foxtail barley ☐ reed canary grass ☐ prairie cord grass ☐ wire rush	☐ foxtail barley ☐ reed canary grass ☐ prairie cord grass ☐ wire rush	☐ alkali cordgrass ☐ common sea-blite ☐ foxtail barley ☐ Nuttall's salt-meadow grass ☐ salt grass ☐ seaside arrow grass ☐ scratch grass
Forbs	☐ small bedstraw ☐ western dock ☐ marsh skullcap ☐ wild mint	☐ western dock ☐ wild mint			☐ samphire

SHALLOW OPEN WATER - PERMANENT

SHALLOW OPEN WATER - INTERMITTENT



Photo taken in the summer, standing water present throughout the year.

- Surface water up to 2 m deep present throughout the year, even in dry conditions
- Deepest wetland zone contains open water covering more than 75% of the wetland area with a submersed aquatic vegetation community

CHARACTERISTIC SPECIES				
SUBMERSED AQUATIC VEGETATION ZONE				
	SLIGHTLY BRACKISH EC 500 to 2,000 µS/cm	MODERATELY BRACKISH EC 2,000 to 5,000 µS/cm	BRACKISH EC 5,000 to 15,000 µS/cm	SUB-SALINE EC 15,000 to 45,000 µS/cm
Aquatics	☐ widgeon grass	☐ widgeon grass ☐ occasionally large-sheath pondweed	☐ widgeon grass	
SPECIES ALONG THE MARGIN OF THE WETLAND				
Graminoids	☐ foxtail barley ☐ bluejoint ☐ fowl bluegrass ☐ tufted hairgrass ☐ wire rush	☐ foxtail barley ☐ reed canary grass ☐ prairie cord grass ☐ wire rush	☐ foxtail barley ☐ reed canary grass ☐ prairie cord grass ☐ wire rush	☐ alkali cordgrass ☐ common sea-blite ☐ foxtail barley ☐ Nuttall's salt-meadow grass ☐ salt grass ☐ seaside arrow grass ☐ scratch grass
Forbs	☐ western dock ☐ wild mint			☐ samphire



Standing water present throughout a typical year.



Dried-up conditions during a dry season/year.

- Subject to periodic flooding, these systems alternate between saline open water and exposed bare soil
- Saline system with an EC of more than 45,000 µS/cm
- Glistening white alkali salt flats are evident when not flooded that are primarily composed of sodium and magnesium chlorides and sulphates
- Deepest wetland zone contains open water covering more than 75% of the wetland area in most years, with a submersed alkali aquatic vegetation community composed exclusively of widgeon grass



Boreal salt flat.

Saline wetlands are not limited to the southern prairie regions of the province, in fact more information is becoming available about saline wetlands in the boreal region with characteristic species including:

- ☐ northern reed grass
- ☐ seaside arrow grass
- ☐ wire rush

CHARACTERISTIC SPECIES	
SUBMERSED ALKALI VEGETATION ZONE	
SALINE EC more than 45,000 µS/cm	
Aquatics	☐ widgeon grass
SPECIES ALONG THE MARGIN	
Graminoids	☐ alkali cordgrass ☐ common sea-blite ☐ foxtail barley ☐ Nuttall's salt-meadow grass ☐ salt grass ☐ seaside arrow grass ☐ scratch grass
Forbs	☐ samphire



Photo credit: Octavio Hermida

Stormwater pond in an urban setting.

Is it Natural or Constructed?

Many shallow open water systems have been artificially created such as borrow pits, settling ponds, stormwater ponds, dugouts, etc. These constructed features may still require consideration under Provincial legislation, even though they aren't classified as wetlands under the AWCS (2015).

WETLAND PLANT IDENTIFICATION

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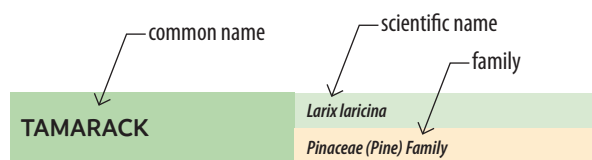
Plant Index

Introduction

To assist in wetland classification, this section contains profiles of the common wetland plant species highlighted in the **Wetland Fact Sheets** (page 37). This is not a comprehensive guide to all wetland plant species. Lists of other wetland plants not profiled can be found in the **Wetland Plant Identification Index** (page 136). Reviewing additional resources, including species dichotomous keys, to aid in confirming your plant identification is recommended. For other guides see **Appendix A** (page 143).

Species Naming:

For species naming conventions, this guide uses information available at time of publishing from the [Alberta Conservation Information Management System](#). Each page provides naming as shown:



In addition to species information, each page provides a visual check box for what class of wetland(s) the species may be found in:



Emergent plant species dominate this marsh.

More Information on Plant Species: The Alberta Biodiversity Monitoring Institute's online [Biodiversity Browser](#) and [Naturelynx](#) can provide more information on the diversity of wetland plant species found across Alberta, along with the other resources listed in **Appendix B** (page 146).

Organization of Species:

Species are organized according to their vegetative forms, while some species are further grouped using their wetland vegetation zone affiliations (for marshes and shallow open water wetlands).

Trees: Woody plants with a single, well-defined trunk, taller than 3 metres. There are both deciduous (in this case, denoting broadleaf species which shed their leaves annually) and coniferous (trees with needle-shaped leaves and cones) wetland trees in Alberta.

Shrubs: Woody plants typically less than 3 metres in height with multiple, branched stems.

Forbs and Graminoids: Herbaceous (non-woody) plant species. Forbs include broad-leaved flowering plants, while graminoids are narrow-leaved grasses, sedges, rushes, cattails, etc. They are often emergent species that tolerate flooded conditions, at least for a portion of the growing season.

Aquatic Plants: Species adapted to living continuously in water. These include submersed and floating species which occupy standing water typically less than 2 metres in depth. Aquatic plants may be free-floating in the water column or fixed to the bottom sediment.

Bryophytes: Small, non-vascular plant species such as mosses, liverworts and hornworts. These species do not produce flowers or seeds, but instead reproduce via spores.

Invasive Plant Species: This section highlights introduced wetland plant species, many of which are regulated under the Alberta Weed Control Act. These are species that landowners must control to prevent from spreading (noxious) or must eradicate completely (prohibited noxious).

Invasive Species: For more information on invasive plant and animal species that frequent wetlands and aquatic environments, visit the [Alberta Invasive Species Council](#) website.

Terminology

Leaf Arrangements



Alternate



Opposite



Whorled



Pinnate



Palmate

Leaf Shapes



Lance



Linear



Elliptic



Oval



Round



Triangular



Diamond



Smooth

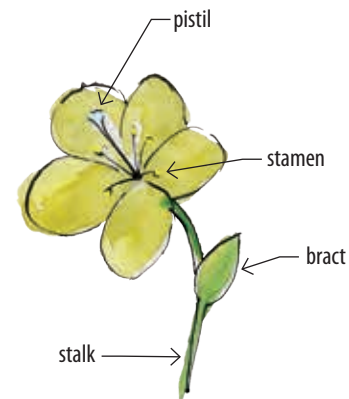
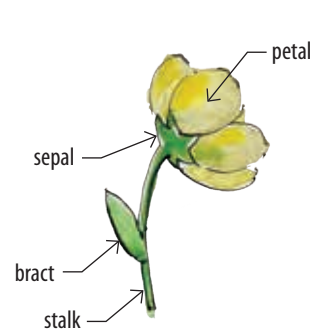


Toothed

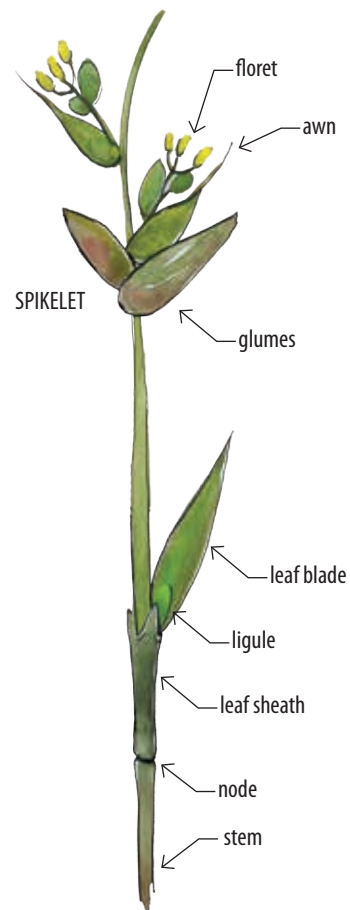


Double-toothed

Forb Flower Parts



Graminoid Parts



Graminoid Flower Arrangements

each flower is stalked



Panicle

flowers are not stalked



Spike

TREES - Coniferous

BLACK SPRUCE

Picea mariana

Pinaceae (Pine) Family

- ☐ Small and slow-growing with characteristic clump of branches towards the top of its crown
- ☐ Branches whorled, lowermost sloping steeply downwards
- ☐ Young twigs with short (1-2 cm) needles and rusty hairs, compared to smooth white spruce twigs
- ☐ Seed cones are small (1-2.5 cm, half the length of white spruce cones), oval and often purple in colour



Black spruce trees.



Cones.



Twigs.

TREES - Coniferous

TAMARACK

Larix laricina

Pinaceae (Pine) Family

- ☐ Also known as **larch**
- ☐ Branches alternate
- ☐ Needles are short (1-2.5 cm) and soft, arranged in clusters of 10-20, bluish green in colour turning yellow and dropping in fall
- ☐ Seed cones are small (1-2 cm) and oval



Tamarack trees.



Cones and needles.



Tamarack needles fall colours.

☒ BOG

☒ FEN

☒ SWAMP

MARSH

SHALLOW OPEN WATER

☐ BOG

☒ FEN

☒ SWAMP

MARSH

SHALLOW OPEN WATER

TREES - Deciduous

ALASKA BIRCH

*Betula neolaskana**Betulaceae (Birch) Family*

- ☐ Bark is dark reddish brown when young, becoming creamy white with age but less peeling than white birch
- ☐ Branches and leaves alternate with hairless, reddish brown, densely warty twigs
- ☐ Leaves 4-7 cm, triangular, double-toothed, hairless to sparsely hairy below, and tapering off to a sharp point



Trees.



Bark.



Leaves and twigs.



BOG

FEN

SWAMP

MARSH

SHALLOW OPEN WATER

TREES - Deciduous

WHITE BIRCH

*Betula papyrifera**Betulaceae (Birch) Family*

- ☐ Also known as **paper birch**
- ☐ Bark is dark reddish brown when young, becoming creamy white with age and shedding off in large sheets
- ☐ Branches and leaves alternate on reddish brown, hairy, sparsely warty twigs
- ☐ Leaves 5-10 cm, oval, double toothed and with hairy underside



Trees.



Bark.



Leaf and twig.



BOG

FEN

SWAMP

MARSH

SHALLOW OPEN WATER

TREES - Deciduous

BALSAM POPLAR

*Populus balsamifera**Salicaceae (Willow) Family*

- ☐ Bark is deeply furrowed and grayish brown when mature compared to the smoother, white appearance of aspen bark
- ☐ Branches and leaves alternate
- ☐ Leaves 7-10 cm (considerably larger than aspen), oval to lance-shaped, finely toothed, dark green and shiny above with lighter underside
- ☐ Large, sticky, fragrant buds on the branch. Good indicator when leaves are not present



Bark and buds.



Tree.



Leaves.



BOG

FEN

SWAMP

MARSH

SHALLOW OPEN WATER

TREES - Deciduous

PLAINS COTTONWOOD

*Populus deltoides**Salicaceae (Willow) Family*

- ☐ Found in riparian swamps of southeastern Alberta
- ☐ Bark is dark grey and deeply furrowed when mature
- ☐ Branches and leaves alternate
- ☐ Leaves 5-10 cm, triangular, coarsely toothed and tapering off to a sharp point



Tree.



Bark.



Leaves.



BOG

FEN

SWAMP

MARSH

SHALLOW OPEN WATER

BOG BIRCH

Betula glandulosa

Betulaceae (Birch) Family

- ☐ Spreading to erect shrub up to 2 m tall
- ☐ Twigs reddish brown, covered with large, warty glands
- ☐ Leaves 1-2 cm, round, thick and leathery, dotted with glands and with 6-10 rounded teeth per side



Twigs.



Shrub.



6 - 10 teeth per side.

Leaf.

DWARF BIRCH

Betula pumila

Betulaceae (Birch) Family

- ☐ Shrub with erect stems up to 3 m tall
- ☐ Twigs reddish brown and finely hairy with less conspicuous glands; older stems are smooth and hairless
- ☐ Leaves 1-5 cm, oval, thick and leathery, dotted with glands and with 10-15 coarse teeth per side



Shrub.



More teeth per side than bog birch.

Leaf.



Leaves.

BOG WILLOW

Salix pedicellaris

Salicaceae (Willow) Family

- ☐ Branching shrub up to 1.5 m tall
- ☐ Twigs hairless and dark grey
- ☐ Leaves 2-5 cm, leathery and dull with a bluish white coating, hairless, smooth-edged and narrowly oval, often widest above the mid-point
- ☐ Catkins 1-2 cm, emerging with the leaves, borne near the tips and along the sides of branches
- ☐ Plants form colonies via spreading, rooting branches (layering)



Branch and leaves.



Leaves and catkins.

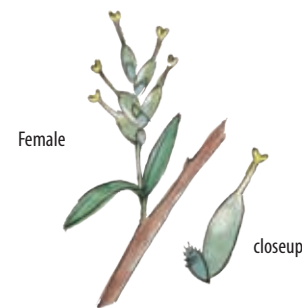
Photo credit: Taylor Vlodavija

HOARY WILLOW

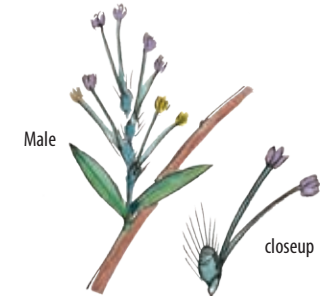
Salix candida

Salicaceae (Willow) Family

- ☐ Branching shrub up to 1.5 m tall
- ☐ Twigs white with woolly hairs, mature branches turning brown and sparsely hairy
- ☐ Leaves narrowly elliptic, 4-8 cm and up to 8 times as long as wide, cobwebby hairs present above and dense, white woolly hairs on underside
- ☐ Catkins up to 5 cm long borne on short, leafy shoots, emerging with the leaves



Catkins.



Shrub.



Leaves.

Photo credit: Taylor Vlodavija

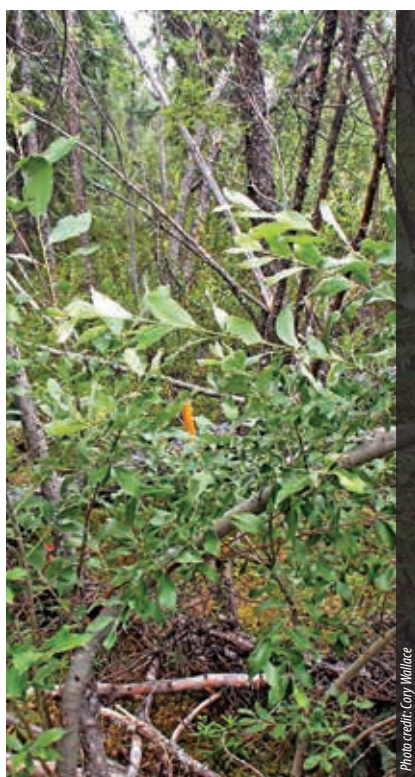


BEAKED WILLOW

Salix bebbiana

Salicaceae (Willow) Family

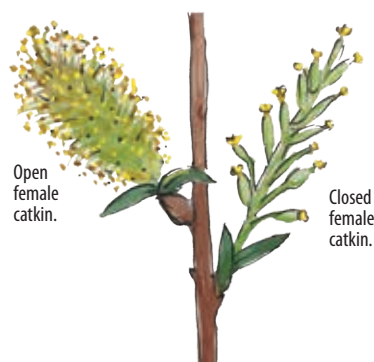
- ☐ Large shrub up to 5 m tall
- ☐ Twigs reddish brown and finely hairy, becoming hairless with age
- ☐ Leaves 3-7 cm, narrowly oval, pointed at both ends with smooth to wavy edges, upper surface dull green and whitish hairy underneath
- ☐ Catkins appear before or with the leaves, stalkless; female (seed) catkins 2-4 cm in length



Shrub.



Leaves.



Open female catkin.

Closed female catkin.

Catkin (female).

PUSSY WILLOW

Salix discolor

Salicaceae (Willow) Family

- ☐ Large shrub up to 6 m tall
- ☐ Twigs shiny reddish brown and hairy, becoming hairless with age
- ☐ Leaves 3-10 cm, elliptic, sometimes toothed above the middle, bright green above and whitish below, hairless
- ☐ Male (pollen) catkins stalkless, densely covered in silky hairs when immature and fully developed before the leaves appear; female (seed) catkins 2-6 cm in length with white hairs



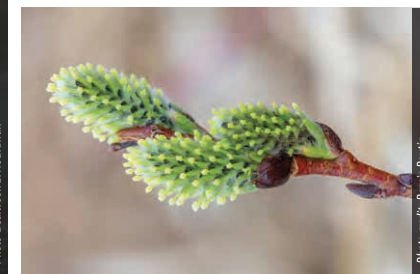
Branch.



Leaves



Catkin - Male.



Catkin - Female.

SHRUBS - Alders

ALDER

*Alnus incana**Betulaceae (Birch) Family*

- ☐ Bushy shrub up to 8 m tall
- ☐ Twigs light green and hairy when young, mature bark with conspicuous pores (lenticels)
- ☐ Leaves 5-10 cm, oval, alternate, coarsely double-toothed, dull green on top with sticky hairs on underside
- ☐ Cone-like, small catkins appearing before the leaves

GREEN ALDER

*Alnus viridis**Betulaceae (Birch) Family*

- ☐ Bushy shrub up to 3 m tall
- ☐ Twigs brown and finely hairy when young, mature bark with conspicuous pores (lenticels)
- ☐ Leaves 7-15 cm, oval to elliptic, alternate, finely single-toothed, dark green above and shiny green, hairless below
- ☐ Cone-like, small catkins



Alder leaf.



Green Alder leaves.



BOG

FEN

SWAMP

MARSH

SHALLOW OPEN WATER

SHRUBS - Dogwood

RED-OSIER DOGWOOD

*Cornus stolonifera**Cornaceae (Dogwood) Family*

- ☐ Erect to spreading shrub up to 3 m tall
- ☐ Branches alternate, twigs red in colour
- ☐ Leaves opposite, 4-12 cm, oval to lance-shaped with prominent parallel veins and a distinct pointed tip
- ☐ Flower white to green with dense, flat-topped clusters at branch tips
- ☐ Fruits white, juicy berries forming in clusters; inedible



Shrub.



Leaves and berries.



Leaves and berries.



BOG

FEN

SWAMP

MARSH

SHALLOW OPEN WATER

Jump to:

Plant ID

Plant Index

LABRADOR TEA

Rhododendron groenlandicum

Ericaceae (Heath) Family

- ❑ Short shrub up to 1 m tall
- ❑ Leaves evergreen and alternate, 1-6 cm, oval to linear shape with smooth edges that roll under, dull green above and rusty orange below with dense, woolly hairs
- ❑ Flowers white to pinkish, forming round, umbrella-shaped clusters



Shrub.



Underside of leaf.



Flowers.



BOG



FEN



SWAMP

MARSH

SHALLOW OPEN WATER

LEATHERLEAF

Chamaedaphne calyculata

Ericaceae (Heath) Family

- ❑ Short shrub up to 60 cm tall
- ❑ Leaves alternate and leathery in appearance, 1-4 cm, oval to elliptic, underside with small brown scales
- ❑ Flowers white, bell-shaped hanging down from one side of the branch in elongated clusters (racemes)



Shrub.



Leaves and flowers.



Leaves and flowers.



BOG



FEN

SWAMP

MARSH

SHALLOW OPEN WATER

Jump to:

Plant ID

Plant Index

SHRUBS - Ericaceous

BOG CRANBERRY

*Vaccinium vitis-idaea**Ericaceae (Heath) Family*

- ☐ Trailing stems 10-20 cm long
- ☐ Leaves evergreen, alternate, 0.5-1.5 cm, oval to elliptic with down-rolled edges, upper surface shiny dark green and lower surface light green
- ☐ Flowers pinkish-white and bell shaped, forming in clusters
- ☐ Fruits are small, bright red, edible berries



Flowers.



Shrub.



Berries.



BOG



FEN



SWAMP



MARSH

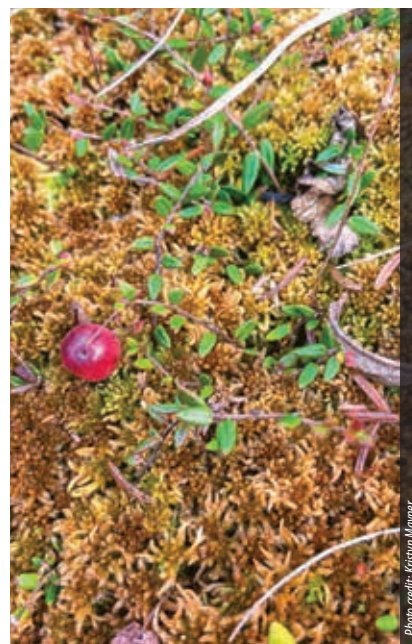
SHALLOW OPEN WATER

SHRUBS - Ericaceous

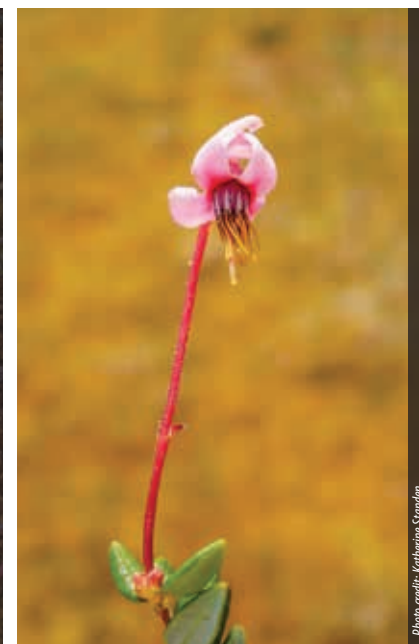
SMALL BOG CRANBERRY

*Vaccinium oxycoccus**Betulaceae (Birch) Family*

- ☐ Tiny, creeping shrub 10-50 cm long
- ☐ Leaves tiny (2-6 mm), alternate, leathery, oval to elliptic with edges that roll under; leaves are widely spaced along vine
- ☐ Flowers appear like tiny shooting stars, comprised of four pink petals sharply pointed backwards
- ☐ Fruit small, round, pale pink to dark red berries



Shrub and berry.



Flower.



BOG



FEN



SWAMP

MARSH

SHALLOW OPEN WATER

Jump to:

Plant ID

Plant Index

FORBS AND GRAMINOIDS - Peatland Indicators

CLOUDBERRY

*Rubus chamaemorus**Rosaceae (Rose) Family*

- ☐ Typically grows on *Sphagnum* moss hummocks
- ☐ Leaves 1-3 per stem; round to kidney shaped, shallowly 5-7 lobed, leathery and toothed
- ☐ Single, white flower at stem tip becomes raspberry-like cluster of berries, reddish when young, amber to yellow when mature



Plant in flower.



Berry.

✓
BOG✓
FEN✓
SWAMP

MARSH

SHALLOW OPEN WATER

MARSH CINQUEFOIL

*Comarum palustre**Rosaceae (Rose) Family*

- ☐ Stems reddish brown, spreading along ground with ascending flowering stems
- ☐ Leaves pinnately compound with 5-7 leaflets on flowering stem, oval and coarsely toothed
- ☐ Flowers cluster at stem tip with 5 purple sepals and 5 maroon petals



Plant in flower.

✓

BOG

✓

FEN

✓

SWAMP

✓

MARSH

SHALLOW OPEN WATER

FORBS AND GRAMINOIDS - Peatland Indicators

BUCK-BEAN

*Menyanthes trifoliata**Menyantheceae (Buckbean) Family*

- ☐ Aquatic to emergent spreading plants
- ☐ Leaves alternate, crowded near the stem base, compound with three oval leaflets
- ☐ Flowers clustered at tip of long stem with 5 white, hairy petals



Plant in flower.

BOG

✓
FEN✓
SWAMP

MARSH

SHALLOW OPEN WATER

THREE-LEAVED SOLOMAN'S SEAL

*Maianthemum trifolium**Asparagaceae (Asparagus) Family*

- ☐ Typically grows on *Sphagnum* moss hummocks
- ☐ Leaves commonly with three per stem, lance-shaped to oval, stalkless with smooth margins
- ☐ Flowers white, with 3-8 elongated along the stem forming red berries



Plant in flower.



Berries.

✓

BOG

✓

FEN

✓

SWAMP

✓

MARSH

SHALLOW OPEN WATER

FORBS AND GRAMINOIDS - Peatland Indicators

SHEATHED COTTONGRASS*Eriophorum vaginatum**Cyperaceae (Sedge) Family*

- ☐ Densely tufted, forming compact clumps or tussocks
- ☐ Stems are stiff and 3-sided, 20-60 cm tall
- ☐ Leaves long and slender (thread-like), emerging from the base of the stem
- ☐ Flowers found on a single spike with seed heads covered by a fluffy mass of cotton-like hairs



Plant in flower.



BOG



FEN



SWAMP

MARSH

SHALLOW OPEN WATER

BUNCHBERRY*Cornus canadensis**Cornaceae (Dogwood) Family*

- ☐ Low, spreading perennial 5 to 10 cm tall
- ☐ Leaves in whorls of 4-6 at stem tip, elliptic to oval with smooth edges, green above and whitish below
- ☐ Flowers tiny, in compact clusters at centre of 4 showy white, petal-like bracts
- ☐ Fruit small, bright red berries forming in clumps



Plants in flower.



Berries.



BOG

FEN

SWAMP

MARSH

SHALLOW OPEN WATER

FORBS AND GRAMINOIDS - Peatland Indicators

PITCHER PLANT*Sarracenia purpurea**Sarraceniaceae (Pitcher Plant) Family*

- ☐ Carnivorous (insect-digesting) plant
- ☐ Leaves at stem base, leaves 10-20 cm, pitcher-shaped and filled with digestive substrate, green to yellowish green with purple veins
- ☐ A single flower located at the top of a 20-30 cm leafless stalk, deep purple to yellow, 5 sepals, petals curved inward



Plant with basal leaves.



BOG



FEN



SWAMP



Flower.

MARSH

SHALLOW OPEN WATER

ROUND-LEAVED SUNDEW*Drosera rotundifolia**Droseraceae (Sundew) Family*

- ☐ Carnivorous (insect-digesting) plant, 5 to 10 cm tall
- ☐ Leaves round with sticky, red, gland-tipped hairs, located at stem base in a circular arrangement
- ☐ Flowers small with 5 white petals, only open in sunlight



Entire plant.



BOG



FEN



SWAMP



Leaves.

MARSH

SHALLOW OPEN WATER

FORBS AND GRAMINOIDS - Swamp Indicators

DEWBERRY

*Rubus pubescens**Rosaceae (Rose) Family*

- ☐ Sprawling plant with weak stems
- ☐ Leaves with 3 sharply toothed, oval to diamond-shaped leaflets (similar to raspberry leaves)
- ☐ Flowers white to pinkish, typically 1 flower per stem, flower stalks often covered with hairs
- ☐ Dark red, raspberry-like fruit



Leaves.



Fruit.



BOG

FEN

SWAMP

MARSH

SHALLOW OPEN WATER

ARROW-LEAVED COLTSFOOT

*Petasites frigidus var. sagittatus**Asteraceae (Aster) Family*

- ☐ Leaves large (up to 30 cm long), at stem base, triangular (arrow-shaped) with more than 20 shallow teeth per side; greenish grey above and white-woolly below
- ☐ Dense clusters of small, white flowers



Leaves.



Plant in flower.



BOG

FEN

SWAMP

MARSH

SHALLOW OPEN WATER

FORBS AND GRAMINOIDS - Swamp Indicators

MARSH MARIGOLD

*Caltha palustris**Ranunculaceae (Buttercup) Family*

- ☐ Smooth, hollow, sprawling or ascending stems
- ☐ Leaves large (up to 20 cm wide), kidney shaped or notched at the bottom with wavy edges
- ☐ Flowers made up of 5-9 bright yellow petal-like sepals, up to 4 cm across



Leaves.



Flowers.



BOG

FEN

SWAMP

MARSH

SHALLOW OPEN WATER

Jump to:

Plant ID

Plant Index

WILD MINT

*Mentha arvensis**Lamiaceae (Mint) Family*

- ☐ Distinctive mint scent
- ☐ Stems square, hairy, up to 50 cm tall
- ☐ Leaves opposite, oval to lance-shaped, toothed with glandular dots
- ☐ Flowers form in clusters, whorled at the leaf axils, purple to pink



Leaves.



Flowers.

WESTERN DOCK

*Rumex occidentalis**Polygonaceae (Buckwheat) Family*

- ☐ Stems simple, often red, up to 150 cm tall
- ☐ Leaves alternate, lower leaves oval to lance-shaped with edges irregularly curled, long stalked
- ☐ Flowers form in dense clusters on upper part of stem, green to red



Plant in flower.



Flowers.



Red flowers.

BLUEJOINT

*Calamagrostis canadensis**Poaceae (Grass) Family*

- Stems up to 120 cm tall, nodes along stems coloured purplish blue
- Leaves numerous with blades up to 30 cm long, rough to touch with stiff hairs above and below
- Flowers in panicles, typically loose and open (more than 2 cm wide) with a fuzzy appearance



Panicle/florets.



Plants in flower.



Nodes on stem.

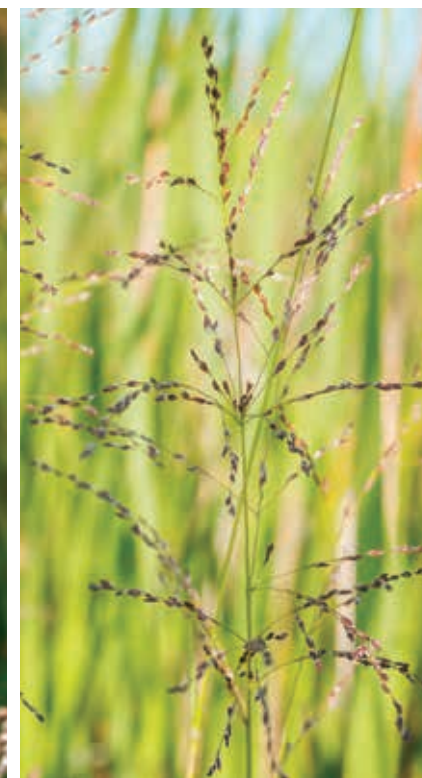
FOWL BLUEGRASS

*Poa palustris**Poaceae (Grass) Family*

- Stems up to 100 cm, often in clumps without spreading rootstocks
- Leaf blades are hairless, flat or folded and have a distinct boat-shaped tip
- Flowers in pyramid-shaped panicles, loose and open on spreading branches in whorls of 4 or 5; lemmas have long cobwebby hairs at their base



Cluster of plants in flower.



Panicle/florets.



FEN



SWAMP



MARSH

BOG

SHALLOW OPEN WATER



FEN



SWAMP



MARSH

BOG

SHALLOW OPEN WATER

FOXTAIL BARLEY

*Hordeum jubatum**Poaceae (Grass) Family*

- ☐ Tolerant of saline soils
- ☐ Tufted grass up to 60 cm tall
- ☐ Leaves blueish green, flat, hairy and rough
- ☐ Flowers as nodding spikes, up to 12 cm long with greenish purple, distinctly long, hair-like awns



Photo credit: Taylor Vlodavalia

Spike.



Cluster of plants.



BOG

FEN

SWAMP

MARSH

SHALLOW OPEN WATER

WIRE RUSH

*Juncus balticus**Juncaceae (Rush) Family*

- ☐ Stems characteristically round in cross-section, up to 90 cm tall
- ☐ Leaves emerge from stem base, usually bladeless, sheaths yellow to brown
- ☐ Flowers a panicle of spikelets clustered on one side of the stem, greenish to purple; bract appears as an extension of the stem



Plants.



Flowers.



BOG

FEN

SWAMP

MARSH

SHALLOW OPEN WATER

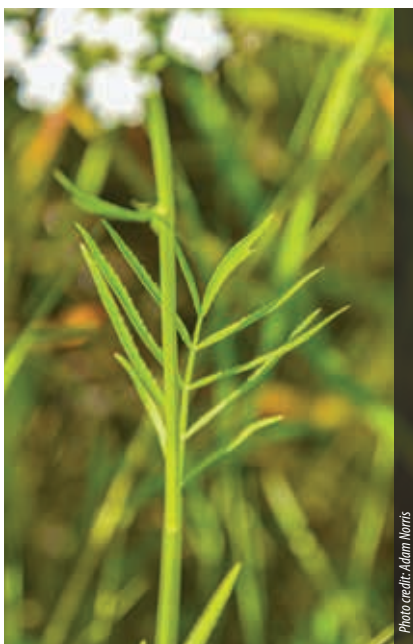
Jump to:

Plant ID

Plant Index

WATERPARSNIP*Sium suave**Apiaceae (Carrot) Family*

- ☐ Stems round, hollow and strongly ribbed, up to 100 cm tall
- ☐ Mature leaves alternate and pinnate (once divided) with linear to lance-shaped leaflets and toothed margins; submersed leaves may be 2-3 times divided
- ☐ Flower umbrella-like with numerous white flowers per head



Leaves.



Flowers.



BOG

FEN

SWAMP

MARSH

SHALLOW OPEN WATER

WATER SMARTWEED*Persicaria amphibia**Polygonaceae (Buckwheat) Family*

- ☐ Stems erect to trailing, this plant has both terrestrial and aquatic forms
- ☐ Leaves lance-shaped and alternate, generally short-stalked and hairy except when floating they are long-stalked and hairless
- ☐ Flowers in pink spikes, up to 18 cm in length



Plant with flower – terrestrial form.



Plant with flower – aquatic (floating) form.



BOG

FEN

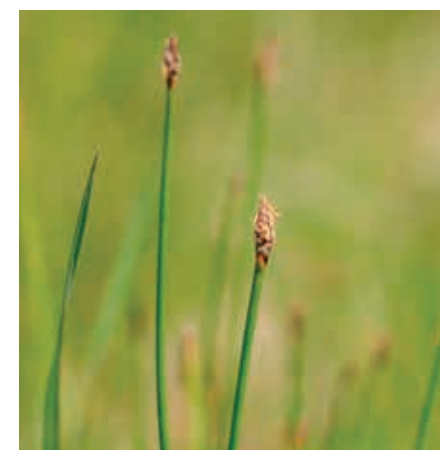
SWAMP

MARSH

SHALLOW OPEN WATER

NEEDLE SPIKERUSH*Eleocharis acicularis**Cyperaceae (Sedge) Family*

- ☐ Forms dense mats, stems are needle-like up to 10 cm tall
- ☐ Leaves are bladeless sheaths emerging from base of stem
- ☐ Flowers consist of single small spike at stem tip, oval to lance-shaped, somewhat flattened



Plant in flower.



BOG

FEN

SWAMP

MARSH

SHALLOW OPEN WATER

Jump to:

Plant ID

Plant Index

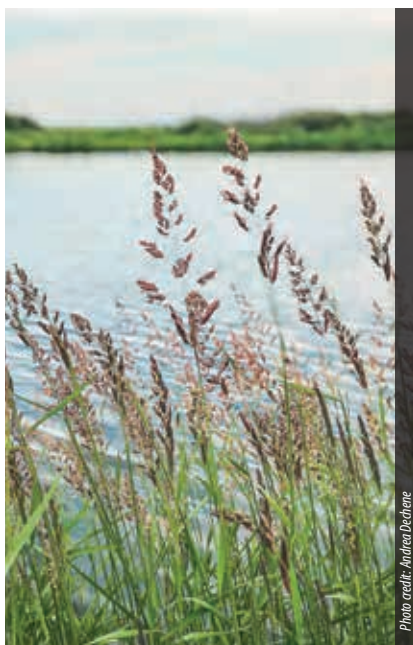
REED CANARY GRASS

*Phalaris arundinacea**Poaceae (Grass) Family*

- ☐ Stems long, greenish blue, up to 150 cm tall
- ☐ Leaves numerous, long, flat and wide (up to 1.5 cm); rough, usually with tattered margins; basal sheaths pink to reddish
- ☐ Flowers compact panicles up to 18 cm in length, opening more during flowering, florets pink to purple



Cluster of plants.



Panicle.

Photo credit: Andrea DeChene

SLOUGHGRASS

*Beckmannia syzigachne**Poaceae (Grass) Family*

- ☐ Stems pale green, up to 1 m tall
- ☐ Leaves firm, flat and rough, up to 1 cm wide
- ☐ Flowers in a narrow panicle with many branches of disc-like spikelets arranged on one side of the stem in 2 rows



Cluster of plants.



Panicle.

AWNED SEDGE

*Carex atherodes**Cyperaceae (Sedge) Family*

- A robust emergent sedge up to 120 cm tall, loosely tufted
- Stems triangular in cross-section
- Leaves typically shorter than the stem, dull green and notably hairy (compared to small bottle sedge)
- Flowers composed of up to 10 cylindrical spikes: 2-6 narrow male spikes at the tip and 2-4 female spikes below, widely spaced



Entire plant.



Hairy leaves.



Spike.



FEN



MARSH

BOG

SWAMP

SHALLOW OPEN WATER

SMALL BOTTLE SEDGE

*Carex utriculata**Cyperaceae (Sedge) Family*

- A robust emergent sedge up to 100 cm tall, densely tufted
- Stems triangular in cross-section
- Leaves yellowish green and hairless with a cross-hatched pattern on the underside of leaf blades, particularly apparent near the intersection with sheaths
- Flowers composed of 2-4 overlapping male spikes at tip with 5-7 well-spaced cylindrical female spikes below with inflated perigynia



Leaves - note the cross-hatched pattern.



Female spike.



BOG



FEN



MARSH

SWAMP

SHALLOW OPEN WATER

WATER SEDGE

*Carex aquatilis**Cyperaceae (Sedge) Family*

- ☐ A robust emergent sedge up to 80 cm tall, densely tufted
- ☐ Stems triangular in cross-section, reddish at base
- ☐ Leaves with distinct, blueish green blades, narrower (less than 1 cm width) than awned sedge and small bottle sedge
- ☐ Flowers cylindrical spikes with 1-2 purplish brown male spikes located at the tip and 2-4 female spikes located below; the lowest bract extends beyond the uppermost spike



Cluster of plants.



Spikes.

Photo credit: Taylor Vadopija

GRACEFUL SEDGE

*Carex praegracilis**Cyperaceae (Sedge) Family*

- ☐ A narrow-leaved, creeping sedge up to 75 cm tall
- ☐ Stems triangular in cross-section
- ☐ Leaves smooth, turning blackish towards the base of the stem
- ☐ Flower heads clustered at tip of stems with 5-15 small spikes



Spike.

Photo credit: John Scholze



Cluster of plants.

Photo credit: John Scholze



COMMON CATTAIL

*Typha latifolia**Typhaceae (Cattail) Family*

- ☐ Often forms large colonies, stems up to 2 m tall
- ☐ Leaves stiff, flat and feel spongy
- ☐ Flowers in cylindrical spikes more than 10 cm long, greenish brown; mature spikes are covered in fluffy hairs



Plants in flower.



Mature flower.

Photo credit: Adam Norris

BOG

FEN ✓

SWAMP

MARSH ✓

SHALLOW OPEN WATER

GREAT BULRUSH

*Schoenoplectus acutus var. acutus**Cyperaceae (Sedge) Family*

- ☐ Grows up to 3 m in height
- ☐ Stems round in cross-section and characteristically firm
- ☐ Leaves reduced to sheaths at stem base
- ☐ Flowers as panicles spreading to drooping with oval spikelets



Plant in flower.



BOG

FEN

SWAMP

MARSH ✓

SHALLOW OPEN WATER

THREE-SQUARE RUSH

*Schoenoplectus pungens var. pungens**Cyperaceae (Sedge) Family*

- ☐ Stems slender, blueish green, triangular in cross-section
- ☐ Leaves narrow, v-shaped at the stem base, often spreading, flat towards the tip
- ☐ Flowers tightly clustered spikelets growing on one side of the stem, reddish brown with an emerging bract which appears a continuation of the stem



Plants in flower.

Photo credit: Miranda Piesch

BOG

FEN

SWAMP

MARSH ✓

SHALLOW OPEN WATER

Jump to:

Plant ID

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FORBS AND GRAMINOIDS - Salinity Indicators

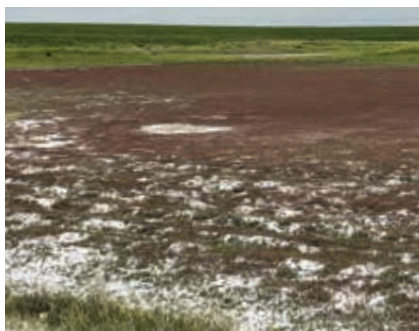
SAMPHIRE

*Salicornia rubra**Amaranthaceae (Amaranth) Family*

- ☐ Entire plant turns red at maturity
- ☐ Stems fleshy/succulent, woody at base
- ☐ Leaves scale-like triangles, greenish red in colour
- ☐ Flowers sunken into the stem, hidden by scale-like bracts



Close up of plant.



Cluster of mature plants.



BOG

FEN

SWAMP

MARSH

SHALLOW OPEN WATER

NUTTALL'S
SALT-MEADOW GRASS*Puccinellia nuttalliana**Poaceae (Grass) Family*

- ☐ Forms distinct clumps of multiple stems
- ☐ Leaves alternate, 2-4 concentrated on the lower half of the stem, hairless, rough textured and flat
- ☐ Flowers oval to triangular panicles with spikelets overlapping on top half of spreading branches, green to purple florets



Cluster of plants.



Panicle.



BOG

FEN

SWAMP

MARSH

SHALLOW OPEN WATER

AQUATIC PLANTS - Floating

COMMON DUCKWEED

*Lemna minor**Araceae (Arum) Family*

- ☐ Small (up to 4 mm), free-floating aquatic species; often forms a dense carpet
- ☐ Leaves oval to round with a single, short root attached floating singly or in rosettes
- ☐ Flowers rarely evident, small, without petals or sepals



Floating leaves.



BOG

FEN

SWAMP

MARSH

SHALLOW OPEN WATER

Jump to:

Plant ID

Plant Index

AQUATIC PLANTS - Floating

LARGE-LEAVED WHITE
WATER CROWFOOT*Ranunculus aquatilis**Ranunculaceae (Buttercup) Family*

- ☐ Stem submersed, weak and leafy
- ☐ Submersed leaves are hair-like and soft, collapsing when they are out of the water; floating leaves are broad, flat with 3-5 lobes
- ☐ Flowers floating or held above water surface, 5 white petals with a yellow center



Photo credit: Ricarda Paesch



BOG

FEN

SWAMP

MARSH

SHALLOW OPEN WATER

VARIOUS-LEAVED
PONDWEED*Potamogeton gramineus**Potamogetonaceae (Pondweed) Family*

- ☐ Stems submersed, green, round and leafy
- ☐ Submersed leaves are long, linear and stalkless; floating leaves are elliptical, leathery and shiny bright to dark green
- ☐ Flowers dense cylindrical spikes held above the water surface

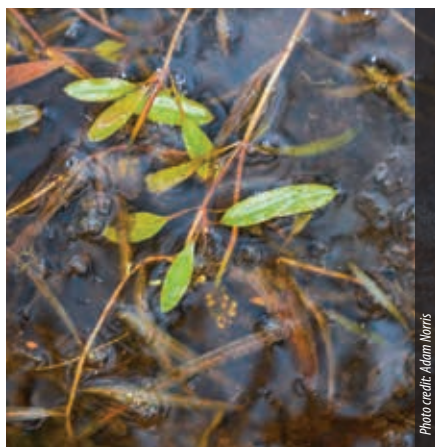


Photo credit: Adam Norris



BOG

FEN

SWAMP

MARSH

SHALLOW OPEN WATER

AQUATIC PLANTS - Submersed

COMMON
BLADDERWORT*Utricularia vulgaris**Lentibulariaceae (Bladderwort) Family*

- ☐ Submersed, free floating carnivorous plant
- ☐ Leaves submersed and pinnately divided; leaflets finely branched in hair-like segments with abundant insect-trapping bladders attached to each base
- ☐ Flowers are small and bright yellow, held above the water surface



Photo credit: Katherine Standen and Jenna Rabley

Flowers.



Photo credit: Meg Schmitt

Bladders.



Photo credit: Katherine Standen and Jenna Rabley

Plant.



BOG

FEN

SWAMP

MARSH

SHALLOW OPEN WATER

AQUATIC PLANTS - Submersed

HORNWORT

*Ceratophyllum demersum**Ceratophyllaceae (Hornwort) Family*

- ☐ Submersed, free-floating plant
- ☐ Stems slender and branching
- ☐ Leaves narrow and long in whorls of 5-12, further forked with spiny teeth and becoming denser towards the end of branches
- ☐ Flowers tiny, red and cylindrical, forming in the axils of submersed leaves

Photo credit: Alberta Lake Management Society



BOG

FEN

SWAMP

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SPIKE
WATER-MILFOIL*Myriophyllum sibiricum**Haloragaceae (Watermilfoil) Family*

- ☐ Submersed stems and leaves, rooted
- ☐ Leaves dark green to purple, pinnately divided (feather-like) and whorled around the stem
- ☐ Flowers whorled on pink stem tips above the water, male flowers are purple

Photo credit: Alberta Lake Management Society



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AQUATIC PLANTS - Submersed

WIDGEON GRASS

*Ruppia cirrhosa**Ruppiaceae (Widgeon-grass) Family*

- ☐ Entirely submersed, rooted plant
- ☐ Leaves thread-like, often in fan-shaped clusters
- ☐ Flowers tiny and lacking petals and sepals, once pollinated the flower stalks form 5-30 characteristic spiral coils



Photo credit: Aldama Center for Ecological Resilience



Photo credit: Aldama Center for Ecological Resilience



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SMALL-LEAF
PONDWEED*Potamogeton pusillus**Potamogetonaceae (Pondweed) Family*

- ☐ Very small, submersed pondweed
- ☐ Stems round and thin
- ☐ Leaves long, narrow (2 mm) and thread-like, translucent green
- ☐ Flowers emergent whorls of 1-3 slender cylindrical clusters per plant

Photo credit: Alberta Lake Management Society



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AQUATIC PLANTS - Submersed

CLASPING-LEAF PONDWEED

Potamogeton richardsonii
Ruppiaceae (Widgeon-grass) Family

- ☐ Stems singular, submersed with leaves
- ☐ Leaves up to 13 cm, oval to lance-shaped, translucent green with strong parallel veins and wavy edges
- ☐ Flowers long (up to 10 cm) spikes with dense whorls forming above the water



Photo credit: Alberta Lake Management Society

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SAGO PONDWEED

Stuckenia pectinata
Potamogetonaceae (Pondweed) Family

- ☐ Stem and leaves submersed
- ☐ Stems thin, abundantly branched, light green to white
- ☐ Leaves thread-like and sharply pointed, form fan-like clusters
- ☐ Flowers greenish white in spikes consisting of 2 to 6 interrupted clusters in a loose whorl



Photo credit: Alberta Lake Management Society

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BRYOPHYTES - *Sphagnum* Mosses

RUSTY PEAT MOSS

Sphagnum fuscum
Sphagnaceae Family

- ☐ Hummock-forming moss, found on higher and drier locations further away from the water table
- ☐ Stem dark brown, form dense canopies with small, compact heads



Photo credit: Krista Williams

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POOR-FEN SPHAGNUM

Sphagnum angustifolium
Sphagnaceae Family

- ☐ Hollow-forming moss, often located in close proximity to the water table
- ☐ Stems transparent yellow-green
- ☐ Forms loose, fluffy canopies with two hanging branches



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BRYOPHYTES - *Sphagnum* Mosses

MIDWAY PEAT MOSS

*Sphagnum magellanicum**Sphagnaceae* Family

- ☐ In Alberta, *Sphagnum magellanicum* is now referred to *Sphagnum divinum* by ecologists.
- ☐ As name implies, often grows along the sides of hummocks, midway to hollows
- ☐ Stems pink to clear and leaves strongly concave
- ☐ Relatively larger heads forming reddish canopies



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SHORE-GROWING
PEAT MOSS*Sphagnum riparium**Sphagnaceae* Family

- ☐ Forms loose mats often in standing water, preferring more minerotrophic conditions
- ☐ Leaves and heads relatively large, yellow-green in colour in loose canopies



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BRYOPHYTES - Brown Mosses

ADUNCUS
BROWN MOSS*Drepanocladus aduncus**Amblystegiaceae* Family

- ☐ Stems slender and irregularly branched
- ☐ Leaves curled to point in one direction



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GOLDEN MOSS

*Tomentypnum nitens**Amblystegiaceae* Family

- ☐ Relatively large with erect stems
- ☐ Stems covered with reddish rhizoids
- ☐ Leaves long, lance-shaped and strongly folded (pleated), yellow to golden brown



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BRYOPHYTES - Brown Mosses

HAMATOCAULIS MOSS

*Hamatocaulis vernicosus**Calliergonaceae Family*

- ☐ Found in moderate-rich fens
- ☐ Upright, yellow-green moss
- ☐ Pronounced hook on upper portion
- ☐ Branches held at 90 degrees from stem
- ☐ Leaves with a red base, pleated

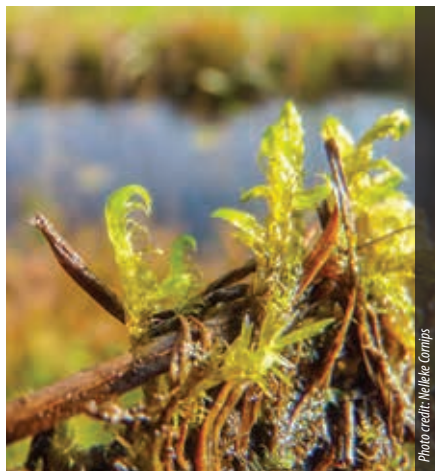


Photo credit: W. J. K. Camps



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SCORPIDIUM MOSS

*Scorpidium scorpioides**Calliergonaceae Family*

- ☐ Found in (extreme-rich) fens
- ☐ Found floating in water or along the edges of pools of water
- ☐ Sparsely branched with a swollen appearance
- ☐ Leaves overlap, resembling a caterpillar
- ☐ Colour varies from green to purplish black



Photo credit: Courtesy of Royal Alberta Museum



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BRYOPHYTES - Feather Mosses

SCHREBER'S MOSS

*Pleurozium schreberi**Hylocomiaceae Family*

- ☐ Also known as **big red stem**
- ☐ Stems distinctly red, pinnately branched
- ☐ Leaves shiny, relatively large, light yellow to green in colour



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STAIR-STEP MOSS

*Hylocomium splendens**Hylocomiaceae Family*

- ☐ Regularly branched, feather-like, olive to bright green
- ☐ Stems red and creeping
- ☐ Branches form a characteristic stair-step arrangement

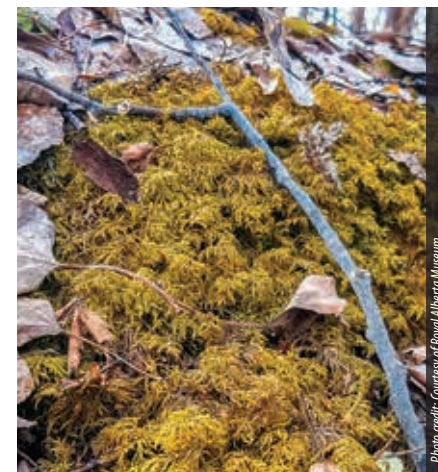


Photo credit: Courtesy of Royal Alberta Museum



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BRYOPHYTES - Feather Mosses

SLENDER HAIRCAP MOSS

*Polytrichum strictum**Polytrichaceae Family*

- ☐ Erect, unbranched blueish green moss
- ☐ Stems covered with whitish rhizoids
- ☐ Leaves erect when dry, spreading when moist
- ☐ Often found intermixed with *Sphagnum* mosses



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DICRANUM MOSS

*Dicranum undulatum**Dicranaceae Family*

- ☐ Erect, unbranched structure
- ☐ Stems colourless with orange/brown rhizoids
- ☐ Leaves loosely erect and wavy with blunt tips



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BRYOPHYTES - Other True Mosses

TUFTED MOSS

*Aulacomnium palustre**Aulacomniaceae Family*

- ☐ Erect and unbranched
- ☐ Stems covered in rhizoids leading to reddish hue below
- ☐ Leaves yellow-green, curled when dry, erect and spreading when moist



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CLIMACIUM MOSS

*Climacium dendroides**Climaciaceae Family*

- ☐ Grows in patches with individual stem resembling a palm tree
- ☐ Branches rigid, stubby and yellow-green
- ☐ Stems leaves are well-spaced and pointed; branch leaves are narrower and coarsely toothed near the tip



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BRYOPHYTES - Other True Mosses

LIVERWORT

*Mylia anomala**Myliaceae Family*

- ☐ Most common liverwort in peatlands often found growing with rusty peat moss
- ☐ Narrow and pointed structure
- ☐ Leaves oval to round, concave; overlapping arrangement resembling shingles on a roof



Photo credit: Dick Hladkma



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CRYSTALWORT

*Riccia fluitans**Ricciaceae Family*

- ☐ Common liverwort in mineral sites, floating on the water often in thick mats
- ☐ Leaves blueish green with 2-6 forks, often interlocking in chains that resemble a tangled mass



Photo credit: Courtesy of Royal Alberta Museum



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INVASIVE PLANT SPECIES - Forbs

CREEPING THISTLE

*Cirsium arvense**Asteraceae (Aster) Family*

- ☐ Also known as **Canada thistle**
- ☐ Designated as noxious in Alberta
- ☐ Stems up to 1.5 m tall, grooved, upright, hollow and woody
- ☐ Leaves lance-shaped, dark green, clasping the stem and with occasional sharp spines
- ☐ Flowers form in clusters of 1-3, urn-shaped and most often purple



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PURPLE LOOSESTRIFE

*Lythrum salicaria**Lythraceae (Loosestrife) Family*

- ☐ Designated as prohibited noxious in Alberta
- ☐ Stems up to 1.5 m tall, woody and squareish (4-6 sides)
- ☐ Leaves opposite to whorled near base, lance-shaped up to 10 cm long
- ☐ Flowers reddish purple, clustered in leaf axils, blooming from the bottom upwards

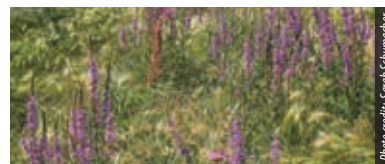


Photo credit: Sarah Schumacher

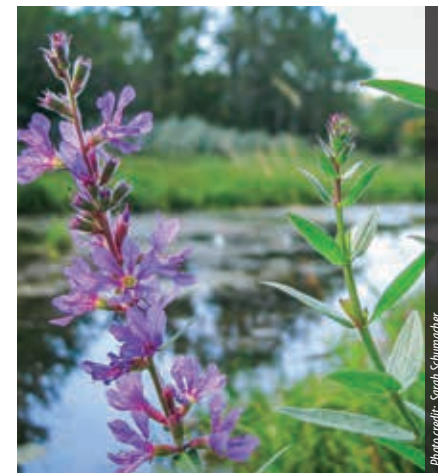


Photo credit: Sarah Schumacher



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INVASIVE PLANT SPECIES - Forbs

FLOWERING RUSH

*Butomus umbellatus**Butomaceae (Flowering-rush) Family*

- ☐ Designated as prohibited noxious in Alberta
- ☐ Stems up to 1.5 m tall, erect and triangular
- ☐ Leaves green and lance-shaped, originating from base and also triangular in cross-section, spongy to touch
- ☐ Flowers small (2.5 cm wide) but numerous (20-50), borne in umbrella-shaped clusters, pink to white in colour

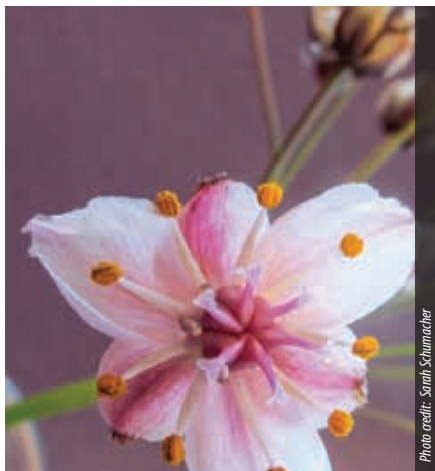


Photo credit: Sarah Schumacher



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HIMALAYAN BALSAM

*Impatiens glandulifera**Balsaminaceae (Balsam) Family*

- ☐ Designated as prohibited noxious in Alberta
- ☐ Stems up to 3 m tall, smooth and usually hollow
- ☐ Leaves lance-shaped with pointed tips and sharply toothed edges, opposite or in whorls of 3
- ☐ Flowers bilateral with 5 petals (the upper petals forming a hood over those below), pink to purple, clusters of 5-10 along stems borne from the upper leaf axils



Photo credit: Sarah Schumacher



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INVASIVE PLANT SPECIES - Aquatic

EURASIAN WATER MILFOIL

*Myriophyllum spicatum**Haloragaceae (Watermilfoil) Family*

- ☐ Designated as prohibited noxious in Alberta
- ☐ Submersed stems and leaves, rooted
- ☐ Leaves greyish green, occurring in whorls of 3-4 with up to 16 pairs of fine, thin leaflets (compared to native water milfoil plants with much fewer leaflets)
- ☐ Flowers small and yellow, produced on a spike above the water surface



Photo credit: Alison Fox, University of Florida, Bugwood.org



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CURLY LEAF PONDWEED

*Potamogeton crispus**Potamogetonaceae (Pondweed) Family*

- ☐ Stems branched and flattened, submersed with leaves
- ☐ Leaves lance-shaped, up to 10 cm in length with wavy edges and arranged spirally around the stem
- ☐ Flowers reddish brown and small, arranged in a dense spike borne on a curved stalk

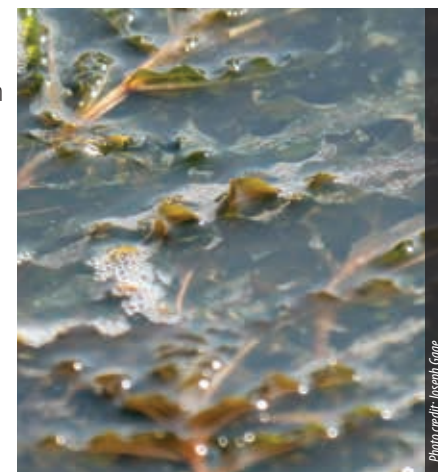


Photo credit: Joseph Gage



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WETLAND PLANT IDENTIFICATION INDEX

Following is a comprehensive list of wetland plant species. Any species highlighted in this guide have an associated page number listed. For comprehensive plant identification resources, see **Appendix A** (page 143) for other field guides that focus solely on plant identification and can be used to complement this guide.

Common Name	Page	Scientific Name	Group	Wetland Class
Aduncus Brown Moss	page 127	<i>Drepanocladus aduncus</i>	Bryophyte - Brown Moss	F, M, W
Alaska Birch	page 80	<i>Betula neolaskana</i>	Tree - Deciduous	S
Alder	page 90	<i>Alnus incana</i>	Tall Shrub	S
Alkali Cord Grass		<i>Spartina gracilis</i>	Graminoid - Grass	M
Alpine Hedysarum		<i>Hedysarum alpinum</i>	Forb	S
Arrow-Leaved Coltsfoot	page 100	<i>Petasites frigidus</i> var. <i>sagittatus</i>	Forb	F, S, M
Awned Sedge	page 112	<i>Carex atherodes</i>	Graminoid - Sedge	F, M
Balsam Poplar	page 82	<i>Populus balsamifera</i>	Tree - Deciduous	S
Beaked Willow	page 88	<i>Salix bebbiana</i>	Tall Shrub	F, S
Black Spruce	page 78	<i>Picea mariana</i>	Tree - Conifer	B, F, S
Bluejoint	page 104	<i>Calamagrostis canadensis</i>	Graminoid - Grass	F, S, M
Bog Birch	page 84	<i>Betula glandulosa</i>	Tall Shrub	F
Bog Cranberry	page 94	<i>Vaccinium vitis-idaea</i>	Ericaceous Shrub	B, F, S, M
Bog Muhly		<i>Muhlenbergia glomerata</i>	Graminoid - Grass	B, F, S, M
Bog Rosemary		<i>Andromeda polifolia</i>	Ericaceous Shrub	B, F, S
Bog Willow	page 86	<i>Salix pedicellaris</i>	Tall Shrub	F, S
Buckbean	page 97	<i>Menyanthes trifoliata</i>	Forb	F, S

Common Name	Page	Scientific Name	Group	Wetland Class
Bunchberry	page 98	<i>Cornus canadensis</i>	Forb	S
Clasping-Leaf Pondweed	page 124	<i>Potamogeton richardsonii</i>	Aquatics	M
Climacium Moss	page 131	<i>Climacium dendroides</i>	Bryophyte - Moss	F, S
Cloudberry	page 96	<i>Rubus chamaemorus</i>	Forb	B, F, S
Common Bladderwort	page 121	<i>Utricularia vulgaris</i>	Aquatic - Submersed	F, M, W
Common Cattail	page 116	<i>Typha latifolia</i>	Graminoid	F, M
Common Duckweed	page 119	<i>Lemna minor</i>	Aquatic - Floating	M
Common Nettle		<i>Urtica dioica</i>	Forb	F, S, M
Common Sea-Blite		<i>Suaeda calceoliformis</i>	Forb	M
Common Tall Manna Grass		<i>Glyceria grandis</i>	Graminoid - Grass	M
Creeping Spike-Rush		<i>Eleocharis palustris</i>	Graminoid - Rush	M
Creeping Thistle	page 133	<i>Cirsium arvense</i>	Forb	S, M
Crystalwort	page 132	<i>Riccia fluitans</i>	Aquatic - Submersed	M, W
Curly Leaf Pondweed	page 135	<i>Potamogeton crispus</i>	Aquatic - Submersed	W
Dewberry	page 100	<i>Rubus pubescens</i>	Forb	B, F, S, M
Dicranum Moss	page 130	<i>Dicranum undulatum</i>	Bryophyte - Moss	B, F
Dwarf Birch	page 85	<i>Betula pumila</i>	Tall Shrub	B, F, S
Eurasian Water Milfoil	page 135	<i>Myriophyllum spicatum</i>	Aquatic - Submersed	W
Flat-Leaved Bladderwort		<i>Utricularia intermedia</i>	Aquatic - Submersed	F, S, M, W
Flowering Rush	page 134	<i>Butomus umbellatus</i>	Forb	M
Fowl Bluegrass	page 105	<i>Poa palustris</i>	Graminoid - Grass	F, M, W

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Common Name	Page	Scientific Name	Group	Wetland Class
Foxtail Barley	page 106	<i>Hordeum jubatum</i>	Graminoid - Grass	M
Giant Calliargon Moss		<i>Calliargon giganteum</i>	Bryophyte - Brown Moss	F
Gold Saxifrage		<i>Chrysosplenium iowense</i>	Forb	F, M
Golden Moss	page 127	<i>Tomentypnum nitens</i>	Bryophyte - Brown Moss	F
Graceful Sedge	page 115	<i>Carex praegracilis</i>	Graminoid - Sedge	F, M
Great Bulrush	page 116	<i>Schoenoplectus acutus</i> var. <i>acutus</i>	Graminoid - Rush	M
Green Alder	page 90	<i>Alnus viridis</i>	Tall Shrub	S
Hairy-Fruited Sedge		<i>Carex lasiocarpa</i>	Graminoid - Sedge	B, F, M, W
Hamatocaulis Moss	page 128	<i>Hamatocaulis lapponicus</i>	Bryophyte - Brown Moss	F
Himalayan Balsam	page 134	<i>Impatiens glandulifera</i>	Forb	M
Hoary Willow	page 87	<i>Salix candida</i>	Tall Shrub	F, S
Horned Pondweed		<i>Zannichellia palustris</i>	Aquatic - Submersed	M, W
Hornwort	page 122	<i>Ceratophyllum demersum</i>	Aquatic - Submersed	W
Ivy-Leaved Duckweed		<i>Lemna trisulca</i>	Aquatic - Floating	M
Kidney-Leaved Violet		<i>Viola renifolia</i>	Forb	F, S
Labrador Tea	page 92	<i>Rhododendron groenlandicum</i>	Ericaceous Shrub	B, F, S
Large-Leaved White Water Crowfoot	page 120	<i>Ranunculus aquatilis</i>	Aquatics	M, W
Large-Sheath Pondweed		<i>Stuckenia vaginata</i>	Aquatic - Submersed	W
Leatherleaf	page 93	<i>Chamaedaphne calyculata</i>	Ericaceous Shrub	B, F
Limprichtia Brown Moss		<i>Limprichtia revolvens</i>	Bryophyte - Brown Moss	F

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Common Name	Page	Scientific Name	Group	Wetland Class
Liverwort	page 132	<i>Mylia anomala</i>	Bryophyte - Liverwort	B, F, S
Long-Leaved Chickweed		<i>Stellaria longifolia</i>	Forb	F, S, M
Manitoba Maple		<i>Acer negundo</i>	Tall Shrub	S
Marsh Cinquefoil	page 96	<i>Comarum palustris</i>	Forb	B, F, S, M
Marsh Marigold	page 101	<i>Caltha palustris</i>	Forb	F, S, M
Marsh Skullcap		<i>Scutellaria galericulata</i>	Forb	F, S, M
Marsh Violet		<i>Viola palustris</i>	Forb	S, M
Meadow Sedge		<i>Carex praticola</i>	Graminoid - Sedge	S, M
Midway Peat Moss	page 126	<i>Sphagnum magellanicum</i>	Bryophyte - Peat Moss	B, F
Mud Sedge		<i>Carex limosa</i>	Graminoid - Sedge	F, S, M
Narrow Spinulose Shield Fern		<i>Dryopteris carthusiana</i>	Pteridophyte	S
Narrow-Leaf Cottonwood		<i>Populus angustifolia</i>	Tree - Deciduous	S
Needle Spikerush	page 109	<i>Eleocharis acicularis</i>	Graminoid - Rush	M
Northern Laurel		<i>Kalmia polifolia</i>	Ericaceous Shrub	B, F, S
Northern Reed Grass		<i>Calamagrostis stricta</i> ssp. <i>inexpansa</i>	Graminoid - Grass	F, S, M
Northern Starflower		<i>Trientalis borealis</i>	Forb	S, M
Nuttall's Salt Meadow Grass	page 118	<i>Puccinellia nuttalliana</i>	Graminoid - Grass	M
Perennial Sow Thistle		<i>Sonchus arvensis</i>	Forb	S, M
Pitcher Plant	page 99	<i>Sarracenia purpurea</i>	Forb	B, F, S
Plains Cottonwood	page 83	<i>Populus deltoides</i>	Tree - Deciduous	S

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Poor-Fen Sphagnum	page 125	<i>Sphagnum angustifolium</i>	Bryophyte - Peat Moss	B, F, S
Prairie Cord Grass		<i>Spartina pectinata</i>	Graminoid - Grass	M
Prostrate Sedge		<i>Carex chordorrhiza</i>	Graminoid - Sedge	B, F, M, W
Purple Loosestrife	page 133	<i>Lythrum salicaria</i>	Forb	F, M
Purple-Fringed Heartwort		<i>Ricciocarpos natans</i>	Aquatic - Submersed	F, M, W
Pussy Willow	page 89	<i>Salix discolor</i>	Tall Shrub	F, S
Quackgrass		<i>Elymus repens</i>	Graminoid - Grass	M
Rannoch-Rush		<i>Scheuchzeria palustris</i>	Forb	B, F
Red Goosefoot		<i>Chenopodium rubrum</i>	Forb	M
Red-Osier Dogwood	page 91	<i>Cornus stolonifera</i>	Tall Shrub	S
Reed Canary Grass	page 110	<i>Phalaris arundinacea</i>	Graminoid - Grass	M
Round-Leaved Sundew	page 99	<i>Drosera rotundifolia</i>	Forb	B, F, S
Rusty Peat Moss	page 125	<i>Sphagnum fuscum</i>	Bryophyte - Peat Moss	B, F, S
Sago Pondweed	page 124	<i>Stuckenia pectinata</i>	Aquatic - Submersed	M, W
Salt Grass		<i>Distichlis spicata</i>	Graminoid - Grass	M
Samphire	page 118	<i>Salicornia rubra</i>	Forb	M
Sartwell's Sedge		<i>Carex sartwellii</i>	Graminoid - Sedge	M
Schreber's Moss	page 129	<i>Pleurozium schreberi</i>	Bryophyte - Feathermoss	B, F, S
Scorpidium Moss	page 128	<i>Scorpidium scorpioides</i>	Bryophyte - Brown Moss	F
Scratch Grass		<i>Muhlenbergia asperifolia</i>	Graminoid - Grass	M

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Common Name	Page	Scientific Name	Group	Wetland Class
Seaside Arrow Grass		<i>Triglochin maritima</i>	Forb	F, M
Sheathed Cottongrass	page 98	<i>Eriophorum vaginatum</i>	Graminoid - Grass	B, F, S
Shore-Growing Peat Moss	page 126	<i>Sphagnum riparium</i>	Bryophyte - Peat Moss	F
Short-Awned Foxtail		<i>Alopecurus aequalis</i>	Graminoid - Grass	M
Skunk Currant		<i>Ribes glandulosum</i>	Low Shrub	S
Slender Haircap Moss	page 130	<i>Polytrichum strictum</i>	Bryophyte - Moss	B, F, S
Slender Wheatgrass		<i>Elymus trachycaulus</i>	Graminoid - Grass	M
Sloughgrass	page 111	<i>Beckmannia syzigachne</i>	Graminoid - Grass	M
Small Bedstraw		<i>Galium trifidum</i>	Forb	B, F, S, M
Small Bog Cranberry	page 95	<i>Vaccinium oxycoccos</i>	Ericaceous Shrub	B, F, S
Small Bottle Sedge	page 113	<i>Carex utriculata</i>	Graminoid - Sedge	B, F, M
Small-Leaf Pondweed	page 123	<i>Potamogeton pusillus</i>	Aquatics	W
Spangletop		<i>Scolochloa festuacea</i>	Graminoid - Grass	M
Spike Watermilfoil	page 122	<i>Myriophyllum sibiricum</i>	Aquatic - Submersed	M, W
Spotted Touch-Me-Not		<i>Impatiens capensis</i>	Forb	S, M
Stair-Step Moss	page 129	<i>Hylocomium splendens</i>	Bryophyte - Feathermoss	B, F, S
Swamp Horsetail		<i>Equisetum fluviatile</i>	Pteridophyte	B, F, S, M
Tamarack	page 79	<i>Larix laricina</i>	Tree - Conifer	F, S
Three-Leaved Solomon's-Seal	page 97	<i>Maianthemum trifolium</i>	Forb	B, F, S, M
Three-Seeded Sedge		<i>Carex trisperma</i>	Graminoid - Sedge	B, F, S, M

B - Bog F - Fen S-Swamp M-Marsh W-Shallow Open Water

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Common Name	Page	Scientific Name	Group	Wetland Class
Three-Square Rush	page 117	<i>Schoenoplectus pungens</i>	Graminoid - Rush	M
Tufted Bulrush		<i>Trichophorum cespitosum</i>	Graminoid - Rush	B, F, M
Tufted Hairgrass		<i>Deschampsia cespitosa</i>	Graminoid - Grass	B, F, M
Tufted Moss	page 131	<i>Aulacomnium palustre</i>	Bryophyte - Moss	B, F, S
Two-Stamened Sedge		<i>Carex diandra</i>	Graminoid - Sedge	M
Various-Leaved Pondweed	page 120	<i>Potamogeton gramineus</i>	Aquatics	M, W
Water Arum		<i>Calla palustris</i>	Forb	F, S, M
Water Hemlock		<i>Cicuta maculata</i>	Forb	F, S, M
Waterparsnip	page 108	<i>Sium suave</i>	Forb	F, M
Water Sedge	page 114	<i>Carex aquatilis</i>	Graminoid - Sedge	F, S, M
Water Smartweed	page 109	<i>Persicaria amphibia</i>	Forb	S, M
Western Dock	page 103	<i>Rumex occidentalis</i>	Forb	S, M
White Birch	page 81	<i>Betula papyrifera</i>	Tree - Deciduous	S
White Spruce		<i>Picea glauca</i>	Tree - Conifer	S
Widgeon Grass	page 123	<i>Ruppia cirrhosa</i>	Aquatic - Submersed	M, W
Wild Mint	page 102	<i>Mentha arvensis</i>	Forb	S, M
Wild Red Currant		<i>Ribes triste</i>	Low Shrub	F, S
Wire Rush	page 107	<i>Juncus balticus</i>	Graminoid - Rush	M

B - Bog F - Fen S-Swamp M-Marsh W-Shallow Open Water

APPENDIX A

Resources and References

Alberta Environment and Parks (AEP). 2014. [Guide for Determining Permanence of Wetland Basins](#). Land Policy Branch, Policy and Planning Division, Edmonton, AB.

Alberta Environment and Parks. 2020. [Alberta Conservation Information Management System](#). Edmonton, AB.

Alberta Environment and Sustainable Resource Development (ESRD). 2012. [Stepping back from the water : a beneficial management practices guide for new development near water bodies in Alberta's settled region](#). Regional Science and Planning, Calgary, AB.

Alberta Environment and Sustainable Resource Development (ESRD). 2013. [Alberta Wetland Policy](#). Water Policy Branch, Policy and Planning Division, Edmonton, AB.

Alberta Environment and Sustainable Resource Development (ESRD). 2015. [Alberta Wetland Classification System](#). Water Policy Branch, Policy and Planning Division, Edmonton, AB.

Alberta Invasive Species Council. 2020. [Fact Sheets](#).

Alberta Lake Management Society. [Aquatic Plants of Alberta, A Collection of Native and Invasive Species](#).

Alberta Merged Wetland Inventory. 2020. Alberta Environment and Parks.

Aquality Environmental Consulting Ltd. 2014. [Common Mineral Wetland Plants of Alberta](#). Edmonton, AB.

Argus, G.W. 2008. [A guide to the identification of Salix \(willows\) in Alberta](#). Devonian Botanical Garden, Devon, AB.

Beckingham, J.D. and J.H. Archibald. 1996. [Field Guide to Ecosites of Northern Alberta](#). Natural Resources Canada, Canadian Forest Service, Northern Forestry Centre, Edmonton, AB.

Bubar, C.J., S.J. McColl and L.M. Hall. 2009. [Weeds of the Prairies](#). Alberta Agriculture and Rural Development, Edmonton, AB.

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Ducks Unlimited Canada. 2018. [Field Guide: Boreal Wetland Classes in the Boreal Plains Ecozone of Canada](#). Version 1.2. Edmonton, AB.

Government of Alberta. 2003. [Water For Life: Alberta's Strategy for Sustainability. Alberta Environment](#). Edmonton, AB.

Government of Alberta. 2020. [Alberta Wetland Identification and Delineation Directive](#). Water Policy Branch, Alberta Environment and Parks. Edmonton, AB.

Johnson, J., L. Kershaw, A. MacKinnon, J. Pojar. 1995. **Plants of the Western Forest: Alberta, Saskatchewan, Manitoba Boreal Forest and Aspen Parkland**. Lone Pine Publishing, Edmonton, AB.

Kershaw, L. J. and L. Allen. 2019. [Illustrated keys to the Vascular Plants of Alberta](#).

Lahring, Heinjo. 2003. **Water and wetland plants of the Prairie Provinces: A field guide for Alberta, Saskatchewan, Manitoba and the Northern United States**. Canadian Plains Research Center. University of Regina.

Lahring, H. 2004. **Water and Wetland Plants of the Prairie Provinces**. Canadian Plains Research Center, University of Regina, Regina, SK.

Moss, E. H. 1983. **Flora of Alberta**. 2nd edition. University of Toronto Press, Toronto, Ontario.

Natural Regions and Subregions of Alberta. 2005. Natural Regions Committee - Alberta Sustainable Resource Development, Alberta Environment, Alberta Community Development and Agriculture and Agri-Food Canada.

Packer, J. G. and A. J. Gould. 2017. **Vascular Plants of Alberta Part 1: Ferns, Fern Allies, Gymnosperms, and Monocots**. University of Calgary Press, Calgary, Alberta.

Province of Alberta. 2016. **Weed Control Act, Office Consolidation**. Alberta Regulation 19/2010 with amendments up to and including Alberta Regulation 125/2016. Published by Alberta Queen's Printer.

Royers, F. and R. Dickinson. 2007. **Plants of Alberta: Trees, Shrubs, Wildflowers, Ferns, Aquatic Plants & Grasses**. Lone Pine Publishing, Edmonton, AB.

Soil Classification Working Group. 1998. **The Canadian System of Soil Classification, Third Edition**. Agriculture and Agri-Food Canada, Ottawa, ON.

Stewart, R.E. and H.A. Kantrud. 1971. [Classification of Natural Ponds and Lakes in the Glaciated Prairie Region](#). Bureau of Sport Fisheries and Wildlife, Washington.

Tannas, K. 2001. **Common Plants of the Western Rangelands (All Volumes)**. Alberta Agriculture, Food and Rural Development, Olds College and Lethbridge College.

United States Department of Agriculture (USDA). 2018. **Field Indicators of Hydric**

Soils in the United States: A Guide for Identifying and Delineating Hydric Soils. Version 8.2, 2018. Natural Resources Conservation Service in Cooperation with the National Technical Committee for Hydric Soils.

Vitt, D.H. 2017. [A guide to mosses and liverworts of Alberta peatlands](#). NAIT Boreal Research Institute. Edmonton, AB.

Vitt, D. H., J.E. Marsh and R.B. Bovey. 1988. **Mosses Lichens and Ferns of Northwest North America**. Lone Pine Publishing.

Warner, B.G., Rubec, C.D.A. (1997). [The Canadian Wetland Classification System](#). Wetlands Research Centre, University of Waterloo, Waterloo, ON.

APPENDIX B

Von Post Decomposition Rating

Step 1: Is it mineral or organic soil?

Here is how to test for organic soil (with more than 30% organic matter) in the field:

- Gently rub a pinch of wet soil material between the forefinger and thumb.
- If the material feels gritty or retains its shape, it is mineral soil material.
- If the material feels consistently greasy, it is likely organic soil material.

Step 2: How decomposed is the organic soil?

Von Post decomposition ratings offer a method to determine the degree of organic soil decomposition in the field:

- Take a handful of organic soil in your hand and squeeze it.
- The extent of decomposition is determined by:
 1. the nature of the liquid that is squeezed out,
 2. how much organic material is extruded from the hand,
 3. the nature of the plant matter.

Von Post		Nature of Squeezed Liquid	Extruded Organic Matter	Nature of Plant Matter
Poorly decomposed organic soil (peat), typical of peatlands	1	Clear, colourless	None	Plant structure unaltered
	2	Yellow-brown	None	Plant structure distinct, almost unaltered
	3	Slightly turbid, brown	None	Plant structure distinct, most remains easily identifiable
	4	Strongly turbid, brown	None	Plant structure distinct, most remains identifiable
	5	Strongly turbid, contains little organic material in suspension	Very little	Plant structure clear but indistinct and difficult to identify
Highly decomposed organic soil, found in deeper layers of peatlands or shallow organic layers of Mineral Wetlands	6	Muddy, much organic material in suspension	One third	Plant structure indistinct, with most unidentifiable
	7	Strongly muddy	One half	Plant structure indistinct
	8	Thick mud, little free water	Two thirds	Plant structure very in-distinct, with only resistant material such as roots identifiable
	9	No free water	Nearly all	Plant structure almost unrecognizable
	10	No free water	All	Plant structure unrecognizable, amorphous

APPENDIX C

Glossary

Acidity-Alkalinity: A chemical gradient indicating the amount of charged hydrogen ions (H+) present in an aqueous solution. Acidic refers to soil or water with a pH less than 7, while alkaline refers to soil or water with a pH of more than 7 and with the capacity to buffer or neutralize an acid.

Algal Crust: Dried deposits of algae (Chara) species.

Aquatic Vegetation: Plants that occupy the open water zone of wetlands up to a maximum depth of two metres. Species rooted in the substrate may have submersed or floating leaves; other species are free-floating in the water column without anchorage to the substrate.

Biodiversity: A measure of the variability of all living organisms found on earth including from terrestrial, marine, and other aquatic ecosystems.

Bog: A peatland receiving water inputs primarily from precipitation (rain or snow), with high acidity and low plant diversity.

Brackish: Water with moderate to high concentrations of dissolved salts and other dissolved solids; electrical conductivity ranges from 5,000 $\mu\text{S}/\text{cm}$ to 15,000 $\mu\text{S}/\text{cm}$.

Bryophytes: Small, non-vascular plants, such as mosses, liverworts and hornworts. Do not produce seeds or flowers, but instead reproduce via spores.

Classification Decision Key: Pathway to categorize wetland classes, forms and types by sorting them according to shared characteristics.

Compound: A leaf consisting of several distinct parts (leaflets), joined to a single stem.

Coniferous: Refers to cone-bearing trees with needle-like leaves; in Alberta wetlands, coniferous trees include black spruce, white spruce and tamarack.

Deciduous: Generally broadleaf trees that shed their leaves annually; in Alberta wetlands, deciduous trees include several birch and poplar species.

Deep Wetland Vegetation Zone: A wetland plant community zone characteristic of semi-permanent marshes containing robust, emergent graminoids that are tolerant of prolonged flooding and deeper water levels than species in shallower vegetation zones (see shallow wetland plant zone and wet meadow plant zone).

Dynamic: In relation to water regime, indicates a high degree of fluctuation in water level or flow.

Electrical Conductivity: A measure of the amount of current carried through water or soil thereby indicating the salinity concentration.

Emergent Vegetation: Plant species which can tolerate variable and sometimes prolonged flooding; generally pertains to robust, erect graminoids such as cattails, rushes, sedges and grasses.

Ephemeral Water Body: Often occurring at the interface between wetland and upland habitat, these features lack the soil, vegetation and hydrology indicators that are defined in the Alberta Wetland Identification and Delineation Directive to designate them as wetlands.

Ericaceous Shrubs: Flowering shrubs that belong to the Ericaceae (heath) family, and primarily thrives in acidic soil, making them useful indicators of bogs, poor fens and conifer swamps. Includes Labrador tea, leatherleaf, bog cranberry, etc.

Evergreen: Having leaves or foliage that remains green and functional through more than one growing season.

Extreme-Rich Fen: Highly minerotrophic or nutrient-rich fens with a pH greater than 7.0, often associated with springs and the deposition of calcium-rich marl.

Fen: A peatland receiving nutrient-rich water inputs from precipitation, surface water and groundwater (minerotrophic), ranging from moderately acidic (poor fens) to alkaline (rich fens) and with relatively high plant diversity.

Floating Vegetation: Plants that entirely or partly (have select leaves, stems, flowers) float on the water surface; they may either be free-floating in the water column or rooted to the substrate (fixed-floating).

Fresh-water: Water with very low concentrations of dissolved salts and other dissolved solids; electrical conductivity is less than 500 µS/cm.

Gleying: Blue-grey or greenish soil that results from the reduction of iron and manganese caused by prolonged saturation under anaerobic (oxygen-deprived) conditions.

Graminoid Vegetation: Herbaceous plants such as grasses, sedges, rushes and cattails.

Hummocky Microtopography: Mounded topography at a site-scale that is usually composed of peat and/or graminoid vegetation forming hummocks and hollows, often allowing pools of standing water to accumulate during wet periods.

Hydric Soil: Soil that is saturated with water for prolonged periods during the growing season, leading to the development of anaerobic (oxygen-deprived) conditions in the rooting zone.

Hydrology: The study of the properties, distribution and circulation of aboveground, below ground and atmospheric water.

Hydrophyte/Hydrophytic Vegetation: A plant species that has adapted to growing in wet areas under continuous or periodic waterlogged conditions.

Intermittent Wetland: Those wetlands that alternate between saline open water and exposed bare soil (e.g., salt flats) on a seasonal basis.

Isolated Wetland: Often surrounded by topographic highs, these wetlands typically receive water from precipitation only and are not connected with other surface water bodies (e.g., other wetlands, rivers, lakes) or groundwater inputs as a result of their landscape position.

Leaf Axil: The angle between the supporting stem and the upper side of the leaf or stem.

Marl: Unconsolidated deposits of calcium carbonate or magnesium carbonate, and often indicated by the accumulation of shells from aquatic invertebrates.

Marsh: A mineral wetland with fluctuating water levels near, at or above the ground surface for variable periods during the year, supporting graminoid vegetation communities.

Mineral Soil: Soil consisting predominantly of clay, silt and sand minerals containing less than 17% organic carbon by weight.

Minerotrophic: Refers to wetlands that receive water from diverse sources (precipitation, surface water and groundwater inputs) and, as a result, has accumulated minerals from soil and/or bedrock resulting in nutrient-rich conditions.

Mixedwood: A wooded wetland consisting of a mix of coniferous and deciduous tree species where neither species represents more than 75% cover.

Moderately Brackish: Water with moderate concentrations of dissolved salts and other dissolved solids; electrical conductivity ranges from 2,000 µS/cm to 5,000 µS/cm.

Moderate-Rich Fen: Moderately minerotrophic or nutrient-rich fens, with a pH between 5.5 and 7.0.

Mottling: Distinct spots or blotches of red-brown colours interspersed throughout a soil layer, indicative of oxidized iron or manganese deposits that experience fluctuating water levels and associated oxygen availability.

Ombrotrophic: Refers to wetlands that receive only nutrient-poor water inputs, primarily from precipitation.

Organic Soil: Soil developed mainly from organic deposits (peat, plant litter and debris), containing at least 17% organic carbon or 30% organic matter by weight.

Peat: Partially decomposed plant material making up the organic soil layer found in peatlands, where decomposition is hindered by saturated or waterlogged conditions.

Peatland: A wetland with more than 40 cm of accumulated peat; includes bogs, fens and some conifer swamps.

Permanent Wetland: Those wetlands with surface water up to 2 m deep present throughout the year, even in drought conditions.

pH: Logarithmic scale expressing acidity or alkalinity of a substance, where 7 is neutral, values less than 7 are acidic and values higher than 7 are alkaline or basic.

Prairie Pothole: Shallow open water wetlands that are found across the prairie and parkland natural regions, often isolated from surface water connections.

Poor Fen: Less minerotrophic or nutrient-rich than other fens, these systems have a pH of 5.5 or less.

Recharge: The process by which surface water infiltrates the soil and percolates downward to the groundwater system.

Redox Features: A collective term for mottling, gleying and other processes which are indicative of oxidation and reduction in a soil, caused by fluctuating water levels and associated oxygen conditions.

Rhizoids: Thin, plant outgrowths that function similar to roots. Rhizoids work to anchor plants to the ground and facilitate the absorption of nutrients.

Saline: Water with very high concentrations of dissolved salts and other dissolved solids; electrical conductivity is greater than 45,000 $\mu\text{S}/\text{cm}$.

Saline Fen: Fen with graminoid vegetation, pH between 6.5 and 7.5, and electrical conductivity greater than 2000 $\mu\text{S}/\text{cm}$.

Salinity: A measure of amount of dissolved salt contained in a solution, often measured as an Electrical Conductivity.

Salt Flat: An intermittently flooded mineral wetland where salts are concentrated by evaporation during dry periods and may appear as whitish crystals on the bare surface.

Saturated: Soil in a condition where all pores are filled with water.

Seasonal Wetland: Those wetlands with surface water present through most of the average growing season, but has little to no surface water remaining by late summer.

Semi-Permanent Wetland: Those wetlands with surface water present for most or all of the year, except in years when drought conditions persist.

Shallow Open Water: A mineral wetland characterized by at least 25% cover of standing open water up to 2 m in depth, often with submersed and/or floating aquatic vegetation.

Shallow Wetland Vegetation Zone: A wetland plant community zone characteristic of seasonal marshes (also found in semi-permanent marshes and some shallow open water wetlands); this zone is dominated by narrow-leaved graminoids (sedges and grasses) that tolerate seasonal flooding.

Shrubby Vegetation: Woody plants typically less than 3 m in height with multiple, branched stems.

Slightly Brackish: Water with low concentrations of dissolved salts and other dissolved solids; electrical conductivity ranges between 500 $\mu\text{S}/\text{cm}$ and 2,000 $\mu\text{S}/\text{cm}$.

Soil Texture: Refers to the composition of soil particles (clay, silt, sand), measured using their relative particle sizes and abundance.

Stagnant: In relation to water regime, refers to a relatively stable water table with minimal fluctuations over time and no to slow-flowing water under normal climatic conditions.

Submersed Alkali Plant Zone: Characteristic of intermittent saline shallow open water wetlands, this vegetation zone is tolerant of highly saline conditions and composed exclusively of widgeon grass.

Submersed and/or Floating Aquatic Vegetation Zone: A wetland plant community zone characteristic of seasonal and semi-permanent shallow open water wetlands, consisting of both submersed and/or floating aquatic vegetation.

Submersed Vegetation: Aquatic plants growing under the water surface, some may have floating leaves and/or flowers.

Submersed Vegetation Zone: A wetland plant community zone characteristic of permanent shallow open water wetlands, consisting of only submersed aquatic vegetation.

Sub-Saline: Water with high concentrations of dissolved salts and other dissolved solids; electrical conductivity ranges between 15,000 $\mu\text{S}/\text{cm}$ and 45,000 $\mu\text{S}/\text{cm}$.

Swamp: A mineral wetland class (although wooded coniferous swamps are rarely peatlands) characterized by fluctuating water levels and with more than 25% woody species (tree and/or shrub) cover.

Temporary Wetland: Those wetlands with surface water present for a short period of time after snowmelt or heavy rainfall, but otherwise lacks surface water; temporary wetlands are affected by the water table for long enough to promote formation of water altered soils within 30 cm of ground surface and a dominance of water tolerant vegetation during parts of the growing season.

Transition Zone: A zone where one wetland class or form may transition into another or where a wetland may transition into upland, often exhibiting ecosystem functions of both systems.

Von Post Decomposition: A field test used to determine the degree of organic matter decomposition in an organic soil on a scale of 1 (undecomposed) to 10 (completely decomposed).

Warty: Glands on twigs that appear like warts. Glands may be dense or sparse, raised or flat and may vary in colour.

Water Permanence: Indicates the degree of fluctuation of the water table seasonally, resulting in various periods of standing water at the surface and hence the wetland types: temporary, seasonal, semi-permanent, permanent and intermittent.

Water Table: The elevation of groundwater above or below the soil surface.

Wet Meadow Vegetation Zone: A wetland plant community zone characteristic of temporary marshes (also found in seasonal and semi-permanent marshes as well as some shallow open water wetlands); this zone is dominated by narrow-leaved graminoids (grasses) that tolerate only temporary flooding.

Wetland: Land that is saturated with water long enough to promote formation of water altered soils, growth of water tolerant vegetation and various kinds of biological activity that are adapted to wet environments.

Wetland Class: Categories of wetlands divided based on the predominant soil types (organic or mineral), vegetation, water and nutrient regimes; includes bogs, fens, swamps, marshes and shallow open water wetlands.

Wetland Complex: A contiguous wetland area consisting of more than one wetland class. Wetland complexes comprised of both bogs and fens are common in the boreal region, however complexes may also include marshes, swamps and/or shallow open water wetlands.

Wetland Form: Wetland classes are divided into forms using the predominant vegetation structure present, namely wooded, shrubby, graminoid, aquatic or bare.

Wetland Type: Wetland forms are divided into types based on acidity-alkalinity, water permanence and salinity gradients, which can all be correlated to distinct vegetation community assemblages.

Wooded: A wetland form that contains more than 25% tree cover.

Wooded Vegetation: Tree species more than 3 m tall.

Woody: Hard stemmed plants that survive over a period of years. Woody plants are typically comprised of trees and shrubs.

Notes

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Notes

Alberta Wetland Classification System Field Guide

Questions or comments on the guide? Your feedback is welcomed.

Contact wbf_bmp@ducks.ca with "AWCS Field Guide" in the subject line.