PEI WETLAND FIELD GUIDE

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INTRODUCTION

This guide has been developed to assist PEI government staff in determining when an area has a high probability of being a wetland, potentially triggering the need for a more formal assessment by a professional wetland delineator. It focuses on the three necessary requirements for an area to be classed as wetland: (i) hydrophytic vegetation is dominant, (ii) hydric soils are present, and (iii) there is active hydrology. Each of these is covered in separate sections below, with emphasis on the most common plants, soil features, and hydrology indicators to know and recognize. In addition, short descriptions of each of the main wetland classes (bog, fen, marsh, swamp) are provided along with a classification key.

Users are reminded that for wetlands to form, there must be a significant period during the growing season when soils are saturated near the surface. This restricted drainage is caused by a combination of: (1) **high inputs of water** (e.g., snow melt precipitation, flooding, seepage, tides, groundwater); and/or (2) **slow removal of water** due to (i) slow internal drainage (caused by high soil clay content, compaction, near-surface bedrock, etc.), (ii) slope position (lower slope, depression, level), and/or (iii) low evapo-transpiration rates.

Assessors should always be **<u>reading the site</u>** and asking: *Does it make sense that near-surface water could regularly collect here during the growing season and promote wetland development*? *What is causing the high input and/or slow removal of water at this location*?

CANADIAN WETLAND CLASSIFICATION

1a. Wetland ecosystems with an accumulation of peat (≥ 40cm)

- **2a**. Peatland dominated by bryophytes and graminoids
  - **3a**. Peatland receiving water exclusively from precipitation and not influenced by groundwater (i.e, ombrogenous); *Sphagnum*-dominated vegetation: **BOG**
  - **3b.** Peatland receiving water rich in dissolved minerals, (i.e., geogenous); vegetation cover composed dominantly of graminoid species and brown mosses: **FEN**
- **2b.** Peatland dominated by trees, shrubs, and forbs; waters are rich in dissolved minerals: **SWAMP**

1b. Wetland ecosystems characterized by minimal or no peat accumulation (< 40cm)

- **4a**. Wetlands with free surface water persisting above the ground surface for variable periods or not at all. If surface water persists through the summer, water depths are sufficiently shallow to permit survival of woody or herbaceous vegetation which cover more than 25% of the surface area of the wetland
  - **5a**. Periodically standing surface water and gently moving, nutrient-rich groundwater with vegetation dominated by woody plants often more than 1m high: **SWAMP**
  - **5b**. Periodic or persistent standing water or slow-moving surface water which is circum-neutral to alkaline and generally nutrient rich - vegetation is dominated by graminoids, shrubs, forbs, or emergent plants: **MARSH**

- **4b**. Wetlands with free surface water up to 2m deep, present for all or most of the year, with less than 25% of the surface water area occluded by standing emergent or woody plants. Submerged or floating aquatic plants usually dominate the vegetation: **SHALLOW WATER**

BOG: Primary Characteristics
Open peatland formed by *Sphagnum* mosses. Source of water and minerals is predominantly precipitation (= ombrogenous), not inflow from surroundings. Usually dominated by ericaceous (Heather family) shrubs, wiry sedges, and *Sphagnum* mosses. Often contains black spruce not exceeding 30% cover.

FEN: Primary Characteristics
Open peatlands formed from *Sphagnum* or graminoids (e.g., sedges). Source of water and minerals is predominantly inflow from surroundings (= geogenous). Vegetation varies with the fertility of the site's geology. Poor fens are dominated by ericaceous shrubs, richer fens by graminoids (sedges and grasses). Often contains red maple or eastern larch not exceeding 30% cover.

SWAMP: Primary Characteristics
Wetlands dominated by trees and/or tall shrubs with an organic layer containing highly decomposed woody material. Soils can be organic (> 40cm thick) or mineral. Understory vegetation is frequently dominated by ferns, but also contains shrubs and sedges. Tree dominants reflect regional and/or nutritional gradients with black spruce, larch, balsam fir, red maple, eastern white cedar, and white ash the most common species.

MARSH: Primary Characteristics
Mineral wetlands with little accumulation of organic materials. Soils are usually saturated and often ponded, but water levels may fluctuate widely between spring and summer. Plant zonation reflects average water conditions – from floating aquatics, to pickerel weed, to graminoids (sedges, grasses, rushes) moving to an upland or swamp boundary.

HYDROPHYTIC VEGETATION

A "hydrophyte" is any plant that is adapted to the stresses associated with a waterlogged rooting zone. Some hydrophytes, like the common softrush, form systems of intercellular stem and root spaces (aerenchyma) that connect leaves and stems with roots to keep tissues oxygenated in times of flooding. Other plants form tussocks (e.g., black sedge and tussock sedge) that have upper and lower root zones that function when water levels are high and low respectively.

Softrush (*Juncus effusus*) with aerenchyma

Tussock sedge (*Carex stricta*) with upper and lower rooting zones

An ability to root adventitiously from positions along the stem itself is found in various hydrophytes. This can be seen in a common grass of flooded fields (creeping bentgrass) which spreads over the water surface, rooting at each stem node. It also occurs in the very common speckled alder that often lines stream channels.

Creeping bentgrass (*Agrostis stolonifera*)

Speckled alder (*Alnus incana*) with adventitious rooting along the stem

Hydrophytic Trees

PEI has no obligate wetland trees. The most common water tolerant species are willows, black spruce, red maple, eastern larch, balsam fir, eastern white cedar, and yellow birch; with white ash, American elm, and black ash less common.

Trees in swamps may occur in elevated areas (mounds or hummocks) above the water table and often their roots are restricted to the wetland surface or can appear stilted. Shallow rooting in swamps means trees are less anchored and more susceptible to blowdown.

Yellow birch (*Betula alleghaniensis*) with stilted, shallow rooting due (in this case) to high water levels.

Hydrophytic Rankings (Indicator Status)

Wetland delineation grew out of the need to protect infrastructure and place development in areas not prone to flooding or water erosion. You will first recognize that some areas may be wetland based on the lay of the land (geomorphology) and later by characteristic plant communities. For example, some delineators refer to the “green line of sorrow” when they see patches of cinnamon fern because this means much fieldwork to come. Plant indicator status was developed into an objective scoring system by the US Army Corps of Engineers with wetland experts assigning plants into one of five possible groups:

1. OBLIGATE:	**almost always in wetlands**
2. FACULTATIVE WETLAND:	**66-99% of cases in wetland**
3. FACULTATIVE:	**33-66% of cases in wetland**
4. FACULTATIVE UPLAND:	**66-99% of cases in upland**
5. UPLAND:	**almost always in uplands**

While PEI uses the same Wetland Indicator Plant rankings as Nova Scotia and New Brunswick, all provinces would benefit from more localized rankings to better characterize wetland vegetation.

"Green Line of Sorrow"

…so called because lush Cinnamon fern (*Osmundastrum cinnamomeum*) cover likely means a swamp and lots more field work for the wetland delineator

Common Wetland Plants

Delineators and inspectors look to common signature plants to assess the wetland edge. Below are 27 signature plants to know for various wetland types in PEI.

Sphagnum spp. are the most reliable and helpful for bogs, fens, and swamps, and they can form wetland organic soils.

Carpet of *Sphagnum* moss

1. ***<u>Sphagnum spp.</u>*** **ALL PEATLANDS**

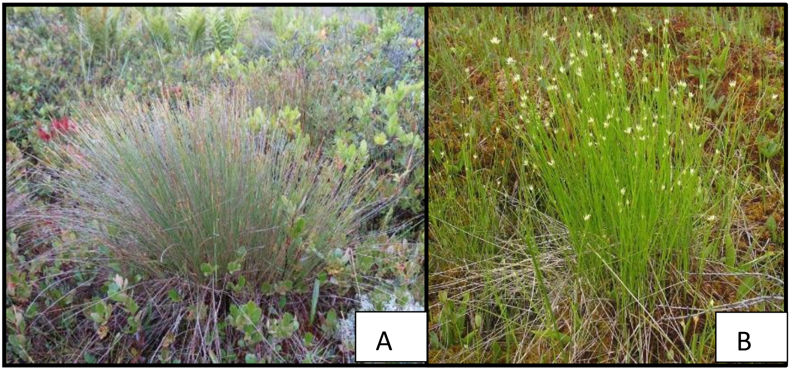
- Sphagnum mosses have distinctive rosette-like heads (capitula).

- Each head is framed by radiating branches and these branches are made up of leaves from 1-3 mm long.

- The common *Sphagnum magellanicum* is shown above. Note leaves are the fine lines along each branch.

2. <u>Sedges</u> **BOGS and POOR FENS**

Wiry sedges:



A) Tufted clubrush (*Trichophorum cespitosum*)

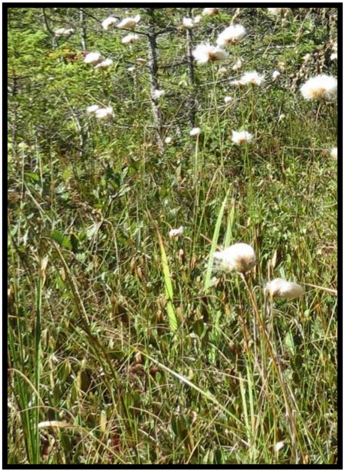
B) White beakbrush (*Rhynchospora alba*)

Boreal Bog Sedge (*Carex magellanica*)

***Carex* features:**

female spikes with scales (brown) and perigynia (green)

3. <u>Cottongrasses</u> **BOGS and POOR FENS**



Three Cottongrasses (clockwise from top):

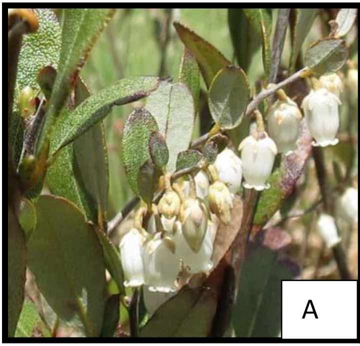
Tufted Cottongrass (*Eriophorum vaginatum*)

Tawny Cottongrass (*E. virginicum*)

Narrow-leaved Cottongrass (*E. angustifolium*)

4. **<u>Heath family (Ericaceae): evergreen leathery versus deciduous</u>**

BOGS and POOR FENS



A and B = evergreen leaves

C = deciduous leaves

A) Leatherleaf (*Chamaedaphne calyculata*),
B) Labrador Tea (*Rhododendron groenlandicum*)
C) Rhodora (*Rhododendron canadense*)

5. **<u>Sweet gale (*Myrica gale*)</u>** **FENS**

- Bluish-green aromatic leaves
- Leaf tip toothed
- Nitrogen-fixing shrub
- Adventitious roots

6. **Tussock sedges (*Carex stricta* and *C. nigra*)** **FENS**

Left: *Carex stricta* = tussock sedge
Right: *C. nigra* = black sedge

Left: fibrillose sheath base of tussock sedge, *Carex stricta*
Right: female and male spikes of black sedge, *C. nigra*

7. **<u>Cinnamon fern (*Osmundastrum cinnamomeum*)</u>** **SWAMPS**

Close-up of a vegetative frond and the cinnamon-coloured reproductive frond. Note the tuft of hair (white here, brown in maturity) at the base of the pinnae that helps distinguish cinnamon fern from interrupted fern (*Claytosmunda claytoniana*).

The white inner core of the cinnamon fern rhizome can be eaten raw.

8. **<u>Black spruce (*Picea mariana*)</u>** **PEATLANDS**

9. **<u>Eastern larch (*Larix laricina*)</u>**

Trees with dark green persistent needles (centre-left) are black spruce. Trees visible throughout with deciduous, feathery needles are larch (also known as Tamarack or Hackmatack). Both can be found in bogs, fens, and swamps.

SWAMPS

10. **<u>Eastern white cedar (*Thuja occidentalis*)</u>**

Scale-like leaves of eastern white cedar (common in treed swamps in western PEI).

11. **<u>Red maple (*Acer rubrum*)</u>** **FENS and SWAMPS**

Top: winged seed of red maple in late May
Bottom: red maple/cinnamon fern swamp

12. **<u>Sensitive fern (*Onoclea sensibilis*)</u>** **SWAMPS**

- A once-cut fern with wavy pinnae (leaf) margins
- Separate vegetative and reproductive fronds
- Vegetative fronds "sensitive" to frosts
- Brown reproductive fronds persist overwinter

13. **Fine sedges:** **SWAMPS**

Acidic swamp

Three-seeded sedge (*Carex trisperma*)

Bristle stalked sedge (*Carix leptalea*)

Rich swamp

14. **Large sedges:** **RICH SWAMPS and MARSHES**

Carex gynandra, the nodding sedge

Carex pseudocyperus, Cyperus-like sedge

15. **Manna grasses: *Glyceria spp*.**

Swamps

(Left): *Glyceria canadensis* and (Right) *G. striata*

Marsh

Glyceria grandis

16. **<u>Speckled alder (*Alnus incana*)</u>** **SWAMPS and MARSHES**

Top:	Shrub habit
Lower left:	Double serrate leaf margin
Lower right:	Lenticels on bark…. ”speckled” lenticels

17. **<u>Willows (*Salix spp.*)</u>** **SWAMPS and MARSHES**

Willow characteristics:

- Lanceolate leaves (top: Bebb's willow, *Salix bebbiana*)
- Buds flattened and single scaled (bottom left)
- Catkins - female shown (bottom right, shining willow, *Salix lucida*)

18. **<u>Holly family</u>** (all now considered species of *Ilex*)

Common winterberry (*Ilex verticillata*) **SWAMPS**
Mountain holly (*Ilex mucronata*) **FENS/SWAMPS**

Common Winterberry: leaves finely toothed

Mountain Holly: leaves not toothed, leaf tip apiculate (mucro), leaves have purplish coloured petioles.

19. **Dogwood: *Cornus spp*.** **MARSHES**

Note how leaf veins are almost parallel

Red osier dogwood (*Cornus sericea*)

20. **<u>Bluejoint (*Calamagrostis canadensis*)</u>**

MARSHES and FENS

Purplish tinges in spikelets and often at nodes.

Bluejoint indicates good habitat integrity.

Bluejoint at right side but Reed canary grass clump — 1m taller — moving in at left.

21. **Freshwater cordgrass (*Sporobolus michauxiana*)**

Dominant in dune slack marsh (from PEI)   Raceme of spikes

This is one of the largest native grasses.

It tolerates salt, compaction, and waterlogging.

Often in dune slack regions. It has fine hairs in the ligule zone (where blade meets stem). This will let you separate it from other grasses.

22. **<u>Softstem bulrush</u>** **<u>(*Schoenoplectus tabernaemontani*)</u>**

Softstem bulrush spikelets more ovoid than those of hardstem.

Stem easily crushed versus the more resistant stem of hardstem.

Softstem bulrush zone in freshwater dune marsh (from PEI).

23. **<u>Wooly bulrush (*Scirpus cyperinus*)</u>**

DISTURBED AREAS and MARSHES


Scirpus cyperinus complex (includes *atrocinctus* and c*yperinus*). Both common and both disturbance indicators (and they hybridize).

24. **<u>Softrush (*Juncus effusus*)</u>**

Disturbed AREAS and MARSHES

J. effusus in a ditch

Juncus flowers (*J. fliformis* pictured) are lilies in miniature: capsule surrounded by six tepals.

Note how the green softrush colour stands out.

Invasive Species

Invasive species are touted as the second threat to biodiversity on Earth (after habitat loss). Exotic species usually indicate an anthropogenic alteration of ecosystem processes.

We end this brief list of important wetland species to know with three exotics. **Cattails** are useful indicators of wetland alteration. When you see these, look for a source of nutrient inflow or an alteration in hydrology. The last two species (**glossy buckthorn** and **reed canary grass**) are also disturbance and alteration indicators, but these two may also invade native communities and displace native plants (see also #20, bluejoint being displaced by much taller reed canary).

25. **Cattails (*Typha spp.*)** **MARSHES and DITCHES**

Flowers minute and clustered in a spike

Mind the gap: The exotic narrow-leaved cattail has a wide gap between female and male portions of the spike.

A hybrid which is the most disturbance related of all cattails, *Typha* x *glauca*, has an intermediate gap width.

Narrow-leaved cattail *(Typha angustifolia*) specimen from Acadia University (E.C. Smith Herbarium)

26. **<u>Glossy buckthorn (*Frangula alnus*)</u>**

SWAMPS and DISTURBED AREAS

Glossy buckthorn is shade tolerant, fast growing, and bird and mammal dispersed. It may slow down and alter the course of natural plant community succession.

- Leaves entire (not toothed)
- Veins of leaves impressed
- Flowers small white
- Berries (not shown) black
- Seedlings are established (see photo at right) after fruits are eaten and dispersed by birds and mammals

27. **<u>Reed canary grass (*Phalaris arundinacea*)</u>**

MARSHES and DITCHES (also hayfields)

Top: Reed canary grass in a polluted stream.
Bottom: Reed canary grass displacing native *Carex torta* in a riparian wetland.

HYDRIC SOILS

When soils are saturated for a significant period of time during the growing season, redoximorphic (redox) features start to form which reflect changes in microbial activity and soil chemistry that occur under anaerobic conditions. These changes are mainly related to: (i) a build-up of organic matter and (ii) changes in iron (Fe) chemistry that affect soil colour.

Common features associated with Hydric Soils

1. **Build-up of organic material at the surface**

Caused by decreased decomposition rates due to high water content and change in microbial communities. Look for organic horizons ≥ 20 cm and derived from hydrophytic vegetation. You can easily estimate organic thickness by pushing (not turning) a soil auger into the surface. The auger will stop when it hits mineral soil.

(A)  (B)  (C) 

2. **Depleted mineral soil in top 30 cm**

Caused by oxidized iron (Fe^{3+}) being transformed into reduced iron (Fe^{2+}) under anaerobic conditions, followed by removal of this soluble Fe^{2+} by diffusion or mass flow. This essentially removes the iron oxide “paint” that gives much of the red, yellow, and orange colour to soil, resulting in a greyish, low chroma soil colour. Low chroma (≤ 2) can be assessed using a Munsell Colour Chart.

(A)

(B)

3. **Presence of distinct redox concentrations near the surface**

Occurs when water table fluctuations or intermittent ponding allows air/oxygen back into the soil. Pockets of concentrated iron are re-oxidized to Fe^{3+} resulting in reddish/orange splotches against a lighter background (also called redox mottles). When contrast between background soil colour and redox concentration colour is *distinct* or *prominent*, it usually indicates more prolonged anaerobic conditions (see Distinct and Prominent Contrast chart below). Look for 5% or more redox concentrations in the first full auger depth in mineral soil.

(A) 

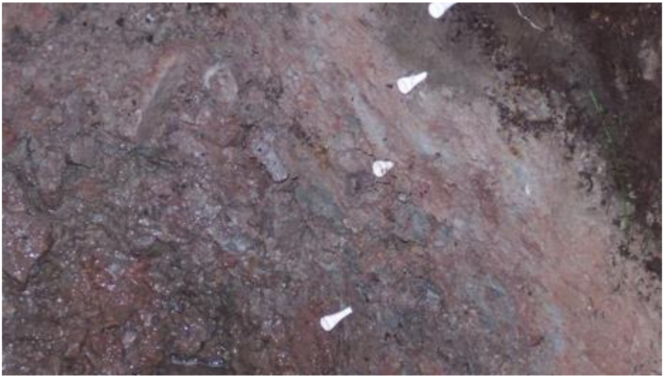
(B) 

The image to the left (showing many distinct redox concentrations in a brownish surface soil) is a common hydric soil indicator in vernal pools and fields subject to periodic surface ponding.

(C)

4. **Presence of redox depletions near the surface**

Depletions are the flip side of concentrations. For an area to have concentrated iron pockets, another area must have been depleted of iron. Concentrations are usually more visible than depletions, except in red soils where depletions are usually more visible (sometimes called grey mottles, photo 4A). Sometimes both concentrations and depletions are clearly visible in the same soil (photo 4B). When the majority of soil has been depleted, you have a depleted matrix (photo 3A above).



(A)

(B)

5. **Varying shades of grey in surface mineral soil**

Sometimes soils saturated for long periods of time will show varying shades of grey colour in surface soil where there have been different levels of depletion and/or movement of organic acids (staining). This is more common in sandy soils.

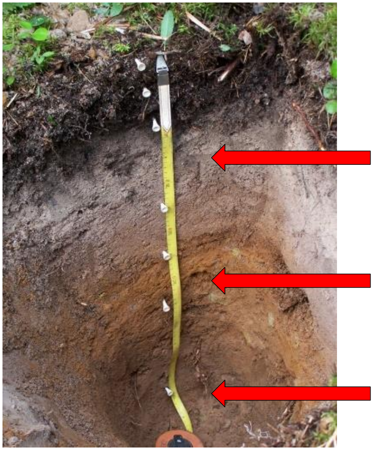
(A) 

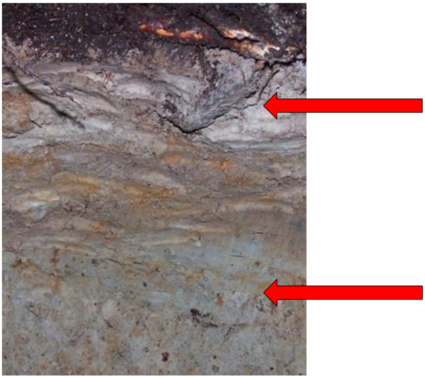
(B) 

Depletion versus Leaching

Iron "paint" in soil can also be removed via a process called leaching. Leaching is not the same as depletion and is common in acidic upland soils. Leaching involves movement of oxidized (Fe^{3+}) iron in combination with organic acids, while depletion is movement of soluble reduced (Fe^{2+}) iron. Leaching only occurs at the surface (A-horizon), and the iron collects further down in the soil (B-horizon) where it more uniformly enriches soil colour. Depletion happens wherever soil is subject to prolonged anaerobic conditions (any horizon) and often results in depleted colours deeper in the profile (see next page).

(A) 

(B) 

(C) 

(A) Hydric soil with depletion throughout profile (all horizons).

(B) Upland soil with leaching in surface A-horizon, enriched iron in B-horizon, and normal yellowish-brown colour in C-horizon.

(C) Hydric soil with leached and depleted surface A-horizon and depleted B-horizon below (along with distinct to prominent redox concentrations).

The problem with red soils

PEI is covered almost entirely by soils derived from red parent materials. Unfortunately, red soils do not consistently change colour the way non-red soils do under anaerobic conditions. Although not all red soils are "problem" red soils, reliance on hydric indicators derived elsewhere in mainly non-red soils is problematic.

While some "official" hydric indicators listed for the northeast United States are applicable in PEI, it is recommended:

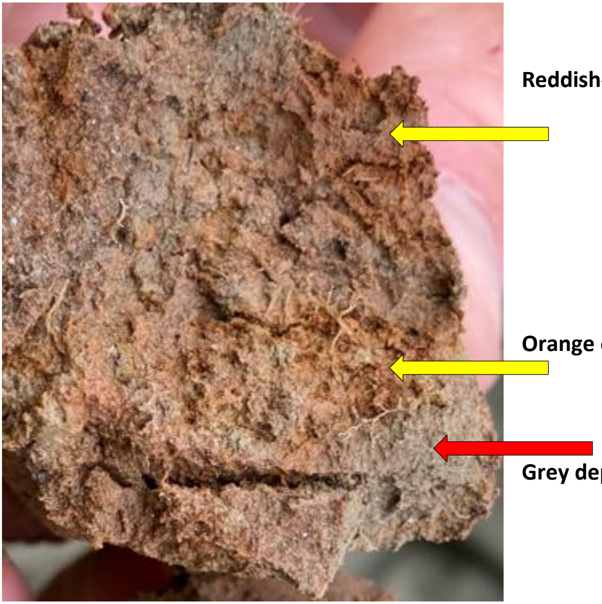
1. **That assessors also look for site-specific or local indicators of prolonged anerobic conditions in potential wetland soils (and the degree of expression of these indicators) compared to adjacent upland soils.**

For example, many "official" hydric soil indicators require a chroma of 2 or less in some part of the surface soil being assessed. Such a low chroma may not be possible in some red soils, but the difference in chroma between adjacent upland and wetland soils may be significant. A site visited in western PEI had a chroma of 6 in the upland, 4 in the boundary area, and 3 inside the wetland (at the same depths) – a decreasing trend that supported the wetland and boundary call at that site.

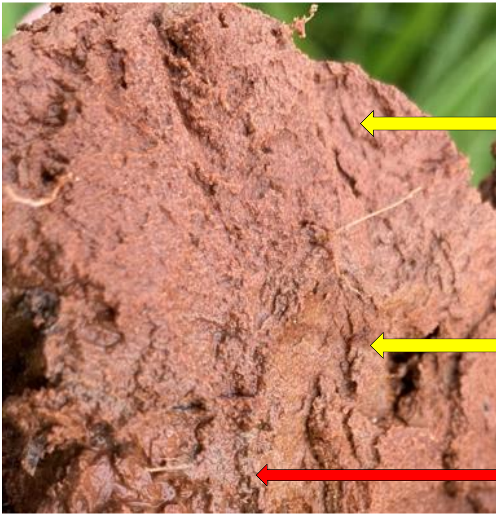
2. **That wetland assessors in PEI always look for and recognize the importance of redox depletions when assessing possible hydric soils.**

As noted above, redox depletions are often more visible than redox concentrations in red soils, and they are just as much a redox feature as concentrations are.

Below are photos of PEI soils where redox depletions (alone or in combination with concentrations) found near the soil surface supported a hydric soil call.



The majority of the soil above has had its matrix colour (paint) altered by chemical reduction and redistribution of iron, whereas the soil below has more of its original matrix colour still visible.



Partially depleted pale reddish-brown matrix

Orange concentration

Grey depletion

The image to the left shows the presence of grey redox depletions in a dark surface soil enriched in organic matter.

Sample depletion area

The image above shows light grey depletions in the bottom section (along with some orange concentrations and reddish-brown matrix), and a dark, organically enriched upper section with lighter depletion streaks.

Note: Hydric soils are *soils that have formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part*. They are not defined by the presence of "official" hydric soil indicators.

Distinct and Prominent Contrast

The following differences in Hue, Value, and Chroma denote distinct to prominent contrast between redox concentration and soil matrix colours (Δ = change in).

Assessed using a Munsell Colour Chart.

Δ Hue refers to change in Hue page, not Hue number. For example, when moving from 7.5 YR to 10 YR, Δ Hue = 1.

Δ Hue = 0; Δ Value = 0; Δ Chroma ≥ 2
Δ Hue = 0; Δ Value = 1; Δ Chroma ≥ 2
Δ Hue = 0; Δ Value = 2; Δ Chroma ≥ 2
Δ Hue = 0; Δ Value ≥ 3
Δ Hue = 1; Δ Value = 0; Δ Chroma ≥ 2
Δ Hue = 1; Δ Value = 1; Δ Chroma ≥ 2
Δ Hue = 1; Δ Value ≥ 2
Δ Hue = 2; Δ Value = 0; Δ Chroma ≥ 1
Δ Hue = 2; Δ Value ≥ 1
Δ Hue ≥ 3

Note: if both colours have Value of 3 or less and Chroma of 2 or less, the contrast is faint regardless of the difference in Hue.

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Note: When assessing soils with an auger, always remove soil from the auger barrel and examine a clean surface

<u>ACTIVE HYDROLOGY</u>

For wetlands to form, there must be active hydrology that provides the necessary “wetness” during the growing season for hydric soils and dominant hydrophytic vegetation to develop. However, this active hydrology may not be evident year-round or occur to the same degree every year. This can be a problem when officially delineating wetland boundaries, but it should not be a problem for flagging a site as “probable” wetland requiring further evaluation.

If you have evidence of hydrophytic vegetation and hydric soils, as well as site conditions that suggest water could regularly collect and promote wetland development, then you have enough <u>weight-of-evidence</u> to flag a site as probable wetland, regardless of the presence of any hydrology indicators at time of assessment.

<u>Site conditions conducive to active wetland hydrology</u>

Site is located in: (i) a depression, (ii) a toe or lower slope position (long slope), (iii) a topographically defined drainage or flow channel, (iv) a level area adjacent to a water body, (v) a level area underlain by low-permeable soil or near-surface bedrock, (vi) a seepage or groundwater discharge area, or (vii) a concave position within a floodplain.

If hydrology indicators are present at time of assessment, they should be noted.

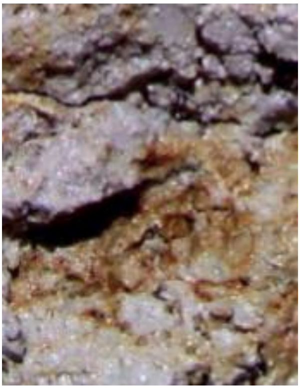
Common and Useful Hydrology indicators

1. <u>Surface water present</u>: Self-explanatory.

2. <u>High water table</u>: Water table within 30 cm of surface (or 60 cm in dry season). Can be assessed using a soil auger, but some time may be needed for water level to stabilize after auger use.

3. <u>Saturation</u>: Saturated soils within 30 cm of surface. In mineral soil, saturation often appears as glistening on the soil surface. If using a soil auger, glistening should be evident on fresh soil from inside the auger barrel.

High water table



Saturated mineral soil

Prolonged saturation can also lead to production of H_2S gas from chemical reduction of sulphate (rotten egg smell). However, this does not always happen, or it can be ephemeral. If you have a rotten egg smell, you must also have saturation.

4. Water-stained leaves: Staining often occurs in leaves that are in contact with the soil surface while inundated for long periods. Overlapping leaves may become matted together due to wetness and decomposition. Water-stained leaves maintain their blackish or grayish colors when dry. They should contrast strongly with fallen leaves in nearby upland areas.

5. Sediment or drift deposits: Sediment deposits on vegetation or ground surfaces, or rafted debris that has been deposited on the ground surface or entangled in vegetation or other fixed objects, both suggest possible active hydrology.

Dark, water-stained leaves

Vegetation drift deposit

6. Iron deposits: Thin orange or yellow crust or gel of oxidized iron on the ground surface or on objects near the surface.

7. Algae or marl deposits: Algae left on or near the soil surface after dewatering or marl deposits (calcium carbonate) precipitated from standing or flowing water.

Iron deposits on mineral soil

Iron deposits on organic surface layer and base of graminoid vegetation (from PEI)

Moist algae deposit in vernal pool (from PEI)

8. Drainage patterns: Flow patterns visible on the soil surface or eroded into the soil, low vegetation bent over in the direction of flow, absence of leaf litter or small woody debris due to flowing water, or other similar evidence that water flowed across the ground surface.

Drainage pattern that will show itself even when dry

Sloped wetland drainage

Bent vegetation in direction of flow

PROBLEM and ATYPICAL CONDITIONS

Problem wetlands are naturally occurring wetland types that lack indicators of hydrophytic vegetation, hydric soil, and/or wetland hydrology periodically (due to normal seasonal or annual variability) or permanently (due to the nature of the soils or plant species on site). Examples include vernal pools (vegetation) and some red parent material soils.

Atypical wetlands are wetlands in which vegetation, soil, and/or hydrology indicators are absent due to recent human or natural disturbance events (e.g., construction, clearing, beaver flooding).

If you have problem or atypical conditions with respect to vegetation or soils, but other indicators are there including site conditions that supports an active hydrology call, then assume probable wetland and flag the site.

ASSESSMENT CHECKLIST

1. Hydrophytic vegetation appears dominant: **Yes / No**
2. Hydric soil features found near the surface: **Yes / No**
   - Build-up of organic material at the surface
   - Depleted mineral soil in top 30 cm
   - Distinct to prominent redox concentrations in surface soil
   - Presence of redox depletions in surface soil
   - Varying shades of grey in surface soil

3a. Evidence of active hydrology: **Yes / No**

- Surface water present
- High water table
- Saturation in top 30 cm
- Water-stained leaves
- Sediment or drift deposits
- Iron deposits
- Algae or marl deposits
- Drainage patterns
- Other

OR

3b. Site conditions conducive to active hydrology:

- Depression
- Toe or lower slope position (long slope)
- Topographically defined drainage or flow channel
- Level area adjacent to a water body
- Level area underlain by low-permeable substrate
- Seepage or groundwater discharge area
- Concave position within a floodplain.

If the answer is Yes to all, then the site is a definite or probable wetland and should be flagged.

Percent Area Charts