### **Wetland Delineation**

FOR

# Fundy Tidal Power Demonstration Site— Shore Facility

# Cape Sharp Cumberland County, Nova Scotia

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### Cape Sharp, Nova Scotia

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### INTRODUCTION

Initial botanical assessments were performed on October 2, 2008, June 11, 2009 and August 26, 2009 on a property located on the north shore of the Bay of Fundy, about 7 km southwest of Parrsboro. The site was located at approximately 45° 22' 19'' N and 64° 24' 21'' W located on the "Parrsboro, Nova Scotia" 21H08, 1:50,000 topographic map. Figure 1 is an aerial view of the study area.

A wetland delineation was subsequently performed on September 20, 2009. The wetland boundaries depicted in this report represent a calculated estimation of the jurisdictional limits within the site, and are subject to modification following a detailed survey. The site is about 2.25 hectares.

The property includes a variety of habitats, including upland softwood forest just south of West Bay Road, leading to an escarpment that drops to a salt marsh (Figure 2) behind a barrier beach. Part of the upland includes cleared fields. There are at least three gullies from the upland that flow into the salt marsh, each braiding out into a high shrub zone (mostly chokecherries (*Prunus virginiana*) and alders (*Alnus spp*). The first two gullies (on the west side of the site, see Figure 3) are sharply defined with steep walls, much of which are bare of vegetation. The gully to the east is broader, more like a ravine, and the surrounding slopes are less steep, allowing forest cover down to the stream banks.

#### **Existing Site Conditions**

The upland softwood forest (Figure 4) was a fairly dense growth of balsam fir (*Abies balsamea*) and white spruce (*Picea glauca*). Below the escarpment, the forest transitioned into an open deciduous/mixed forest with white and yellow birches (*Betula papyrifera* and *Betula Allegheniensis*) and shrubs such as speckled alder (*Alnus incana*) and chokecherry (*Prunus virginiana*).

The two gullies to the west had a similar structure and a similar floristic composition to each other. The sides of these gullies tended to be rocky with occasional cover such as creeping buttercup (*Ranunculus repens*), various ferns, and red raspberry (*Rubus idaeus*). Solitary roseroot plants (*Sedum rosea*) occasionally grew along the banks. The stream in the ravine on the east side was a woodland stream, albeit joining the salt marsh in a similar fashion to the two gullies, through a high shrub zone dominated by speckled alders and occasional chokecherries. The shrub zone for this stream was not

contiguous to that of the two western gullies, but the botanical structure was similar. A small pond (appearing to be man-made) exists on the west side of the ravine, at the end of a woods road.

All water flow on the study site was south to the salt marsh. The salt marsh lies between the upland areas and an exposed barrier stony/gravel beach (Figure 4), and contains a small pond that then exits through a stream to the Bay of Fundy. Typical salt marsh plants such as cord-grasses (*Spartina spp.*) were close to the pond, and above the drift line freshwater species such as cat-tails (*Typha latifolia*) became abundant. The dominant graminoid between the pond and the cat-tails was Chaffy sedge (*Carex palacea*).

According to the *Soils of Cumberland County Nova Scotia* (Report number 17, Nova Scotia Soil Survey 1973), the soil on site is an undulating moderately stony Hebert Series. These soils have "a loose open structure, coarse texture, rapid natural drainage, and consequent problems of droughtiness". The salt marsh on the site is not identified in this soil survey, but salt marshes are described as "containing fine-textured reddish brown deposits of silty clay loam (are) distributed around the coastline, chiefly in the mouths of creeks and rivers".

Figure 1. Site and Vicinity. (see Appendix C for the wetland overlay).The salt marsh pond is left of centre, behind the barrier beachThe image is taken from an aerial photo #04311 125 L-20B (04-06-29).



Figure 2: Pond/saltmarsh complex behind the barrier beach. The upland sample site is in the forest above the saltmarsh east of the shrubs.



Figure 3. The central gully, showing the flowing water, the rocky sides, and occasional patches of vegetation. The stream meanders through a shrub zone before joining the salt marsh.



Figure 4. The upland conifer forest between West Bay Road and the escarpment.



Figure 5. The forest below the escarpment becomes mixed, with several hardwood species.



#### Methods

This wetland delineation was conducted in accordance with the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987). Jurisdictional wetland boundaries were delineated through aerial photograph interpretation and single point wetland analysis. Wetland data were recorded on Sample Wetland Delineation Data Sheets (Appendix A). *Munsell Soil Color Charts* (X-Rite Inc. 2000) were used to aid in identifying hydric soils in the field. The *Flora of Nova Scotia* (Zinck 1998) aided with plant nomenclature and identification.

Field wetland botanical surveys were conducted on October 2, 2008 and June 11, 2009 by Marbicon Inc. Botanist Jim Jotcham. This delineation was performed on September 20, 2009. Heather Levy of Envirosphere Inc. assisted. Mr. Jotcham walked throughout the site to determine the location of potentially jurisdictional boundaries within the property. Four single data point locations were sampled to evaluate whether or not the vegetation, hydrology, and soils data supported a determination of wetland or non-wetland status. The location of these data points was recorded with a Garmin XL12 gps receiver capable of sub 5 metre accuracy. Points were averaged to achieve the most accurate reading possible. The estimated boundary was flagged with pink "wetland delineation" tape, each visible from the other, and marked with the gps. These flags and gps locations are listed in Appendix D. The area of wetland was estimated using MapInfo using all marked points.

#### Jurisdictional Wetlands of Nova Scotia

This report describes wetlands of Nova Scotia that may be regulated by the Nova Scotia Department of Environment in the *Environmental Assessment Regulations*, *Activities Designation Regulations*, and *Approvals Procedures Regulations*. Specific information is further described in the *Operational Bulletin Respecting Alteration of Wetlands (March 2006)* 

"Wetland means land commonly referred to as a marsh, swamp, fen or bog that either periodically or permanently has a water table at, near or above the land's surface or that is saturated with water, and sustains aquatic processes as indicated by the presence of poorly drained soils, hydrophytic vegetation and biological activities adapted to wet conditions." This definition for wetlands applies to freshwater environments and salt marshes and is used by the Nova Scotia Department of Environment in delivery of all programs.

Water approvals are required to alter a wetland of any size. Sites larger than 2 ha require an environmental assessment.

The Nova Scotia *Environmental Goals and Sustainable Prosperity Act* specifies that "A policy of preventing net loss of wetlands will be established in the year 2009". Net loss of wetlands means "net loss of wetland area and function, including habitat".

### **Routine Determinations**

To be determined a wetland; the following three criteria should be met:

- A majority of dominant vegetation species are wetland associated species;
- Hydrologic conditions exist that result in periods of flooding, ponding, or saturation during the growing season; and
- Hydric soils are present.

#### Vegetation

Hydrophytic vegetation is defined as the sum total of macrophytic plant life that occurs in areas where the frequency and duration of inundation or soil saturation produce permanent or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present (Environmental Laboratory 1987). The definition of wetlands includes the phrase " sustains aquatic processes as indicated by the presence of hydric soils, hydrophytic vegetation and biological activities adapted to wet conditions " Hydrophytic vegetation should be the dominant plant type and is characterized by the dominant plant species comprising the plant community (Environmental Laboratory 1987). The "50/20 rule" was used to determine the dominant plant species at each data point location. The rule states that for each stratum in the plant community, dominant species are the most abundant plant species (when ranked in descending order of abundance and cumulatively totaled) that immediately exceed 50 percent of the total dominance measure for the stratum, plus any additional species that

individually comprise 20 percent or more of the total dominance measure for the stratum (HQUSACE 1992).

Dominant plant species observed at each data point were then classified according to their indicator status (probability of occurrence in wetlands) (Table 1), in accordance with the U.S. Fish and Wildlife Service's (USFWS) National List of Vascular Plant Species That Occur in Wetlands: NE Region (Region 1) (1996). These indicators are used as this area most closely resembles the flora of Nova Scotia and climate regime. Further relevant information was reviewed in the Flora of Nova Scotia (Zinck 1998). If the majority (greater than 50 percent) of the dominant vegetation on a site are classified as obligate (OBL), facultative wetland (FACW), or facultative (FAC) (excluding FAC-), then the site is considered to be dominated by hydrophytic vegetation.

Table 1. Classification of Wetland-Associated Plant Species <sup>1</sup>				
Plant Species Classification	Abbreviation <sup>2</sup>	Probability of Occurring in Wetland		
Obligate	OBL	>99%		
Facultative Wetland	FACW	66-99%		
Facultative	FAC	33-66%		
Facultative Upland	FACU	1-33%		
Upland	UPL	<1%		
No indicator status	NI	Insufficient information to determine status		
Plants That Are Not Listed	NL	Does not occur in wetlands in any region.		
(assumed upland species)				

#### <sup>1</sup> Source: Reed 1988

 $^{2}$  A '+' or '-' symbol can be added to the classification to indicate greater or lesser probability, respectively, of occurrence in a wetland.

#### Soils

A hydric soil is defined as a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (USDA-NRCS 2003). Indicators that a hydric soil is present include soil color (gleyed soils and soils with bright mottles and/or low matrix chroma), aquic or preaquic moisture regime, reducing soil conditions, sulfidic material (odor), soils listed on hydric soils list, iron and manganese concretions, organic soils (Histosols), histic epipedon, high organic content in surface layer in sandy soils, and organic streaking in sandy soils. A soil pit was excavated to a minimum depth of 50 centimeters or depth of refusal at each data point. The soil was then examined for hydric soil indicators. The matrix color and mottle color (if present) of the soil was determined using the *Munsell Soil Color Charts*.

#### Hydrology

Wetlands, by definition, either periodically or permanently, has a water table at, near or above the land's surface or that is saturated with water. To be classified as a wetland, a site should have at least one primary indicator or two secondary indicators of wetland hydrology. Primary indicators of wetland hydrology may include, but are not limited to: water marks, drift lines, sediment deposition, drainage patterns, visual observation of saturated soils, and visual observation of inundation. In addition to the primary indicators, there is a variety of secondary wetland hydrology indicators. Secondary indicators include, but are not limited to: oxidized root channels in the upper 12 inches, water-stained leaves, and local soil survey data. When no primary indicators of wetland hydrology are observed at a data point, two or more secondary indicators are required to confirm wetland hydrology.

### RESULTS

Approximately 2.25 hectares of potentially jurisdictional waters of Nova Scotia have been mapped for this site. This only includes that portion of the salt marsh and steams/gullies within the property boundaries. The routine wetland determination forms are included in Appendix A. A list of plant species observed at the data points is included in Appendix B. Also attached is a complete list of plants observed on the property. A discussion of the wetlands and other waters is presented below, and a wetland delineation map is presented in Appendix C. The delineation GPS points are shown in Appendix D.

#### Wetlands

The site has 3 wetland habitats, including the salt marsh, the stream flood plains including the outflow through the high shrub zones leading to the salt marsh, and a seepage area behind a cabin by West Bay Road draining westerly into the central gully. A small pond (an aquatic habitat) was noted just west of the eastern stream beside the woodland, at the end of a woods road.

### Salt Marsh

A complete list of species observed in the salt marsh is presented in Appendix B. The species within the sample are also presented in Appendix B. The species composition gradually changed from halophytic vegetation by the pond to fresh water species at the upper reaches of the marsh. Hydrophytic vegetation dominated the site.

Wetland hydrology indicators observed on site included water saturation and surface water. The wetland is a depression receiving runoff from adjacent slopes.

The mineral soil matrix color within the wetland soil sample was 10Y 6/1 (greenish grey) to at least 50 cm. This colour was on the Munsell gley chart 1. There was little or no peat accumulation at the sample point. This soil was determined to be hydric (F3 – Depleted matrix).

#### Stream floodplain / gully – a shrub fen

A complete list of species observed at this site is presented in Appendix B. Hydrophytic vegetation dominated the site.

Wetland hydrology indicators observed on site included water saturation and surface water.

The point of refusal was at the surface – because of running water having removed the lighter particles, the substrate was too stony to allow soil sampling.

No point samples were located in this system because it was sharply delineated by topography.

### Seepage area - a fen

A complete list of species observed on site is presented in Appendix B. Hydrophytic vegetation dominated the site.

There were three secondary indicators of wetland hydrology at this location: drainage patterns, geomorphic position, and microtopographic relief. The area was otherwise dry on September 20, 2009.

The topsoil was a 3-inch (7.5 cm organic layer, with a soil matrix color 5YR 3/1 (very dark grey). The mineral soil matrix colour was a 10YR 5/3 (brown) from 3-6 inches (7.5-15 cm), and 10Y 5/1 (greenish grey) at 6-18 inches (15-50 cm). This last colour was on the Munsell gley chart 1. Redox features in this layer were about 10% of the matrix, and these were 5YR 5/8 (yellowish red). This soil was determined to be hydric (F2 – loamy gleyed matrix).

### CONCLUSION

Three interconnected wetlands have been identified on the subject property. It is the proponent's responsibility to ensure that all regulatory requirements are met prior to development within this area.

fim Jotcham

Jim Jotcham, February 23, 2010

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### LIST OF APPENDICES

- Appendix A. Routine Wetland Determination Forms
- Appendix B. Vegetation Inventory
- Appendix C. Wetland Delineation
- Appendix D. Data Point and Boundary Point Locations.

Routine Wetland Determination Forms

#### WETLAND DETERMINATION DATA FORM - NOVA SCOTIA

vestigator(s): Jim Jotcham / Heats	er Levy	Affiliation: 11/2	voicon / Enviroyte	re
ndform (hillslope, terrace, etc.): Salt Man	,h	Local re	lief (concave, convex, none):	none
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hydric Soil Present? Yes	No	within a W	etland? Yes	No
Vetland Hydrology Present? Yes	No	If yes, optio	nal Wetland Site ID:	
temarks: (Explain alternative procedures here or in	a separate repor	t.)		
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			FAC species	x 3 =
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Histosol (A1)	Stripped	Matrix (S6)		Sandy	Gleyed Matrix (S4)
Histic Epipedon (A2)	Polyvalu	e Below Surface (S8)		Coast	Prairie Redox (A16)
Black Histic (A3)	Thin Da	rk Surface (S9)		5 cm N	lucky Peat or Peat (S3)
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Piper.         Depth (inches):         Remarks:    YDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of on ✓ Surface Water (A1) ✓ High Water Table (A2) ✓ High Water Table (A2) ✓ High Water Table (A2) ✓ Surface Water (A1) ✓ High Water Table (A2) ✓ Surface Water (B1) Sediment Deposits (B2) Dift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Im Sparsely Vegetated Concave	e is required; check all th — Wate — Aqual — Marl I — Hydro — Oxidia — Prese — Rece — Thin I hagery (B7) — Other Surface (B8)	at apply) r-Stained Leaves (B9) tic Fauna (B13) Deposits (B15) ygen Sulfide Odor (C1) zed Rhizospheres on Livi noce of Reduced Iron (C4 nt Iron Reduction in Tilleo Muck Surface (C7) (Explain in Remarks)	ing Roots I) d Soils (Ce	Hydric Soil Seconda Seconda Surf Drai Mos Dry Satu (C3) Star (C3) Star Geo Sha Micr FAC	Present? Yes No ny Indicators (minimum of two require ace Soil Cracks (B6) nage Patterns (B10) s Trim Lines (B16) Season Water Table (C2) uration Visible on Aerial Imagery (C9) nted or Stressed Plants (D1) morphic Position (D2) Ilow Aquitard (D3) otopographic Relief (D4) -Neutral Test (D5)
Pepth (inches):  Depth (inches):  Remarks:  Primary Indicators (minimum of on  Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  Iron Deposits (B5)  Inundation Visible on Aerial Im  Sparsely Vegetated Concave Field Observations:	e is required; check all th — Wate — Aqual — Marl I — Hydro — Oxidi: — Prese — Rece — Thin I nagery (B7) — Other Surface (B8)	at apply) -Stained Leaves (B9) tic Fauna (B13) Deposits (B15) ygen Sulfide Odor (C1) zed Rhizospheres on Livi nce of Reduced Iron (C4 nt Iron Reduction in Tilled Muck Surface (C7) (Explain in Remarks)	ing Roots I) d Soils (Ce	Hydric Soil Seconda Seconda Surf Drai Mos Dry- Satu (C3) Stur Geo Sha Mica FAC	Present? Yes No ny Indicators (minimum of two require ace Soil Cracks (B6) nage Patterns (B10) s Trim Lines (B16) Season Water Table (C2) uration Visible on Aerial Imagery (C9) nted or Stressed Plants (D1) morphic Position (D2) Ilow Aquitard (D3) otopographic Relief (D4) -Neutral Test (D5)
Piper Depth (inches): Remarks:  PyDROLOGY  Wetland Hydrology Indicators: Primary Indicators (minimum of on y Surface Water (A1) y High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Irr Sparsely Vegetated Concave Field Observations: Surface Water Present? Ye	e is required; check all th Wate Aqual Marl I Hydro Oxidi: Prese Rece Thin I hagery (B7) Other Surface (B8)	at apply) -Stained Leaves (B9) tic Fauna (B13) Deposits (B15) ogen Sulfide Odor (C1) zed Rhizospheres on Livi nice of Reduced Iron (C4 nt Iron Reduction in Tiller Muck Surface (C7) (Explain in Remarks) th (inches):	ing Roots I) d Soils (Ce	Hydric Soil	Present? Yes No Inv Indicators (minimum of two require ace Soil Cracks (B6) nage Patterns (B10) s Trim Lines (B16) Season Water Table (C2) uration Visible on Aerial Imagery (C9) ted or Stressed Plants (D1) morphic Position (D2) Illow Aquitard (D3) otopographic Relief (D4) -Neutral Test (D5)
Type:	e is required; check all th — Wate — Aqual — Marl I — Hydro — Oxidi; — Prese — Rece — Thin I hagery (B7) — Other Surface (B8) s <u>~</u> No Dept s <u>~</u> No Dept	at apply) Stained Leaves (B9) tic Fauna (B13) Deposits (B15) ogen Sulfide Odor (C1) zed Rhizospheres on Livi nce of Reduced Iron (C4 nt Iron Reduction in Tilled Muck Surface (C7) · (Explain in Remarks) th (inches):	ing Roots I) d Soils (Cf	Hydric Soil	Present? Yes No rry Indicators (minimum of two require ace Soil Cracks (B6) nage Patterns (B10) s Trim Lines (B16) Season Water Table (C2) uration Visible on Aerial Imagery (C9) nted or Stressed Plants (D1) morphic Position (D2) Ilow Aquitard (D3) otopographic Relief (D4) Neutral Test (D5)
Typer	e is required; check all th Wate Aqual Marl I Hydro Oxidi: Prese Rece Thin I surface (B8) s <u>/</u> No Depti s No Depti s No Depti	at apply) Stained Leaves (B9) tic Fauna (B13) Deposits (B15) ogen Sulfide Odor (C1) zed Rhizospheres on Livi nce of Reduced Iron (C4 nt Iron Reduction in Tilled Vuck Surface (C7) (Explain in Remarks) th (inches): th (inches):	ing Roots I) d Soils (Cc	Hydric Soil  Seconds  Seconds  Surf  Surf  Moss  Surf  Satu  G3) Stur  G60  Surf  FAC	Present? Yes No No rry Indicators (minimum of two require ace Soil Cracks (B6) nage Patterns (B10) s Trim Lines (B16) Season Water Table (C2) rration Visible on Aerial Imagery (C9) tied or Stressed Plants (D1) morphic Position (D2) Ilow Aquitard (D3) otopographic Relief (D4) -Neutral Test (D5)
Pepth (inches):  Depth (inches):  Remarks:  PyDROLOGY  Vetland Hydrology Indicators: Primary Indicators (minimum of on	e is required; check all th Wate Aqual Mari II Prese Rece Thin I s V No Depl s No Depl	at apply) r-Stained Leaves (B9) tic Fauna (B13) Deposits (B15) ygen Sulfide Odor (C1) zed Rhizospheres on Livi ence of Reduced Iron (C4 nt Iron Reduction in Tilled Muck Surface (C7) • (Explain in Remarks) th (inches): th (inches): entity (inches):	ing Roots I) d Soils (Cd 	Hydric Soil Seconda Surt Drai Drai Mos Dry Surt (C3) Stur (C3) Stur Gec Sha Mici FAC and Hydrolog if available:	Present? Yes No ary Indicators (minimum of two require ace Soil Cracks (B6) nage Patterns (B10) s Trim Lines (B16) Season Water Table (C2) iration Visible on Aerial Imagery (C9) ited or Stressed Plants (D1) morphic Position (D2) llow Aquitard (D3) otopographic Relief (D4) -Neutral Test (D5) y Present? Yes No
Depth (inches):         Depth (inches):         Permarks:         YDROLOGY         Wetland Hydrology Indicators:         Primary Indicators (minimum of on         ✓ Surface Water (A1)         ✓ High Water Table (A2)         ✓ Saturation (A3)         Water Marks (B1)         Sediment Deposits (B2)         Drift Deposits (B3)         Algal Mat or Crust (B4)         Iron Deposits (B5)         Inundation Visible on Aerial Im         Sparsely Vegetated Concave         Field Observations:         Surface Water Present?         Ye         Saturation Present?         Ye         Saturation Recorded Data (stream of the server)	e is required; check all th Wate Aqual Marl Hydrc Oxidi: Prese Rece Thin I hagery (B7) Other Surface (B8) s No Depl s No Depl s No Depl pauge, monitoring well, additional sectors and the s	at apply) r-Stained Leaves (B9) tic Fauna (B13) Deposits (B15) yean Sulfide Odor (C1) ted Rhizospheres on Livi ence of Reduced Iron (C4 nt Iron Reduction in Tilled Muck Surface (C7) • (Explain in Remarks) th (inches): th (inches): ential photos, previous ins	ing Roots I) d Soils (Cd 	Hydric Soil Seconda Surf Drai Drai Mos Dry Surf Surf Geo Surf	Present? Yes No ary Indicators (minimum of two require ace Soil Cracks (B6) nage Patterns (B10) s Trim Lines (B16) Season Water Table (C2) rration Visible on Aerial Imagery (C9) ted or Stressed Plants (D1) morphic Position (D2) llow Aquitard (D3) otopographic Relief (D4) -Neutral Test (D5) y Present? Yes No
Pyper         Depth (inches):         Permarks:             Primary Indicators:         Primary Indicators (minimum of on	e is required; check all th 	at apply) r-Stained Leaves (B9) tic Fauna (B13) Deposits (B15) yean Sulfide Odor (C1) ted Rhizospheres on Livi ince of Reduced Iron (C4 nt Iron Reduction in Tilled Muck Surface (C7) (Explain in Remarks) th (inches):	ing Roots I) d Soils (Cd 	Hydric Soil Seconda Surf Drai Drai Surf Su	Present? Yes No ary Indicators (minimum of two require ace Soil Cracks (B6) nage Patterns (B10) s Trim Lines (B16) Season Water Table (C2) rration Visible on Aerial Imagery (C9) ted or Stressed Plants (D1) morphic Position (D2) llow Aquitard (D3) otopographic Relief (D4) -Neutral Test (D5) y Present? Yes No
Pipe:         Depth (inches):         Remarks:             YDROLOGY           Wetland Hydrology Indicators:         Immary Indicators (minimum of on yes)         Y Surface Water (A1)         Y High Water Table (A2)         Yater Marks (B1)         Sediment Deposits (B2)         Drift Deposits (B3)         Algal Mat or Crust (B4)         Iron Deposits (B5)         Inundation Visible on Aerial Im         Sparsely Vegetated Concave         Field Observations:         Surface Water Present?         Ye         Vater Table Present?         Ye         Saturation Present?         Ye         Secribe Recorded Data (stream generates:         Water I	e is required; check all th Wate Aqual Mari Oxidi: Prese Rece Thin I hagery (B7) Other Surface (B8) s No Depl s No Depl s No Depl pauge, monitoring well, ad	at apply) r-Stained Leaves (B9) tic Fauna (B13) Deposits (B15) ygen Sulfide Odor (C1) zed Rhizospheres on Livi ence of Reduced Iron (C4 nt Iron Reduction in Tilled Muck Surface (C7) • (Explain in Remarks) th (inches): th (inches): erial photos, previous ins	ing Roots I) d Soils (Cd 	Hydric Soil Seconda Surf Drai Mos Dry Satu (C3) Sta Gec Sha Mici FAC and Hydrolog if available:	Present? Yes No ary Indicators (minimum of two require ace Soil Cracks (B6) nage Patterns (B10) s Trim Lines (B16) Season Water Table (C2) iration Visible on Aerial Imagery (C9) ited or Stressed Plants (D1) morphic Position (D2) llow Aquitard (D3) otopographic Relief (D4) -Neutral Test (D5) y Present? Yes No
Pipe:         Depth (inches):         Remarks:         YDROLOGY         Wetland Hydrology Indicators:         Primary Indicators (minimum of on         ✓ Surface Water (A1)         ✓ High Water Table (A2)         ✓ Saturation (A3)         Water Marks (B1)         Sediment Deposits (B2)         Drift Deposits (B3)         Algal Mat or Crust (B4)         Iron Deposits (B5)         Inundation Visible on Aerial Im         Sparsely Vegetated Concave         Field Observations:         Surface Water Present?         Ye         Saturation Present?         Ye         Saturation Present?         Ye         Saturation Present?         Ye         Remarks:         Wet /	e is required; check all th Wate Aqual Mari Oxidi: Prese Rece Thin I hagery (B7) Other Surface (B8) s No Depl s No Depl s No Depl s No Depl pauge, monitoring well, additional sectors of the sectors o	at apply) r-Stained Leaves (B9) tic Fauna (B13) Deposits (B15) ygen Sulfide Odor (C1) zed Rhizospheres on Livi ence of Reduced Iron (C4 nt Iron Reduction in Tilled Muck Surface (C7) • (Explain in Remarks) th (inches): th (inches): erial photos, previous ins	ing Roots I) d Soils (Cf 	Hydric Soil Seconda Surt Drai Mos Dry Satu (C3) Stur Gec Sha Mici FAC and Hydrolog if available:	Present? Yes No ary Indicators (minimum of two require ace Soil Cracks (B6) nage Patterns (B10) s Trim Lines (B16) Season Water Table (C2) iration Visible on Aerial Imagery (C9) ited or Stressed Plants (D1) morphic Position (D2) llow Aquitard (D3) otopographic Relief (D4) -Neutral Test (D5) y Present? Yes No

Adapted from U.S. Army Corps of Engineers form for Northeast-North Central Supplement for use in Nova Scotia (2009)

### WETLAND DETERMINATION DATA FORM – NOVA SCOTIA

			~ 1	1
Project/Site: Cape Sharp	Municipality	y/County: _	Cambe	rland Co. Sampling Date: Sept 201
Applicant/Owner: Fundy Ocean Research	Centre	for 2	nergy	Sampling Point: R - U
Investigator(s): JIH Jotchan / Heather A	evy	Affiliation:	Marb	Icon / Envirosphere
Landform (hillslope, terrace, etc.): hillslope / to	mace		Local relief (	concave, convex, none): <u>slope</u>
Slope (%): 5-10 Lat: 45° 22.2771		Long:	64 024.	212 Datum: NAD 83
Soil Map Unit Name/Type: (TBP)			Wet	land Type:
Are climatic / hydrologic conditions on the site typical for thi	is time of yea	ar? Yes	V No	(If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology	significantly	disturbed?	2. Are "	Normal Circumstances" present? Yes No
Are Vegetation, Soil, or Hydrology	naturally pro	blematic?	(If nee	eded, explain any answers in Remarks.)
SUMMARY OF FINDINGS – Attach site map	showing	samplin	g point lo	cations, transects, important features, etc.
Understandig Versetation Pressant? Vers	la -	ls th	he Sampled	Area
Hydrophytic Vegetation Present? Tes	NO	with	nin a Wetlan	d? Yes No
Wetland Hydrology Present? Yes	No v	If ye	es, optional V	Vetland Site ID:
Remarks: (Explain alternative procedures here or in a se	parate repor	1.)		
(above salt marsh.)				
VEGETATION - Use scientific names of plants				
	Absolute	Dominan	t Indicator	Dominance Test worksheet:
FIR (Plot size: 10 M manua)	% Cover	Species?	FAC	Number of Dominant Species
2 Mtu Azh	5	N	FACU	
3				Total Number of Dominant Species Across All Strata: 4 (B)
4.		-		
5				That Are OBL, FACW, or FAC: 502 (A/B)
En anter En a	35	= Total Co	ver	Provalance Index worksheet:
Sapling/Shrub Stratum (Plot size:)	,	N	FACU	Total % Cover of Multiply by:
2 Suc Alder	60	4	FACE	OBL species x1 =
3 MAN ADA	5	N	FACU	FACW species $60 \times 2 = 120$
4.				FAC species 34 x3= /02
5				FACU species <u>/</u> 2 x 4 = <u>48</u>
	66	= Total Co	wer	UPL species $1/5$ x5 = $575$
Herb Stratum (Plot size: 5 24 )	10	4	NL	Column Totals: 221 (A) 845 (B)
2 Astor Arun	5	N	NL	Prevalence Index = $B/A = 3.8$
3 Bunchberry	2	N	FAC-	Hydrophytic Vegetation Indicators:
4. Aralia rud.	1	N	FACH	Rapid Test for Hydrophytic Vegetation
5. Sol. rugosa	/	N	FAC	Dominance Test is >50% NO
6. Oxalis - yellaw	50	4	UPL	Prevalence Index is ≤3.0 <sup>1</sup> − N 0
7. Ranpberry	1	N	FAC-	<ul> <li>Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)</li> </ul>
9				Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
10.				Indiana di badia a la data di badia di
	120	= Total Co	over	be present, unless disturbed or problematic.
Woody Vine Stratum (Plot size: NONC)				
1				Hydrophytic
		- Total Co		Present? Yes No V

Remarks: (Include photo numbers here or on a separate sheet.)

Profile Description: (Describe to the dep		
	oth needed to document the indicator or	confirm the absence of indicators.)
Depth Matrix	Redox Features	
inches) Color (moist) %	Color (moist) % Type <sup>1</sup>	Loc <sup>2</sup> Texture Remarks
2-24 24R 2.5/2	Nore	casse (~ talas s/ope)
-12" 54R 3/3	Non	Coasse
124 Rate Incha	a- 0	
12 NOCKY / Teta		
Super Concentration D-Depletion RM		Sand Graine 2 contiant PL-Pare Lining M. Makin
vdric Soil Indicators:	-neutred matrix, 05-covered of coaled of	Indicators for Problematic Hydric Soils <sup>3</sup>
Histored (A1)	Stripped Matrix (S6)	Sandy Gleved Matrix (S4)
Histosof (A1)	Polyvalue Below Surface (S8)	Coast Prairie Redox (A16)
Plack Histic (A3)	Thin Dark Surface (S9)	5 cm Mucky Post or Post (S2)
_ Diack Histic (A3)	Loomy Musicy Minoral (53)	o ciri Mocky Feat of Feat (53)
Hydrogen Sullide (A4)	Loomy Cloved Matrix (F2)	Iton-Mangariese Masses (F12)
_ Stratified Layers (A5)	Depleted Matrix (F2)	Other (Explain In Hemarks)
_ Depleted Below Dark Surface (A11)	Depleted Matrix (F3)	
_ Thick Dark Surface (A12)	Hedox Dark Surface (F6)	
Sandy Mucky Mineral (S1)	Hedox Depressions (F8)	
<ul> <li>Depleted Dark Surface (F7)</li> </ul>	Red Parent Material (TF2)	
Sandy Redox (S5)		
ndicators of hydrophytic vegetation and w	etiand hydrology must be present, unless di	sturbed or problematic.
estrictive Layer (if observed):		
Type: Stoner/Talo		
Depth (inches): ~ 34 plas.		Hydric Soil Present? Yes No
Remarks:		
YDROLOGY		
YDROLOGY Vetland Hydrology Indicators:		Secondary Indicators (minimum of two require
YDROLOGY Vetland Hydrology Indicators: trimary Indicators (minimum of one is requi	ired; check all that apply) NON	Secondary Indicators (minimum of two require     Surface Soil Cracks (B6)
YDROLOGY Vetland Hydrology Indicators: rrimary Indicators (minimum of one is reau Surface Water (A1)	ired; check all that apply) NON Water-Stained Leaves (B9)	Secondary Indicators (minimum of two require     Surface Soil Cracks (B6)     Drainage Patterns (B10)
YDROLOGY Vetland Hydrology Indicators: rrimary Indicators (minimum of one is requi Surface Water (A1)	ired; check all that apply) NON Water-Stained Leaves (B9) Aquatic Fauna (B13)	Secondary Indicators (minimum of two require     Surface Soil Cracks (B6)     Drainage Patterns (B10)     Mose Trim Linge (B16)
YDROLOGY Vetland Hydrology Indicators: Irrimary Indicators (minimum of one is requind) Surface Water (A1) High Water Table (A2)	ired; check all that apply) — Water-Stained Leaves (B9) — Aquatic Fauna (B13) Mart Denceite (B15)	<ul> <li><u>Secondary Indicators (minimum of two require</u></li> <li>Surface Soil Cracks (B6)</li> <li>Drainage Patterns (B10)</li> <li>Moss Trim Lines (B16)</li> <li>Descene Web Table (20)</li> </ul>
YDROLOGY Vetland Hydrology Indicators: Irimary Indicators (minimum of one is requ Surface Water (A1) High Water Table (A2) Saturation (A3)	ired: check all that apply) — Water-Stained Leaves (B9) — Aquatic Fauna (B13) — Marl Deposits (B15)	Secondary Indicators (minimum of two require     Surface Soil Cracks (B6)     Drainage Patterns (B10)     Moss Trim Lines (B16)     Dry-Season Water Table (C2)
YDROLOGY Vetland Hydrology Indicators: Primary Indicators (minimum of one is requinated and the second seco	ired; check all that apply) — Water-Stained Leaves (B9) — Aquatic Fauna (B13) — Marl Deposits (B15) — Hydrogen Sulfide Odor (C1)	Secondary Indicators (minimum of two require     Surface Soil Cracks (B6)     Drainage Patterns (B10)     Moss Trim Lines (B16)     Dry-Season Water Table (C2)     Saturation Visible on Aerial Imagery (C9)
YDROLOGY Vetland Hydrology Indicators: Primary Indicators (minimum of one is requinated) Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2)	ired; check all that apply) Water-Stained Leaves (B9) Aquatic Fauna (B13) Marl Deposits (B15) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living	Secondary Indicators (minimum of two require     Surface Soil Cracks (B6)     Drainage Patterns (B10)     Moss Trim Lines (B16)     Dry-Season Water Table (C2)     Saturation Visible on Aerial Imagery (C9) Roots (C3) Stunted or Stressed Plants (D1)
YDROLOGY Vetland Hydrology Indicators: trimary Indicators (minimum of one is requi Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3)	ired; check all that apply) Water-Stained Leaves (B9) Aquatic Fauna (B13) Marl Deposits (B15) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Presence of Reduced Iron (C4)	Secondary Indicators (minimum of two require     Surface Soil Cracks (B6)     Drainage Patterns (B10)     Moss Trim Lines (B16)     Dry-Season Water Table (C2)     Saturation Visible on Aerial Imagery (C9) Roots (C3)     Stunted or Stressed Plants (D1)     Geomorphic Position (D2)
YDROLOGY Vetland Hydrology Indicators: trimary Indicators (minimum of one is requi Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4)	ired; check all that apply) Water-Stained Leaves (B9) Aquatic Fauna (B13) Marl Deposits (B15) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled S	Secondary Indicators (minimum of two require     Surface Soil Cracks (B6)     Drainage Patterns (B10)     Moss Trim Lines (B16)     Dry-Season Water Table (C2)     Saturation Visible on Aerial Imagery (C9) Roots (C3)     Stunted or Stressed Plants (D1)     Geomorphic Position (D2) oilis (C6)     Shallow Aguitard (D3)
YDROLOGY Vetland Hydrology Indicators: trimary Indicators (minimum of one is requinated by the second by the sec	ired: check all that apply) Water-Stained Leaves (B9) Aquatic Fauna (B13) Marl Deposits (B15) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled S Thin Muck Surface (C7)	Secondary Indicators (minimum of two require     Surface Soil Cracks (B6)     Drainage Patterns (B10)     Moss Trim Lines (B16)     Dry-Season Water Table (C2)     Saturation Visible on Aerial Imagery (C9) Roots (C3) Stunted or Stressed Plants (D1)     Geomorphic Position (D2) oils (C6) Shallow Aquitard (D3)     Microtopographic Belief (D4)
YDROLOGY Vetland Hydrology Indicators: trimary Indicators (minimum of one is requi Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Isoudotes Vieible on Agrial Imagent (F	ired: check all that apply) Water-Stained Leaves (B9) Aquatic Fauna (B13) Marl Deposits (B15) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled S Thin Muck Surface (C7) Other (Evolain in Remote)	Secondary Indicators (minimum of two require     Surface Soil Cracks (B6)     Drainage Patterns (B10)     Moss Trim Lines (B16)     Dry-Season Water Table (C2)     Saturation Visible on Aerial Imagery (C9) Roots (C3)     Stunted or Stressed Plants (D1)     Geomorphic Position (D2) oils (C6)     Shallow Aquitard (D3)     Microtopographic Relief (D4)     EAC Neutral Top
VDROLOGY Vetland Hydrology Indicators: rimary Indicators (minimum of one is requi Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B	ired: check all that apply) — Water-Stained Leaves (B9) — Aquatic Fauna (B13) — Marl Deposits (B15) — Hydrogen Sulfide Odor (C1) — Oxidized Rhizospheres on Living — Presence of Reduced Iron (C4) — Recent Iron Reduction in Tilled S — Thin Muck Surface (C7) 37) — Other (Explain in Remarks)	Secondary Indicators (minimum of two require     Surface Soil Cracks (B6)     Drainage Patterns (B10)     Moss Trim Lines (B16)     Dry-Season Water Table (C2)     Saturation Visible on Aerial Imagery (C9) Roots (C3) Stunted or Stressed Plants (D1)     Geomorphic Position (D2) oils (C6) Shallow Aquitard (D3)     Microtopographic Relief (D4)     FAC-Neutral Test (D5)
YDROLOGY Vetland Hydrology Indicators: rimary Indicators (minimum of one is requi Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B Sparsely Vegetated Concave Surface (	ired; check all that apply) Water-Stained Leaves (B9) Aquatic Fauna (B13) Marl Deposits (B15) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled S Thin Muck Surface (C7) 37) Other (Explain in Remarks) (B8)	Secondary Indicators (minimum of two require     Surface Soil Cracks (B6)     Drainage Patterns (B10)     Moss Trim Lines (B16)     Dry-Season Water Table (C2)     Saturation Visible on Aerial Imagery (C9) Roots (C3)     Stunted or Stressed Plants (D1)     Geomorphic Position (D2) oils (C6)     Shallow Aquitard (D3)     Microtopographic Relief (D4)     FAC-Neutral Test (D5)
YDROLOGY Vetland Hydrology Indicators: Irimary Indicators (minimum of one is requi Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B Sparsely Vegetated Concave Surface ( ield Observations:	ired; check all that apply) — Water-Stained Leaves (B9) — Aquatic Fauna (B13) — Marl Deposits (B15) — Hydrogen Sulfide Odor (C1) — Oxidized Rhizospheres on Living — Presence of Reduced Iron (C4) — Recent Iron Reduction in Tilled S — Thin Muck Surface (C7) 37) — Other (Explain in Remarks) (B8)	Secondary Indicators (minimum of two require     Surface Soil Cracks (B6)     Drainage Patterns (B10)     Moss Trim Lines (B16)     Dry-Season Water Table (C2)     Saturation Visible on Aerial Imagery (C9) Roots (C3)     Stunted or Stressed Plants (D1)     Geomorphic Position (D2) oils (C6)     Shallow Aquitard (D3)     Microtopographic Relief (D4)     FAC-Neutral Test (D5)
YDROLOGY Vetland Hydrology Indicators: trimary Indicators (minimum of one is reque Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B Sparsely Vegetated Concave Surface ( ield Observations: Surface Water Present? Yes	ired: check all that apply)  Water-Stained Leaves (B9) Aquatic Fauna (B13) Marl Deposits (B15) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled S Thin Muck Surface (C7) Thin Muck Surface (C7) Other (Explain in Remarks) (B8) No Depth (inches):	Secondary Indicators (minimum of two requires         Surface Soil Cracks (B6)         Drainage Patterns (B10)         Moss Trim Lines (B16)         Dry-Season Water Table (C2)         Saturation Visible on Aerial Imagery (C9)         Roots (C3)       Stunted or Stressed Plants (D1)         Geomorphic Position (D2)       oils (C6)         Microtopographic Relief (D4)         FAC-Neutral Test (D5)
YDROLOGY Vetland Hydrology Indicators: Primary Indicators (minimum of one is reque Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B Sparsely Vegetated Concave Surface ( ield Observations: Surface Water Present? Yes Yes	ired: check all that apply)  Water-Stained Leaves (B9) Aquatic Fauna (B13) Marl Deposits (B15) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled S Thin Muck Surface (C7) Thin Muck Surface (C7) Other (Explain in Remarks) (B8) No Depth (inches): Depth (inches):	Secondary Indicators (minimum of two requires
YDROLOGY  Vetland Hydrology Indicators:  Primary Indicators (minimum of one is requ Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B Sparsely Vegetated Concave Surface ( ield Observations: Surface Water Present? Yes Vater Table Present? Yes	ired: check all that apply)  Wow  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  Marl Deposits (B15)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled S  Thin Muck Surface (C7)  Thin Muck Surface (C7)  Other (Explain in Remarks) (B8)  No  Depth (inches): Depth (inches): Depth (inches):	Secondary Indicators (minimum of two require     Surface Soil Cracks (B6)     Drainage Patterns (B10)     Moss Trim Lines (B16)     Dry-Season Water Table (C2)     Saturation Visible on Aerial Imagery (C9) Roots (C3) Stunted or Stressed Plants (D1)     Geomorphic Position (D2) oils (C6) Shallow Aquitard (D3)     Microtopographic Relief (D4)     FAC-Neutral Test (D5)
YDROLOGY         Vetland Hydrology Indicators:         Primary Indicators (minimum of one is requination (A1)         Surface Water (A1)         High Water Table (A2)         Saturation (A3)         Water Marks (B1)         Sediment Deposits (B2)         Drift Deposits (B3)         Algal Mat or Crust (B4)         Iron Deposits (B5)         Inundation Visible on Aerial Imagery (B         Sparsely Vegetated Concave Surface (Field Observations:         Surface Water Present?       Yes	ired; check all that apply)  Wow Water-Stained Leaves (B9) Aquatic Fauna (B13) Marl Deposits (B15) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled S Thin Muck Surface (C7) Depth (inches): No Depth (inches): No Depth (inches): No Depth (inches):	Secondary Indicators (minimum of two requires
YDROLOGY         Vetiand Hydrology Indicators:         Primary Indicators (minimum of one is requinated by the second seco	Interference         <td colspan="</td> <td></td>	
YDROLOGY         Vetland Hydrology Indicators:         >rimary Indicators (minimum of one is requent)	ired: check all that apply)       NON	Secondary Indicators (minimum of two requires
YDROLOGY         Vetland Hydrology Indicators:         Primary Indicators (minimum of one is requ	ired: check all that apply)	Secondary Indicators (minimum of two requires
YDROLOGY         Vetland Hydrology Indicators:         Primary Indicators (minimum of one is requent)	ired: check all that apply)   Woon  Water-Stained Leaves (B9)  Aquatic Fauna (B13)  Marl Deposits (B15)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living  Presence of Reduced Iron (C4)  Recent Iron Reduction in Tilled S  Thin Muck Surface (C7)  Thin Muck Surface (C7)  Thin Muck Surface (C7)  Thin Muck Surface (C7)  Depth (inches):  No Depth (inches): Depth (inches):  onitoring well, aerial photos, previous inspect	Secondary Indicators (minimum of two requires o
YDROLOGY         Vetland Hydrology Indicators:         Primary Indicators (minimum of one is requination)         Surface Water (A1)         High Water Table (A2)         Saturation (A3)         Water Marks (B1)         Sediment Deposits (B2)         Drift Deposits (B3)         Algal Mat or Crust (B4)         Iron Deposits (B5)         Inundation Visible on Aerial Imagery (B         Sparsely Vegetated Concave Surface (field Observations:         Surface Water Present?       Yes	ired; check all that apply)  WooN  Aquatic Fauna (B13)  Aquatic Fauna (B13)  Hydrogen Sulfide Odor (C1)  Oxidized Rhizospheres on Living Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled S Thin Muck Surface (C7) Thin Muck Surface (C7) Thin Muck Surface (C7) Thin Muck Surface (C7) Depth (inches): No Depth (inches): Depth (inches): No Depth (inches): Dep	Secondary Indicators (minimum of two requires a surface Soil Cracks (B6)         Drainage Patterns (B10)         Moss Trim Lines (B16)         Dry-Season Water Table (C2)         Saturation Visible on Aerial Imagery (C9)         Roots (C3)       Stunted or Stressed Plants (D1)         Geomorphic Position (D2)         oils (C6)       Shallow Aquitard (D3)         Microtopographic Relief (D4)         FAC-Neutral Test (D5)         Wetland Hydrology Present?       Yes No         ctions), if available:
YDROLOGY         Wetland Hydrology Indicators:         Primary Indicators (minimum of one is requent)	ired; check all that apply)  Water-Stained Leaves (B9) Aquatic Fauna (B13) Marl Deposits (B15) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled S Thin Muck Surface (C7) Thin Muck Surface (C7) Thin Muck Surface (C7) Thin Muck Surface (C7) Depth (inches): No Depth (	Secondary Indicators (minimum of two require

lect/Site: <u>Cape )harp</u>	Municipalit	e for 5	Lund	Sampling D	Sampling Date:	p 20/
licant/Owner: Turdy Odean ne	leaven Lence	A 101 20	m	Sampling Po	And And	
estigator(s): JIM JOTCHAM / He	ather nevy	Amiliation:	TIAPO	con / invirosp	rene	
dform (hillslope, terrace, etc.):	repression	Loc	al reliet (	concave, convex, none):	concave	2
pe (%): _2 Lat: 45 * 2 *	(, ) > 7	Long: 67	~ ~ ~ ~	1.176	Datum: NAV 8	5
Map Unit Name/Type: (TBD)			Wet	land Type: <u>Intermitte</u>	nt Stream	
climatic / hydrologic conditions on the site typi	cal for this time of ye	ar? Yes 🔽	_ No	(If no, explain in R	lemarks.)	
Vegetation, Soil, or Hydrology	significantly	disturbed?)	Are "I	Normal Circumstances" p	present? Yes	No
Vegetation, Soil, or Hydrology	naturally pro	oblematic?	(If nee	eded, explain any answe	rs in Remarks.)	
MMARY OF FINDINGS – Attach sit	e map showing	sampling p	oint lo	cations, transects,	important featur	res, etc.
drophytic Vegetation Present? Yes	< No	Is the S	ampled	Area		
dric Soil Present? Yes	No	within a	Wetlan	d? Yes	No	
etland Hydrology Present? Yes	No	If yes, o	ptional W	/etland Site ID:		
amarks: (Explain alternative procedures here	or in a separate repo	rt.)			10 0	
Sepage area. drains to	gulley; prot	boby very	wet	in spring (?	). Dry a Day	20/08
Jupper of the second	/ / /	/ /				
GETATION - Use scientific names o	f plants.					
	Absolute	Dominant Inc	dicator	Dominance Test work	sheet:	
ee Stratum (Plot size: 10 4 Talles)	% Cover	V I	HU	Number of Dominant S	pecies 2	
R.D. Fix	30	- <u>y</u>	FAC	That Are OBL, FACW,	or FAC: 2	(A)
Dalsar IV	5	NF	Aru	Total Number of Domin	nant 🧹	
Write pitch		/	Incert	Species Across All Stra	ata:	(B)
				Percent of Dominant S	pecies / n g	,
	65	- Total Cover		That Are OBL, FACW,	or FAC: 60 A	(A/B)
pling/Shrub Stratum (Plot size: 5 M	)	- Total Ootol		Prevalence Index wor	ksheet:	
Red Elder (brown pith)	5	Y_ F	ACUL	Total % Cover of:	Multiply by	
				OBL species	x 1 =	-
				FACW species	x 2 =	
				FAC species	x 3 =	
				FACU species	× 4 =	
orb Stratum (Plot size: 5M)		= Total Cover		UPL species	x 5 =	
Cinganan Fern	20	Y FA	CW	Column Totals:	(A)	(B)
Sein word Fern	20	Y A	ACT	Prevalence Index	= B/A =	
Sol, rugosa	5	NI	FAC	Hydrophytic Vegetation	on Indicators:	
Maran theman	2	N	FAL	Rapid Test for Hyd	Irophytic Vegetation	
				Dominance Test is	>50%	
				Prevalence Index i	s ≤3.0 <sup>1</sup>	
				Morphological Ada	ptations1 (Provide sup	porting
				data in Remark	s or on a separate she	et)
				Problematic Hydro	pnytic Vegetation' (Ex	plain)
				1Indicators of hydric so	il and wetland hydrolog	iv must
oody Vine Stratum (Plot size:	_)	= Total Cover		be present, unless dist	urbed or problematic.	
				Hydrophytic		
				Vegetation Precent2	N V N	
	a	- Total Cover		riesent? Ye	NO	-
		= Total Cover				

Dooth Matrix	lepth needed to document the indicator or co	nfirm the absence of indicators.)
Jepui Iviauix	Redox Features	-
inches) Color (moist) %	Color (moist) % Type <sup>1</sup> Loc	c <sup>2</sup> Texture Remarks
1-3" 54R 3/1		organic
-6ª 104R 5/3		loan
-18" 104R 5/1	54R 5/8 102	loam
ype: C=Concentration, D=Depletion, F	IM=Reduced Matrix, CS=Covered or Coated San	nd Grains. <sup>2</sup> Location: PL=Pore Lining, M=Matrix.
dric Soil Indicators:		Indicators for Problematic Hydric Soils <sup>3</sup> :
Histosol (A1)	Stripped Matrix (S6)	Sandy Gleyed Matrix (S4)
Histic Epipedon (A2)	Polyvalue Below Surface (S8)	Coast Prairie Redox (A16)
Black Histic (A3) Hydrogen Sulfide (A4)	Loamy Mucky Mineral (E1)	5 cm Mucky Peat or Peat (S3)
Stratified Lavers (A5)	Loamy Gleved Matrix (F2)	Other (Explain in Remarks)
Depleted Below Dark Surface (A11)	Depleted Matrix (F3)	
Thick Dark Surface (A12)	Redox Dark Surface (F6)	
Sandy Mucky Mineral (S1)	Redox Depressions (F8)	
<ul> <li>Depleted Dark Surface (F7)</li> </ul>	Red Parent Material (TF2)	
_ Sandy Redox (S5)		
ndicators of hydrophytic venetation and	wetland hydrology must be present upless distu	inhed or problematic
estrictive Laver (if observed):	netiana nyarotogy mast be present, amese alota	
Type: NONC		
Depth (inches):		Hydric Soil Procent? Yes /
		, , , , , , , , , , , , , , , , , , , ,
YDROLOGY		
etland Hydrology Indicators:		Secondary Indicators (minimum of two require
rimary Indicators (minimum of one is re-	guired; check all that apply)	Surface Soil Cracks (B6)
Surface Water (A1)	Water-Stained Leaves (B9)	Drainage Patterns (B10)
High Water Table (A2)	Aquatic Fauna (B13)	Moss Trim Lines (B16)
	Marl Deposits (B15)	Dry-Season Water Table (C2)
_ Saturation (A3)		
Saturation (A3) Water Marks (B1)	Hydrogen Sulfide Odor (C1)	Saturation Visible on Aerial Imagery (C9)
_ Saturation (A3) _ Water Marks (B1) _ Sediment Deposits (B2)	Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Ro	Saturation Visible on Aerial Imagery (C9) oots (C3) Stunted or Stressed Plants (D1)
Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3)	Hydrogen Sulfide Odor (C1)     Oxidized Rhizospheres on Living Ro     Presence of Reduced Iron (C4)	<ul> <li>Saturation Visible on Aerial Imagery (C9)</li> <li>tots (C3) Stunted or Stressed Plants (D1)</li> <li>Geomorphic Position (D2)</li> </ul>
Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4)	Hydrogen Sulfide Odor (C1)     Oxidized Rhizospheres on Living Ro     Presence of Reduced Iron (C4)     Recent Iron Reduction in Tilled Soils	Saturation Visible on Aerial Imagery (C9)     Sobots (C3) Stunted or Stressed Plants (D1)     Geomorphic Position (D2)     Snallow Aquitard (D3)
Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5)	Hydrogen Sulfide Odor (C1)     Oxidized Rhizospheres on Living Ro     Presence of Reduced Iron (C4)     Recent Iron Reduction in Tilled Soils     Thin Muck Surface (C7)	Saturation Visible on Aerial Imagery (C9) Costs (C3) Stunted or Stressed Plants (D1) Geomorphic Position (D2) s (C6) Shallow Aquitard (D3) Microtopographic Relief (D4)
Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery	Hydrogen Sulfide Odor (C1)     Oxidized Rhizospheres on Living Ro     Presence of Reduced Iron (C4)     Recent Iron Reduction in Tilled Soils     Thin Muck Surface (C7)     Other (Explain in Remarks)	<ul> <li>Saturation Visible on Aerial Imagery (C9)</li> <li>Stunted or Stressed Plants (D1)</li> <li>Geomorphic Position (D2)</li> <li>Shallow Aquitard (D3)</li> <li>Microtopographic Relief (D4)</li> <li>FAC-Neutral Test (D5)</li> </ul>
Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery Sparsely Vegetated Concave Surfac	Hydrogen Sulfide Odor (C1)     Oxidized Rhizospheres on Living Rc     Presence of Reduced Iron (C4)     Recent Iron Reduction in Tilled Soils     Thin Muck Surface (C7)     (B7) Other (Explain in Remarks) e (B8)	<ul> <li>Saturation Visible on Aerial Imagery (C9)</li> <li>Stunted or Stressed Plants (D1)</li> <li>Geomorphic Position (D2)</li> <li>S(C6)</li> <li>Shallow Aquitard (D3)</li> <li>Microtopographic Relief (D4)</li> <li>FAC-Neutral Test (D5)</li> </ul>
Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery Sparsely Vegetated Concave Surfac eld Observations:	Hydrogen Sulfide Odor (C1)     Oxidized Rhizospheres on Living Rc     Presence of Reduced Iron (C4)     Recent Iron Reduction in Tilled Soils     Thin Muck Surface (C7)     Other (Explain in Remarks) e (B8)	<ul> <li>Saturation Visible on Aerial Imagery (C9)</li> <li>Stunted or Stressed Plants (D1)</li> <li>Geomorphic Position (D2)</li> <li>S (C6)</li> <li>Shallow Aquitard (D3)</li> <li>Microtopographic Relief (D4)</li> <li>FAC-Neutral Test (D5)</li> </ul>
_ Saturation (A3) _ Water Marks (B1) _ Sediment Deposits (B2) _ Drift Deposits (B3) _ Algal Mat or Crust (B4) _ Iron Deposits (B5) _ Inundation Visible on Aerial Imagery _ Sparsely Vegetated Concave Surfac eld Observations: urface Water Present? Yes	Hydrogen Sulfide Odor (C1)     Oxidized Rhizospheres on Living Ro     Presence of Reduced Iron (C4)     Recent Iron Reduction in Tilled Soils     Thin Muck Surface (C7)     Other (Explain in Remarks) e (B8)     No      Depth (inches):	<ul> <li>Saturation Visible on Aerial Imagery (C9)</li> <li>Stunted or Stressed Plants (D1)</li> <li>Geomorphic Position (D2)</li> <li>Shallow Aquitard (D3)</li> <li>Microtopographic Relief (D4)</li> <li>FAC-Neutral Test (D5)</li> </ul>
Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Iron Deposits (B5) Inundation Visible on Aerial Imagery Sparsely Vegetated Concave Surface ield Observations: urface Water Present? Yes/ /ater Table Present? Yes/	Hydrogen Sulfide Odor (C1)     Oxidized Rhizospheres on Living Rc     Presence of Reduced Iron (C4)     Recent Iron Reduction in Tilled Soils     Thin Muck Surface (C7)     Other (Explain in Remarks) e (B8)     No     Depth (inches):     No     Depth (inches):	<ul> <li>Saturation Visible on Aerial Imagery (C9)</li> <li>Stunted or Stressed Plants (D1)</li> <li>Geomorphic Position (D2)</li> <li>Shallow Aquitard (D3)</li> <li>Microtopographic Relief (D4)</li> <li>FAC-Neutral Test (D5)</li> </ul>
Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Iron Deposits (B5) Inundation Visible on Aerial Imagery Sparsely Vegetated Concave Surface ield Observations: urface Water Present? Yes /ater Table Present? Yes aturation Present? Yes	Hydrogen Sulfide Odor (C1)     Oxidized Rhizospheres on Living Ro     Presence of Reduced Iron (C4)     Recent Iron Reduction in Tilled Soils     Thin Muck Surface (C7)     Other (Explain in Remarks) e (B8)     No     Depth (inches):     Depth (inches):     Depth (inches):     Depth (inches):     Depth (inches):     No	Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Geomorphic Position (D2) s (C6) Shallow Aquitard (D3) Microtopographic Relief (D4) FAC-Neutral Test (D5) Wetland Hydrology Present? Yes No
Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Iron Deposits (B5) Inundation Visible on Aerial Imagery Sparsely Vegetated Concave Surface ield Observations: urface Water Present? Yes /ater Table Present? Yes aturation Present? Yes aturation Present? Yes aturation Present? Yes aturation Present? Yes aturation Present? Yes ncludes capillary fringe)	Hydrogen Sulfide Odor (C1)     Oxidized Rhizospheres on Living Rc     Presence of Reduced Iron (C4)     Recent Iron Reduction in Tilled Soils     Thin Muck Surface (C7)     (B7) Other (Explain in Remarks) e (B8)     No     Depth (inches):     No     Depth (inches):     No     Depth (inches):     No     Depth (inches):     No	Saturation Visible on Aerial Imagery (C9) poots (C3) Stunted or Stressed Plants (D1) Geomorphic Position (D2) s (C6) Shallow Aquitard (D3) Microtopographic Relief (D4) FAC-Neutral Test (D5) Wetland Hydrology Present? Yes No pob. if available:
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Adapted from U.S. Army Corps of Engineers form for Northeast-North Central Supplement for use in Nova Scotia (2009)

#### WETLAND DETERMINATION DATA FORM - NOVA SCOTIA

Project/Site: <u>Cape Sharp</u> Municipality/County: _	Curberland G. Sampling Date: Sep 20/09
Applicant/Owner: <u>Fundy Ocean leaventh Centre for</u>	Energy Sampling Point: BR - UZ
Investigator(s): <u>Jim Jotcham / Heather Levy</u> Attiliation:_	Marbrean / Environghere
Landform (hillslope, terrace, etc.): <u>None</u>	Local relief (concave, convex, none): <u>flat / NON e</u>
Slope (%): <u>None</u> Lat: <u>45° 22.347</u> Long:	<u>64°24, 194'</u> Datum: <u>NAD 83</u>
Soil Map Unit Name/Type: ( <i>TBD</i> )	Wetland Type: <u>NON</u>
Are climatic / hydrologic conditions on the site typical for this time of year? Yes Are Vegetation, Soil, or Hydrology significantly disturbed? Are Vegetation, Soil, or Hydrology naturally problematic?	No (If no, explain in Remarks.)         Are "Normal Circumstances" present? Yes No         (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Hydric Soil Present?	Yes No Yes No	Is the Sampled Area within a Wetland? Yes No
Wetland Hydrology Present?	Yes No	If yes, optional Wetland Site ID:
Remarks: (Explain alternative proced	tures here or in a separate repor	t.)

#### VEGETATION - Use scientific names of plants.

1.	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot size: 10 M hading	% Cover	Species?	Status	Number of Dominant Species
1 W. Spruce	50	4	FACU	That Are OBL, FACW, or FAC: 2 (A)
2 Bol fix	5	N	FAC	
a line kind	5	N	FACU	Total Number of Dominant
3. Taper Diren			Inca	Species Across Air Strata. (B)
4				Percent of Dominant Species
5				That Are OBL, FACW, or FAC: 40% (A/B)
	60	= Total Co	ver	Brouplance Index worksheet:
Sapling/Shrub Stratum (Plot size: _ > M)	-	4	FACUL	Prevalence index worksneet:
1. Spec, Heder	5	7	1-ACW	Total % Cover of:Multiply by:
2.				OBL species x 1 =
3				FACW species x 2 = 10
4				FAC species #2 x3= /26
4				FACU species $91$ x 4 = 364
5	5	Tetel Co		11PL species 45 x5- 225
Hack Stratum (Plateira: 5 M)		= 1 otal Co	ver	$\frac{1}{2}$
Herb Stratum (Plot size.	25	4	FAC+	Column Totals: 103 (A) (B)
1. Spin, Wood ferh	20		FACI	Prevalence Index - B/A - 3.96
2. Aralic Nuch	37	1	1104	
3. Have grass	35	9	NL	Hydrophytic Vegetation Indicators:
4. Aster acu.	10	N	NC	Rapid Test for Hydrophytic Vegetation
5 Mtr ASK	1	N	FACIE	Dominance Test is >50% ~ NO
6. Sol reg	2	N	FAC	Prevalence Index is ≤3.0 <sup>1</sup> ~ M <sup>o</sup>
7.				Morphological Adaptations <sup>1</sup> (Provide supporting
8				data in Hemarks or on a separate sheet)
0				Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
10	-			
10	110	- Total Co	107	'Indicators of hydric soil and wetland hydrology must
Woody Vine Stratum (Plot size: NONE)	110	= 10tal 00	Yei	be present, unless disturbed or problematic.
Woody vine Stratam (intersizer/				Underschudie
1				Vegetation
2				Present? Yes No
1		= Total Co	ver	
Remarks: (Include photo numbers here or on a separate	sheet.)			
Aincest & seepage area				
i Jacener - Preserver				

Profile Description: (Describe to the	depth needed to document the indicator of	commune absence of indicators.)	
Depth Matrix	Color (moist) % Type <sup>1</sup>	Loc <sup>2</sup> Texture	Bamarke
1 24 1 5 4 P 3/2			Indina
D-3 d. JA JE			
5 - 9 4 5 9 K 4/6	N/Ne		
9" refusal / vock	/ledge ?)		
Type: C=Concentration, D=Depletion,	RM=Reduced Matrix, CS=Covered or Coated	Sand Grains. <sup>2</sup> Location: PL=Pore Indicators for Problemat	e Lining, M=Matrix. ic Hydric Soils <sup>3</sup> :
Histosol (A1)	Stripped Matrix (S6)	Sandy Gleved Matrix	(S4)
Histic Epipedon (A2)	Polyvalue Below Surface (S8)	Coast Prairie Redox (	A16)
Black Histic (A3)	Thin Dark Surface (S9)	5 cm Mucky Peat or P	eat (S3)
Hydrogen Sulfide (A4)	Loamy Mucky Mineral (F1)	Iron-Manganese Mass	ses (F12)
Stratified Layers (A5)	Loamy Gleyed Matrix (F2)	Other (Explain in Rem	narks)
Depleted Below Dark Surface (A11	) Depleted Matrix (F3)		
Thick Dark Surface (A12)	Redox Dark Surface (F6)		
Sandy Mucky Mineral (S1)	Redox Depressions (F8)		
Depleted Dark Surface (F7)	Red Parent Material (TF2)		
_ Sandy Redox (S5)			
ndicators of hydrophytic vegetation an	d wetland hydrology must be present, unless	disturbed or problematic.	
(estrictive Laver (if observed):			
Type rocky			
Type:		Hydric Soil Present? Ye	es No
Type:		Hydric Soil Present? Ye	es No
Type:rec.Ky Depth (inches):? " Remarks:		Hydric Soil Present? Ye	es No
YDROLOGY		Hydric Soil Present? Ye	es <u>No</u> <u>No</u>
Aestrictive Layer (in observed): Type:rec.Ky Depth (inches):? " Remarks: YDROLOGY Wetland Hydrology Indicators:A	JON e	Hydric Soil Present? Yo Secondary Indicators (n	ninimum of two require
testrictive Layer (in observed): Type:rec.Ky Depth (inches):9 '' Temarks:  YDROLOGY Vetland Hydrology Indicators:A Primary Indicators (infinum of one is referred):	JON C squired: check all that apply)	Hydric Soil Present? Ye	ninimum of two requires (B6)
YDROLOGY Yetland Hydrology Indicators: Surface Water (A1)	JON 2 squired; check all that apply) Water-Stained Leaves (B9)	Hydric Soil Present? Ye Secondary Indicators (n 	ninimum of two requires (B6) (B10)
YDROLOGY  Vetland Hydrology Indicators  Surface Water (A1)  High Water Table (A2)	JON 2 squired: check all that apply) — Water-Stained Leaves (B9) — Aquatic Fauna (B13) — Mad December (B16)	Hydric Soil Present? Ye Secondary Indicators (m 	ninimum of two requires s (B6) (B10) 116)
	JON C squired: check all that apply) Water-Stained Leaves (B9) Aquatic Fauna (B13) Marl Deposits (B15)	Hydric Soil Present? Ye Secondary Indicators (n 	ninimum of two requires s (B6) (B10) 116) Table (C2)
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Vettand Hydrology Indicators:         Armarks:         YDROLOGY         Vetland Hydrology Indicators:         Armarks:         Primary Indicators:         Surface Water (A1)         High Water Table (A2)         Saturation (A3)         Water Marks (B1)         Sediment Deposits (B2)         Drift Deposits (B3)         Algal Mat or Crust (B4)         Iron Deposits (B5)         Inundation Visible on Aerial Imager         Sparsely Vegetated Concave Surface		Hydric Soil Present? Ye Secondary Indicators (n 	ninimum of two requires s (B6) (B10) t16) Table (C2) on Aerial Imagery (C9) d Plants (D1) on (D2) D3) Relief (D4) D5)
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Vegetation Inventory

### Wetland Indicator Categories (USAC 1987):

Indicator Code	Wetland Type	Comment
OBL	Obligate Wetland	Occurs almost always (estimated probability 99%) under natural conditions in wetlands.
FACW	Facultative Wetland	Usually occurs in wetlands (estimated probability 67%-99%), but occasionally found in non-wetlands.
FAC	Facultative	Equally likely to occur in wetlands or non-wetlands (estimated probability 34%-66%).
FACU	Facultative Upland	Usually occurs in non-wetlands (estimated probability 67%-99%), but occasionally found on wetlands (estimated probability 1%-33%).
UPL	Obligate Upland	Occurs in wetlands in another region, but occurs almost always (estimated probability 99%) under natural conditions in non-wetlands in the regions specified. If a species does not occur in wetlands in any region, it is not on the National List.
NA	No agreement	The regional panel was not able to reach a unanimous decision on this species.
NI	No indicator	Insufficient information was available to determine an indicator status.
NO	No occurrence	The species does not occur in that region.

(NL = species not listed)

## **Plant Species Observed at Data Point Locations:**

### Sample Pair 1 = salt marsh boundary

		Wetland	%
<u>Scientific Name</u>	Common Name	<b>Indicator</b>	<u>Cover</u>
BR-U1 (= Upland 1, slop	pe above salt marsh)		

Abies balsamea	Balsam Fir	FAC	30%	Tree
Sorbus americana	American mountain ash	FACU	5%	Tree
Alnus incana	Speckled alder	FACW	60%	Shrub
Sorbus americana	American White Ash	FACU	5%	Shrub
Picea glauca	White spruce	FACU	1%	Shrub
Dennstaedtia punctilobula	Hay-scented fern	NL	60%	Herb
Oxalis stricta	Upright yellow wood sorrel	UPL	50%	Herb
Solidago rugosa	Rough-leaf goldenrod	FAC	30%	Herb
Rubus idaeus	Red raspberry	FAC-	20%	Herb
Aster acuminatus	Whorled aster	NL	5%	Herb
Cornus canadensis	Dwarf dogwood	FAC-	2%	Herb
Aralia nudicaulis	Wild sarsaparilla	FACU	1%	Herb

### **BR-W1** (= Wetland 1, salt marsh)

Picea glauca	White spruce	FACU	5%	Shrub
Spartina pectinata	Cord grass	OBL	20%	Herb
Typha latifolia	Broad-leaved cattail	OBL	10%	Herb
Aster novi-belgii	New Belgium american aster	FACW+	10%	Herb
Carex palacea	Chaffy sedge	OBL	10%	Herb
Rumex orbiculatus	Water dock	OBL	5%	Herb
Polygonum sagittatum	Arrow-leaved tear-thumb	OBL	2 %	Herb
Iris versicolor	Blue flag	OBL	2 %	Herb

### Sample Pair 2 = wet seepage area behind cabin draining westerly to the central gully

		Wetland	%	
<u>Scientific Name</u>	Common Name	<b>Indicator</b>	<u>Cover</u>	
BR-U2 (= Upland 2, uplan	nd forest)			
Abies balsamea	Balsam Fir	FAC	50%	Tree
Betula papyrifera	Paper birch	FACU	5%	Tree
Picea glauca	White spruce	FACU	5%	Tree
Alnus incana	Speckled alder	FACW	5%	Shrub
Dryopteris carthusiana	Spinulose shield fern	FAC+	35%	Herb
Aralia nudicaulis	Wild sarsaparilla	FACU	35%	Herb
Aster acuminatus	Whorled aster	NL	10%	Herb
Sorbus americana	American mountain ash	FACU	1%	Herb
Solidago rugosa	Rough-leaf goldenrod	FAC	2%	Herb
Deschampsia flexuosa	Crinkled hairgrass	NL	35%	Herb

### **BR-W2** (= Wetland 2, seepage area draining west to gully)

Picea glauca	White spruce	FACU	30%	Tree
Abies balsamea	Balsam Fir	FAC	20%	Tree
Betula papyrifera	Paper birch	FACU	5%	Tree
Sambucus racemosa	Red Elderberry	FACU	5%	Shrub
Osmunda cinnamomea	Cinnamon fern	FACW	20%	Herb
Spinulose shield fern	Dryopteris carthusiana	FAC+	20%	Herb
Solidago rugosa	Rough-leaf goldenrod	FAC	5%	Herb
Maianthemum canadense	Wild Lily-of-the-valley	FAC-	2%	Herb

# **Site vegetation inventory surveyed** October 2, 2008, June 11, 2009, and September 20, 2009. Scientific names are from Zinck (1998). Synonyms are in brackets.

S-ranks are: S4 Usually widespread, fairly common throughout its range in the province, and apparently secure with many occurrences, but the Element is of long-term concern (e.g. watch list). (100+ occurrences).

- S5 Demonstrably widespread, abundant, and secure throughout its range in the province, and essentially ineradicable under present conditions.
- SE Exotic: An exotic established in the province

NSDNR ranks are restricted to native species:

Red = known to be, or that is thought to be at risk.

Yellow = sensitive to human activities or natural events.

Green = not believed to be sensitive or at risk.

Wetland Indicator status is described above (Appendix B).

		Sub-national		
		Rank	NSDNR	Wetland
Common Name	Binomial	(ACCDC)	Rank	Indicator

### Plant species found on the exposed gravel barrier beach (and directly behind the crest):

Pearly everlasting	Anaphalis margaritacea	S5	Green	NL
Small white aster	Aster (Symphyotrichum) lateriflorus	S5	Green	FACW-
Rough aster	Aster (Symphyotrichum) puniceus	<b>S</b> 5	Green	OBL
Parasol white-top	Aster (Doellingeria) umbellatus	S5	Green	FACW
American sea-rocket	Cakile edentula	S5	Green	FACU
Wild morning-glory	Calystegia sepium	<b>S</b> 5	Green	FAC-
Ox-eye daisy	Chrysanthemum leucanthemum	SE		NL
Bull thistle	Cirsium vulgare	SE		FACU-
American dune grass	Elymus (Leymus) mollis	S5	Green	FACU-
Common eyebright	Euphrasia officinalis (nemorosa)	S5SE	Green	NL
Strawberry	Fragaria virginiana	S5	Green	FACU
Hemp-nettle	Galeopsis tetrahit	SE		NL
Mouse-eared hawkweed	Hieracium pilosella	SE		NL
Hawkweed	Hieracium piloselloides	SE		NL
Sea-beach sandwort	Honckenya peploides	<b>S</b> 5	Green	FACU
Beach pea	Lathyrus maritimus (japonicus)	<b>S</b> 5	Green	FACU-
Fall dandelion	Leontodon autumnalis	SE		NL
Scotch lovage	Ligusticum scothicum	<b>S</b> 5	Green	FAC
Sea lavender	Limonium carolinianum	<b>S</b> 5	Green	OBL
Butter-and-eggs	Linaria vulgaris	SE		NL
Mayweed	Matricaria maritima	SE		UPL
Evening primrose	Oenothera biennis	S5	Green	FACU-

White spruce	Picea glauca	S5	Green	FACU
Seashore plantain	Plantago maritima	S5	Green	FACW
Fowler knotweed	Polygonum fowleri	S5	Green	NL
Chokecherry	Prunus virginiana	S5	Green	FACU
Gooseberry	Ribes hirtellum	S5	Green	FAC
Multiflora rose	Rosa rugosa	SE		FACU-
Common wild rose	Rosa virginiana	S5	Green	FAC
Raspberry	Rubus idaeus	S5	Green	FAC-
Common groundsel	Senecio vulgaris	SE		FACU
White goldenrod	Solidago bicolor	S5	Green	NL
Perennial sow-thistle	Sonchus arvensis	SE		UPL
Cord grass	Spartina alterniflora	S5	Green	OBL
Salt hay	Spartina patens	S5	Green	OBL
Cord grass	Spartina pectinata	S5	Green	OBL
Plant species found in the salt	marsh zone:			
Orach	Atriplex prostrata	S5	Green	NL
Chaffy sedge	Carex paleacea	S5	Green	OBL
Spikegrass	Distichlis spicata	<b>S</b> 4	Green	FACW+
Soft rush	Juncus effusus	S5	Green	FACW+
Black-grass rush	Juncus gerardii	S5	Green	FACW+
Sea lavender	Limonium carolinianum	S5	Green	OBL
Seashore plantain	Plantago maritima	S5	Green	FACW
American alkali grass	Puccinellia americana	S4S5	Green	OBL
Holy grass	Hierochloe odorata	S4S5	Green	FACW
Water dock	Rumex orbiculatus	S5	Green	OBL
Glasswort	Salicornia europaea	S5	Green	OBL
Saltmarsh bulrush	Schoenoplectus maritimus	S4S5	Green	OBL
Seaside goldenrod	Solidago sempervirens	S5	Green	FACW
Large bur-reed	Sparganium eurycarpum	<b>S</b> 4	Green	OBL
Cord grass	Spartina alterniflora	S5	Green	OBL
Salt hay	Spartina patens	S5	Green	OBL
Cord grass	Spartina pectinata	S5	Green	OBL
Sea-blite	Suaeda maritima	S5SE	Green	OBL
Arrow-grass	Triglochin maritima	S5	Green	OBL
Cat-tail, broad-leaved	Typha latifolia	S5	Green	OBL
(found above the drift line)				

### Plant species found along the forest/saltmarsh edge northeast of the pond:

Balsam fir	Abies balsamea	S5	Green	FAC
Green alder	Alnus viridis	S5	Green	FAC

Aster (Symphyotrichum) novi-belgii	S5	Green	FACW+
Calamagrostis canadensis	S5	Green	FACW+
Galium asprellum	<b>S</b> 5	Green	OBL
Picea glauca	<b>S</b> 5	Green	FACU
Polygonum sagittatum	<b>S</b> 5	Green	OBL
Populus tremuloides	<b>S</b> 5	Green	NL
Ranunculus repens	SE		FAC
Rubus idaeus	<b>S</b> 5	Green	FAC-
Sorbus americana	<b>S</b> 5	Green	FACU
	Aster (Symphyotrichum) novi-belgii Calamagrostis canadensis Galium asprellum Picea glauca Polygonum sagittatum Populus tremuloides Ranunculus repens Rubus idaeus Sorbus americana	Aster (Symphyotrichum) novi-belgiiS5Calamagrostis canadensisS5Galium asprellumS5Picea glaucaS5Polygonum sagittatumS5Populus tremuloidesS5Ranunculus repensSERubus idaeusS5Sorbus americanaS5	Aster (Symphyotrichum) novi-belgiiS5GreenCalamagrostis canadensisS5GreenGalium asprellumS5GreenPicea glaucaS5GreenPolygonum sagittatumS5GreenPopulus tremuloidesS5GreenRanunculus repensSERubus idaeusS5GreenSorbus americanaS5Green

Plant species found along the shrub/saltmarsh edge west of the forest edge:

Speckled alder	Alnus incana	S5	Green	FACW
Green alder	Alnus viridis	<b>S</b> 5	Green	FAC
Sweet vernal grass	Anthoxanthum odoratum	SE		FACU
Sandwort	Arenaria lateriflora	<b>S</b> 5	Green	FAC
Fringed sedge	Carex crinita	S4S5	Green	OBL
Shallow sedge	Carex lurida	<b>S</b> 5	Green	OBL
Stalk-grain sedge	Carex stipata	<b>S</b> 5	Green	NL
Water horsetail	Equisetum fluviatile	<b>S</b> 5	Green	OBL
Narrow-leaved goldenrod	Euthamia graminifolia	<b>S</b> 5	Green	FAC
Northern manna-grass	Glyceria X laxa	S4?	Green	NL
Blue flag	Iris versicolor	<b>S</b> 5	Green	OBL
Japanese knotweed	Polygonum cuspidatum	SE		FACU-
Lady's-thumb	Polygonum persicaria	SE		FACW
Creeping buttercup	Ranunculus repens	SE		FAC
Cottongrass bulrush	Scirpus cyperinus	<b>S</b> 5	Green	FACW+
Hemlock water-parsnip	Sium suave	<b>S</b> 5	Green	OBL
Canada goldenrod	Solidago canadensis	S5	Green	FACU
Rough-leaf goldenrod	Solidago rugosa	S5	Green	FAC
Meadow-rue	Thalictrum pubescens	<b>S</b> 5	Green	FACW+
Coltsfoot	Tussilago farfara	SE		FACU
Cat-tail, broad-leaved	Typha latifolia	<b>S</b> 5	Green	OBL
Tufted vetch	Vicia cracca	SE		NL

### Plant species found in the shrub zone (including on the escarpment):

Red maple	Acer rubrum	S5	Green	FAC
Speckled alder	Alnus incana	S5	Green	FACW
Green alder	Alnus viridis	S5	Green	FAC
Meadow foxtail	Alopecurus pratensis	SE		FACW
Parasol white-top	Aster (Doellingeria) umbellatus	S5	Green	FACW
Yellow sedge	Carex flava	S5	Green	OBL

Graceful sedge	Carex gracillima	S4S5	Green	FACU
Strawberry	Fragaria virginiana	<b>S</b> 5	Green	FACU
Hemp-nettle	Galeopsis tetrahit	SE		NL
Apple	Malus pumila	SE		NL
Sensitive fern	Onoclea sensibilis	<b>S</b> 5	Green	FACW
White spruce	Picea glauca	S5	Green	FACU
Arrow-leaved tearthumb	Polygonum sagittatum	S5	Green	OBL
Chokecherry	Prunus virginiana	S5	Green	FACU
Common wild rose	Rosa virginiana	S5	Green	FAC
Common blackberry	Rubus allegheniensis	<b>S</b> 5	Green	FACU-
Red raspberry	Rubus idaeus	<b>S</b> 5	Green	FAC-
Sheep sorrel	Rumex acetosella	SE		UPL
Rough-leaf goldenrod	Solidago rugosa	<b>S</b> 5	Green	FAC
Little strarwort	Stellaria graminea	SE		FACU-
Meadow-rue	Thalictrum pubescens	<b>S</b> 5	Green	FACW+
Red Clover	Trifolium pratense	SE		FACU-
Gypsy-weed	Veronica officinalis	S5SE		FACU-
Possum-haw viburnum	Viburnum nudum	S5	Green	FACW
Plant species found in the o	ld field above the escarpment):			
Yarrow	Achillea millefolium	<b>S</b> 5	Green	FACU
Speckled alder	Alnus incana	S5	Green	FACW
Green alder	Alnus viridis	S5	Green	FAC
Meadow foxtail	Alopecurus pratensis	SE		FACW
New York aster	Aster (Symphyotrichum) novi-belgii	S5	Green	FACW+
Hedge bindweed	Calystegia sepium	<b>S</b> 5	Green	FAC-
Fringed sedge	Carex crinita	S4S5	Green	OBL
Yellow sedge	Carex flava	S5	Green	OBL
Marsh straw sedge	Carex hormathodes	S4S5	Green	OBL
Pale sedge	Carex pallescens	S5	Green	NL
Pointed broom sedge	Carex scoparia	S5	Green	FACW
Poverty oat-grass	Danthonia spicata	S5	Green	NL
Parasol white-top	Doellingeria umbellata	S5	Green	FACW
Quack-grass	Elymus repens	SE		FACU-
Wild mock-cucumber	Echinocystis lobata	SE		FAC
Fireweed	Epilobium angustifolium	S5	Green	FAC
Hairy willow-herb	Epilobium ciliatum	S5	Green	FAC-
Woodland horsetail	Equisetum sylvaticum	S5	Green	FACW
Narrow-leaved goldenrod	Euthamia graminifolia	S5	Green	FAC
Hair fescue	Festuca filiformis	SE		NL
Red fescue	Festuca rubra	S5	Green	FACU

Strawberry	Fragaria virginiana	<b>S</b> 5	Green	FACU
Brittle-stem hemp nettle	Galeopsis tetrahit	SE		NL
Fowl manna-grass	Glyceria striata	S5	Green	OBL
Orange day-lily	Hemerocallis fulva	SE		NL
Mouse-eared hawkweed	Hieracium pilosella	SE		NL
Hawkweed	Hieracium piloselloides	SE		NL
Common bluets	Houstonia (Hedyotis) caerulea	S5	Green	FACU
Spotted jewel-weed	Impatiens capensis	<b>S</b> 5	Green	FACW
Blue flag	Iris versicolor	<b>S</b> 5	Green	OBL
Soft rush	Juncus effusus	<b>S</b> 5	Green	FACW+
Ground juniper	Juniperus communis	<b>S</b> 5	Green	NL
Hairy woodrush	Luzula acuminata	<b>S</b> 5	Green	FAC
Apple	Malus pumila	SE		NL
Musk cheeseweed	Malva moschata	SE		NL
Sensitive fern	Onoclea sensibilis	<b>S</b> 5	Green	FACW
Timothy	Phleum pratense	SE		FACU
Kentucky bluegrass	Poa pratensis	S5	Green	FACU
Arrow-leaved tearthumb	Polygonum sagittatum	S5	Green	OBL
Tall buttercup	Ranunculus acris	SE		FAC+
Creeping buttercup	Ranunculus repens	SE		FAC
Smooth gooseberry	Ribes hirtellum	S5	Green	FAC
Common wild rose	Rosa virginiana	S5	Green	FAC
Common blackberry	Rubus allegheniensis	S5	Green	FACU-
Bristly Dewberry	Rubus hispidus	S5	Green	FACW
Raspberry	Rubus idaeus	S5	Green	FAC-
Bulrush	Scirpus atrocinctus	S5	Green	FACW+
Rough-leaf goldenrod	Solidago rugosa	<b>S</b> 5	Green	FAC
Narrow-leaved meadowsweet	Spiraea alba	S5	Green	FACW+
Rabbit-foot clover	Trifolium arvense	SE		NL
Red Clover	Trifolium pratense	SE		FACU-
Possum -haw viburnum	Viburnum nudum	<b>S</b> 5	Green	FACW
Tufted vetch	Vicia cracca	SE		NL
Plant species found in the eas	t forest zone:			
Balsam fir	Abies balsamea	<b>S</b> 5	Green	FAC
Red Maple	Acer rubrum	<b>S</b> 5	Green	FAC
Speckled alder	Alnus incana	<b>S</b> 5	Green	FACW
Green alder	Alnus viridis	<b>S</b> 5	Green	FAC
Wild sarsaparilla	Aralia nudicaulis	S5	Green	FACU
Whorled aster	Aster (Oclemena) acuminatus	S5	Green	NL
Yellow birch	Betula allegheniensis	S5	Green	FAC

Paper birch	Betula papyrifera	<b>S</b> 5	Green	FACU
Softleaf sedge	Carex disperma	<b>S</b> 5	Green	FACW+
Graceful sedge	Carex gracillima	S4S5	Green	FACU
Bladder sedge	Carex intumescens	S5	Green	FACW+
Alternate-leaf dogwood	Cornus alternifolia	S5	Green	NL
Dwarf dogwood	Cornus canadensis	S5	Green	FAC-
Poverty oat-grass	Danthonia spicata	S5	Green	NL
Eastern hay-scented fern	Dennstaedtia punctilobula	S5	Green	NL
Crinkled hairgrass	Deschampsia flexuosa	<b>S</b> 5	Green	NL
Spinulose shield fern	Dryopteris carthusiana	S5	Green	FAC+
Strawberry	Fragaria virginiana	<b>S</b> 5	Green	FACU
Brittle-stem hempnettle	Galeopsis tetrahit	SE		NL
Rough bedstraw	Galium asprellum	<b>S</b> 5	Green	OBL
Common bluets	Houstonia (Hedyotis) caerulea S5		Green	FACU
American fly honeysuckle	Lonicera canadensis	<b>S</b> 5	Green	FACU
Wild Lily-of-the-valley	Maianthemum canadense	S5	Green	FAC-
Common apple	Malus pumila	SE		NL
Indian-pipe	Monotropa uniflora	S5	Green	FACU-
Interrupted fern	Osmunda claytoniana	<b>S</b> 5	Green	FAC
Cinnamon fern	Osmunda cinnamomea	S5	Green	FACW
Upright yellow wood sorrel	Oxalis stricta	S5	Green	UPL
Timothy	Phleum pratense	SE		FACU
White spruce	Picea glauca	S5	Green	FACU
Trembling poplar	Populus tremuloides	S5	Green	NL
Old-field cinquefoil	Potentilla simplex	S5	Green	FACU-
Chokecherry	Prunus virginiana	S5	Green	FACU
Bracken fern	Pteridium aquilinum	<b>S</b> 5	Green	FACU
Creeping buttercup	Ranunculus repens	SE		FAC
Skunk currant	Ribes glandulosum	<b>S</b> 5	Green	FACW
Common blackberry	Rubus allegheniensis	S5	Green	FACU-
Raspberry	Rubus idaeus	<b>S</b> 5	Green	FAC-
Red Elderberry	Sambucus racemosa	<b>S</b> 5	Green	FACU
Rough-leaf goldenrod	Solidago rugosa	<b>S</b> 5	Green	FAC
American mountain-ash	Sorbus americana	S5	Green	FACU
Meadow-rue	Thalictrum pubescens	<b>S</b> 5	Green	FACW+
Northern starflower	Trientalis borealis	<b>S</b> 5	Green	FAC
Velvet-leaf blueberry	Vaccinium myrtilloides	<b>S</b> 5	Green	FAC
Gypsy-weed	Veronica officinalis	S5SE	Green	FACU-
Possum-haw viburnum	Viburnum nudum	<b>S</b> 5	Green	FACW
Wooly blue violet	Viola sororia	S5	Green	FAC-

### Plant species found in the central gully

Balsam fir	Abies balsamea	<b>S</b> 5	Green	FAC
Speckled alder	Alnus incana	<b>S</b> 5	Green	FACW
Whorled aster	Aster (Oclemena) acuminatus	<b>S</b> 5	Green	NL
Parasol white-top	Aster (Doellingeria) umbellatus S5		Green	FACW
Large-leaved avens	Avens macrophyllum	<b>S</b> 5	Green	NL
Paper birch	Betula papyrifera	<b>S</b> 5	Green	FACU
Fringed sedge	Carex crinita	S4S5	Green	OBL
Creeping thistle	Cirsium arvense	SE		FACU
Alternate-leaf dogwood	Cornus alternifolia	S5	Green	NL
Spinulose shield fern	Dryopteris carthusiana	<b>S</b> 5	Green	FAC+
Wild mock-cucumber	Echinocystis lobata	SE		FAC
Hairy willow-herb	Epilobium ciliatum	<b>S</b> 5	Green	FAC-
Hemp-nettle	Galeopsis tetrahit	SE		NL
Rough bedstraw	Galium asprellum	<b>S</b> 5	Green	OBL
American fly honey-suckle	Lonicera canadensis	S5	Green	FACU
Common apple	Malus pumila	SE		NL
Sensitive fern	Onoclea sensibilis	S5	Green	FACW
White spruce	Picea glauca	<b>S</b> 5	Green	FACU
Chokecherry	Prunus virginiana	S5	Green	FACU
Creeping buttercup	Ranunculus repens	SE		FAC
Common blackberry	Rubus allegheniensis	S5	Green	FACU-
Red raspberry	Rubus idaeus	S5	Green	FAC-
Dwarf red raspberry	Rubus pubescens	S5	Green	FACW
Water dock	Rumex orbiculatus	<b>S</b> 5	Green	OBL
Mad dog skullcap	Scutellaria lateriflora	<b>S</b> 5	Green	FACW+
Roseroot	Sedum rosea	SE		FACU-
Bulrush	Scirpus atrocinctus	<b>S</b> 5	Green	FACW+
Marsh fern	Thelypteris palustris	<b>S</b> 5	Green	NL
Colt's-foot	Tussilago farfara	SE		FACU
Gypsy-weed	Veronica officinalis	S5SE	Green	FACU
Possum-haw viburnum	Viburnum nudum	S5	Green	FACW
Plant species found in the eas	stern gully/ravine:			
Balsam fir	Abies balsamea	S5	Green	FAC
Red Maple	Acer rubrum	S5	Green	FAC

Red Maple	Acer rubrum	S5	Green	FAC
Mountain maple	Acer spicatum	<b>S</b> 5	Green	FACU-
Speckled alder	Alnus incana	S5	Green	FACW
Farewell summer	Aster (Symphyotrichum) lateriflorum	<b>S</b> 5	Green	FACW-
Fringed sedge	Carex crinita	S4S5	Green	OBL
Shallow sedge	Carex lurida	S5	Green	OBL

Stalk-grain sedge	Carex stipata	S5	Green	NL
White turtlehead	Chelone glabra	S5	Green	OBL
Spinulose shield fern	Dryopteris carthusiana	S5	Green	FAC+
Hairy willow-herb	Epilobium ciliatum	S5	Green	FAC-
Hemp-nettle	Galeopsis tetrahit	SE		NL
Fowl manna-grass	Glyceria striata	S5	Green	OBL
Spotted jewel-weed	Impatiens capensis	S5	Green	FACW
Cinnamon fern	Osmunda cinnamomea	S5	Green	FACW
Arrow-leaved tearthumb	Polygonum sagittatum	S5	Green	OBL
Self-heal	Prunella vulgaris	S5	Green	FACU+
Chokecherry	Prunus virginiana	S5	Green	FACU
Creeping buttercup	Ranunculus repens	SE		FAC
Bristly black current	Ribes lacustre	S5	Green	FACW
Dwarf red raspberry	Rubus pubescens	S5	Green	FACW
Meadow-rue	Thalictrum pubescens	S5	Green	FACW+
Northern starflower	Trientalis borealis	S5	Green	FAC
Gypsy-weed	Veronica officinalis	S5SE	Green	FACU-

Wetland Delineation

The wetland (within the boundaries shown) covers approximately 2.25 hectares. The yellow dots are the sample point locations.



### Data point (4) and boundary point (88) GPS locations

### **Data Point GPS Locations:**

Description	Latitude	Longitude	Data sheet code
Wetland site 1:	N 45° 22.278'	W 64° 24.211'	BR-W1
Upland site 1:	N 45° 22.271'	W 64° 24.216'	BR-U1
Wetland site 2:	N 45° 22.357'	W 64° 24.198'	BR-W2
Upland site 2:	N 45° 22.351'	W 64° 24.193'	BR-U2

### **Boundary point GPS locations:**

Latitude	Longitude	GPS Point
45 ° 22.352	64 °24.324	1
45 ° 22.346	64 °24.335	2
45 ° 22.333	64 °24.349	3
45 ° 22.322	64 °24.35	4
45 ° 22.32	64 °24.344	5
45 ° 22.322	64 °24.336	6
45 ° 22.318	64 °24.337	7
45 ° 22.314	64 °24.331	8
45 ° 22.316	64 °24.322	9
45 ° 22.315	64 °24.311	10
45 ° 22.318	64 °24.304	11
45 ° 22.322	64 °24.303	12
45 ° 22.327	64 °24.29	13
45 ° 22.327	64 °24.284	14
45 ° 22.327	64 °24.273	15
45 ° 22.328	64 °24.268	16
45 ° 22.331	64 °24.261	17
45 ° 22.333	64 °24.259	18
45 ° 22.336	64 °24.253	19
45 ° 22.342	64 °24.242	20
45 ° 22.351	64 °24.232	21
45 ° 22.355	64 °24.226	22
45 ° 22.366	64 °24.222	23
45 ° 22.365	64 °24.211	24

45 ° 22.373	64 °24.198	25
45 ° 22.381	64 °24.201	26
45 ° 22.382	64 °24.199	27
45 ° 22.374	64 °24.198	28
45 ° 22.364	64 °24.207	29
45 ° 22.363	64 °24.219	30
45 ° 22.354	64 °24.226	31
45 ° 22.35	64 °24.226	32
45 ° 22.363	64 °24.161	33
45 ° 22.359	64 °24.174	34
45 ° 22.361	64 °24.198	35
45 ° 22.365	64 °24.19	36
45 ° 22.3566	64 °24.212	37
45 ° 22.349	64 °24.215	38
45 ° 22.347	64 °24.223	39
45 ° 22.35	64 °24.227	40
45 ° 22.347	64 °24.236	41
45 ° 22.342	64 °24.238	42
45 ° 22.334	64 °24.253	43
45 ° 22.327	64 °24.265	44
45 ° 22.32	64 °24.273	45
45 ° 22.31	64 °24.267	46
45 ° 22.311	64 °24.258	47
45 ° 22.305	64 °24.252	48
45 ° 22.294	64 °24.237	49
45 ° 22.293	64 °24.24	50
45 ° 22.283	64 °24.223	51
45 ° 22.278	64 °24.219	52
45 ° 22.274	64 °24.213	53
45 ° 22.267	64 °24.205	56
45 ° 22.266	64 °24.198	57
45 ° 22.262	64 °24.196	58
45 ° 22.256	64 °24.193	59
45 ° 22.257	64 °24.187	60
45 ° 22.26	64 °24.169	61
45 ° 22.268	64 °24.156	62
45 ° 22.272	64 °24.15	63
45 ° 22.273	64 °24.135	64
45 ° 22.268	64 °24.141	65
45 ° 22.262	64 °24.139	66

45 ° 22.268	64 °24.129	67
45 ° 22.27	64 °24.108	68
45 ° 22.276	64 °24.093	69
45 ° 22.279	64 °24.084	70
45 ° 22.272	64 °24.093	71
45 ° 22.269	64 °24.108	72
45 ° 22.264	64 °24.129	73
45 ° 22.26	64 °24.137	74
45 ° 22.258	64 °24.151	75
45 ° 22.253	64 °24.164	76
45 ° 22.247	64 °24.183	77
45 ° 22.242	64 °24.195	78
45 ° 22.235	64 °24.202	79
45 ° 22.228	64 °24.205	80
45 ° 22.224	64 °24.206	81
45 ° 22.219	64 °24.216	82
45 ° 22.222	64 °24.223	83
45 ° 22.229	64 °24.245	84
45 ° 22.238	64 °24.268	85
45 ° 22.25	64 °24.299	86
45 ° 22.263	64 °24.329	87
45 ° 22.275	64 ° 24.358	88