## APPENDIX



WETLAND
DELINEATION AND
FUNCTIONAL ASSESSMENTS

## HIGHWAY 101 CAMBRIDGE INTERCHANGE AND CONNECTOR ROADS EA wetland delineation and functional ASSESSMENTS



# HIGHWAY 101 CAMBRIDGE INTERCHANGE WETLAND DELINEATION AND FUNCTIONAL ASSESSMENTS 

## NOVA SCOTIA DEPARTMENT OF PUBLIC

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## EXECUTIVE SUMMARY

As a component to the proposed Highway 101 Cambridge Interchange and Connector Roads Environmental Assessment (EA), WSP Canada Inc. was contracted by Nova Scotia Department of Public Works to identify and evaluate wetlands found within the proposed project site.

A desktop review of site conditions using available mapping and data for the area was conducted prior to field surveys. The desktop review was conducted to identify known mapped wetlands and potential unmapped wetlands and assist in scoping field surveys. Wetland field delineations and assessments were conducted between August 18 September 30, 2021. Additional areas with suspected wetland habitat were screened during the field surveys to identify and confirm the presence / absence of wetlands.

A total of twelve (12) wetlands were identified and evaluated during the field studies, with a total of 58.28 hectares (ha) of wetland delineated within the project area. A summary table of wetlands at the site is found below, with further detailed descriptions and functional evaluation data found in Section 2.

| Wetland ID | Wetland Type | Size (ha) |
| :---: | :---: | :---: |
| Wetland 1 | Forested Swamp/ Fen Complex | 28 |
| Wetland 2 | Riparian Shrub Swamp | 6.75 |
| Wetland 3 | Forested Swamp | 0.29 |
| Wetland 4 | Vernal pool | 0.045 |
| Wetland 5 | Forested/Shrub swamp complex | 0.4 |
| Wetland 6 | Forested/Shrub swamp complex | 0.73 |
| Wetland 7 | Riparian Shrub Swamp | 3.1 |
| Wetland 8 | Forested Swamp | 0.08 |
| Wetland 9 | Forested/Shrub swamp Complex | 8.75 |
| Wetland 10 | Riparian Graminoid Marsh | 7.25 |
| Wetland 11 | Riparian Shrub Swamp | 4 |
| Wetland 12 | Vernal pool | 0.007 |
|  |  |  |

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## 1 INTRODUCTION

WSP Canada Inc. (WSP) was retained by Nova Scotia Department of Public Works (NSDPW) to undertake and complete an environmental assessment registration, under the Nova Scotia Environment Act, for a proposed interchange and connector roads from Highway 101 to Trunk land Brooklyn Street in Cambridge, Nova Scotia (the Project). The proposed interchange is located between Coldbrook and Berwick (Exits 14 and 15 respectively) in Cambridge, Nova Scotia, just west of the Annapolis Valley First Nation. It will feature a 2 kilometre (km) connector road southerly to Trunk 1, and a 1.6 km northerly connection to Brooklyn Street. The connector road to Trunk 1 will be a controlled access minor arterial roadway owned by NSPW with a limited number of access points to adjacent lands. At Trunk 1 the new intersection will be constructed as a roundabout just east of County Home Road, with a new 600 m southerly connection to Waterville Mountain Road.

As a component to the environmental assessment, WSP completed wetland delineation and field assessments within the project area to confirm the presence / absence of mapped and unmapped wetlands and assess the functions of wetlands identified within the project area.

### 1.1 BACKGROUND MAPPING REVIEW

Prior to the commencement of field work, a desktop review of Nova Scotia Department of Natural Resources and Renewables (NSDNRR) Significant Habitat Database, Service Nova Scotia and Municipal Relations Property Online, topographic mapping, and available satellite imagery was completed. The locations of known mapped wetlands wetlands were recorded for ground-truthing during field work. Review of the site topography and distribution of natural features also allowed the site visit to be focused on areas with an elevated potential for wetlands not shown on mapping.

### 1.2 WETLAND IDENTIFICATION

Wetland screening and assessments were completed between August $18-20^{\text {th }}$ and September $28-30^{\text {th }}$. The presence / absence of wetlands was evaluated in accordance with the U.S. Army Corps of Engineers Wetlands Delineation Manual and the Northcentral and Northeastern Interim Regional Supplement (U.S. Army Corps of Engineers, 2012). During field work, forested areas with typical wetland characteristics were screened to confirm the presence / absence of wetlands.

The vegetation, soil and hydrology of any perspective wetland area was evaluated to determine whether the conditions present constitute a wetland. When a wetland was identified, the boundary was determined in accordance with the protocol and the boundary location was recorded using a Differential Global Positioning System (GPS) unit. The wetland was classified using the U.S. Army Corps of Engineers Wetland Delineation Manual (Environmental Laboratory, 1987). A functional assessment for each wetland was completed using the Wetland Ecosystem Services Protocol for Atlantic Canada (WESP-AC), Nova Scotia Version 2.0 (NS ECC, 2021). The wetland delineation assessment methodology is described in Section 2 - Wetland Delineation.
2 WETLAND DELINEATION

### 2.1 METHODOLOGY

Wetlands were identified and delineated in accordance with the Corps of Engineers Wetland Delineation Manual and the Northcentral and Northeast Interim Regional Supplement (Corps Manual) (U.S. Army Corps of Engineers ,
2012). For an area to be identified as wetland it must show positive indicators in all three areas of assessment. The areas of assessment used were: hydrophytic vegetation, hydric soils, and wetland hydrology.
The soil, vegetation, and hydrology were evaluated at a test pit location. If a wetland was identified, an upland test pit location was selected and evaluated for the same criteria. A wetland boundary was determined between the upland and wetland test pit locations; this boundary was then extended around the exterior of the wetland and recorded using a Differential GPS unit. When necessary, additional soil probes were excavated to confirm the boundary.

### 2.1.1 HYDROPHYTIC VEGETATION

As defined in the Corps Manual, hydrophytic vegetation is the community of macrophytes that occur in areas where inundation or soil saturation is either permanent or of sufficient frequency and duration to exert a controlling influence on the plant species present. The vegetation is assessed based on the indicator status of the dominant plant species in each strata (tree, shrub and herbaceous stratum). Vegetation indicator status defines the frequency of a specific species to occur within upland or wetland areas and its general tolerance for habitat variability. The indicator status varies from obligate ( $>99 \%$ of occurrences are in a wetland) to upland ( $<1 \%$ of occurrences are in a wetland). An assessment for hydrophytic vegetation is carried out at the wetland and upland test pit locations.

### 2.1.2 HYDRIC SOILS

Hydric soils are soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper layers. Hydric soil indicators are formed predominantly by the accumulations or loss of iron, manganese, sulphur, or carbon compounds in a saturated and anaerobic environment. Examples of hydric soils include organic deposits caused by the accumulation of organic matter (lack of oxygen preventing decomposition) and mineral soils with gleyed or depleted matrices (soils stripped of iron and manganese). Soil profiles are observed in any suspected wetland, and the presence or absence of a positive indicator for hydric soils is noted. The soil profile is also observed at the upland test pit location to help determine the boundary location.

### 2.1.3 WETLAND HYDROLOGY

A site is considered to show a positive indicator for wetland hydrology when either one primary indicator or two secondary indicators are observed. Common primary and secondary indicators are listed below:
Primary Indicators

- Surface water, high water table, saturation
- Water marks on trees
- Sediment deposits
- Water-stained leaves
- Drift deposits


## Secondary Indicators

- Drainage patterns
- Stunted or stressed plants
- Dry-season water table


### 2.2 RESULTS

Twelve wetlands were identified during the site survey and are shown in Appendix A. The total wetland area delineated on the project site is approximately 58.28 hectares (ha) which represents $8.9 \%$ of the total site area (approximately 307 ha ).

Wetland 1 is classified as a forested swamp / fen complex and has an approximate area of 28 ha. Dominant species found within the tree stratum of the fen area were Black Spruce (Picea mariana), and Yellow Birch (Betula
alleghaniensis). The tree stratum of the forested swamp area was dominated by Red Maple (Acer rubrum) and Eastern Larch (Larix laricina). Dominant species found within the shrub stratum of the fen area were Eastern Larch and Black Spruce. The shrub stratum in the forested swamp area was dominated by Red Maple and Eastern Larch. The dominant species in the herbaceous layer of the fen area of the wetland was Leatherleaf (Chamaedaphne calyculata) and the dominant herbaceous species within the forested swamp area was Bladder Sedge (Carex intumescens). The soil profile and hydric soil indicator within this wetland was organic (Histosol [A1]) with a depth of greater than 50 centimetres (cm). Wetland hydrology indicators present within this wetland included surface water (A1), high water table (A2), and saturation (A3).

Wetland 1 coordinates: $368773.50 \mathrm{~m} \mathrm{E}, 4991830.20 \mathrm{~m} \mathrm{~N}$, UTM 20T
Wetland 2 is classified as a riparian shrub swamp and occurs along a small permanent watercourse. The approximate area of the wetland is 6.75 ha within the project area. However, the wetland extends upstream beyond the project boundary for several hundred meters to the northwest. Dominant species found within the tree stratum was Red Maple. Dominant species found within the shrub stratum was Speckled Alder (Alnus incana). Dominant species found within the herbaceous stratum were Bluejoint Reed-grass (Calamagrostis canadensis), Spotted Jewelweed (Impatiens capensis), and Bladder Sedge. The soil profile and hydric soil indicator within this wetland was organic (Histosol [A1]) with a depth of greater than 50 cm . Wetland hydrology indicators present within this wetland included surface water (A1), high water table (A2), and saturation (A3).
Wetland 2 Coordinates: 369422.00 m E, 4992463.00 m N, UTM 20T
Wetland 3 is classified as a forested swamp and had an approximate area of 0.29 ha. A small intermittent watercourse was detected flowing diagonally though the wetland from the northeast to the southwest. The channel was mostly dry at the time of the assessment. The dominant species within the tree stratum was Red Maple. The dominant species found within the shrub stratum was Speckled Alder. The Herbaceous stratum was dominated by Spotted Jewelweed. The soil profile within this wetland was fines, 7.5 YR, $2.5 / 2,100 \%(0-15 \mathrm{~cm})$, and sandy loam 7.5 YR $4 / 2,100 \%(15-40 \mathrm{~cm})$, and refusal (rock) at $40+\mathrm{cm}$. Hydric soil indicators included thin dark surface (S9). Wetland hydrology indicators present within this wetland included surface water (A1), high water table (A2), and saturation (A3).

Wetland 3 Coordinates: 368962.80 m E, 4989942.29 m N, UTM 20T
Wetland 4 is classified as a vernal pool and had an approximate area of $450 \mathrm{~m}^{2}$. The pool was mostly dry during the assessment in late August 2021. Dominant species found within the tree stratum was Quaking Aspen (Populus tremuloides). Dominant species within the shrub stratum was Pussy-Willow (Salix discolor). Dominant species within the herbaceous stratum was Sallow Sedge (Carex lurida). The soil profile within this wetland was fines 7.5 YR 2.5/1 $100 \%(0-7 \mathrm{~cm})$, sandy loam 7.5 YR 6/2 $100 \%$ ( $7-35 \mathrm{~cm}$ ), and fines 7.5 YR 3/4 $100 \%$ ( $35-50+\mathrm{cm}$ ). Hydric soil indicators included thin dark surface (S9). Wetland hydrology indicators present within this wetland included surface water (A1), high water table (A2), and saturation (A3).

Wetland 4 Coordinates: 369030.96 m E, 4991278.69 m N, UTM 20T
Wetland 5/6/9: Wetlands 5 and 6 were originally delineated and later found to be part of the larger Wetland 9, which occurs between Wetlands 5 and 6 , and forms a complex of the three wetlands. Small areas of marginal upland habitat separate the wetlands. The approximate overall area of the combined wetland was approximately 8.75 ha. Dominant tree species within the wetland area was Black Spruce. Dominant species within the shrub stratum were Balsam Fir (Abies balsamea), Speckled Alder, Common Winterberry (Ilex verticillata), and Black Cherry (Prunus serotina). Dominant species within the herbaceous stratum were Wool-Rush (Scirpus cyperinus) and Cinnamon Fern (Osmunda cinnamomea). Soil profile within the wetland was histosol $0-50+\mathrm{cm}$, hydric soil indicators included Histosol (A1). Hydric soil indicators included surface water (A1), and saturation (A3)
Wetland 5/6/9 Complex Coordinates: 369011.20 m E, 4992141.37 m N, UTM 20T
Wetland 7 is classified as a riparian shrub swamp and has an approximate area of 3.1 ha . This wetland is found bordering a large permanent watercourse. Dominant species within the tree stratum was Red Maple. Dominant species found within the shrub stratum was Speckled Alder. Dominant species within the herbaceous stratum were Rice Cutgrass (Leersia oryzoides) and Reed Canary Grass (Phalaris arundinacea). The soil profile and hydric soil
indicator within this wetland was organic (Histosol [A1]) with a depth of greater than 50 cm . Wetland hydrology indicators present within this wetland included surface water (A1), high water table (A2), and saturation (A3).
Wetland 7 Coordinates: 369859.95 m E, 4992155.93 m N, UTM
Wetland 8 is a classified as a forested swamp and has an approximate area of $887 \mathrm{~m}^{2}$. Dominant species found within the tree stratum were Red Maple and Largetooth Aspen (Populus grandientata). Dominant species found within the shrub stratum were Red Maple and Gray Birch (Betula populifolia). Dominant species found within the herbaceous stratum were Bristly Dewberry (Rubus hispidus) and Cinnamon Fern. Soil profile within the wetland was fines 7.5 YR $3 / 2100 \%(0-5 \mathrm{~cm})$, fines 7.5 YR $5 / 1100 \%(5-15 \mathrm{~cm})$, and fines 5 YR $4 / 4100 \%(15-25 \mathrm{~cm})$. Refusal (rock) was reached at 25 cm . Hydric soil indicators for this wetland included thin dark surface (S9). Wetland hydrology indicators included saturation (A3).

Wetland 8 coordinates: $369444.00 \mathrm{~m} \mathrm{E}, 4991739.00 \mathrm{~m}$ N, UTM 20T
Wetland 10 is classified as a riparian graminoid marsh and occurs along the Cornwallis River. The area of delineated wetland within the project area is approximately 7.25 ha, however this wetland extends outside the project area for several kilometers along the Cornwallis River riparian corridor. Dominant species within the tree stratum was an unidentified Willow species (Salix spp.). Dominant species within the shrub stratum was a Hawthorn species (Crataegus spp.). Dominant species found within the herb stratum was Reed Canary Grass. Soil profile within this wetland was fines 5 YR $5 / 160 \%$, 5 YR $5 / 840 \%(0-50+\mathrm{cm})$. Hydric soil indicators included depleted matrix (F3). Wetland hydrology indicators present within this wetland included surface water (A1), high water table (A2), and saturation (A3).
Wetland 10 Coordinates: $368934.00 \mathrm{~m} \mathrm{E}, 4990991.00 \mathrm{~m} \mathrm{~N}$, UTM 20T
Wetland 11 is classified as a riparian shrub swamp which borders a small permanent stream. The area of delineated wetland within the project area is approximately 4 ha, however this wetland extends outside the project area for several hundred meters south. Dominant species within the tree stratum was Black Cherry. Dominant species found within the shrub stratum was Speckled Alder. Dominant species found within the herbaceous stratum was Sensitive Fern. Soil profile within this wetland was fines 7.5 YR $3 / 1100 \% ~(0-15 \mathrm{~cm})$, and coarse 7.5 YR $5 / 1100 \%$ ( $15-50$ cm ). Hydric soil indicators for this wetland included Thin Dark Surface (S9). Wetland hydrology indicators present within this wetland included surface water (A1), high water table (A2), and saturation (A3).

## Wetland 11 Coordinates: 368998.02 m E, 4989608.29 m N UTM 20T

Wetland 12 is classified as a vernal pool, with an approximate area of $70 \mathrm{~m}^{2}$. The vernal pool was mostly dry at the time of the assessment and is below the minimum size of regulated wetlands in Nova Scotia ( $>100 \mathrm{~m}^{2}$ ). Dominant species within the tree stratum was Red Maple. Dominant species within the shrub stratum was a Serviceberry species (Amelanchier spp.). No dominant species were noted within the herbaceous stratum. Soil profile within this wetland was organic ( $0-10 \mathrm{~cm}$ ), loamy 5 YR $2.5 / 1,100 \%(10-25 \mathrm{~cm})$, and sandy loam 7.5 YR 4/2, 100\% (25-40 cm ). Refusal (rock) was encountered at 40 cm . Hydric soil indicators for this wetland included thin dark surface (S9). Wetland hydrology indicators included saturation (A3).

Wetland 12 Coordinates: 369087.72 m E, 4991077.31 m N UTM 20T

## 3 WETLAND FUNCTIONAL ASSESSMENT

### 3.1 METHODOLOGY

An assessment of wetland function and value was carried out during wetland screening field assessments. The functional assessments were conducted using the WESP-AC version 2.0 for Nova Scotia, which is a combined field and desktop evaluation method designed to assess the condition and function of Nova Scotia's wetlands. WESP-AC generates scores ( 0 to 10 ) and ratings (Lower, Moderate, and Higher) for each of a wetland's functions and benefits. The assessment is completed in a consistent and transparent manner to ensure the scores and ratings can be used to make informed decisions about wetland avoidance, minimisation, and replacement. It can also help to ensure that wetland restoration mitigates against unavoidable loss of specific functions and benefits (NBDELG, 2017). Table 1, extracted from the Manual for Wetland Ecosystem Services Protocol for Atlantic Canada (WESP-AC) NBDELG, 2017, describes the wetlands functions and their benefits that are measured by the WESP-AC.

Table 1: Benefits of Wetland Functions Scored by WESP-AC

| FUNCTION |  | DEFINITION |
| :--- | :--- | :--- |
| Hydrologic Functions: | The effectiveness for storing runoff <br> or delaying the downslope <br> movement of surface water for long <br> or short periods. | Flood control, maintain ecological <br> systems. |
| Stream Flow Support | The effectiveness for contributing <br> water to streams especially during <br> the driest part of a growing season. | Support fish and other aquatic life. |
| Water Quality Maintenance Functions: | The effectiveness for maintaining <br> or reducing temperature of <br> downslope waters. | Support coldwater fish and other <br> aquatic life. |
| Water Cooling | The effectiveness for intercepting <br> and filtering suspended inorganic <br> sediments thus allowing their <br> deposition, as well as reducing <br> energy of waves and currents, <br> resisting excessive erosion, and <br> stabilising underlying sediments or <br> soil. | Maintain quality of receiving <br> waters. Protect shoreline structures <br> from erosion. |
| Sediment Retention \& Stabilization |  |  |
| Phosphorus Retention | The effectiveness for retaining <br> phosphorus for long periods ( $>1$ <br> growing season). | Maintain quality of receiving <br> waters. |
| Nitrate Removal \& Retention | The effectiveness for retaining <br> particulate nitrate and converting <br> soluble nitrate and ammonium to <br> nitrogen gas while generating little | Maintain quality of receiving <br> waters. |


| FUNCTION | DEFINITION | POTENTIAL BENEFITS |
| :---: | :---: | :---: |
|  | or no nitrous oxide (a potent greenhouse gas). |  |
| Carbon Sequestration | The effectiveness of a wetland both for retaining incoming particulate and dissolved carbon, and through the photosynthetic process, converting carbon dioxide gas to organic matter (particulate or dissolved). And to then retain that organic matter on a net annual basis for long periods while emitting little or no methane (a potent greenhouse gas). | Maintain quality of receiving waters. |
| Organic Nutrient Export | The effectiveness for producing and subsequently exporting organic nutrients (mainly carbon), either particulate or dissolved. | Support food chains in receiving waters. |
| Ecological Habitat Functions: |  |  |
| Fish Habitat | The capacity to support an abundance and diversity of native fish (both anadromous and resident species). | Support recreational and ecological values |
| Aquatic Invertebrate Habitat | The capacity to support or contribute to an abundance or diversity of invertebrate animals which spend all or part of their life cycle underwater or in moist soil. Includes dragonflies, midges, clams, snails, water beetles, shrimp, aquatic worms, and others. | Support salmon and other aquatic life. Maintain regional biodiversity. |
| Amphibian \& Reptile Habitat | The capacity to support or contribute to an abundance or diversity of native frogs, toads, salamanders, and turtles. | Maintain regional biodiversity. |
| Waterbird Feeding Habitat | The capacity to support or contribute to an abundance or diversity of waterbirds that migrate or winter but do not breed in the region. | The capacity to support or contribute to an abundance or diversity of waterbirds that migrate or winter but do not breed in the region. |
| Waterbird Nesting Habitat | The capacity to support or contribute to an abundance or diversity of waterbirds that nest in the region. | Maintain regional biodiversity. |
| Songbird, Raptor, \& Mammal Habitat | The capacity to support or contribute to an abundance or diversity of native songbird, raptor, and mammal species and functional groups, especially those that are | Maintain regional biodiversity. |


| FUNCTION | DEFINITION | POTENTIAL BENEFITS |
| :--- | :--- | :--- |
|  | most dependent on wetlands or <br> water. |  |
| Native Plant and Pollinator Habitat | The capacity to support or <br> contribute to a diversity of native, <br> hydrophytic, vascular plant species, <br> communities, and/or functional <br> groups, as well as the pollinating <br> insects linked to them. | Maintain regional biodiversity and <br> food chains. |
| Public Use \& Recognition* | Prior designation of the wetland, by <br> a natural resource or environmental <br> agency, as some type of special <br> protected area. Also, the potential <br> and actual use of a wetland for low- <br> intensity outdoor recreation, <br> education, or research. | Commercial and social benefits of <br> recreation. Protection of prior <br> public investments. |

### 3.2 RESULTS

The findings of the WESP-AC for Wetlands found within the project area are summarized in Table $\mathbf{2}$ to Table 5. A full listing of the functional assessment data is included in the WESP-AC data forms in Appendix $\mathbf{C}$.

| WETLAND FUNCTIONS OR OTHER ATTRIBUTES: | wetland 1 |  | wetland 2 |  | wetland 3 |  | wetland 4 |  | WETLAND $5^{*}$ |  | WETLAND $6^{*}$ |  | wetland 7 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | function RATING | benberits RATING | $\begin{aligned} & \text { FUNCTION } \\ & \text { RATING } \end{aligned}$ | BENDFITS RATING | FUNCTION RATING | BENEFITS RATING | FUNCTION <br> RATING | BENDFITS RATING | FUNCTION RATING | BENEFITS RATING | function RATING | BENEFITS <br> RATING | function RATING | BENEFITS RATING |
| Water Storage \& Delay (WS) | Lower | Higher | Lower | Higher | Lower | Higher | Moderate | Moderate | Lower | Higher | Lower | Higher | Lower | Higher |
| Stream Flow Support (SFS) | Higher | Lower | Moderate | Moderate | Lower | Moderate | Lower | Lower | Lower | Lower | Moderate | Lower | Moderate | Moderate |
| Water Cooling (WC) | Lower | Lower | Higher | Higher | Higher | Moderate | Moderate | Lower | Moderate | Moderate | Lower | Lower | Higher | Higher |
| Sediment Retention \& Stabilization (SR) | Moderate | Higher | Moderate | Higher | Lower | Higher | Higher | Moderate | Lower | Higher | Lower | Higher | Moderate | Higher |
| Phosphorus Retention (PR) | Lower | Higher | Lower | Higher | Lower | Higher | Higher | Moderate | Lower | Higher | Lower | Higher | Lower | Higher |
| Nitrate Removal \& Retention (NR) | Lower | Higher | Higher | Higher | Moderate | Higher | Higher | Moderate | Moderate | Higher | Lower | Moderate | Moderate | Higher |
| Carbon Sequestration (CS) | Higher |  | Lower |  | Lower |  | Lower |  | Lower |  | Moderate |  | Lower |  |
| Organic Nutrient Export (OE) | Moderate |  | Moderate |  | Lower |  | Lower |  | Lower |  | Moderate |  | Moderate |  |
| Anadromous Fish Habitat (FA) | Lower | Lower | Higher | Higher | Lower | Lower | Lower | Lower | Lower | Lower | Lower | Lower | Higher | Higher |
| Resident Fish Habitat (FR) | Lower | Lower | Higher | Moderate | Lower | Lower | Lower | Lower | Lower | Lower | Lower | Lower | Moderate | Higher |
| Aquatic Invertebrate Habitat (INV) | Moderate | Lower | Higher | Higher | Lower | Moderate | Moderate | Higher | Moderate | Moderate | Moderate | Lower | Higher | Moderate |
| Amphibian \& Turtle Habitat (AM) | Lower | Lower | Higher | Moderate | Moderate | Moderate | Higher | Moderate | Higher | Moderate | Lower | Lower | Moderate | Moderate |
| Waterbird Feeding Habitat (WBF) | Lower | Lower | Higher | Moderate | Moderate | Moderate | Higher | Moderate | Moderate | Moderate | Lower | Lower | Moderate | Moderate |
| Waterbird Nesting Habitat (WBN) | Lower | Lower | Higher | Moderate | Moderate | Moderate | Higher | Moderate | Moderate | Moderate | Lower | Lower | Moderate | Moderate |
| Songbird, Raptor, \& Mammal Habitat (SBM) | Moderate | Moderate | Higher | Moderate | Higher | Moderate | Moderate | Moderate | Higher | Moderate | Moderate | Moderate | Moderate | Moderate |
| Pollinator Habitat (POL) | Moderate | Moderate | Moderate | Moderate | Higher | Lower | Moderate | Moderate | Moderate | Moderate | Moderate | Moderate | Higher | Moderate |
| Native Plant Habitat (PH) | Lower | Lower | Moderate | Lower | Moderate | Lower | Lower | Lower | Lower | Moderate | Lower | Lower | Moderate | Lower |
| Public Use \& Recognition (PU) |  | Moderate |  | Lower |  | Moderate |  | Moderate |  | Moderate |  | Moderate |  | Higher |
| Wetland Sensitivity (Sens) |  | Higher |  | Moderate |  | Moderate |  | Lower |  | Moderate |  | Higher |  | Higher |
| Wetland Ecological Condition (EC) |  | Higher |  | Higher |  | Lower |  | Lower |  | Moderate |  | Lower |  | Higher |
| Wetland Stressors (STR) (higher score means more stress) |  | Higher |  | Higher |  | Higher |  | Moderate |  | Higher |  | Higher |  | Higher |



Table 3: Wetland WESP-AC Scores (Wetland 8 - Wetland 12)

| WETLAND FUNCTIONS OR OTHER ATTRIBUTES: | WETLAND 8 |  | WETLAND 9* |  | wetland 10 |  | WETLAND 11 |  | wetland 12 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | FUNCTION RATING | benefits rating | function rating | benblits rating | function rating | benefits rating | FUNCTION RATING | benefits rating | function rating | BENEFITS Rating |
| Water Storage \& Delay (WS) | Moderate | Moderate | Lower | Lower | Lower | Higher | Lower | Moderate | n/a | n/a |
| Stream Flow Support (SFS) | Lower | Lower | Moderate | Moderate | Moderate | Moderate | Moderate | Moderate | n/a | n/a |
| Water Cooling (WC) | Lower | Lower | Moderate | Moderate | Moderate | Higher | Higher | Moderate | n/a | n/a |
| Sediment Retention \& Stabilization (SR) | Moderate | Higher | Lower | Higher | Moderate | Higher | Lower | Higher | n/a | n/a |
| Phosphorus Retention (PR) | Lower | Higher | Lower | Higher | Lower | Higher | Lower | Higher | n/a | n/a |
| Nitrate Removal \& Retention (NR) | Moderate | Moderate | Lower | Higher | Moderate | Higher | Lower | Higher | n/a | n/a |
| Carbon Sequestration (CS) | Moderate |  | Lower |  | Lower |  | Lower |  | n/a |  |
| Organic Nutrient Export (OE) | Moderate |  | Moderate |  | Higher |  | Higher |  | n/a |  |
| Anadromous Fish Habitat (FA) | Lower | Lower | Lower | Lower | Higher | Higher | Higher | Higher | n/a | n/a |
| Resident Fish Habitat (FR) | Lower | Lower | Lower | Lower | Higher | Moderate | Moderate | Higher | n/a | n/a |
| Aquatic Invertebrate Habitat (INV) | Lower | Lower | Lower | Moderate | Moderate | Higher | Higher | Higher | n/a | n/a |
| Amphibian \& Turtle Habitat (AM) | Lower | Lower | Moderate | Moderate | Higher | Higher | Moderate | Moderate | n/a | n/a |
| Waterbird Feeding Habitat (WBF) | Lower | Lower | Moderate | Moderate | Higher | Moderate | Moderate | Moderate | n/a | n/a |
| Waterbird Nesting Habitat (WBN) | Lower | Lower | Moderate | Moderate | Higher | Higher | Moderate | Higher | n/a | n/a |
| Songbird, Raptor, \& Mammal Habitat (SBM) | Moderate | Moderate | Higher | Moderate | Moderate | Moderate | Higher | Moderate | n/a | n/a |
| Pollinator Habitat (POL) | Moderate | Lower | Moderate | Moderate | Moderate | Moderate | Moderate | Moderate | n/a | n/a |
| Native Plant Habitat (PH) | Lower | Lower | Moderate | Moderate | Moderate | Lower | Moderate | Moderate | n/a | n/a |
| Public Use \& Recognition (PU) |  | Moderate |  | Moderate |  | Higher |  | Moderate |  | n/a |
| Wetland Sensitivity (Sens) |  | Higher |  | Higher |  | Higher |  | Moderate |  | n/a |
| Wetland Ecological Condition (EC) |  | Lower |  | Lower |  | Lower |  | Moderate |  | n/a |
| Wetland Stressors (STR) (higher score means more stress) |  | Higher |  | Higher |  | Higher |  | Higher |  | n/a |


| WETLAND FUNCTIONS OR OTHER ATTRIBUTES: | WETLAND 1 |  | WETLAND 2 |  | wETLAND 3 |  | WETLAND 4 |  | WETLAND 5* |  | WETLAND 6* |  | WETLAND 7 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | $\begin{gathered} \hline \text { FUNCTION } \\ \text { RATING } \\ \hline \end{gathered}$ | $\begin{gathered} \hline \text { BENEFITS } \\ \text { RATING } \\ \hline \end{gathered}$ | $\begin{aligned} & \text { FUNCTION } \\ & \text { RATING } \\ & \hline \end{aligned}$ | $\begin{gathered} \hline \text { BENEFITS } \\ \text { RATING } \\ \hline \end{gathered}$ | $\begin{aligned} & \text { FUNCTION } \\ & \text { RATING } \\ & \hline \end{aligned}$ | $\begin{gathered} \hline \text { BENEFITS } \\ \text { RATING } \\ \hline \end{gathered}$ | $\begin{aligned} & \text { FUNCTION } \\ & \text { RATING } \end{aligned}$ | $\begin{aligned} & \hline \text { BENEFITS } \\ & \text { RATING } \\ & \hline \end{aligned}$ | $\begin{gathered} \text { FUNCTION } \\ \text { RATING } \\ \hline \end{gathered}$ | $\begin{gathered} \hline \text { BENEFITS } \\ \text { RATING } \\ \hline \end{gathered}$ | $\begin{aligned} & \text { FUNCTION } \\ & \text { RATING } \end{aligned}$ | $\begin{aligned} & \hline \text { BENEFITS } \\ & \text { RATING } \\ & \hline \end{aligned}$ | $\begin{aligned} & \text { FUNCTION } \\ & \text { RATING } \\ & \hline \end{aligned}$ | $\begin{gathered} \hline \text { BENEFITS } \\ \text { RATING } \\ \hline \end{gathered}$ |
| Hydrologic Group | Higher | Higher | Higher | Higher | Higher | Higher | Higher | Moderate | Higher | Higher | Higher | Higher | Higher | Higher |
| Water Quality Support Group | Lower | Higher | Lower | Higher | Lower | Higher | Higher | Moderate | Lower | Higher | Lower | Higher | Lower | Higher |
| Aquatic Support Group | Moderate | Lower | Higher | Higher | Moderate | Moderate | Lower | Moderate | Lower | Moderate | Lower | Lower | Moderate | Higher |
| Aquatic Habitat Group | Lower | Lower | Higher | Moderate | Moderate | Moderate | Higher | Moderate | Moderate | Moderate | Lower | Lower | Moderate | Higher |
| Transition Habitat Group | Moderate | Lower | Higher | Lower | Higher | Lower | Moderate | Lower | Higher | Lower | Moderate | Lower | Higher | Lower |
| Wetland Condition |  | Higher |  | Higher |  | Lower |  | Lower |  | Moderate |  | Lower |  | Higher |
| Wetland Risk (Average of Sensitivity \& Stressors) |  | Higher |  | Higher |  | Moderate |  | Moderate |  | Higher |  | Higher |  | Higher |

 missing data from the assessments.

Table 5: WESP- AC Summary Ratings for Grouped Functions, Wetland Condition and Wetland Risk (Wetland 8 - Wetland 12)

| WETLAND FUNCTIONS OR OTHER ATTRIBUTES: | WETLAND 8 |  | WETLAND 9 |  | WETLAND 10 |  | WETLAND 11 |  | WETLAND 12 |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | function rating | benefits rating | function rating | benefits rating | function rating | benepits rating | function rating | benefits rating | FUNCTION RATING | benefits rating |
| Hydrologic Group | Moderate | Moderate | Lower | Lower | Lower | Higher | Lower | Moderate | n/a | n/a |
| Water Quality Support Group | Moderate | Higher | Lower | Higher | Moderate | Higher | Lower | Higher | n/a | n/a |
| Aquatic Support Group | Moderate | Lower | Moderate | Lower | Higher | Higher | Higher | Moderate | n/a | n/a |
| Aquatic Habitat Group | Lower | Lower | Moderate | Moderate | Higher | Higher | Moderate | Higher | n/a | n/a |
| Transition Habitat Group | Moderate | Lower | Higher | Lower | Moderate | Lower | Higher | Lower | n/a | n/a |
| Wetland Condition |  | Lower |  | Lower |  | Lower |  | Moderate |  | n/a |
| Wetland Risk (Average of Sensitivity \& Stressors) |  | Higher |  | Higher |  | Higher |  | Higher |  | n/a |

 missing data from the assessments.

### 3.3 DISCUSSION

A review of the grouped function results for wetlands found within the project area appear to mostly have higher functions or benefits relating to the water quality support group. Wetlands 2, 7, 10, and 11 all border permanent watercourses and as such have better overall functions and benefits relating to aquatic habitat. All of the watercourses identified within wetlands on site are tributaries of the Cornwallis River, and have potential of accommodating anadromous fish species at some point during a typical year. A functional assessment was not completed on Wetland 12, as its area is below the minimum size threshold to be considered a regulated wetland under provincial wetland legislation.

The wetland risk grouped function was rated higher at the majority of the wetlands within the project area. A "Higher" rating in this category indicates more risk or potential for degradation than that of a typical wetland found in an undeveloped area. This may be a result of the extensive agricultural operations found throughout the project area, and the associated potential sedimentation, and input of nutrients and contaminants from ploughing, tilling, pesticide application, livestock, etc. Due to differing size, morphology, and condition, wetlands at the site show a reflective amount of variance in the function and benefits from one wetland to the next.

Several of the wetlands evaluated had "Higher" ratings in two or more of the grouped function results, which may increase the probability of a Wetland of Special Significance (WSS) designation due to recent changes to the interpretation of the Nova Scotia Environment Act. Beginning in spring of 2022, wetland functional assessment results, along with confirmed species at risk sightings or usage, will be integrated into the decision-making process regarding Special Significance designations.

## 4 CONCLUSION

Approximately 58.28 ha of wetland was identified and assessed during field assessments at the proposed Highway 101 Cambridge Interchange and Connector Roads project site. The data within this document has been compiled to inform regulators and stakeholders of wetland size, condition, and location within the site as part of the environmental assessment process.
The Nova Scotia Wetland Policy requires that alteration applications includes functional assessment of the wetland(s) and a compensation project to offset the loss of wetland habitat, typically at a ratio of 2:1 (two square metres of compensation for every square metre altered). A wetland alteration includes not only infilling of a wetland, but also direct or indirect changes made to inflow or outflow characteristics. A compensation agreement will be required to provide sufficient information to facilitate approval from the Nova Scotia Department of Environment and Climate Change of any proposed wetland alterations.
This report has been prepared for the sole benefit of NSDPW. Any other person or entity may not rely on this report without the express written consent of WSP and NSDPW. WSP accepts no responsibility for damages suffered by any third party as a result of decisions made, or actions conducted based on this report. No other warranties are implied or expressed. This report has been prepared by Brady Leights, B. Et., and reviewed by Cody Pytlak, B.A.
The findings presented in this report are based on field observations made between August $18-20^{\text {th }}$ and September September $28-30^{\text {th }}$, 2021.These results rely on conditions identified during the site visits which may alter over time. We trust that this report meets your requirements at this time. If there are any questions, please do not hesitate to contact our office.

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## APPENDIX



WETLAND FIGURE


## APPENDIX



WETLAND PHOTOGRAPHIC LOGS


Photo 1: Cambridge Wetland 1 eastern section, May 42021.


Photo 3: Cambridge Wetland 1 looking north, August 182021.


Photo 2: Cambridge Wetland 1 looking east, August 182021.


Photo 4: Cambridge Wetland 1 shrub and emergents, May 42021.


Photo 5: Stunted black spruce at Cambridge Wetland 1, August 182021


Photo 7: Wetland 1 plot location, August 182021.


Photo 6: Cambridge Wetland 1 shrub and overmature trees, May 42021.


Photo 8: Upland edge at wetland 1, August 18, 2021.


Photo 1: Cambridge Wetland 2 northern view, September 282021.


Photo 3: Cambridge Wetland 2 edge condition, September 282021.


Photo 2: Cambridge Wetland 2 western view, September 282021.


Photo 4: Cambridge Wetland 2 herbaceous community, September 282021.


Photo 5: Cambridge Wetland 2 upland edge, September 282021.


Photo 6: Cambridge Wetland 2 upland edge continued, September 282021.


Photo 7: Cambridge Wetland 2 upland soil plot, September 282021.


Photo 1: Cambridge Wetland 3 northern view, August 192021.


Photo 3: Cambridge Wetland 3 western view, August 192021.


Photo 2: Cambridge Wetland 3 eastern view, August 192021.


Photo 4: Cambridge Wetland 3 southern view, August 192021.


Photo 5: Cambridge Wetland 3 wetland soil, August 192021.


Photo 6: Cambridge Wetland 3 upland soil, August 192021.


Photo 1: Cambridge Wetland 5 northern view, August 202021.

Photo 3: Cambridge Wetland 5 shrub canopy, August 202021.



Photo 2: Cambridge Wetland 5 western view, August 20 2021..


Photo 4: Cambridge Wetland 5 shrub canopy, August 202021.


Photo 5: Cambridge Wetland 5 eastern view, August 202021.


Photo 7: Cambridge Wetland 5 herbaceous vegetation, August 202021.


Photo 6: Cambridge Wetland 5 southern view, August 202021.


Photo 8: Cambridge Wetland 5 herbaceous vegetation, August 202021.


Photo 1: Cambridge Wetland 6 northern view, August 202021.


Photo 3: Cambridge Wetland 6 western view, August 202021.


Photo 2: Cambridge Wetland 6 eastern view, August 202021.


Photo 4: Cambridge Wetland 6 southern view, August 202021.


Photo 5: Cambridge Wetland 6 shrub habitat, August 202021.


Photo 7: Cambridge Wetland 6, August 202021.


Photo 6: Cambridge Wetland 6 immature conifer, August 202021.


Photo 8: Cambridge Wetland 6, August 202021.


Photo 1: Cambridge Wetland 7 northern view, September 282021.

Photo 3: Cambridge Wetland 7 watercourse, September 282021.



Photo 2: Cambridge Wetland 7 eastern view, September 282021.


Photo 4: Cambridge Wetland 7 western view, September 282021.


Photo 5: Cambridge Wetland 7 southern view, September 282021.


Photo 6: Cambridge Wetland 7 shrub habitat, September 282021.


Photo 8: Cambridge Wetland 7 herbaceous vegetation, September 282021.


Photo 1: Cambridge Wetland 8 northern view, September 282021.


Photo 3: Cambridge Wetland 8 southern view, September 282021.


Photo 2: Cambridge Wetland 8 eastern view, September 282021.


Photo 4: Cambridge Wetland 8 western view, September 282021.


Photo 5: Cambridge Wetland 8 canopy, September 282021.


Photo 7: Cambridge Wetland 8 bare ground, September 282021.


Photo 6: Cambridge Wetland 8 bare ground, September 282021.


Photo 8: Cambridge Wetland 8 bare ground, September 282021.


Photo 1: Cambridge Wetland 9, September 282021.


Photo 3: Cambridge Wetland 9, September 282021.


Photo 2: Cambridge Wetland 9, September 282021.


Photo 4: Cambridge Wetland 9, September 282021.


Photo 5: Cambridge Wetland 9, September 282021.


Photo 7: Cambridge Wetland 9, September 282021.


Photo 6: Cambridge Wetland 9, September 282021.


Photo 8: Cambridge Wetland 9, September 282021.


Photo 1: Cambridge Wetland 10 watercourse, September 212021.


Photo 3: Cambridge Wetland 10, September 212021.


Photo 2: Cambridge Wetland 10 eastern view, September 212021.


Photo 4: Cambridge Wetland 10 western view, September 212021.


Photo 5: Cambridge Wetland 10 vegetation, September 212021.


Photo 7: Cambridge Wetland 10 northern view, September 212021.


Photo 8: Cambridge Wetland 10, September 212021.


Photo 1: Cambridge Wetland 11, May 52021.


Photo 3: Cambridge Wetland 11, May 52021.


Photo 2: Cambridge Wetland 11, May 52021.


Photo 4: Cambridge Wetland 11, September 212021.


Photo 5: Cambridge Wetland 11, September 212021.


Photo 7: Cambridge Wetland 11, May 52021.


Photo 6: Cambridge Wetland 11, September 212021.


Photo 8: Cambridge Wetland 11, September 212021.


Photo 1: Cambridge Wetland 12 eastern view, September 302021.


Photo 3: Cambridge Wetland 12 northern view, September 302021.


Photo 2: Cambridge Wetland 12 western view, September 302021.


Photo 4: Cambridge Wetland 12 southern view, September 302021.


Photo 5: Cambridge Wetland 12, September 30 2021..


Photo 7: Cambridge Wetland 12 upland soil, September 302021.


Photo 6: Cambridge Wetland 12, September 302021.


Photo 8: Cambridge Wetland 12 wetland soil, September 302021.

## APPENDIX

WETLAND FUNCTIONAL ASSESSMENT RESULTS

| Cover Page: Basic Description of Assessment | WESP-AC version 2 |
| :---: | :---: |
| Site Name: | Cambridge interchange Wetland 1 |
| Investigator Name: | BL |
| Date of Field Assessment: | 18 August, 2021 |
| Nearest Town: | Waterville, NS |
| Latitude (decimal degrees): | 368716 |
| Longitude (decimal degrees): | 4991808 |
| Is a map based on a formal on-site wetland delineation available? | Yes |
| Approximate size of the Assessment Area (AA, in hectares): | $\sim 30$ |
| AA as percent of entire wetland (approx.). Attach sketch map if AA is smaller than the entire contiguous wetland. | 90 |
| What percent (approx.) of the wetland were you able to visit? | 90 |
| What percent (approx.) of the AA were you able to visit? | 90 |
| Were you able to ask the site owner/manager about any of the questions? | No |
| Indicate here if you intentionally surveyed for rare plants, calciphile plants, or rare animals: | Yes |
| Have you attended a WESP-AC training session? If so, indicate approximate month \& year. | Yes |
| How many wetlands have you assessed previously using WESP-AC? (approx.) | >100 |
| Comments about the site or this WESP-AC assessment (attach extra page if desired): |  |


|  | A | B | C | D | E |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | Date: 18 Aug 2020 |  | Site Identifier: Cambridge Wetland 1 | Investigator: BL |  |
| 2 | Form OF (Office). Non-tidal Wetland Data Form. WESP-AC version 2 for Nova Scotia wetlands only. DIRECTIONS: Conduct an assessment only after reading the accompanying <br> Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answering many of the questions below will require using these online map viewers: <br> Google Earth Pro: https://www.google.com/earth/download/gep/agree.html <br> Provincial Landscape Viewer: https://nsgi.novascotia.ca/plv/ <br> For most wetlands, completing this office data form will require 1-2 hours. For a list of functions to which each question pertains, see bracketed abbreviations in the Definitions/Explanations column. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention \& Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV=Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM=Amphibian \& Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, \& Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use \& Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors. |  |  |  |  |
| 3 | \# | Indicators | Condition Choices | Data | Definitions/Explanations |
| 4 | OF1 | Province | Mark the province in which the AA is located by changing the 0 in the colurm next to it to a "1". Mark only one. |  | This determines to which province's calibration wetlands the raw score of any wetland is normalised. |
| 5 |  |  | New Brunswick | 0 | data exists in a particular province. |
| 6 |  |  | Nova Scotia | 1 |  |
| 7 |  |  | Prince Edward Island | 0 |  |
| 8 |  |  | Newfoundland-Labrador | 0 |  |
| 9 | OF2 | Ponded Area Wuthin 1 km | The area of surface water ponded during most of the growing season that is both (1) in or adjacent to the $A A$ and (2) within 1 km is: |  | "Adjacent" means not separated from the AA by a wide expanse ( $>50 \mathrm{~m}$ ) of upland (including roads $>50 \mathrm{~m}$ wide). Include ponded areas likely to be hidden by wetland vegetation. If surface water |
| 10 |  |  | $<0.01$ hectare (about $10 \mathrm{~m} \times 10 \mathrm{~m}$ ). | 0 | extends beyond 1 km , include only the part within 1 km . Do not include tidal areas. Measure the |
| 11 |  |  | 0.01-0.1 hectare. | 0 |  |
| 12 |  |  | 0.1-1 hectare. | 0 |  |
| 13 |  |  | 1 to 10 hectares. | 1 |  |
| 14 |  |  | 10 to 100 hectares. | 0 |  |
| 15 |  |  | $>100$ hectares. | 0 |  |
| 16 | OF3 | Ponded Water \& Wetland Wthin 1 km | The area of wetlands and surface water ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: |  | See definition of adjacent in OF2. If the AA's wetland vegetation extends beyond 1 km , include only the part within 1 km "Ponded" means not flowing in rivers or streams. [Sens, WBF] |
| 17 |  |  | $<0.01$ hectare (about $10 \mathrm{~m} \times 10 \mathrm{~m}$ ). | 0 |  |
| 18 |  |  | 0.01-0.1 hectare. | 0 |  |
| 19 |  |  | 0.1-1 hectare. | 0 |  |
| 20 |  |  | 1 to 10 hectares. | 1 |  |
| 21 |  |  | 10 to 100 hectares. | 0 |  |
| 22 |  |  | >100 hectares. | 0 |  |
| 23 | OF4 | Size of Largest Nearby Vegetated Tract or | The largest vegetated patch or corridor that includes the AA's vegetation plus alladjacent upland vegetation that is not lamn, row crops, heavily grazed lands, conifer plantation is: |  | See definition of adjacent in OF2. Use Google Earth Pro's polygon ruler (as described above). <br> Exclude conifer plantations only if it is obvious that trees were planted in rows. [AM, PH, SBM, Sens] |
| 24 |  |  | $<0.01$ hectare (about $10 \mathrm{~m} \times 10 \mathrm{~m}$ ). | 0 |  |
| 25 |  |  | 0.01-0.1 hectare. | 0 |  |
| 26 |  |  | 0.1-1 hectare. | 0 |  |
| 27 |  |  | 1 to 10 hectares. | 0 |  |
| 28 |  |  | 10 to 100 hectares. | 1 |  |
| 29 |  |  | 100 to 1000 hectares. | 0 |  |
| 30 |  |  | $>1000$ hectares. [This is nearly always the answer in relatively undeveloped landscapes.] | 0 |  |


|  | A | B | C | D | E |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 31 | OFS | Distance to Large Vegetated Tract | The minimum distance from the edge of the AA to the edge of the closestvegetated land (but excluding row crops, lamn, conifer plantation) larger than 375 hectares (about 2 km on a side), is: |  | To measure distance, use Google Earth Pro (Ruler > Line tool). The 375 -ha criterion is from the Fundy Model Forest Project. [AM, PH, POL, SBM, Sens] |
| 32 |  |  | $<50 \mathrm{~m}$, and not separated from the 375 -ha vegetated area by any width ofpaved roads, stretches of open water, row crops, bare ground, lawn, or impervious surface. Or the $A A$ itself contains $>375$ ha of vegetation. [This is often the answer in relatively undeveloped landscapes.] | 0 |  |
|  |  |  | 40 m , but completely separated from the 375-ha vegetated area by those features, and AA does not contain $>375$ ha of vegetation. | 0 |  |
| 34 |  |  | 50-500 m, and not separated. | 0 |  |
| 35 |  |  | 50-500 m, but separated by those features. | 1 |  |
| 36 |  |  | $0.5-5 \mathrm{~km}$, and not separated. | 0 |  |
| 37 |  |  | $0.5-5 \mathrm{~km}$, but separated by those features. | 0 |  |
| 38 |  |  | None of the above (the closest patches or corridors which are that large are $>5 \mathrm{~km}$ away). | 0 |  |
| 39 | OF6 | Herbaceous Uniqueness | The AA's vegetation cover is $>10 \%$ herbaceous* but uplands within 5 km have $<10 \%$ herbaceous cover. If so, enter " 3 " and continue to OF7. If not, consider: <br> The AA's vegetation cover is $>10 \%$ herbaceous* but uplands within 1 km have $<10 \%$ herbaceous cover. If so enter " 2 " and continue to Of7. If not, consider: <br> The AA's vegetation cover is $>10 \%$ herbaceous* but uplands within 100 m of the wetland edge have $<10 \%$ herbaceous cover. If so, enter "1". <br> [* NOTE: Exclude lamns, row crops, heavily grazed lands, forest, shrublands. Include moss as well as grasslike plants in this use of "herbaceous vegetation'] | 1 | For this question only, consider moss to be herbaceous vegetation. Determine the score by vieving aerial imagery in Google Earth after successively drawing or estimating the boundaries of the buffers of $5 \mathrm{~km}, 1 \mathrm{~km}$, and 100 m radius focused on the center of the AA. Circles of specified radius can be dramn in Google Earth Pro by clicking on the Ruler icon, then Circle in the pop-up menu. [AMN, PHN, POLv, SBMN, WBFv, WBNv] |
| 40 | OF1 | Woody Uniqueness | The AA's vegetation cover is $>10 \%$ woody* but uplands within $5 \mathrm{kmhave}<10 \%$ woody cover. If so, enter " 3 " and continue to OF8. If not, consider: <br> The AA's vegetation is $>10 \%$ woody ${ }^{\star}$ but uplands within 1 km have $<10 \%$ woody cover. If so enter " 2 " and continue to OF8. If not, consider: <br> The AA's vegetation is $>10 \%$ woody ${ }^{\star}$ but uplands within 100 m of the wetland edge have $<10 \%$ woody cover. If so, enter " 1 " <br> [* NOTE: woody cover = trees \& shrubs taller than 1 m ] | 0 | See above. Do not consider conifer plantations to be forest if it is obvious that trees were planted in rows. [AMN, PHV, POLv, SBMN] |
| 41 | OF8 | Local Vegetated Cover Percentage | Draw a 5 -km radius circle measured from the center of the AA. Ignoring all permanent water in the circle, the percent of the remaining are that is wooded or unmanaged herbaceous vegetation (NOT lawn, row crops, bare or heavily grazed land, clearcuts, or conifer plantations) is: |  | In Google Earth, draw the 5 km buffer and then estimate land cover percentages, or do GIS analysis of an appropriate land cover layer. [AM, PH, POL, SBM, Sens] |
| 42 |  |  | -5\% of the land. | 0 |  |
| 43 |  |  | 5 to 20\% of the land. | 0 |  |
| 44 |  |  | 20 to 60\% of the land. | 1 |  |
| 45 |  |  | 60 to $90 \%$ of the land. | 0 |  |
| 46 |  |  | >90\% of the land. SKIP to OF10. | 0 |  |
| 47 | OF9 | Type of Land Cover | Wthin the 5 -km radius circle, and ignoring all permanent water, the land area that is bare or non-perennial cover is mostly: |  | [AM, SBM] |
| 48 |  |  | Impervious surface, e.g., paved road, parking lot, building, exposed rock. | 0 |  |
| 49 |  |  | Bare pervious surface, e.g., lawn, recent (< 5 yrs ago) clearcut, dirt or gravel road, cropland, landslide, conifer plantation. | 1 |  |
| 50 | OF10 | Distance by Road to Nearest Population | Measured along the maintained road nearest the A , the distance to the nearestpopulation center is: |  | "Population center" means a settled area with more than about 5 regularly- inhabited structures per square kilometer In Google Earth Pro, click on the Ruler icon, then Path, and draw and measure the |
| 51 |  | Center | $<100 \mathrm{~m}$. | 0 |  |
| 52 |  |  | 100-500m. | 1 |  |
| 53 |  |  | $0.5-1 \mathrm{~km}$ | 0 |  |
| 54 |  |  | $1-5 \mathrm{~km}$ | 0 |  |
| 55 |  |  | -5km | 0 |  |
| 56 | OF11 | Distance to Nearest Maintained Road | From the center of the AA, the distance to the nearest maintained public road (dirt or paved) is: |  | Determine this by viewing aerial imagery in Google Earth Pro and measuring with the Ruler>Line |
| 57 |  |  | $<10 \mathrm{~m}$ | 1 |  |
| 58 |  |  | 10-25m. | 0 |  |
| 59 |  |  | 25-50m. | 0 |  |
| 60 |  |  | 50-100 m. | 0 |  |
| 61 |  |  | 100-500m. | 0 |  |
| 62 |  |  | >500 m. | 0 |  |


|  | A | B | C | D | E |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 63 | OF12 | Wildife Access | Draw a circle of radius of 5 km from the center of the $A A$ If marmals and amphibians can move from the center of the $A A$ to $A L L$ other separate wetlands and ponds located within the circle without being forced to cross pavement (any width), lawns, bare ground, and/or marine waters, mark $1=$ yes can move to all, $0=$ no. Change toblank if there are no other wetlands within 5 km . | 0 | Draw the 5 km circle in Google Earth Pro using the Circle tool and search for roads and wetlands within it, being alert for roads hidden under forest canopy. [AM, SBM, STR] |
| 64 | OF13 | Distance to Ponded Water | The distance from the AA center to the closest (but separate) ponded water body visible in Google Earth imagery is: |  | In Google Earth Pro, zoom in closely to examine the surrounding landscape for ponds, lakes, and wetlands that appear to be permanently flooded. [AM, PH, SBM, Sens, WBF, WBN] |
| 65 |  |  | -50 m, and not separated by any width of paved roads, stretches of open water, row crops, lamn, bare ground, or impervious surface. | 0 |  |
| 66 |  |  | 50 m , but completely separated by those features. | 0 |  |
| 67 |  |  | $50-500 \mathrm{~m}$, and not separated. | 0 |  |
| 68 |  |  | $50-500 \mathrm{~m}$, but separated by those features. | 1 |  |
| 69 |  |  | $0.5-1 \mathrm{~km}$, and not separated. | 0 |  |
| 70 |  |  | $0.5-1 \mathrm{~km}$, but separated by those features. | 0 |  |
| 71 |  |  | None of the above (the closest patches or corridors that large are >1 km away). | 0 |  |
| 72 | OF14 | Distance to Large Ponded Water | The distance from the AA center to the closest (but separate)non-tidal body of water that is ponded during most of the year and islarger than 8 hectares during most of a normal year is: |  | Determine this by viewing aerial imagery in Google Earth. [Sens, WBF, WBN] |
| 73 |  |  | $<100 \mathrm{~m}$ | 0 |  |
| 74 |  |  | $100 \mathrm{~m}-1 \mathrm{~km}$ | 0 |  |
| 75 |  |  | 1-2km. | 0 |  |
| 76 |  |  | 2-5 km | 0 |  |
| 77 |  |  | $5-10 \mathrm{~km}$ | 1 |  |
| 78 |  |  | $>10 \mathrm{~km}$ | 0 |  |
| 79 | OF15 | Tidal Proximity | The distance from the AA edge to the closesttidal water body (regardless of its salinity) is: |  | In Google Earth, measure the distance to the ocean (including Bay of Fundy) or tidal river, whichever is closer. If you need to see how far upriver a river is tidal, see the KNZ file provided with this calculator for NS (NS Headtide). Points shown in those files are only an approximation, so local information if available may be preferable. [FA, WBF] |
| 80 |  |  | $\angle 100 \mathrm{~m}$ | 0 |  |
| 81 |  |  | $100 \mathrm{~m}-1 \mathrm{~km}$ | 0 |  |
| 82 |  |  | $1-5 \mathrm{~km}$ | 0 |  |
| 83 |  |  | $5-10 \mathrm{~km}$ | 0 |  |
| 84 |  |  | $10-40 \mathrm{~km}$ | 1 |  |
| 85 |  |  | $>40 \mathrm{~km}$ | 0 |  |


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| 86 | OF16 | Upland Edge Contact | Select one: |  | [ NR , SBM, Sens] |
|  |  |  | The AA has no upland edge (or upland is <1\% of perimeter). The AA is entirely surrounded by (\& contiguous with) other wetlands or water. | 0 |  |
|  |  |  | 1-25\% of the AA's perimeter abuts upland (including filled areas). The rest adjoins other wetlands or water that is mostly wider than the AA | 0 |  |
| 89 |  |  | 25-50\% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA. | 0 |  |
| 90 |  |  | $50-75 \%$ of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA | 0 |  |
| 91 |  |  | More than $75 \%$ of the AA's perimeter abuts upland. Any remainder adjoins other wetlands or water that is mostly wider than the AA. This will be true for most assessments done with WESP-AC. | 1 |  |
| 92 | OF17 | Food Damage fromNon tidal Waters | Wthin 5 km downstream or downslope of the AA (select first true choice): |  | Contact local authories to determine if such maps exist. Where available, LDAR imagery can provide finer elevational resolution useful for flood modeling. [WSV] |
| 93 |  |  | Maps show Flood Zone or Flood Risk areas and there appears to be infrastructure vulnerable to river flooding not caused by tidal storm surges. | 0 |  |
| 94 |  |  | Maps show Food Zone or Flood Risk areas, but infrastructure is absent or is not vulnerable to floods from a non-tidal river. In some cases levees, upriver dams, or other measures may partly limit damage or risk from smaller events. | 0 |  |
| 95 |  |  | Maps do not show Food Zone or Food Risk areas (or no such mapping has been done locally) and there appears to be infrastructure vulnerable to river flooding unrelated to tidal storm surges. | 0 |  |
| 96 |  |  | Maps do not show Flood Zone or Food Risk areas (or no such mapping has been done locally) and there isno infrastructure vulnerable to river flooding unrelated to tidal storm surges. | 1 |  |
| 97 | OF18 | Relative Elevation in Watershed | In Google Earth, enable the Terrain layer (lower left menu) and open the NS_Watersheds Secondary KMZ file that accompanies this calculator. Then determine the AA's approximate elevation (bottom right, NOT the "eye alt'). Then move cursor around to determine the watershed's maximum and minimum elevation. Divide the AA's elevation by the (max-min). | 0.08 | [FA, NR, Sens, SFSV, WCV, WSv] |
| 98 | OF19 | Water Quality Sensitive Watershed or Area | The AA is in a Protected Water Supply area (Designated Water Supply Area, Natural Watershed Municipal Surface Water Supply Area, or Municipal Water Supply Area) according to the provided KMZ overlay ("NS Protected Water Supply Areas'). Enter 1= yes, 0= no. | 0 | If an ACCDC report is available for this AA, it also may contain such information. [NRV] |


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| 99 |  | Degraded Water Upstream | Sampling indicates a problem with concentrations of metals, hydrocarbons, nutrients, or other substances (excluding bacteria, acidic water, high temperatures) being present at levels harmful to aquatic life or humans, and: |  | May use existing data, or sample those waters as part of this wetland assessment. "Harmful" should be evaluated with regard to current federal or provincial water quality standards. [AM, FA, FR, NRV, PRV, SRV, STR, WBF, WBN] |
| 100 |  |  | The condition is present within the AA | 0 |  |
| 101 |  |  | The condition is present in waters within 1 km that flowinto the AA, but has not been documented in the AA itself. | 0 |  |
| 102 |  |  | Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters. | 0 |  |
| 103 |  |  | Data are insufficient (no or inadequate sampling within 1 km , or condition exists only at $>1 \mathrm{~km}$ upstream). This is the situation for nearly all wetlands in this region. | 1 |  |
| 104 | OF21 | Degraded | The problem described above is downslope fromthe AA, and: |  | May use existing data, or monitor waters as part of this wetland assessment. [NRV, PRv, SRV] |
| 105 |  | Donnstream | The condition is present within 1 km downslope and connected to the AA by a channel. | 0 |  |
| 106 |  |  | The condition is present within 5 km downslope and connected to the AA by a channel, or within 1 km but not connected to the AA by a channel. | 0 |  |
| 107 |  |  | Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters. | 0 |  |
| 108 |  |  | Data are insufficient (no or inadequate sampling within 1 km , or condition exists only at $>1 \mathrm{~km}$ upstream). This is the situation for nearly all wetlands in this region. | 1 |  |
| 109 | OF22 | Wetland as a \% of Its Contributing Area (Catchment) | From a topographic map and field observations, estimate the approximate boundaries of the catchment (CA) of the entire wetland of which the AA may be only a part. Then adjust those boundaries if necessary based on your field observations of the surrounding terrain, and/or by using procedures described in the Manual. Divide the area of the wetland (not just the $A A$ ) by the approximate area of its catchment excluding the area of the wetland itself. When doing the calculation, if ponded water is adjacent to the wetland, include that in the wetland area. The result is: |  | Topographic maps may be viewed online at the National Atlas of Canada (Toporama): http://atlas.gc.ca/toporama/en/index.htmI [NR, PR, Sens, SR, WS] |
| 110 |  |  | <0.01, or catchment size unknown due to stormwater pipes that collect water from an indeterminate area. | 1 |  |
| 111 |  |  | 0.01 to 0.1. | 0 |  |
| 112 |  |  | 0.1 to 1. | 0 |  |
| 113 |  |  |  | 0 |  |
| 114 | OF23 | Unvegetated Surface in the Contributing Area | The proportion of the AA's contributing area (measured to no more than 1000 m upslope) that is comprised of buildings, roads, parking lots other pavement, exposed bedrock, landslides, and other mostly-bare surface is about : |  | [FA, INV, NRV, PRV, SRv, STR, WCV, WSV] |
| 115 |  |  | <10\% | 0 |  |
| 116 |  |  | 10 to $25 \%$ | 0 |  |
| 117 |  |  | >25\% | 1 |  |
| 118 | OF24 | Transport From Upslope | A relatively large proportion of the precipitation that falls farther upslope in the CA reaches this wetland quickly as runoff (surface water), as indicated by the following: <br> (a) input channel is present, <br> (b) input channels have been straightened, <br> (c) upslope wetlands have been ditched extensively, <br> (d) land cover is mostly non-forest, <br> (e) CA slopes are steep, and/or <br> (f) most CA soils are shallow (bedrock near surface) and/or have high runoff coefficients. <br> This statement is: |  | [NRV, PRV, SRv, WSU] |
| 119 |  |  | Mostly true. | 0 |  |
| 120 |  |  | Somenhat true. | 1 |  |
| 121 |  |  | Mostly untrue. | 0 |  |
| 122 | OF25 | Aspect | The overland flow direction of most surface water (in streams, rivers, or runoff) that enters the AA is: |  | [AM, NR, SFS, WC, WS] |
| 123 |  |  | Northward (N, NE). north-facing contributing area | 1 |  |
| 124 |  |  | Southward (S, SW). south-facing contributing area. | 0 |  |
| 125 |  |  | Other (E, SE, W, M M), or no detectable uphill slope or input channel (flat). | 0 |  |
| 126 <br> 127 | OF26 | Internal FowDistance (Path Length) | The horizontal flow distance from the wetland's inlet to outlet is: <br> 10 m | 0 | Identify inlets and outlets, if any, from topographic maps (use elevations to determine which are inlets and which are outlets) and augment by field inspection. With the Provincial Landscape Viewer, select Nova.Scotia Tonnas the Baseman Also enable the laver ForestnsW/AM Predicted Flow Then |


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| 128 |  |  | 10-50m. | 0 | measure the inlet-outlet distance. [NR, OE, PR, SR, WS] |
| 129 |  |  | 50-100 m. | 1 |  |
| 130 |  |  | 100-1000 m. | 0 |  |
| 131 |  |  | 1-2 km. | 0 |  |
| 132 |  |  | $>2 \mathrm{~km}$, or wetland lacks an inlet and outlet. | 0 |  |
| 133 | OF27 | Growing Degree Days | In Google Earth, open the KMZ file that accompanies this calculator, called NS_GrowingDegreeDays. Place your cursor over the AA and left-click. From the pop-up window, enter the GRIDCODE number in the next column. | 2200 | This layer was provided by Dr. Dan McKenney of the Canadian Forest Service [AM, CS, FR, INV, NR, OE, PH, PR, Sens, SR, WBF, WCV, WS] |
| 134 | OF28 | Fish Access or Use | According to agency biologists and/or your own observations, the AA [ N ark just the first choice that is true.]: |  | Regarding the last choice, if uncertain if an $A A$ is fishless, consider the possibility its waters have been stocked. [AM, FA, FR, INN, WBF, WBN] |
| 135 |  |  | Is known to support rearing and/or spawning by Atlantic salmon or other anadromous species or eels. Go to Provincial Landscape Viewer>Mildlife>Significant Habitat>Species at Risk. Contact local fishery biologists, review the ACCDC report, and visit these websites: http://wuw.salmonatlas.com/atlanticsalmon/canada-eastindex.1.html http://atlanticsalmonfederation.org/rivers/introduction.htm | 0 |  |
| 136 |  |  | Has not been documented to support Atlantic salmon rearing and/or spawning, but is connected to nearby waters likely to contain Atlantic salmon or other anadromous species or eels and is probably accessed by those during some conditions. | 0 |  |
| 137 |  |  | Is probably is not accessed by any anadromous fish species but is known or likely to haveother fish at least seasonally. | 0 |  |
| 138 |  |  | Is known or likely to be fishless (e.g., too small, dry, and/or not accessible even temporarily, and not stocked). | 1 |  |
| 139 | of29 | Species of Conservation Concern | Wthin the past 10 years, in the AA (or in its adjoining waters or wetland), qualified observers have documented ${ }^{\text {a }}$ ( ${ }^{\text {ark all applicable]: }}$ |  | Request information from ACCDC and/or conduct your own survey at an appropriate season using a approved protocol. For birds, also check eBird.org. [AMN, EC, PHN, POLv, SBMN, Sens, WBFV, wBN] |
|  |  |  | Presence of one or more of the plant species listed in the Plants_Rare worksheet of the accompanying Supplnfo file, or the AA is within a mapped Atlantic Coastal Plain Fora Buffer (go to Provincial Landscape Viewer> Wildlife> Special Management Practice Zones). | 0 |  |
| $\begin{array}{\|l\|} \hline 141 \\ \hline 142 \\ \hline \end{array}$ |  |  | Presence of one or more of the amphibian or reptile species (AM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying Supplnfo file. | 0 |  |
|  |  |  | Presence of one or more of thewaterbird species (MBF, WBN) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying Supplnfo file. | 0 |  |
| 143 |  |  | Presence of one or more of the nestingsongbird or raptor species (SBM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying Supplnfo file, during their nesting season (May-July for most species). | 0 |  |
| 144 |  |  | None of the above, or no data. | 1 |  |
| 145 | OF30 | Important Bird Area (IBA) | In Google Earth, open the KMZ file that accompanies this calculator, calledIBAs_Canada The AA is all or part of an officially designated IBA. Enter 1=yes, $0=$ no. | 0 | The source of this layer, which should be checked periodically for updates, is: http://umw.ibacanada.com/mapviewer.jsp?lang=EN [SBMN, WBFv, WBN] |
| 146 | OF31 | Black Duck Nesting Area | In Google Earth, open the KMZ file that accompanies this calculator, called BlackDuck. Adjust its alignment and opacity. Determine the predicted density (pairs per $25 \mathrm{sq} . \mathrm{km}$ ) of nesting American Black Duck in the AA's vicinity: $<10$ (enter 0), 10-20 (enter 1), 20-30 (enter 2), $>30$ (enter 3). If outside of region shown in map, change toblank | 0 | This was provided by Dr. David Leske. [WBNW] |
| 147 | OF32 | Wintering Deer or Moose Concentration Areas | If $A A$ is on private land with no information, change toblank (not 0). Otherwise: Wth the Provincial Landscape Viewer, for Wintering Moose, go to Wildilife> Significant Habitat. For Mainland Moose Concentration Areas, go to Wildlife> Special Management Practice Zones Enter: yes=1, no= 0 . |  | [SBM] |
| 148 | OF33 | Other Conservation Designation | The AA is all or part of an area designated by government, Frist Nations, or the Nature Conservancy of Canada (NCC) for its exceptional ecological features or highly intact natural conditions. With Provincial Landscape Viewer, see Protected Areas. Enter: yes=1, no=0. If uncertain, consult NCC and agencies for more recent information. | 0 | See: https://novascotia.ca/parksandiprotectedareas/plan/interactive-map/ [PU] |
| 149 | OF34 | Conservation Investment | The AA is part of or contiguous to a wetland on which public or private organizational funds were spent to preserve, create, restore, or enhance the wetland (excluding mitigation wetlands). Ask the property owner. Enter: yes=1, no= 0 . If no information, change tdblank (not 0). | 0 | [PU] |
| 150 | OF35 | Mtigation Investment | The AA is all or part of a mitigation site used explicitly to offset impacts elsewhere. Ask the property owner. Enter: yes=1, no= 0 . If no information, change toblank. | 0 | [PU] |
| 151 | OF36 | Sustained Scientific Use | Plants, animals, or water in the AA have been monitored for $>2$ years, unrelated to any regulatory requirements, and data are available to the public. Or the AA is part of an area that has been designated by an agency or institution as a benchmark, reference, or status-trends monitoring area. Ask the property owner. Enter: yes=1, no=0. If no information, change toblank |  | [PU] |
| 152 | OF37 | Calcareous Region | The AA is NOT in a subregion that has been heavily exposed to acid precipitation. Enter " 1 " if true (green or yellow in map in Appendix AO the Manual). Enter "O" if false. If no information, change toblank |  | [AM, FA, RR, INV, PH] |
| 153 | OF38 | Omership | Select the ONE ownership that covers the most of the AA. In Google Earth, open KMZ file called NS_CrownlandsUse more recent information if available. |  | "Private lands" may include those owned or leased by non-govermmental organizations, e.g., charitable conservation land trusts, DUC, TNC. [PU, STR] |



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|  | Date: | 18 August 2021 | Site Identifier Cambridge interchange wetland 1 | Investiga | ator: BL, CP |
|  | Form F (Field). Non-tidal Wetland Data Form. WESP-AC version 2 for Nova Scotia. DIRECTIONS: Walk for no less than 10 minutes from the wetland edge towards its core, in the part of the AA that is proposed for alteration. If no alteration is proposed, walk in a portion that appears to be most representative of the wetland overall. Walk only where it is safe and legal to do so. Conduct the assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answer these questions primarily based on your onsite observations and interpretations. Do not write in shaded parts of this data form. Answering some questions accurately may require conferring with the landowner or other knowledgable persons, and/or reviewing aerial imagery. For most wetlands, completing this field data form will require 1-2 hours on a site. For a list of functions to which each question pertains, see the accompanying Interpretations form. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage \& Delay, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention \& Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian \& Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, \& Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use \& Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors. |  |  |  |  |
| 3 | \# | Indicators | Condition Choices | Data | Definitions/Explanations |
| 4 | F1 | Wetland Type | Follow the key below and mark the ONE row that best describes MOST of the vegetated part of the AA: <br> A. Moss and/or lichen cover more than $25 \%$ of the ground. Often dominated by ericaceous shrubs (e.g., Labrador tea) or other acid-tolerant plants (e.g., bog cranberry, pitcher plant, sundew, orchids). Substrate is mostly undecomposed peat. Choose between A1 and A2 and mark the choice with 1 in their adjoining colurnn. Othervise go to $B$ below. |  | Ericaceous shrubs are ones in the heather family (Ericaceae). Most have leathery evergreen leaves. They include rhododendron, azalea, swamp laurel, leatherleaf, Labrador tea, and others. Most require acidic soil. Athough not in the family Ericaceae, sweetgale (Myrica gale) should be counted also. [AM, CS, FA, FR, INN, NR, OE, PH, Sens, SFS, WBF, WBN] |
|  |  |  | A1. Surface water is usually absent or, if present, pH is typically $<4.5$ and conductivity is usually $<100 \mu \mathrm{~S} / \mathrm{cm}$ ( 664 ppm TDS). Trees are absent or nearly so. Sedge cover usually sparse or absent but cottongrass and/or lichen cover may be extensive, as well as cloudberry, lingonbery, sheep laurel, and a sedge (Carex rariflora). Wetland surface and surrounding landscape are seldom sloping and wetland often is domed (convex). Inlet and outlet channels are usually absent. If known, pH of peat is $<4.0$. | 1 |  |
| 7 |  |  | A2 Not A1. Surface water, if present, has pH typically $>4.5$ and conductivity is usually $>100 \mu \mathrm{~S} / \mathrm{cm}(>64 \mathrm{ppm} \mathrm{TDS})$. Sedge cover is usually extensive, and/or tree and tall shrub cover is extensive. Sometimes at toe of slope or edge of water body. An exit channel is usually present. Wetter than A1 and peat depth may be shallower ( 42 m ). | 0 |  |
| 8 |  |  | B. Moss and/or lichen cover less than $25 \%$ of the ground. Soil is mineral or decomposed organic (muck). Choose between B1 and B2 and mark the choice with a 1 in their adjoining column: |  |  |
| 9 |  |  | B1. Trees and shrubs taller than 1 m comprise more than $25 \%$ of the vegetated cover. Surface water is mostly absent or inundates the vegetation only seasonally (e.g., vernal pools or floodplain). | 0 |  |
| 10 |  |  | B2. Not B1. Tree \& tall shrubs comprise less than than 25\% of the vegetated cover. Vegetation is mostly herbaceous, e.g., caltail, bulrush, burreed, pond lily, horsetail. Surface water may be extensive and fluctuates seasonally, being either persistent or dnying up partly or entirely. | 0 |  |
|  | Reminder: For all questions, the AA should include all persistent waters in ponds smaller than 8 hectares ( -283 m on a side) that are adjacent to the $A \mathrm{~A}$ The AA should also include part of the water area of adjacent ponded water larger than 8 ha and adjacent rivers wider than 20 m Specifically, the AA should include the open water part adjacent to wetland vegetation and equal in width to the average width of that vegetated zone. Throughout this data form, "adjacent " is used symonymously with abutting, adjoining, bordering, contiguous -- and means no upland (manmade or natura) completely separates the described features along their directly shared edge. Features joined only by a channel are not necessarily considered to be adjacent -- a large portion of their edges must match. The features do not have to be hydrologically connected in order to be considered adjacent. |  |  |  |  |
| 11 | F2 |  |  |  | 1 hectare is 10,000 sq. mor about 2.5 acres. It could have dimensions of $100 \mathrm{mby} 100 \mathrm{~m}, 1000 \mathrm{mby}$ 10 m , or similar. [AM, IN, SBM, WBF] |
| 12 |  | $\begin{aligned} & \text { Wetland Types - } \\ & \text { Adjoining or } \\ & \text { Subordinate } \end{aligned}$ | If the $A A$ is smaller than 1 ha, mark all other types that occupy more than $1 \%$ of the vegetated $A A$ If the $A A$ is larger than 1 ha, mark all other types which are within or adjacent to the $A A$ and occupy more than 1 ha, as visible from the $A A$ or as interpreted from aerial imagery. Do not mark again the type marked in F1. |  |  |
| 13 |  |  | A1. | 0 |  |
| 14 |  |  | A2. | 1 |  |
| 15 |  |  | B1. | 0 |  |
| 16 |  |  | B2. | 0 |  |
| 17 <br> 18 | F3 | Woody Height \& Form Diversity | Following EACH row below, indicate with a number code the percentage of the living vegetation in the AA which is occupied by that feature <br> ( $\mathbf{6}$ if $>95 \%, \mathbf{5}$ if $75-95 \%, \mathbf{4}$ if $50-75 \%, \mathbf{3}$ if $25-50 \%, \mathbf{2}$ if $5-25 \%, \mathbf{1}$ if $-5 \%$, $\mathbf{0}$ if none). If the vegetated part of the AA is largely herbaceous (non- <br> woody) vegetation, these percentages should not sum to $100 \%$ <br> coniferous trees (may include tamarack) taller than 3 m |  | Deciduous shrubs in this region usually include buttonbush, Labrador tea, bayberry (Morella), huckleberry, cranberry, cloudberry, sweetgale, alder, willow, birch, ash, dogwood, and a few others. If you assigned a code of 3 or higher to any of the first four choices and the ground cover beneath the trees/shrubs is $<25 \%$ moss, then question F1 might be "B1". [CS, IN $, ~ N R, ~ P H, ~ P O L, ~ S B M, ~ S e n s] ~$ |


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| 19 |  |  | deciduous trees taller than 3 m | 3 |  |
| 20 |  |  | coniferous or ericaceous shrubs or trees 1-3 mtall not directly below the canopy of trees. | 4 |  |
| 21 |  |  | deciduous shrubs or trees 1-3 m tall not directly below the canopy of trees. | 3 |  |
| 22 |  |  | Coniferous or ericaceous shrubs $<1 \mathrm{mtall}$ not directly below the canopy of taller vegetation. | 3 |  |
| 23 |  |  | deciduous shrubs or trees $<1 \mathrm{mtall}$ (e.g., deciduous seedlings) not directly below the canopy of taller vegetation. | 3 |  |
| 24 | Note: If none of top 4 rous in F3 was marked 2 or greater, SKIP to F9 (N fixers). |  |  |  |  |
| 25 | F4 | Dominance of Most Abundant Shrub Species | Determine which two woody plant species comprise the greatest portion of the low ( $\langle 3 \mathrm{~m}$ ) woody cover. Then choose one: |  | [PH, POL, SBM, Sens] |
| 26 |  |  | those species together comprise $>50 \%$ of such cover. | 1 |  |
| 27 |  |  | those species together do not comprise $>50 \%$ of such cover. | 0 |  |
| 28 | F5 | Woody Diameter Classes | Mark $A L L$ the types that comprise $>5 \%$ of the woody canopy cover in the AA or $>5 \%$ of the wooded areas (if any) along its upland edge (perimeter). The edge should include only the trees whose canopies extend into the AA |  | Estimate the diameters at chest height. If small-diameter trees are overtopped (shaded) by larger ones, visualise a "subcanopy' at the average height of the smaller-dbh trees, to serve as a basis for the minimum $5 \%$ canopy requirement in this question. The trees and shrubs need not be wetland species. [AM, CS, POL, SBM, Sens, WBN] |
| 29 |  |  | Coniferous, $1-9 \mathrm{~cm}$ diameter and $>1 \mathrm{~m}$ tall. | 1 |  |
| 30 |  |  | broad-leaved deciduous 1-9 cm diameter and $>1 \mathrm{mtall}$. | 1 |  |
| 31 |  |  | coniferous, $10-19 \mathrm{~cm}$ diameter. | 1 |  |
| 32 |  |  | broad-leaved deciduous $10-19 \mathrm{~cm}$ diameter. | 1 |  |
| 33 |  |  | coniferous, $20-40 \mathrm{~cm}$ diameter. | 1 |  |
| 34 |  |  | broad-leaved deciduous $20-40 \mathrm{~cm}$ diameter. | 1 |  |
| 35 |  |  | coniferous, 740 cm diameter. | 0 |  |
| 36 |  |  | broad-leaved deciduous $>40 \mathrm{~cm}$ diameter. | 0 |  |
| 37 | F6 | Height Class Interspersion | Follow the key below and mark the ONE row that best describes MOST of the AA: |  | [AM, IN, NR, PH, SBM, Sens] |
|  |  |  | A. Neither the vegetation taller than 1 m nor the vegetation shorter than that comprise $>70 \%$ of the vegetated part of the $A A$. They each comprise $30-70 \%$ Choose between A1 and A2 and mark the choice with 1 in the adjioining colum. Otherwise go to B below. |  |  |
| 38 |  |  |  |  |  |
|  |  |  | A1 The two height classes are mostly scattered and intermixed throughout the AA | 0 |  |
| 40 |  |  | A2 Not A1. The two height classes are mostly in separate zones or bands, or in proportionately large clumps. | 1 |  |
| 41 |  |  | B. Either the vegetation shorter than 1 mcomprises $>70 \%$ of the vegetated part of the $A A$, or the vegetation taller than that does. One size class might even be totally absent. Choose between B1 and B2 and mark the choice with 11 in the adjoining column: |  |  |
| 42 |  |  | B1 The less prevalent height class is mostly scattered and intermixed within the prevalent one. | 0 |  |
| 43 |  |  | B2. Not B1. The less prevalent height class is mostly located apart from the prevalent one, in separate zones or clumps, or is completely absent. | 0 |  |
| 44 | 7 | Large Snags (Dead Standing Trees) | The number of large snags (diameter $\mathbf{2 0} \mathbf{~ c m}$ ) in the AAplus adjacent upland area within 10 m of the wetland edge is: |  | Snags are dead standing trees that often (not always) lack bark and foliage. Include only ones that are at least 2 mtall . [POL, SBM, WBN] |
| 45 |  |  | None, or fewer than $8 /$ hectare which exceed this diameter. | 0 |  |
| 46 |  |  | Several ( $>8 / \mathrm{hectare)}$ ) and a pond, lake, or slow-flowing water wider than 10 mis within 1 km | 1 |  |
| 47 |  |  | Several ( $>8 / \mathrm{hectare} \mathrm{)}$ but above not true. | 0 |  |
| 48 | F8 | Downed Wood | The number of downed wood pieces longer than $\mathbf{2 m}$ and with diameter $>10 \mathrm{~cm}$, and not persistently submerged, is: |  | Exclude temporary "bum piles." [AM, IN N, POL, SBM] |
| 49 |  |  | Few or none that meet these criteria. | 0 |  |
| 50 |  |  | Several ( $>5$ if $A$ A is $>5$ hectares, less for smaller $A$ As) meet these criteria | 0 |  |
| 51 | F9 | NFixers | The percentage of the AA's vegetated cover that contains nitrogen-fixing plants (e.g., alder, sweetgale, clover, lupine, alfalfa, other legumes) is: |  | Do not include $N$-fixing algae or lichens. [FA, $\mathrm{PR}, \mathrm{IN} N, N \mathrm{NR}, \mathrm{OE}, \mathrm{PH}, \mathrm{SBM}$, Sens] |
| 52 |  |  | <1\%or none. | 0 |  |
| 53 |  |  | 1-25\% of the vegetated cover, in the $A A$ or along its water edge (whichever has more). | 1 |  |
| 54 |  |  | $25-50 \%$ of the vegetated cover, in the AA or along its water edge (whichever has more). | 0 |  |
| 55 |  |  | $50-75 \%$ of the vegetated cover, in the AA or along its water edge (whichever has more). | 0 |  |
| 56 |  |  | $>75 \%$ of the vegetated cover, in the $A A$ or along its water edge (whichever has more). | 0 |  |
| 57 | F10 | Sphagnum Moss Extent | The cover of Sphagnum moss (or any moss that forms a dense cushion many centimeters thick), including the moss obscured by taller sedges and other plants rooted in it, is: |  | Exclude moss growing on trees and rocks. [CS, PH] |
| 58 |  |  | -5\% of the vegetated part of the AA | 0 |  |
| 59 |  |  | $5-25 \%$ of the vegetated part of the $A$ A | 0 |  |
| 60 |  |  | 25-50\% of the vegetated part of the AA | 0 |  |
| 61 |  |  | 50-95\% of the vegetated part of the AA | 0 |  |
| 62 |  |  | >95\% of the vegetated part of the AA | 1 |  |



|  | A | B | C | D | E |
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| 103 |  |  | 50-95\% of the vegetated area | 0 |  |
| 104 |  |  | -95\% of the vegetated area | 0 |  |
| 105 | F19 | Dominance of Most Abundant Herbaceous | Determine which two herbaceous species comprise the greatest portion of the herbaceous cover (excluding mosses and floating-leaved aquatic plants). Then choose one of the following: |  | For this question, indude fems as well as graminoids and forbs. [EC, IN, PH, POL, Sens] |


|  | A | B | C | D | E |
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| 106 |  | Species | those species together comprise $>50 \%$ of the areal cover of herbaceous plants at any time during the year. | 0 |  |
| 107 |  |  | those species together do not comprise $>50 \%$ of the areal cover of herbaceous plants at any time during the year. | 1 |  |
| 108 | F20 | Invasive Plant Cover | How extensive is the cover of invasive plant species in the AA? For species, see Plants_invasive worksheet in the accompanying Supplnfo file. |  | [EC, PH, POL, Sens] |
| 109 |  |  | invasive species appear to be absent in the AA, or are present only in trace amount (a few individuas). | 1 |  |
| 110 |  |  | invasive species are present in more than trace amounts, but comprise $<5 \%$ of herbaceous cover (or woody cover, if the invasives are woody). | 0 |  |
| 111 |  |  | invasive species comprise 5-20\% of the herb cover (or woody cover, if the invasives are woody). | 0 |  |
| 112 |  |  | invasive species comprise $20-50 \%$ of the herb cover (or woody cover, if the invasives are woody). | 0 |  |
| 113 |  |  | invasive species comprise $>50 \%$ of the herb cover (or woody cover, if the invasives are woody). | 0 |  |
| 114 | F21 | Invasive Cover Along Upland Edge | Along the wetland-upland boundary, the percent of the upland edge (within 3 mupslope from the wetland) that is occupied by invasive plant species is: |  | If a plant cannot be identified to species (e.g., winter conditions) but its genus contains an exotic species, assume the unidentified plant to also be exotic. If vegetation is so senesced that exotic species cannot be identified, answer "none". [PH, STR] |
| 115 |  |  | none of the upland edge (invasives apparently absent), or AA has no upland edge. | 1 |  |
| 116 |  |  | some (but -5\%) of the upland edge. | 0 |  |
| 117 |  |  | 5-50\% of the upland edge. | 0 |  |
| 118 |  |  | most ( $>50 \%$ ) of the upland edge. | 0 |  |
| 119 | F22 | Fringe Wetland | During most of the year, open water within or adjacent to the vegetated part of the wetland is much wider than the maximum width of the vegetated zone within the wetland. Enter "1" if true, "0" if false. | 0 | [MBF, WBN, WCV] |
| 120 | F23 | Lacustrine Wetland | The vegetated part of the AA is within or adjacent to a body of non-tidal standing open water whose size exceeds 8 hectares during most of a normal year. | 0 | $[\mathrm{FR}, \mathrm{PR}, \mathrm{PU}, \mathrm{WBF}, \mathrm{WBN}]$ |
| 121 | F24 | \% of AA Without Surface Water | The percentage of the AA that never contains surface water during an average year (that is, except perhaps for a few hours after snowmelt on rainstorms), but which is still a wetland, is: |  | 1 hectare is 10,000 sq. mor about 2.5 acres. It could have dimensions of $100 \mathrm{mby} 100 \mathrm{~m}, 1000 \mathrm{mby}$ 10 m , or similar. [AM, FA, FR, INN, NR, PH, PR, SBM, Sens, SRv, WBF, WBN, WC] |
| 122 |  |  | $<1 \%$. In other words, all or nearly all of the AA is covered by water permanently or at least seasonally. | 0 |  |
| 123 |  |  | 1-25\% of the AA , or $<1 \%$ but $>0.01$ ha never contains surface water. | 0 |  |
| 124 |  |  | 25-50\% of the AA never contains surface water. | 0 |  |
| 125 |  |  | $50-75 \%$ of the AA never contains surface water. | 0 |  |
| 126 |  |  | $75-99 \%$ of the AA never contains surface water, or >99\% AND there is at least one persistent water body larger than 1 ha in the AA | 0 |  |
| 127 |  |  | 99-100\% AND there is no persistent ponded water body larger than 1 ha vithin the AA. Enter "1" andSKIP to F42 (Channel Connection). | 1 |  |
| 128 | F25 | \% of AA with Persistent Surface Water | Identify the parts of the $A$ that still contain surface water (flowing or ponded, open or hidden beneath vegetation) even during the driest times of a normal year, i.e., when the AA's surface water is at its lowest annual level. At that time, the percentage of the AA that still contains surface water is: |  | If you are unable to determine the condition at the driest time of year, ask the land owner or neighbors about it if possible. Indicators of persistence may include fish, some dragonflies, beaver, and muskrat. [AM, CS, FA, FR, INV, NR, POL, PR, SBM, WBF, WBN] |
| 129 |  |  | None. The AA dries up completely (no water in channels either) or never has surface water during most years. SKIP to F27. | 0 |  |
| 130 |  |  | 1-20\% of the AA. | 0 |  |
| 131 |  |  | 20-50\% of the AA | 0 |  |
| 132 |  |  | 50-95\% of the AA | 0 |  |
| 133 |  |  | >95\% of the AA True for many fringe wetlands. | 0 |  |
| 134 | F26 | \% of SummertimeWater that Is Shaded | At mid-day during the warmest time of year, the area of surface watervithin the AA that is shaded by vegetation and other features that are within the AA at that time is: |  | [FA, WC] |
| 135 |  |  | -5\% of the water is shaded, or no surface water is present then. | 0 |  |
| 136 |  |  | $5-25 \%$ of the water is shaded. | 0 |  |
| 137 |  |  | $25-50 \%$ of the water is shaded. | 0 |  |
| 138 |  |  | 50-75\% of the water is shaded. | 0 |  |
| 139 |  |  | >75\% of the water is shaded. | 0 |  |
| 140 | F27 | \% of AA that is fooded Only Seasonally | The percentage of the AA's area that is between the annual high water and the annual low water (surface water) is: |  | Flood marks (algal mats, adventitious roots, debris lines, ice scour, etc.) are often evident when not fully inundated. Aso, such areas often have a larger proportion of upland and annual (vs. perennial) plant species. In riverine systems, the extent of this zone can be estimated by multiplying by 2 the bankful height and visualising where that would intercept the land along the river. [CS, FA, INN, NR, OE, PH, SR, WBF, WBN, WS] |
| 141 |  |  | None, or <0.01 hectare and <1\% of the AA SKIP to F29. | 0 |  |
| 142 |  |  | 1-20\% of the AA, or <1\% but $>0.01$ ha | 0 |  |
| 143 |  |  | 20-50\% of the AA | 0 |  |


|  | A | B | C | D | E |
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| 144 |  |  | 50-95\% of the AA | 0 |  |
| 145 |  |  | >95\% of the AA | 0 |  |
| 146 <br> 147 <br> 148 <br> 149 <br> 150 <br> 151 | F28 | Annual Water Fuctuation Range | The annual fluctuation in surface water level within most of the parts of the AA that contain surface water at least temporarily is: |  | Look for flood marks (see above). Because the annual range of water levels is difficult to estimate without multiple visits, consider asking the land owner or neighbors about it. [AM, CS, INV, NR, OE, PH, PR, SR, WBN, WS] |
|  |  |  | $<10$ cm change (stable or nearly so). | 0 |  |
|  |  |  | $10 \mathrm{~cm}-50 \mathrm{~cm}$ change. | 0 |  |
|  |  |  | 0.5-1 m change. | 0 |  |
|  |  |  | 1-2 m change. | 0 |  |
|  |  |  | >2 m change. | 0 |  |
|  | Is the AA plus adjacent ponded water smaller than 0.01 hectare (about $10 \mathrm{~m} \times 10 \mathrm{~m}$, or $1 \mathrm{~m} \times 100 \mathrm{~m}$ )? If so, enter " 1 " in column D andSKIP TO F42 (Connection). |  |  | 0 |  |
| 153 | F29 | Predominant Depth Class | During most of the time when surface water is present during the growing season, its depth, averaged over the entire inundated part of the AA , is: |  | If a boat is unavailable, estimate this by considering wetland size and local topography. Or if timing and safety allow, depths may be measured by drilling through winter ice. This question is asking about the spatial median depth that occurs during most of that time, even if inundation is only seasonal or temporary. If inundation in most but not all of the wetland is brief, the answer will be based on the deptr of the most persistently inundated part of the wetland. Include surface water in channels and ditches as well as ponded areas. [CS, FA, FR, INV, OE, PH, PR, Sens, SFS, SR, WBF, WBN, WC] |
| 154 |  |  | $<10 \mathrm{~cm} \mathrm{deep} \mathrm{(but}>0$ ). | 0 |  |
| 155 |  |  | 10-50 cm deep. | 0 |  |
| 156 |  |  | 0.5-1 mdeep. | 0 |  |
| 157 |  |  | 1-2 mdeep. | 0 |  |
| 158 |  |  | >2 deep. True for many fringe wetlands. | 0 |  |
| 159 | F30 | $\begin{array}{\|l} \hline \text { Depth Classes - } \\ \text { Evenness of } \\ \text { Proportions } \end{array}$ | When present, surface water in most of the AA usually consists of (select one): |  | Estimate these proportions by considering the gradient and microtopography of the site. [FR, INV, WBF, WBN] |
| 160 |  |  | One depth class that comprises >90\% of the AA's inundated area (use the classes in the question above). | 0 |  |
| 161 |  |  | One depth class that comprises 50-90\% of the AA's inundated area | 0 |  |
| 162 |  |  | Neither of above. There are 3 or more depth classes and none occupy $>50 \%$ a | 0 |  |
| 163 | F31 | \% of Water That Is Ponded (not Fowing) | During most times when surface water is present, the percentage that is (1)ponded (stagnant, or flows so slowly that fine sediment is not held in suspension) AND (2) is likely to be deeper than 0.5 min some places, is: |  | Nearly all wetlands with surface water have some ponded water. [AM, CS, INN, NR, OE, PR, Sens, SR, WBF, WBN, WC, WS] |
| 164 |  |  | -5\% of the water, or it occupies $<100$ sq.m cumulatively. Nearly all the surface water is flowing. SKIP to F34. | 0 |  |
| 165 |  |  | 5-30\% of the water. | 0 |  |
| 166 |  |  | 30-70\% of the water. | 0 |  |
| 167 |  |  | 70-95\% of the water. | 0 |  |
| 168 |  |  | >95\% of the water. | 0 |  |
|  | F32 | Ponded Open Water Minimum Size | During most of the growing season, the largest patch of open water that is ponded and is in or bordering the $A A$ is $>0.01$ hectare (about 10 mby 10 m ) and mostly deeper than 0.5 m If true enter " 1 " and continue, If false, enter " 0 " andSKIP to F41 (Floating Algae \& Duckweed). | 0 | Open water is not obscured by vegetation in aerial ('duck's eye') view. It includes vegetation floating on the water surface or entirely submersed beneath it. |
| 169 |  |  |  |  |  |
| 170 | F33 | \% of Ponded Water that is Open | In ducks-eye aerial view, the percentage of the ponded water that isopen (lacking emergent vegetation during most of the growing season, and unhidden by a forest or shrub canopy) is: |  | [AM, CS, FA, FR, INN, NR, OE, PR, SR, WBF, WBN, WC] |
| 171 |  |  | None, or $<1 \%$ of the AA and largest pool occupies $<0.01$ hectares. Enter "1" and SKIP to F41 (Hoating Algae \& Duckweed). | 0 |  |
| 172 |  |  | 1-4\% of the ponded water. Enter "1" and SKIP to F41 (Floating Agae \& Duckweed). | 0 |  |
| 173 |  |  | 5-30\% of the ponded water. | 0 |  |
| 174 |  |  | 30-70\% of the ponded water. | 0 |  |
| 175 |  |  | 70-99\% of the ponded water. | 0 |  |
| 176 |  |  | 100\% of the ponded water. | 0 |  |
| 177 | F34 | Wdth of Vegetated Zone within Wetland | At the time during the growing season when the AA's water level is lowest, the average width of vegetated areain the AA that separates adjoining uplands from open water within the $A A$ is: |  | "Vegetated area" does not include underwater or floating-leaved plants, i.e., aquatic bed. Mdth may include wooded riparian areas if they have wetland soil or plant indicators. [AM, CS, $\mathrm{NR}, \mathrm{OE}, \mathrm{PH}, \mathrm{PR}$, SBM, Sens, SR, WBN] |
| 178 |  |  | <1m | 0 |  |
| 179 |  |  | 1-9m | 0 |  |
| 180 |  |  | 10-29m | 0 |  |
| 181 |  |  | 30-49m | 0 |  |
| 182 |  |  | 50-100m. | 0 |  |
| 183 |  |  | $>100 \mathrm{~m}$, or open water is absent at that time. | 0 |  |
| 184 | F35 | Fat Shoreline Extent | During most of the part of the growing season when water is present, the percentage of the AA'swater edge length that is nearly flat (a slope less than about $5 \%$ measured within 5 mlandward of the water) is: |  | If several isolated pools are present in early summer, estimate the percent of their collective shorelines that has such a gentle slope. [SR, WBN] |
| 185 |  |  | $<1 \%$ of the water edge. | 0 |  |
| 186 |  |  | 1-25\% of the water edge. | 0 |  |
| 187 |  |  | 25-50\% of the water edge. | 0 |  |



|  | A | B | C | D | E |
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| 209 |  |  | Temporary (surface water flows out for <14 days, not necessarily consecutive). | 0 |  |
| 210 |  |  | None -- but maps show a stream network downslope from the AA and within a distance that is less than the AA's length.SKIP to F47 (pH Measurement). | 0 |  |
| 211 |  |  | No surface water flows out of the wetland except possibly during extreme events (<once per 10 years). Or, water flows only into a wetland, ditch, or lake that lacks an outlet. SKIP to F47 (pH Measurement). | 0 |  |
| 212 | F43 | Outflow Confinement | During major runoff events, in the places where surface water exits the AA or connected waters nearby, the water: |  | "Major runoff events" would include biennial high water caused by storms and/or rapid snowmelt. [CS, NR, OE, PR, Sens, SR, STR, WS] |
| 213 |  |  | Mostly passes through a pipe, culvert, narromy breached dike, berm, beaver dam, or other partial obstruction (other than natural topography) that does not appear to drain the wetland artificially during most of the growing season. | 0 |  |
| 214 |  |  | Leaves through natura exits (channels or diffuse outflow), not mainly through artificial or temporary features. | 0 |  |
| 215 |  |  | Is exported more quickly than usual due to ditches or pipes within the AA or connected to its outlet, or within 10 m of the AA's edge, which drain the wetland artificially, or water is pumped out of the AA | 1 |  |
| 216 | F44 | Tributary Channel | At least once annually, surface water from a tributary channel that is $>100 \mathrm{mlong}$ moves into the $A A \quad O$, surface water from a larger permanent water body adjacent to the AA spills into the AA. If it enters only via a pipe, that pipe must be fed by a mapped stream or lake further upslope. If no, SKIP to F47 (pH Measurement). | 0 | If inlet tributaries cannot be searched for due to inaccessibility of part of the AA, follow suggestions in F42 above. [NRV, PH, PRV, SRV] |
| 217 | F45 | Input Water Temperature | Based on lack of shade, water source characteristics, or actual temperature measurements, the inflow is likely to be warmer than surface water in the $A A$ during part of most years. Enter $1=y e s, 0=$ no. | 0 | [W0]] |
| 218 | F46 | Throughflow Resistance | During its travel through the AA at the time of peak annual flow, water arriving in channels: [select only the ONE encountered bymost of the incoming water]. |  | [FA, PR, INN, NR, OE, PR, SR, WS] |
|  |  |  | Does not bump into many plant stems as it travels through the AA. Nearly all the water continues to travel in unvegetated (often incised) channels that have minimal contact with wetland vegetation, or through a zone of open water such as an instream pond or lake. | 0 |  |
| 220 |  |  | Bumps into herbaceous vegetation but mostly remains in farily straight channels. | 0 |  |
|  |  |  | Bumps into herbaceous vegetation and mostly spreads throughout, or is in widely meandering, multi-branched, or braided channels. | 0 |  |
| 222 |  |  | Bumps into tree trunks and/or shrub stems but mostly remains in fairly straight channels. | 0 |  |
| 223 |  |  | Bumps into tree trunks andlor shrub stems and follows a fairly indirect path from entrance to exit (meandering, multi-branched, or braided). | 0 |  |
| 224 | F47 | pH Measurement | The pH in most of the AA's surface water: |  | Preferably, measure this in larger areas of ponded surface water within the AA, or in streams that have passed through (not along) most of the AA Unless surface water is completely absent, do not dig holes or make depressions in peat in order to provide water for this measurement. Avoid measuring near roads or in puddles formed only by recent rain. [AM, FA, FR, NR, WBF, PH, PR, Sens, WBF, WBN] |
| 225 |  |  | Was measured, and is: [enter the reading in the colurn to the right.] |  |  |
| 226 |  |  | Was not measured but surface water is present and is darkly tea-coloured. Or if no surface water, then mosses and plants that indicate peatland (e.g., Labrador tea) are prevalent. Enter "1". | 0 |  |
| 227 |  |  | Neither of above. Enter "1". | 1 |  |
| 228 | F48 | $\begin{aligned} & \text { TDS and/or } \\ & \text { Conductivity } \end{aligned}$ | The TDS (total dissolved solids) or conductivity off the AA's surface water is: (select the first true row with information): |  | See above for measurement guidance. [IR, INV, NRN, PH, PRV, Sens] |
| 229 |  |  | TDS is: [Enter the reading in ppmor mg/L in the column to the right, if measured, or answer next row.] | 0 |  |
| 230 |  |  | Conductivity is [Enter the reading in $\mu \mathbf{S} / \mathrm{cm}$ in the column to the right.] |  |  |
| 231 |  |  | Was not measured, but plants that indicate saline conditions cover much of the vegetated AA Enter "1". | 0 |  |
| 232 |  |  | Neither of above | 1 |  |
| 233 | F49 | Beaver Probability | Use of the AA by beaver during the past 5 years is (select most applicable ONE): |  | [FA, RR, PH, SBM, Sens, WBF, WBN] |
|  |  |  | Evident from direct observation or presence of gnawed limbs, dams, tracks, dens, lodges, or extensive stands of water-killed trees (snags). | 0 |  |
| 235 |  |  | Likely based on known occurrence in the region and proximity to suitable habitat, which may include: (a) a persistent freshwater wetland, pond, or lake, or a perennial low or mid-gradient ( $<10 \%$ ) channel, and (b) a corridor or multiple stands of hardwood trees and shrubs in vegetated areas near surface water. | 0 |  |
| 236 |  |  | Unlikely because site characteristics above are deficient, and/or this is a settled area or other area where beaver are routinely removed. | 1 |  |
| 237 | F50 | Groundwater Strength of Evidence | Select first applicable choice: |  | Adhere to these criteria strictly -- do not use personal judgment based on fen conditions, pH , or other evidence. Consult topographic maps to detect breaks in slope described here. Rust deposits associated with groundwater seeps may be most noticeable as orange discoloration in ice formations along streams during early winter. [AM, CS, FA, FR, INN, NR, OE, PH, PRv, SFS, WC, WS] |
|  |  |  | Springs are known to be present within the AA, or if groundwater levels have been monitored, that has demonstrated that groundwater primarily discharges to the wetland for longer periods during the year than periods when the wetland recharges the groundwater. | 0 |  |
| 239 |  |  | Most of the $A A$ has a slope of $>5 \%$, or is very close to the base of a natural slope longer than 100 and much steeper than the slope of the AA AND the pH of surface water, if known, is $>5.5$. | 0 |  |
| 240 |  |  | Neither of above is true, although some groundwater may discharge to or flow through the AA Or groundwater influx is unknown. | 1 |  |


|  | A | B | C | D | E |
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| 241 | F51 | Internal Gradient | The gracient along most of the flow path within the AA is: |  | This is not the same as the shoreline slope. It is the elevational difference between the AA's inlet and outlet, divided by the flow-distance between them and converted to percent. If available, use a clinometer to measure this. Free clinometer apps can be downloaded to smartphones. If the wetland is large (longer than $\sim 1 \mathrm{~km}$ ), this may be estimated using Google Earth to determine the minimum and maximum elevation within the $A A$, then dividing by length and multiplying by 100. [CS, NR, OE, PR, SR, WBF, WBN, WS] |
| 242 |  |  | 2\% or the AA has no surface water outlet (not even seasonally). | 1 |  |
| 243 |  |  | 2-5\% | 0 |  |
| 244 |  |  | 6-10\% | 0 |  |
| 245 |  |  | >10\% | 0 |  |
| Note for the next three questions: If the AA lacks an upland edge, evaluate based on the AA's entire perimeter, and moving outward into whatever areas 246 are adjacent. In many situations, these questions are best answered by measuring from aerial images. |  |  |  |  |  |
| 247 <br> 248 <br> 249 <br> 250 <br> 251 <br> 252 | F52 | Vegetated Buffer as \% of Perimeter | Wthin a zone extending 30 m laterally from the AA's edge with upland and/or other wetlands, the percentage that containsperennial vegetation cover (except lawns, row crops, heavily grazed land, conifer plantations) is: |  | [AM, FA, FR, INN, NRV, PH, POL, PRV, SBM, Sens, SRv, STR, WBN] |
|  |  |  | -5\% | 0 |  |
|  |  |  | 5 to 30\% | 0 |  |
|  |  |  | 30 to 60\% | 1 |  |
|  |  |  | 60 to 90\% | 0 |  |
|  |  |  | >90\%, or all the area within 30 m of the AA edge is other wetlands. SKIP to F55. | 0 |  |
| 253 | F53 | Type of Cover in Buffer | Wthin 30 m upslope of where the wetland transitions to upland, the upland land cover that is NOT perennial vegetation is mostly (mark ONE): |  | [AM, FA, INN, NRV, PH, POL, SBM, STR, WBN] |
| 254 |  |  | Impervious surface, e.g., paved road, parking lot, building, exposed rock. | 1 |  |
| 255 |  |  | Bare or nearly bare pervious surface or managed vegetation, e.g., lamn, row crops, unpaved road, dike, landside. | 0 |  |
| 256 | F54 | Buffer Slope | The steepest and/or most disturbed part of the upland area that is within 30 m of the wetland and occupies $>10 \%$ of that upland area has a percent slope of: |  | [NRN, PRV, Sens, SRV] |
| 257 |  |  | <1\% (flat -- almost no noticeable slope) or all the area within 30 mof the AA edge is other wetlands. | 0 |  |
| 258 |  |  | 2-5\% | 0 |  |
| 259 |  |  | 5-30\% | 1 |  |
| 260 |  |  | >30\% | 0 |  |
| 261 | F55 | Cliffs or Steep Banks | In the AA or within 100 m , there are elevated terrestrial features such as cliffs, talus slopes, stream banks, or excavated pits (but not riprap) that extend at least 2 m nearly vertically, are urvegetated, and potentially contain crevices or other substrate suitable for nesting or den areas. Enter 1 (yes) or 0 (no). | 0 | Do not include upturned trees as potential den sites. [POL, SBM] |
| 262 | F56 | New or Expanded Wetland | Human actions within or adjacent to the AA have persistently expanded a naturally occurring wetland or created a wetland where there previously was none (e.g., by excavation, impoundment): |  | Determine this using historical aerial photography, old maps, soil maps, or permit files as available [CS, NR, OE, PH, Sens] |
| 263 |  |  | No. | 0 |  |
| 264 |  |  | Yes, and created or expanded $20-100$ years ago. | 0 |  |
| 265 |  |  | Yes, and created or expanded 3 -20 years ago. | 0 |  |
| 266 |  |  | Yes, and created or expanded within last 3 years. | 0 |  |
| 267 |  |  | Yes, but time of origin or expansion unknown. | 0 |  |
| 268 |  |  | Unknown if new or expanded within 20 years or not. | 1 |  |
| 269 | F57 | Burn History | More than $1 \%$ of the AA's previously vegetated area: |  | Look for charred soil or stumps (in multiple widely-spaced locations) or ask landowner. [CS, PH, STR] |
| 270 |  |  | Burned within past 5 years. | 0 |  |
| 271 |  |  | Burned 6-10 years ago. | 0 |  |
| 272 |  |  | Burned 11-30 years ago. | 0 |  |
| 273 |  |  | Burned $>30$ years ago, or no evidence of a burn and no data. | 1 |  |
| 274 | F58 | Visibility | The maximum percentage of the wetland that is visible from the best vantage point on public roads, public parking lots, public buildings, or public maintained trails that intersect, adjoin, or are within 100 m of the $A A$ (select one) is: |  | [PU, STR, WBFV] |
| 275 |  |  | 25\% | 0 |  |
| 276 |  |  | 25-50\% | 0 |  |
| 277 |  |  | -50\% | 1 |  |
| 278 | F59 | Non-consumptive Uses - Actual or Potential | Assuming access permission was granted, select ALL statements that are true of the AA as it currently exists: |  | [PU, STR] |
| 279 |  |  | For an average person, walking is physically possible in (not just near) $>5 \%$ of the $A A$ during most of the growing season, e.g., free of deep water and dense shrub thickets. | 1 |  |
| 280 |  |  | Maintained roads, parking areas, or foot-trails are within 10 m of the $A A$, or the $A A$ can be accessed part of the year by boats arriving via contiguous waters. | 0 |  |
| 281 |  |  | Wthin or near the AA, there is an interpretive center, trails with interpretive signs or brochures, andor regular guided interpretive tours. | 0 |  |


|  | A | B | C | D |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 282 | F60 | Unvisited Core Area | The percentage of the AA almost never visited by humans during an average growing season probably comprises: [ Note: Only include the part actually walked or driven (not simply viewed from) with a vehicle or boat. Do not include visitors on trails outside of the AA unless more than half the wetland is visible from the trails and they are within 30 m of the wetland edge. In that case include only the area occupied by the trail.] |  | [AM, FAv, FRv, PH, PU, SBM, STR, WBF, WBN] |
| 283 |  |  | -5\% and no inhabited building is within 100 mof the $A$ A | 0 |  |
| 284 |  |  | -5\% and inhabited building is within $100 \mathrm{mof} \mathrm{the} A$ A | 0 |  |
| 285 |  |  | $5-50 \%$ and no inhabited building is within 100 m of the $A$ A. | 0 |  |
| 286 |  |  | 5-50\% and inhabited building is within 100 m of the AA | 0 |  |
| 287 |  |  | 50-95\%, with or without inhabited building nearby. | 1 |  |
| 288 |  |  | >95\% of the AA with or without inhabited building nearby. | 0 |  |
| 289 | F61 | Frequently Visited Area | The part of the AA visited by humans almost daily for several weeks during an average growing season probably comprises: [See note above.] |  | [AM, PH, PU, SBM, STR, WBF, WBN] |
| 290 |  |  | -5\% If F60 was answered ">95\%" (mostly never visited), SKIP to F64. | 1 |  |
| 291 |  |  | 5-50\% | 0 |  |
| 292 |  |  | 50-95\% | 0 |  |
| 293 |  |  | >95\% of the AA | 0 |  |
| 294 | F62 | BMP - Soils | Boardwalks, paved trails, fences or other infrastructure and/or well-enforced regulations appear to effectively prevent visitors from walking on soil within nearly all of the AA when the soil is unfrozen. Enter " 1 " if true. | 0 | [PH, PU] |
| 295 | F63 | BMP - Wildlife Protection | Fences, observation blinds, plafforms, paved trails, exclusion periods, and/or well-enforced prohibitions on motorised boats, off-leash pets, and off road vehicles appear to effectively exclude or divert visitors and their pets from the $A A$ at critical times in order to minimize disturbance of wildlife (except during hunting seasons). Enter "1" if true. | 0 | [AM, PU, WBF, WBN] |
| 296 | F64 | Consumptive Uses <br> (Provisioning <br> Services) | Recent evidence was found within the AA of the following potentially-sustainable consumptive uses. Select ALL that apply. |  | [FAv, RRv, WBFV] |
| 297 |  |  | Low-impact commercial timber havest (e.g., selective thinning). | 0 |  |
| 298 |  |  | Commercial or traditional-use havesting of native plants, their fruits, or mushrooms. | 0 |  |
| 299 |  |  | Waterfowl hunting. | 0 |  |
| 300 |  |  | Fishing. | 0 |  |
| 301 |  |  | Trapping of furbearers. | 0 |  |
| 302 |  |  | None of the above. | 1 |  |
| 303 | F65 | Domestic Wells | The closest wells or water bodies that currently provide drinking water are: |  | [NRV] |
| 304 |  |  | Wuthin 0-100 m. of the AA | 0 |  |
| 305 |  |  | $100-500 \mathrm{~m}$ a avay. | 0 |  |
| 306 |  |  | -500 m away, or no information. | 1 |  |
| 307 | F66 | Calcareous Fen | The AA is, or is part of, a calcareous fen. See the Plants_Calcar worksheet in the accompanying Supplifo file for list of plant indicators (calciphiles). Enter 1 If more than two Strong or more than five Moderate calciphile species are present; otherwise enter O , but if not able to identify those and no information, change to blank. |  | [PH, PR] |

Stressor (S) Data Form for Non-Tidal Wetlands. WESP-AC for Nova Scotia version 2. Date: 18 Aug 2021


| S3 | Accelerated Inputs of Nutrients |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | In the last column, place a check mark next to any item -- occurring in either the wetland or its CA - that is likely to have accelerated the inputs of nutrients to the wetland. [NRV, PRR, STR] |  |  |  |  |
|  | Stormwater or wastewater effluent (including failing septic systems), landfills. |  |  |  |  |
|  | Fertilizers applied to lamns, ag lands, or other areas in the CA |  |  |  | 1 |
|  | Livestock, dogs. |  |  |  | 1 |
|  | Artificial drainage of upslope lands. |  |  |  |  |
|  | If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly more nutrients, then leave the "O's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present. |  |  |  |  |
|  |  | Severe (3 points) | Medium (2 points) | Mild (1 point) |  |
|  | Type of loading: | High density of unmaintained septic, some types of industrial sources. | Moderate density septic, cropland, secondary wastewater treatment plant. | Livestock, pets, low density residential. | 2 |
|  | Frequency \& duration of input: | Frequent and year-round. | Frequent but mostly seasonal. | Infrequent \& during high runoff events mainly. | 2 |
|  | AA proximity to main sources (actual or potential): | 0-15m | $15-100 \mathrm{~m}$ or in groundwater. | In more distant part of contributing area. | 2 |
|  | Sum= |  |  |  | 6 |
|  | Stressor subscore= |  |  |  | 0.67 |


| S4 | Excessive Sediment Loading from Contributing Area |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | In the last column, place a check mark next to any item present in the CA that is likely to have elevated the load of waterborme or windborne sediment reaching the wetland fromits CA [FA PR, INW, PH, SRv, STR] |  |  |  |  |
|  | Erosion from plowed fields, fill, timber havest, dirt roads, vegetation clearing, fires. |  |  |  | 1 |
|  | Erosion from construction, in-channel machinery in the CA |  |  |  |  |
|  | Erosion from off-road vehicles in the CA |  |  |  |  |
|  | Erosion from livestock or foot traffic in the CA |  |  |  |  |
|  | Stormwater or wastewater effluent. |  |  |  |  |
|  | Sediment from road sanding, gravel mining, other mining, oil/ gas extraction. |  |  |  |  |
|  | Accelerated channel downcutting or headcutting of tributaries due to altered land use. |  |  |  |  |
|  | Other human-related disturbances within the CA |  |  |  |  |
|  |  then leave the "O's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present. |  |  |  |  |
|  |  | Severe (3 points) | Medium (2 points) | Mild (1 point) |  |
|  | Erosion in CA: | Extensive evidence, high intensity.* | Potentially (based on high-intensity ${ }^{\star}$ land use) or scattered evidence. | Potentially (based on low-intensity ${ }^{\star}$ land use) with little or no direct evidence. | 1 |
|  | Recentness of significant soil disturbance in the CA: | Current \& ongoing. | 1-12 months ago. | $>1$ y ago. | 1 |
|  | Duration of sediment inputs to the wetland: | Frequent and year-round. | Frequent but mostly seasonal. | Infrequent \& during high runoff events mainly. | 1 |
|  | AA proximity to actual or potential sources: | 0-15m. | 15-100 m. | In more distant part of contributing area. | 1 |
|  | * high-intensity= extensive off-road vehicle use, plowing, grading, excavation, erosion with or without veg removal; low-intensity= veg removal only with little or no apparent erosion or disturbance of soil or sediment. |  |  | Sum= | 4 |
|  |  |  |  | Stressor subscore= | 0.33 |
| S5 | Soil or Sediment Alteration Within the Assessment Area |  |  |  |  |
|  |  (whichever is less). [CS, IM $, ~ N R, ~ P H, ~ S R, ~ S T R] ~] ~$ |  |  |  |  |
|  | Compaction from machinery, off-road vehicles, livestock, or mountain bikes, especially during wetter periods. |  |  |  |  |
|  | Leveling or other grading not to the natural contour. |  |  |  |  |
|  | Tillage, plowing (but excluding disking for enhancement of native plants). |  |  |  |  |
|  | Fill or riprap, excluding small amounts of upland soils containing organic amendments (compost, etc.) or small amounts of topsoil imported from another wetland. |  |  |  |  |
|  | Excavation. |  |  |  |  |
|  | Ditch cleaning or dredging in or adjacent to the wetland. |  |  |  |  |
|  | Boat trafic in or adjacent to the wetland and sufficient to cause shore erosion or stir bottom sediments. |  |  |  |  |
|  | Artificial water level or flow manipulations sufficient to cause erosion or stir bottom sediments. |  |  |  |  |
|  |  effects, contrast the current condition with the condition if the checked items never occurred or were no longer present. |  |  |  |  |
|  |  | Severe (3 points) | Medium (2 points) | Mild (1 point) |  |
|  | Spatial extent of altered soil: | >95\% of wetland or >95\% of its upland edge (if any). | 5-95\% of wetland or 5-95\% of its upland edge (if any). | $<5 \%$ of wetland and $<5 \%$ of its upland edge (if any). | 0 |
|  | Recentness of significant soil alteration in wetland: | Current \& ongoing. | 1-12 months ago. | $>1 \mathrm{yr}$ ago. | 0 |
|  | Duration: | Long-lasting, minimal veg recovery. | Long-lasting but mostly revegetated. | Short-term, revegetated, not intense. | 0 |
|  | Timing of soil alteration: | Frequent and year-round. | Frequent but mostly seasonal. | Mainly during one-time or scattered events. | 0 |
|  | Sum= |  |  |  | 0 |



| Cover Page: Basic Description of Assessment | WESP-AC version 2 |
| :---: | :---: |
| Site Name: | Cambridge Interchange Wetland 2 |
| Investigator Name: | BL |
| Date of Field Assessment: | 19 August 2021 |
| Nearest Town: | Waterville, NS |
| Latitude (decimal degrees): | 369422 |
| Longitude (decimal degrees): | 4992463 |
| Is a map based on a formal on-site wetland delineation available? | Yes |
| Approximate size of the Assessment Area (AA, in hectares): | 7.5 |
| AA as percent of entire wetland (approx.). Attach sketch map if AA is smaller than the entire contiguous wetland. | 50\% |
| What percent (approx.) of the wetland were you able to visit? | 50\% |
| What percent (approx.) of the AA were you able to visit? | 100\% |
| Were you able to ask the site owner/manager about any of the questions? | No |
| Indicate here if you intentionally surveyed for rare plants, calciphile plants, or rare animals: | yes |
| Have you attended a WESP-AC training session? If so, indicate approximate month \& year. | Yes |
| How many wetlands have you assessed previously using WESP-AC? (approx.) | >100 |
| Comments about the site or this WESP-AC assessment (attach extra page if desired): |  |


|  | A | B | C | D | E |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | Date: 19 August 2021 |  | Site Identifier: Cambridge wetland 2 | Investigator: BL |  |
| 2 | Form OF (Office). Non-tidal Wetland Data Form. WESP-AC version 2 for Nova Scotia wetlands only. DIRECTIONS: Conduct an assessment only after reading the accompanying <br> Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answering many of the questions below will require using these online map viewers: <br> Google Earth Pro: https://www.google.com/earth/download/gep/agree.html <br> Provincial Landscape Viewer: https://nsgi.novascotia.ca/plv/ <br> For most wetlands, completing this office data form will require 1-2 hours. For a list of functions to which each question pertains, see bracketed abbreviations in the Definitions/Explanations column. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention \& Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV=Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM=Amphibian \& Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, \& Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use \& Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors. |  |  |  |  |
| 3 | \# | Indicators | Condition Choices | Data | Definitions/Explanations |
| 4 | OF1 | Province | Mark the province in which the AA is located by changing the O in the column next to it to a "1". Mark only one. |  | This determines to which province's calibration wetlands the raw score of any wetland is normalised. |
| 5 |  |  | New Brunswick | 0 | data exists in a particular province. |
| 6 |  |  | Nova Scotia | 1 |  |
| 7 |  |  | Prince Edward Island | 0 |  |
| 8 |  |  | Newfoundland-Labrador | 0 |  |
| 9 | OF2 | Ponded Area Wuthin 1 km | The area of surface water ponded during most of the growing season that is both (1) in or adjacent to the $A A$ and (2) within 1 km is: |  | "Adjacent" means not separated from the AA by a wide expanse (>50 m) of upland (including roads $>50 \mathrm{~m}$ wide). Include ponded areas likely to be hidden by wetland vegetation. If surface water |
| 10 |  |  | <0.01 hectare (about $10 \mathrm{~m} \mathrm{\times 10} \mathrm{~m}$ ). | 0 | extends beyond 1 km , include only the part within 1 km Do not include tidal areas. Measure the |
| 11 |  |  | 0.01-0.1 hectare. | 0 |  |
| 12 |  |  | 0.1-1 hectare. | 1 |  |
| 13 |  |  | 1 to 10 hectares. | 0 |  |
| 14 |  |  | 10 to 100 hectares. | 0 |  |
| 15 |  |  | $>100$ hectares. | 0 |  |
| 16 | OF3 | Ponded Water \& Wetland Wthin 1 km | The area of wetlands and surface water ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) withir 1 km is: |  | See definition of adjacent in OF2. If the AA's wetland vegetation extends beyond 1 km , include only the part within 1 km ."Ponded" means not flowing in rivers or streams. [Sens, WBF] |
| 17 |  |  | $<0.01$ hectare (about $10 \mathrm{~m} \mathrm{\times 10} \mathrm{~m}$ ). | 0 |  |
| 18 |  |  | 0.01-0.1 hectare. | 0 |  |
| 19 |  |  | 0.1-1 hectare. | 0 |  |
| 20 |  |  | 1 to 10 hectares. | 0 |  |
| 21 |  |  | 10 to 100 hectares. | 1 |  |
| 22 |  |  | $>100$ hectares. | 0 |  |
| 23 | OF4 | Size of Largest Nearby Vegetated Tract or | The largest vegetated patch or corridor that includes the AA's vegetation plus alladjacent upland vegetation that is not lamn, row crops, heavily grazed lands, conifer plantation is: |  | See definition of adjacent in OF2. Use Google Earth Pro's polygon ruler (as described above). <br> Exclude conifer plantations only if it is obvious that trees were planted in rows. [AM, PH, SBM, Sens] |
| 24 |  |  | $<0.01$ hectare (about $10 \mathrm{~m} \times 10 \mathrm{~m}$ ). | 0 |  |
| 25 |  |  | 0.01-0.1 hectare. | 0 |  |
| 26 |  |  | 0.1-1 hectare. | 0 |  |
| 27 |  |  | 1 to 10 hectares. | 0 |  |
| 28 |  |  | 10 to 100 hectares. | 1 |  |
| 29 |  |  | 100 to 1000 hectares. | 0 |  |
| 30 |  |  | >1000 hectares. [This is nearly always the answer in relatively undeveloped landscapes.] | 0 |  |


|  | A | B | C | D | E |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 31 | OFS | Distance to Large Vegetated Tract | The minimum distance from the edge of the AA to the edge of the closestvegetated land (but excluding row crops, lamn, conifer plantation) larger than 375 hectares (about 2 km on a side), is: |  | To measure distance, use Google Earth Pro (Ruler > Line tool). The 375 -ha criterion is from the Fundy Model Forest Project. [AM, PH, POL, SBM, Sens] |
| 32 |  |  | $<50 \mathrm{~m}$, and not separated from the 375 -ha vegetated area by any width ofpaved roads, stretches of open water, row crops, bare ground, lawn, or impervious surface. Or the $A A$ itself contains $>375$ ha of vegetation. [This is often the answer in relatively undeveloped landscapes.] | 0 |  |
|  |  |  | 40 m , but completely separated from the 375-ha vegetated area by those features, and AA does not contain $>375$ ha of vegetation. | 0 |  |
| 34 |  |  | 50-500 m, and not separated. | 0 |  |
| 35 |  |  | 50-500 m, but separated by those features. | 0 |  |
| 36 |  |  | $0.5-5 \mathrm{~km}$, and not separated. | 0 |  |
| 37 |  |  | $0.5-5 \mathrm{~km}$, but separated by those features. | 1 |  |
| 38 |  |  | None of the above (the closest patches or corridors which are that large are $>5 \mathrm{~km}$ away). | 0 |  |
| 39 | OF6 | Herbaceous Uniqueness | The AA's vegetation cover is $>10 \%$ herbaceous* but uplands within 5 km have $<10 \%$ herbaceous cover. If so, enter " 3 " and continue to OF7. If not, consider: <br> The AA's vegetation cover is $>10 \%$ herbaceous* but uplands within 1 km have $<10 \%$ herbaceous cover. If so enter " 2 " and continue to Of7. If not, consider: <br> The AA's vegetation cover is $>10 \%$ herbaceous* but uplands within 100 m of the wetland edge have $<10 \%$ herbaceous cover. If so, enter "1". <br> [* NOTE: Exclude lamns, row crops, heavily grazed lands, forest, shrublands. Include moss as well as grasslike plants in this use of "herbaceous vegetation'] | 1 | For this question only, consider moss to be herbaceous vegetation. Determine the score by vieving aerial imagery in Google Earth after successively drawing or estimating the boundaries of the buffers of $5 \mathrm{~km}, 1 \mathrm{~km}$, and 100 m radius focused on the center of the AA. Circles of specified radius can be dramn in Google Earth Pro by clicking on the Ruler icon, then Circle in the pop-up menu. [AMN, PHN, POLv, SBMN, WBFv, WBNv] |
| 40 | OF1 | Woody Uniqueness | The AA's vegetation cover is $>10 \%$ woody* but uplands within $5 \mathrm{kmhave}<10 \%$ woody cover. If so, enter " 3 " and continue to OF8. If not, consider: <br> The AA's vegetation is $>10 \%$ woody ${ }^{\star}$ but uplands within 1 km have $<10 \%$ woody cover. If so enter " 2 " and continue to OF8. If not, consider: <br> The AA's vegetation is $>10 \%$ woody ${ }^{\star}$ but uplands within 100 m of the wetland edge have $<10 \%$ woody cover. If so, enter " 1 " <br> [* NOTE: woody cover = trees \& shrubs taller than 1 m ] | 0 | See above. Do not consider conifer plantations to be forest if it is obvious that trees were planted in rows. [AMN, PHV, POLv, SBMN] |
| 41 | OF8 | Local Vegetated Cover Percentage | Draw a 5 -km radius circle measured from the center of the AA. Ignoring all permanent water in the circle, the percent of the remaining are that is wooded or unmanaged herbaceous vegetation (NOT lawn, row crops, bare or heavily grazed land, clearcuts, or conifer plantations) is: |  | In Google Earth, draw the 5 km buffer and then estimate land cover percentages, or do GIS analysis of an appropriate land cover layer. [AM, PH, POL, SBM, Sens] |
| 42 |  |  | -5\% of the land. | 0 |  |
| 43 |  |  | 5 to 20\% of the land. | 0 |  |
| 44 |  |  | 20 to 60\% of the land. | 1 |  |
| 45 |  |  | 60 to $90 \%$ of the land. | 0 |  |
| 46 |  |  | >90\% of the land. SKIP to OF10. | 0 |  |
| 47 | OF9 | Type of Land Cover | Wthin the 5 -km radius circle, and ignoring all permanent water, the land area that is bare or non-perennial cover is mostly: |  | [AM, SBM] |
| 48 |  |  | Impervious surface, e.g., paved road, parking lot, building, exposed rock. | 0 |  |
| 49 |  |  | Bare pervious surface, e.g., lawn, recent (< 5 yrs ago) clearcut, dirt or gravel road, cropland, landslide, conifer plantation. | 1 |  |
| 50 | OF10 | Distance by Road to Nearest Population | Measured along the maintained road nearest the A , the distance to the nearestpopulation center is: |  | "Population center" means a settled area with more than about 5 regularly- inhabited structures per square kilometer In Google Earth Pro, click on the Ruler icon, then Path, and draw and measure the |
| 51 |  | Center | $<100 \mathrm{~m}$. | 0 |  |
| 52 |  |  | 100-500 m. | 1 |  |
| 53 |  |  | $0.5-1 \mathrm{~km}$ | 0 |  |
| 54 |  |  | $1-5 \mathrm{~km}$ | 0 |  |
| 55 |  |  | -5km | 0 |  |
| 56 | OF11 | Distance to Nearest Maintained Road | From the center of the AA, the distance to the nearest maintained public road (dirt or paved) is: |  | Determine this by viewing aerial imagery in Google Earth Pro and measuring with the Ruler>Line |
| 57 |  |  | $<10 \mathrm{~m}$ | 0 |  |
| 58 |  |  | 10-25m. | 0 |  |
| 59 |  |  | 25-50m. | 0 |  |
| 60 |  |  | 50-100 m. | 0 |  |
| 61 |  |  | 100-500m. | 1 |  |
| 62 |  |  | >500 m. | 0 |  |


|  | A | B | C | D | E |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 63 | OF12 | Wildifife Access | Draw a circle of radius of 5 km from the center of the $A A$ If marmals and amphibians can move from the center of the $A A$ to $A L L$ other separate wetlands and ponds located within the circle without being forced to cross pavement (any width), lawns, bare ground, and/or marine waters, mark $1=$ yes can move to all, $0=$ no. Change toblank if there are no other wetlands within 5 km . | 0 | Draw the 5 km circle in Google Earth Pro using the Circle tool and search for roads and wetlands within it, being alert for roads hidden under forest canopy. [AM, SBM, STR] |
| 64 | OF13 | Distance to Ponded Water | The distance from the AA center to the closest (but separate) ponded water body visible in Google Earth imagery is: |  | In Google Earth Pro, zoom in closely to examine the surrounding landscape for ponds, lakes, and wetlands that appear to be permanently flooded. [AM, PH, SBM, Sens, WBF, WBN] |
| 65 |  |  | -50 m, and not separated by any width of paved roads, stretches of open water, row crops, lamn, bare ground, or impervious surface. | 0 |  |
| 66 |  |  | 50 m , but completely separated by those features. | 0 |  |
| 67 |  |  | $50-500 \mathrm{~m}$, and not separated. | 1 |  |
| 68 |  |  | $50-500 \mathrm{~m}$, but separated by those features. | 0 |  |
| 69 |  |  | $0.5-1 \mathrm{~km}$, and not separated. | 0 |  |
| 70 |  |  | $0.5-1 \mathrm{~km}$, but separated by those features. | 0 |  |
| 71 |  |  | None of the above (the closest patches or corridors that large are >1 km away). | 0 |  |
| 72 | OF14 | Distance to Large Ponded Water | The distance from the AA center to the closest (but separate)non-tidal body of water that is ponded during most of the year and islarger than 8 hectares during most of a normal year is: |  | Determine this by viewing aerial imagery in Google Earth. [Sens, WBF, WBN] |
| 73 |  |  | $<100 \mathrm{~m}$ | 0 |  |
| 74 |  |  | $100 \mathrm{~m}-1 \mathrm{~km}$ | 0 |  |
| 75 |  |  | 1-2km. | 0 |  |
| 76 |  |  | 2-5 km | 0 |  |
| 77 |  |  | $5-10 \mathrm{~km}$ | 1 |  |
| 78 |  |  | $>10 \mathrm{~km}$ | 0 |  |
| 79 | OF15 | Tidal Proximity | The distance from the AA edge to the closesttidal water body (regardless of its salinity) is: |  | In Google Earth, measure the distance to the ocean (including Bay of Fundy) or tidal river, whichever is closer. If you need to see how far upriver a river is tidal, see the KNZ file provided with this calculator for NS (NS Headtide). Points shown in those files are only an approximation, so local information if available may be preferable. [FA, WBF] |
| 80 |  |  | $\angle 100 \mathrm{~m}$ | 0 |  |
| 81 |  |  | $100 \mathrm{~m}-1 \mathrm{~km}$ | 0 |  |
| 82 |  |  | $1-5 \mathrm{~km}$ | 0 |  |
| 83 |  |  | $5-10 \mathrm{~km}$. | 0 |  |
| 84 |  |  | $10-40 \mathrm{~km}$ | 1 |  |
| 85 |  |  | $>40 \mathrm{~km}$ | 0 |  |


|  | A | B | C | D | E |
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| 86 | OF16 | Upland Edge Contact | Select one: |  | [ NR , SBM, Sens] |
|  |  |  | The AA has no upland edge (or upland is <1\% of perimeter). The AA is entirely surrounded by (\& contiguous with) other wetlands or water. | 0 |  |
|  |  |  | 1-25\% of the AA's perimeter abuts upland (including filled areas). The rest adjoins other wetlands or water that is mostly wider than the AA | 0 |  |
| 89 |  |  | 25-50\% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA. | 0 |  |
| 90 |  |  | $50-75 \%$ of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA | 0 |  |
| 91 |  |  | More than $75 \%$ of the AA's perimeter abuts upland. Any remainder adjoins other wetlands or water that is mostly wider than the AA. This will be true for most assessments done with WESP-AC. | 1 |  |
| 92 | OF17 | Food Damage fromNon tidal Waters | Wthin 5 km downstream or downslope of the AA (select first true choice): |  | Contact local authories to determine if such maps exist. Where available, LDAR imagery can provide finer elevational resolution useful for flood modeling. [WSV] |
| 93 |  |  | Maps show Flood Zone or Flood Risk areas and there appears to be infrastructure vulnerable to river flooding not caused by tidal storm surges. | 0 |  |
| 94 |  |  | Maps show Food Zone or Flood Risk areas, but infrastructure is absent or is not vulnerable to floods from a non-tidal river. In some cases levees, upriver dams, or other measures may partly limit damage or risk from smaller events. | 0 |  |
| 95 |  |  | Maps do not show Food Zone or Food Risk areas (or no such mapping has been done locally) and there appears to be infrastructure vulnerable to river flooding unrelated to tidal storm surges. | 0 |  |
| 96 |  |  | Maps do not show Flood Zone or Food Risk areas (or no such mapping has been done locally) and there isno infrastructure vulnerable to river flooding unrelated to tidal storm surges. | 1 |  |
| 97 | OF18 | Relative Elevation in Watershed | In Google Earth, enable the Terrain layer (lower left menu) and open the NS_Watersheds Secondary KMZ file that accompanies this calculator. Then determine the AA's approximate elevation (bottom right, NOT the "eye alt'). Then move cursor around to determine the watershed's maximum and minimum elevation. Divide the AA's elevation by the (max-min). | 0.08 | [FA, NR, Sens, SFSV, WCV, WSv] |
| 98 | OF19 | Water Quality Sensitive Watershed or Area | The AA is in a Protected Water Supply area (Designated Water Supply Area, Natural Watershed Municipal Surface Water Supply Area, or Municipal Water Supply Area) according to the provided KMZ overlay ("NS Protected Water Supply Areas'). Enter 1= yes, 0= no. | 0 | If an ACCDC report is available for this AA, it also may contain such information. [NRV] |


|  | A | B | C | D |  |
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| 99 |  | Degraded Water Upstream | Sampling indicates a problem with concentrations of metals, hydrocarbons, nutrients, or other substances (excluding bacteria, acidic water, high temperatures) being present at levels harmful to aquatic life or humans, and: |  | May use existing data, or sample those waters as part of this wetland assessment. "Harmful" should be evaluated with regard to current federal or provincial water quality standards. [AM, FA, FR, NRV, PRV, SRV, STR, WBF, WBN] |
| 100 |  |  | The condition is present within the AA | 0 |  |
| 101 |  |  | The condition is present in waters within 1 km that flowinto the AA, but has not been documented in the AA itself. | 0 |  |
| 102 |  |  | Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters. | 0 |  |
| 103 |  |  | Data are insufficient (no or inadequate sampling within 1 km , or condition exists only at $>1 \mathrm{~km}$ upstream). This is the situation for nearly all wetlands in this region. | 1 |  |
| 104 | OF21 | Degraded | The problem described above is downslope fromthe AA, and: |  | May use existing data, or monitor waters as part of this wetland assessment. [NRV, PRV, SRv] |
| 105 |  | Downstream | The condition is present within 1 km downslope and connected to the AA by a channel. | 0 |  |
| 106 |  |  | The condition is present within 5 km downslope and connected to the AA by a channel, or within 1 km but not connected to the AA by a channel. | 0 |  |
| 107 |  |  | Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters. | 0 |  |
| 108 |  |  | Data are insufficient (no or inadequate sampling within 1 km , or condition exists only at $>1 \mathrm{~km}$ upstream). This is the situation for nearly all wetlands in this region. | 1 |  |
| 109 | OF22 | Wetland as a \% of Its Contributing Area (Catchment) | From a topographic map and field observations, estimate the approximate boundaries of the catchment (CA) of the entire wetland of which the AA may be only a part. Then adjust those boundaries if necessary based on your field observations of the surrounding terrain, and/or by using procedures described in the Manual. Divide the area of the wetland (not just the $A A$ ) by the approximate area of its catchment excluding the area of the wetland itself. When doing the calculation, if ponded water is adjacent to the wetland, include that in the wetland area. The result is: |  | Topographic maps may be viewed online at the National Atlas of Canada (Toporama): http://atlas.gc.ca/toporama/en/index.html [NR, PR, Sens, SR, WS] |
| 110 |  |  | <0.01, or catchment size unknown due to stormwater pipes that collect water from an indeterminate area. | 1 |  |
| 111 |  |  | 0.01 to 0.1. | 0 |  |
| 112 |  |  | 0.1 to 1. | 0 |  |
| 113 |  |  |  | 0 |  |
| 114 | OF23 | Unvegetated Surface in the Contributing Area | The proportion of the AA's contributing area (measured to no more than 1000 m upslope) that is comprised of buildings, roads, parking lots other pavement, exposed bedrock, landslides, and other mostly-bare surface is about : |  | [FA, INV, NRV, PRV, SRv, STR, WCV, WSv] |
| 115 |  |  | <10\% | 0 |  |
| 116 |  |  | 10 to $25 \%$ | 0 |  |
| 117 |  |  | >25\% | 1 |  |
|  | OF24 | Transport From Upslope | A relatively large proportion of the precipitation that falls farther upslope in the CA reaches this wetland quickly as runoff (surface water), as indicated by the following: <br> (a) input channel is present, <br> (b) input channels have been straightened, <br> (c) upslope wetlands have been ditched extensively, <br> (d) land cover is mostly non-forest, <br> (e) CA slopes are steep, and/or <br> (f) most CA soils are shallow (bedrock near surface) and/or have high runoff coefficients. <br> This statement is: |  | [NRV, PRV, SRV, WSU] |
| 119 |  |  | Mostly true. | 0 |  |
| 120 |  |  | Somenhat true. | 1 |  |
| 121 |  |  | Mostly untrue. | 0 |  |
| 122 | OF25 | Aspect | The overland flow direction of most surface water (in streams, rivers, or runoff) that enters the AA is: |  | [AM, NR, SFS, WC, WS] |
| 123 |  |  | Northward (N, NE). north-facing contributing area | 0 |  |
| 124 |  |  | Southward (S, SW). south-facing contributing area. | 1 |  |
| 125 |  |  | Other (E, SE, W, MM), or no detectable uphill slope or input channel (flat). | 0 |  |
| 126 <br> 127 | OF26 | Internal Fow Distance (Path Length) | The horizontal flow distance from the wetland's inlet to outlet is: <br> 10 m | 0 | Identify inlets and outlets, if any, from topographic maps (use elevations to determine which are inlets and which are outlets) and augment by field inspection. Whth the Provincial Landscape Viewer, select NovaScotia Tonoas the Baseman_Also enable the laver Forestn W/AM Predicted Flow Then |




|  | A | B | C | D | E |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | Date: | 9angust 2021 | Site Identifier: Cambridge wetland 2 | Investiga | ator: BL |
|  | Form F (Field). Non-tidal Wetland Data Form. WESP-AC version 2 for Nova Scotia. DIRECTIONS: Walk for no less than 10 minutes from the wetland edge towards its core, in the part of the AA that is proposed for alteration. If no alteration is proposed, walk in a portion that appears to be most representative of the wetland overall. Walk only where it is safe and legal to do so. Conduct the assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answer these questions primarily based on your onsite observations and interpretations. Do not write in shaded parts of this data form. Answering some questions accurately may require conferring with the landowner or other knowledgable persons, and/or reviewing aerial imagery. For most wetlands, completing this field data form will require 1-2 hours on a site. For a list of functions to which each question pertains, see the accompanying Interpretations form. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage \& Delay, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention \& Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS=Carbon Sequestration, OE= Organic Nutrient Export, INV=Invertebrate Habitat, $\mathrm{FA}=$ Anadromous Fish Habitat, $\mathrm{FR}=$ Resident Fish Habitat, AM=Amphibian \& Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, \& Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use \& Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors. |  |  |  |  |
| 3 | \# | Indicators | Condition Choices | Data | Definitions/Explanations |
| 4 | F1 | Wetland Type | Follow the key below and mark the ONE row that best describes MOST of the vegetated part of the AA: <br> A. Moss and/or lichen cover more than $\mathbf{2 5 \%}$ of the ground. Often dominated by ericaceous shrubs (e.g., Labrador tea) or other acid-tolerant plants (e.g., bog cranberry, pitcher plant, sundew, orchids). Substrate is mostly undecomposed peat. Choose between A1 and A2 and mark the choice with a 1 in their adjoining colurnn. Othervise go to $B$ below. |  | Ericaceous shrubs are ones in the heather family (Ericaceae). Most have leathery evergreen leaves. They include rhododendron, azalea, swamp laurel, leatherleaf, Labrador tea, and others. Most require acidic soil. Athough not in the family Ericaceae, sweetgale (Myrica gale) should be counted also. [AM, CS, FA, FR, INN, NR, OE, PH, Sens, SFS, WBF, WBN] |
|  |  |  | A1. Surface water is usually absent or, if present, pH is typically $<4.5$ and conductivity is usually $<100 \mu \mathrm{~S} / \mathrm{cm}$ ( $<64 \mathrm{ppm}$ TDS). Trees are absent or nearly so. Sedge cover usually sparse or absent but cottongrass and/or lichen cover may be extensive, as well as cloudberry, lingonberry, sheep laurel, and a sedge (Carex rariflor a). Wetland surface and surrounding landscape are seldom sloping and wetland often is domed (convex). Inlet and outlet channels are usually absent. If known, pH of peat is $<4.0$. | 0 |  |
| 7 |  |  | A2 Not A1. Surface water, if present, has pH typically $>4.5$ and conductivity is usually $>100 \mu \mathrm{~S} / \mathrm{cm}$ ( $>64 \mathrm{ppm}$ TDS). Sedge cover is usually extensive, andor tree and tall shrub cover is extensive. Sometimes at toe of slope or edge of water body. An exit channel is usually present. Wetter than A 1 and peat depth may be shallower ( $<2 \mathrm{~m}$ ). | 0 |  |
| 8 |  |  | B. Moss and/or lichen cover less than $25 \%$ of the ground. Soil is mineral or decomposed organic (muck). Choose between B1 and B2 and mark the choice with a 1 in their adjoining column: |  |  |
| 9 |  |  | B1. Trees and shrubs taller than 1 m comprise more than $25 \%$ of the vegetated cover. Surface water is mostly absent or inundates the vegetation only seasonally (e.g., vernal pools or floodplain). | 0 |  |
| 10 |  |  | B2. Not B1. Tree \& tall shrubs comprise less than than 25\% of the vegetated cover. Vegetation is mostly herbaceous, e.g., caltail, bulrush, burreed, pond lily, horsetail. Surface water may be extensive and fluctuates seasonally, being either persistent or drying up partly or entirely. | 1 |  |
|  | Reminder: For all questions, the AA should include all persistent waters in ponds smaller than 8 hectares ( -283 m on a side) that are adjacent to the $A A$ The AA should also include part of the water area of adjacent ponded water larger than 8 ha and adjacent rivers wider than 20 m . Specifically, the AA should include the open water part adjacent to wetland vegetation and equal in width to the average width of that vegetated zone. Throughout this data form, "adjacent " is used synonymously with abutting, adjoining, bordering, contiguous -- and means no upland (manmade or natural) completely separates the described features along their directly shared edge. Features joined only by a channel are not necessarily considered to be adjacent -- a large portion of their edges must match. The features do not have to be hydrologically connected in order to be considered adjacent. |  |  |  |  |
| 11 |  |  |  |  | 1 hectare is 10,000 sq. mor about 2.5 acres. It could have dimensions of $100 \mathrm{mby} 100 \mathrm{~m}, 1000 \mathrm{mby}$ 10 m , or similar. [AM, INN, SBM, WBA] |
| 12 |  | Wetland Types Adjoining or Subordinate | If the $A A$ is smaller than 1 ha, mark all other types that occupy more than $1 \%$ of the vegetated $A A$ If the $A A$ is larger than 1 ha, mark all other types which are within or adjacent to the AA and occupy more than 1 ha, as visible from the $A A$ or as interpreted from aerial imagery. Do not mark again the type marked in F1. |  |  |
| 13 |  |  | A1. | 0 |  |
| 14 |  |  | A2. | 0 |  |
| 15 |  |  | B1. | 0 |  |
| 16 |  |  | B2. | 0 |  |
| 17 <br> 18 | F3 | Woody Height \& Form Diversity | Following EACH row below, indicate with a number code the percentage of the living vegetation in the AA which is occupied by that feature <br> ( $\mathbf{6}$ if $>95 \%, \mathbf{5}$ if $75-95 \%, \mathbf{4}$ if $50-75 \%, \mathbf{3}$ if $25-50 \%, \mathbf{2}$ if $5-25 \%, \mathbf{1}$ if $-5 \%, \mathbf{0}$ if none). If the vegetated part of the $A A$ is largely herbaceous (non- <br> woody) vegetation, these percentages should not sum to $100 \%$ <br> coniferous trees (may include tamarack) taller than 3 m | \| | Deciduous shrubs in this region usually include buttonbush, Labrador tea, bayberry (Morella), huckleberry, cranberry, cloudberry, sweetgale, alder, willow, birch, ash, dogwood, and a few others. If you assigned a code of 3 or higher to any of the first four choices and the ground cover beneath the trees/shrubs is $<25 \%$ moss, then question F1 might be "B1". [CS, IN $, ~ N R, ~ P H, ~ P O L, ~ S B M, ~ S e n s] ~$ |


|  | A | B | C | D | E |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 19 |  |  | deciduous trees taller than 3 m | 3 |  |
| 20 |  |  | coniferous or ericaceous shrubs or trees 1-3 mtall not directly below the canopy of trees. | 1 |  |
| 21 |  |  | deciduous shrubs or trees 1-3 mtall not directly below the canopy of trees. | 3 |  |
| 22 |  |  | Coniferous or ericaceous shrubs <1 mtall not directly below the canopy of taller vegetation. | 2 |  |
| 23 |  |  | deciduous shrubs or trees $<1 \mathrm{mtall}$ (e.g., deciduous seedlings) not directly below the canopy of taller vegetation. | 3 |  |
| 24 | Note: If none of top 4 rows in F3 was marked 2 or greater, SKIP to F9 ( N fixers). |  |  |  |  |
| 25 | F4 | Dominance of Most Abundant Shrub Species | Determine which two woody plant species comprise the greatest portion of the low ( $\langle<\mathrm{m}$ ) woody cover. Then choose one: |  | [PH, POL, SBM, Sens] |
| 26 |  |  | those species together comprise $>50 \%$ of such cover. | 1 |  |
| 27 |  |  | those species together do not comprise $>50 \%$ of such cover. | 0 |  |
| 28 | F | Woody Diameter Classes | Mark $A \amalg$ the types that comprise $>5 \%$ of the woody canopy cover in the $A A$ or $>5 \%$ of the wooded areas (if any) along its upland edge (perimeter). The edge should include only the trees whose canopies extend into the AA |  | Estimate the diameters at chest height. If small-diameter trees are overtopped (shaded) by larger ones, visualise a "subcanopy" at the average height of the smaller-dbh trees, to serve as a basis for the minimum $5 \%$ canopy requirement in this question. The trees and shrubs need not be wetland species. [AM, CS, POL, SBM, Sens, WBN] |
| 29 |  |  | coniferous, $1-9 \mathrm{~cm}$ diameter and $>1 \mathrm{~m}$ tall. | 1 |  |
| 30 |  |  | broad-leaved deciduous $1-9 \mathrm{~cm}$ diameter and $>1 \mathrm{mtall}$. | 1 |  |
| 31 |  |  | coniferous, $10-19 \mathrm{~cm}$ diameter. | 1 |  |
| 32 |  |  | broad-leaved deciduous $10-19 \mathrm{~cm}$ diameter. | 1 |  |
| 33 |  |  | coniferous, $20-40 \mathrm{~cm}$ diameter. | 1 |  |
| 34 |  |  | broad-leaved deciduous $20-40 \mathrm{~cm}$ diameter. | 1 |  |
| 35 |  |  | coniferous, 740 cm diameter. | 0 |  |
| 36 |  |  | broad-leaved deciduous $>40 \mathrm{~cm}$ diameter. | 0 |  |
| 37 | F6 | Height Class Interspersion | Follow the key below and mark the ONE row that best describes MOST of the AA: |  | [AM, INW, NR, PH, SBM, Sens] |
|  |  |  | A. Neither the vegetation taller than 1 m nor the vegetation shorter than that comprise $>70 \%$ of the vegetated part of the $A A$. They each comprise $30-70 \%$ Choose between A 1 and A 2 and mark the choice with a 1 in the adjoining colum. Otherwise go to B below. |  |  |
| 38 |  |  |  |  |  |
| 39 |  |  | A1 The two height classes are mostly scattered and intermixed throughout the AA | 1 |  |
| 40 |  |  | A2 Not A1. The two height classes are mostly in separate zones or bands, or in proportionately large clumps. | 0 |  |
| 41 |  |  | B. Ether the vegetation shorter than 1 m comprises $>70 \%$ of the vegetated part of the $A A$, or the vegetation taller than that does. One size class might even be totally absent. Choose between B1 and B2 and mark the choice with a 1 in the adjoining column: |  |  |
| 42 |  |  | B1 The less prevalent height class is mostly scattered and intermixed within the prevalent one. | 0 |  |
| 43 |  |  | B2. Not B1. The less prevalent height class is mostly located apart from the prevalent one, in separate zones or clumps, or is completely absent. | 0 |  |
| 44 | 7 | Large Snags (Dead Standing Trees) | The number of large snags (diameter $\mathbf{2 0} \mathbf{~ c m}$ ) in the AA plus adjacent upland area within 10 m of the wetland edge is: |  | Snags are dead standing trees that often (not always) lack bark and foliage. Include only ones that are at least 2 m tall. [POL, SBM, WBN] |
| 45 |  |  | None, of fewer than $8 /$ hectare which exceed this diameter. | 1 |  |
| 46 |  |  |  | 0 |  |
| 47 |  |  | Several ( $>8$ hectare) but above not true. | 0 |  |
| 48 | F8 | Domned Wood | The number of downed wood pieces longer than 2 m and with diameter $>10 \mathrm{~cm}$, and not persistently submerged, is: |  | Exclude temporay "bum piles." [AM, IN, POL, SBM] |
| 49 |  |  | Few or none that meet these criteria. | 1 |  |
| 50 |  |  | Several ( $>5$ if $A$ A is $>5$ hectares, less for smaller $A$ As) meet these criteria | 0 |  |
| 51 | F9 | NFixers | The percentage of the AA's vegetated cover that contains nitrogen-fixing plants (e.g., alder, sweetgale, clover, lupine, alfalfa, other legumes) is: |  | Do not include $N$-fixing algae or lichens. [FA, $\mathrm{PR}, \mathrm{IN}, \mathrm{NR}, \mathrm{N}, \mathrm{OE}, \mathrm{PH}, \mathrm{SBM}$, Sens] |
| 52 |  |  | <1\% or none. | 0 |  |
| 53 |  |  | 1-25\% of the vegetated cover, in the AA or along its water edge (whichever has more). | 0 |  |
| 54 |  |  | $25-50 \%$ of the vegetated cover, in the AA or along its water edge (whichever has more). | 1 |  |
| 55 |  |  | $50-75 \%$ of the vegetated cover, in the AA or along its water edge (whichever has more). | 0 |  |
| 56 |  |  | $>75 \%$ of the vegetated cover, in the AA or along its water edge (whichever has more). | 0 |  |
| 57 | F10 | Sphagnum Moss Extent | The cover of Sphagnum moss (or any moss that forms a dense cushion many centimeters thick), including the moss obscured by taller sedges and other plants rooted in it, is: |  | Exclude moss growing on trees and rocks. [CS, PH] |
| 58 |  |  | -5\% of the vegetated part of the AA | 0 |  |
| 59 |  |  | $5-25 \%$ of the vegetated part of the $A$ A | 1 |  |
| 60 |  |  | $25-50 \%$ of the vegetated part of the AA | 0 |  |
| 61 |  |  | $50-95 \%$ of the vegetated part of the AA | 0 |  |
| 62 |  |  | >95\% of the vegetated part of the AA | 0 |  |


|  | A | B | C | D |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 63 | F11 | \% Bare Ground \& Thatch | Consider the parts of the AA that lack surface water at the driest time of the growing season. Viewed from directly above the ground layer, the predominant condition in those areas at that time is: |  | Thatch is dead plant material (stems, leaves) resting on the ground surface. Bare ground that is present under a tree or shrub canopy should be counted. Boulders count as bare ground. Wetlands with mineral soils and that are heavily shaded or are dominated by annual plant species tend to have more extensive areas that are bare during the early growing season. [AM, EC, INV, NR, OE, POL, PR SBM, Sens] |
| 64 |  |  | Little or no ( $-5 \%$ ) bare ground is visible between erect stems or under canopy anywhere in the vegetated $A A$ Ground is extensively blanketed by dense thatch, moss, lichens, graminoids with great stem densities, or plants with ground-hugging foliage. | 1 |  |
| 65 |  |  | Slightly bare ground ( $5-20 \%$ bare between plants) is visible in places, but those areas comprise less than $5 \%$ of the unflooded parts of the AA | 0 |  |
| 66 |  |  | Much bare ground (20-50\% bare between plants) is visible in places, and those areas comprise more than $5 \%$ of the unflooded parts of the AA | 0 |  |
| 67 |  |  | Other conditions. | 0 |  |
| 68 |  |  | Not applicable. Surface water (either open or obscured by emergent plants) covers all of the AA all the time. | 0 |  |
| 69 | F12 | Ground Irregularity | Imagine the AA vithout ary living vegetation. Excluding the portion of the $A A$ that is always under water, the number of hummocks, small pits, raised mounds, animal burrows, ruts, gullies, natural levees, microdepressions, and other areas of peat or mineral soil that are raised or depressed $>10 \mathrm{~cm}$ compared to most of the area within a few meters surrounding them is: |  | The depressions may be of human or natural origin. [AM, EC, INV, $\mathrm{NR}, \mathrm{PH}, \mathrm{POL}, \mathrm{PR}, \mathrm{SBM}, \mathrm{SR}, \mathrm{WS}]$ |
| 70 |  |  | Few or none (minimal microtopography; $<1 \%$ of the land has such features, or entire $A$ i is always water-coverec). | 0 |  |
| 71 |  |  | Intermediate. | 0 |  |
| 72 |  |  | Several (extensive micro-topography). | 1 |  |
| 73 | F13 | Upland Inclusions | Within the A , inclusions of upland are: |  | [AM, NR, SBM] |
| 74 |  |  | Few or none. | 1 |  |
| 75 |  |  | Intermediate (1-10\% of vegetated part of the AA). | 0 |  |
| 76 |  |  | Many (e.g, wetland-upland "mosaic", $>10 \%$ of the vegetated $A A$ ). | 0 |  |
| 77 | F14 | Soil Texture | In parts of the AA that lack persistent water, the texture of soil in the uppermost layer is mostly. [To determine this, use a trowel to check in at least 3 widely spaced locations, and use the soil texture key (in Appendix A of the Manual).] |  | [CS, NR, OE, PH, PR, Sens, SFS, WS] |
| 78 |  |  | Loamy: soils that may contain a little fine grit and do not make a "ribbon" longer than 2 cm when moistened, rolled, squeezed, and extended between thumb and forefinger. | 0 |  |
| 79 |  |  | Fines: includes silt, clay, silt, soils that make a ribbon longer than 2 cm when moistened, rolled, squeezed, and extended between thumb anc forefinger. | 1 |  |
| 80 |  |  | Deep Peat, to $40 \mathrm{~cm} \mathrm{depth} \mathrm{or} \mathrm{greater}$. | 0 |  |
| 81 |  |  | Shallow Peat or organic <40 cm deep. | 0 |  |
| 82 |  |  | Coarse: includes sand, loamy sand, gravel, cobble, soils that do not make a ribbon when moistened, rolled, squeezed, and extended between thumb and forefinger. | 0 |  |
| 83 | F15 | Shorebird Feeding Habitats | During any 2 consecutive weeks of the growing season, the extent of mudflats, bare unshaded saturated areas not covered by thatch, and unshaded waters shallower than 6 cm is: [Include also any area that is adjacent to the $A A$ ] |  | This addresses needs of many but not all migratory sandipipers, plovers, and related species. [WBF] |
| 84 |  |  | None, or <100 sq. m | 1 |  |
| 85 |  |  | 100-1000 sq. m. | 0 |  |
| 86 |  |  | 1000-10,000 sq. m | 0 |  |
| 87 |  |  | $>10,000$ sq. m | 0 |  |
| 88 | F16 | Herbaceous \% of | In aerial ('ducks eye') view, the maximum annual cover of herbaceous vegetation (all non-woody plants except moss) is: |  | [AM, WBF, WBN] |
|  |  | Vegetated Wetland | -5\% of the vegetated part of the AA or <0.01 hectare (whichever is less). Mark "1" here andSKIP to F20 (Invasive Plant Cover). | 0 |  |
| 89 <br> 90 <br> 91 |  |  | 5-25\% of the vegetated part of the AA. | 0 |  |
| 91 |  |  | 25-50\% of the vegetated part of the $A A$ | 0 |  |
| 92 |  |  | 50-95\% of the vegetated part of the $A$ A | 1 |  |
| 93 |  |  | >95\% of the vegetated part of the AA. | 0 |  |
| 94 | F17 | Forb Cover | Within parts of the AA having herbaceous cover (excluding SAV), the areal cover of forbs reaches an annual maximum of: |  | Forbs are flowering plants. Do not include grasses, sedges, cattail, other graminoids, ferms, horsetails, |
| 95 |  |  | -5\% of the herbaceous part of the $A$ A. | 0 | or others that lack showy flowers. [POL] |
| 96 |  |  | $5-25 \%$ of the herbaceous part of the AA | 1 |  |
| 97 |  |  | 25-50\% of the herbaceous part of the AA | 0 |  |
| 98 |  |  | 50-95\% of the herbaceous part of the AA | 0 |  |
| 99 |  |  | >95\% of the herbaceous part of the AA | 0 |  |
| 100 | F18 | Sedge Cover | Sedges (Carex spp.) and cottongrass (Eriophorum spp.) occupy. |  | [CS] |
| 101 |  |  | -5\% of the vegetated area, or none. | 0 |  |
| 102 |  |  | 5-50\% of the vegetated area. | 1 |  |


|  | A | B | C | D | E |
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| 103 |  |  | 50-95\% of the vegetated area | 0 |  |
| 104 |  |  | -95\% of the vegetated area | 0 |  |
| 105 | F19 | Dominance of Most Abundant Herbaceous | Determine which two herbaceous species comprise the greatest portion of the herbaceous cover (excluding mosses and floating-leaved aquatic plants). Then choose one of the following: |  | For this question, indude fems as well as graminoids and forbs. [EC, IN, PH, POL, Sens] |


|  | A | B | C | D | E |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 106 |  | Species | those species together comprise $>50 \%$ of the areal cover of herbaceous plants at any time during the year. | 1 |  |
| 107 |  |  | those species together do not comprise $>50 \%$ of the areal cover of herbaceous plants at any time during the year. | 0 |  |
| 108 | F20 | Invasive Plant Cover | How extensive is the cover of invasive plant species in the AA? For species, see Plants invasive worksheet in the accompanying Supplnfo file. |  | [EC, PH, POL, Sens] |
| 109 |  |  | invasive species appear to be absent in the AA, or are present only in trace amount (a few individuas). | 1 |  |
| 110 |  |  | invasive species are present in more than trace amounts, but comprise $<5 \%$ of herbaceous cover (or woody cover, if the invasives are moody). | 0 |  |
| 111 |  |  | invasive species comprise 5-20\% of the herb cover (or woody cover, if the invasives are woody). | 0 |  |
| 112 |  |  | invasive species comprise 20-50\% of the herb cover (or woody cover, if the invasives are woody). | 0 |  |
| 113 |  |  | invasive species comprise $>50 \%$ of the herb cover (or woody cover, if the irvasives are woody). | 0 |  |
| 114 | F21 | Invasive Cover Along Upland Edge | Along the wetland-upland boundary, the percent of the upland edge (within 3 mupslope from the wetland) that is occupied by invasive plant species is: |  | If a plant cannot be identified to species (e.g., winter conditions) but its genus contains an exotic species, assume the unidentified plant to also be exotic. If vegetation is so senesced that exotic species cannot be identified, answer "none". [PH, STR] |
| 115 |  |  | none of the upland edge (invasives apparently absent), or AA has no upland edge. | 1 |  |
| 116 |  |  | some (but -5\%) of the upland edge. | 0 |  |
| 117 |  |  | 5-50\% of the upland edge. | 0 |  |
| 118 |  |  | most ( $>50 \%$ ) of the upland edge. | 0 |  |
| 119 | F22 | Fringe Wetland | During most of the year, open water within or adjacent to the vegetated part of the wetland is much wider than the maximum width of the vegetated zone within the wetland. Enter "1" if true, "0" if false. | 0 | [MBF, WBN, WCV] |
| 120 | F23 | Lacustrine Wetland | The vegetated part of the AA is within or adjacent to a body of non-tidal standing open water whose size exceeds8 hectares during most of a normal year. | 0 | [ $\mathrm{F}, \mathrm{PR}, \mathrm{PU}, \mathrm{WBF}, \mathrm{WBN}$ ] |
| 121 | F24 | \% of AAWithout Surface Water | The percentage of the AA that never contains surface water during an average year (that is, except perhaps for a few hours after snowmelt on rainstorms), but which is still a wetland, is: |  | 1 hectare is 10,000 sq. mor about 2.5 acres. It could have dimensions of $100 \mathrm{mby} 100 \mathrm{~m}, 1000 \mathrm{mby}$ 10 m , or similar. [AM, FA, $\operatorname{FR}, \mathrm{IN}, \mathrm{NR}, \mathrm{PH}, \mathrm{PR}, \mathrm{SBM}$, Sens, SRv, WBF, WBN, WC] |
| 122 |  |  | <1\%. In other words, all or nearly all of the AA is covered by water permanently or at least seasonally. | 0 |  |
| 123 |  |  | 1-25\% of the AA , or $<1 \%$ but $>0.01$ ha never contains surface water. | 0 |  |
| 124 |  |  | 25-50\% of the AA never contains surface water. | 1 |  |
| 125 |  |  | 50-75\% of the AA never contains surface water. | 0 |  |
| 126 |  |  | 75-99\% of the AA never contains surface water, or $>99 \%$ AND there is at least one persistent water body larger than 1 ha in the AA | 0 |  |
| 127 |  |  | 99-100\% AND there is no persistent ponded water body larger than 1 ha within the AA Enter "1" andSKIP to F42 (Channel Connection). | 0 |  |
| 128 | F25 | \% of AA with <br> Persistent Surface Water | Identify the parts of the AA that still contain surface water (flowing or ponded, open or hidden beneath vegetation) even during the driest times of a normal year, i.e., when the AA's surface water is at its lowest annual level. At that time, the percentage of the AA that still contains surface water is: |  | If you are unable to determine the condition at the driest time of year, ask the land owner or neighbors about it if possible. Indicators of persistence may include fish, some dragonflies, beaver, and muskrat. [AM, CS, FA, FR, INN, NR, POL, PR, SBM, WBF, WBN] |
| 129 |  |  | None. The AA dries up completely (no water in channels either) or never has surface water during most years. SKIP to F27. | 0 |  |
| 130 |  |  | 1-20\% of the AA. | 0 |  |
| 131 |  |  | 20-50\% of the AA | 1 |  |
| 132 |  |  | 50-95\% of the AA | 0 |  |
| 133 |  |  | >95\% of the AA True for many fringe wetlands. | 0 |  |
| 134 | F26 | \% of Summertime Water that is Shaded | At mid-day during the warmest time of year, the area of surface waterwithin the $A A$ that is shaded by vegetation and other features that are within the $A A$ at that time is: |  | [FA, WC] |
| 135 |  |  | -5\% of the water is shaded, or no surface water is present then. | 0 |  |
| 136 |  |  | $5-25 \%$ of the water is shaded. | 0 |  |
| 137 |  |  | 25-50\% of the water is shaded. | 0 |  |
| 138 |  |  | 50-75\% of the water is shaded. | 0 |  |
| 139 |  |  | >75\% of the water is shaded. | 1 |  |
| 140 | F27 | \% of AA that is Fooded Only Seasonally | The percentage of the $A$ A's area that is between the annual high water and the annual low water (surface water) is: |  | Flood marks (algal mats, adventitious roots, debris lines, ice scour, etc.) are often evident when not fully inundated. Aso, such areas often have a larger proportion of upland and annual (vs. perennial) plant species. In riverine systems, the extent of this zone can be estimated by multiplying by 2 the bankful height and visualising where that would intercept the land along the river. [CS, FA, IN, NR, OE, PH, SR, WBF, WBN, WS] |
| 141 |  |  | None, or <0.01 hectare and <1\% of the AA SKIP to F29. | 0 |  |
| 142 |  |  | 1-20\% of the AA, or <1\% but >0.01 ha. | 0 |  |
| 143 |  |  | 20-50\% of the AA | 0 |  |





|  | A | B | C | D | E |
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| 241 | F51 | Internal Gradient | The gracient along most of the flow path within the $A A$ is: |  | This is not the same as the shoreline slope. It is the elevational difference between the AA's inlet and outlet, divided by the flow-distance between them and converted to percent. If available, use a clinometer to measure this. Free clinometer apps can be downloaded to smartphones. If the wetland is large (longer than $\sim 1 \mathrm{~km}$ ), this may be estimated using Google Earth to determine the minimum and maximum elevation within the $A A$, then dividing by length and multiplying by 100. [CS, NR, OE, PR, SR, WBF, WBN, WS] |
| 242 |  |  | 2\%\% or the AA has no surface water outlet (not even seasonally). | 1 |  |
| 243 |  |  | 2-5\% | 0 |  |
| 244 |  |  | 6-10\% | 0 |  |
| 245 |  |  | >10\% | 0 |  |
| Note for the next three questions: If the AA lacks an upland edge, evaluate based on the AA's entire perimeter, and moving outward into whatever areas 246 are adjacent. In many situations, these questions are best answered by measuring from aerial images. |  |  |  |  |  |
| 247 | F5 | Vegetated Buffer as \% of Perimeter | Wthin a zone extending 30 m laterally from the AA's edge with upland and/or other wetlands, the percentage that containsperennial vegetation cover (except lawns, row crops, heavily grazed land, conifer plantations) is: |  | [AM, FA, FR, INV, NRV, PH, POL, PRV, SBM, Sens, SRv, STR, WBN] |
| 248 |  |  | -5\% | 0 |  |
| 249 |  |  | 5 to 30\% | 0 |  |
| 250 |  |  | 30 to 60\% | 0 |  |
| 251 |  |  | 60 to 90\% | 1 |  |
| 252 |  |  | >90\%, or all the area within 30 m of the AA edge is other wetlands. SKIP to F55. | 0 |  |
| 253 | F53 | Type of Cover in Buffer | Wthin 30 m upslope of where the wetland transitions to upland, the upland land cover that is NOT perennial vegetation is mostly (mark ONE): |  | [AM, FA, INV, NRv, PH, POL, SBM, STR, WBN] |
| 254 |  |  | Impervious surface, e.g., paved road, parking lot, building, exposed rock. | 0 |  |
| 255 |  |  | Bare or nearly bare pervious surface or managed vegetation, e.g., lamn, row crops, unpaved road, dike, landslide. | 1 |  |
| 256 | F54 | Buffer Slope | The steepest and/or most disturbed part of the upland area that is vithin 30 m of the wetland and occupies $>10 \%$ of that upland area has a percent slope of: |  | [NRV, PRV, Sens, SRV] |
| 257 |  |  | <1\% (flat -- almost no noticeable slope) or all the area within 30 mof the $A$ A edge is other wetlands. | 0 |  |
| 258 |  |  | 2-5\% | 1 |  |
| 259 |  |  | 5-30\% | 0 |  |
| 260 |  |  | >30\% | 0 |  |
| 261 | F55 | Cliffs or Steep Banks | In the AA or within 100 m , there are elevated terrestrial features such as cliffs, talus slopes, streambanks, or excavated pits (but not riprap) that extend at least 2 m nearly vertically, are urvegetated, and potentially contain crevices or other substrate suitable for nesting or den areas. Enter 1 (yes) or 0 (no). | 0 | Do not include upturned trees as potential den sites. [POL, SBM] |
| 262 | F56 | New or Expanded Wetland | Human actions within or adjacent to the AA have persistently expanded a naturally occurring wetland or created a wetland where there previously was none (e.g., by excavation, impoundment): |  | Determine this using historical aerial photography, old maps, soil maps, or permit files as available [CS, NR, OE, PH, Sens] |
| 263 |  |  | No. | 0 |  |
| 264 |  |  | Yes, and created or expanded 20-100 years ago. | 0 |  |
| 265 |  |  | Yes, and created or expanded $3-20$ years ago. | 0 |  |
| 266 |  |  | Yes, and created or expanded within last 3 years. | 0 |  |
| 267 |  |  | Yes, but time of origin or expansion unknown. | 0 |  |
| 268 |  |  | Unknown if new or expanded within 20 years or not. | 1 |  |
| 269 | F57 | Burn History | More than $1 \%$ of the AA's previously vegetated area: |  | Look for charred soil or stumps (in multiple widely-spaced locations) or ask landowner. [CS, PH, STR] |
| 270 |  |  | Burned within past 5 years. | 0 |  |
| 271 |  |  | Burned 6-10 years ago. | 0 |  |
| 272 |  |  | Burned 11-30 years ago. | 0 |  |
| 273 |  |  | Burned $>30$ years ago, or no evidence of a burn and no data. | 1 |  |
| 274 | F58 | Visibility | The maximum percentage of the wetland that is visible from the best vantage point on public roads, public parking lots, public buildings, or public maintained trails that intersect, adjoin, or are within 100 m of the $A A$ (select one) is: |  | [PU, STR, WBFV] |
| 275 |  |  | 25\%\% | 1 |  |
| 276 |  |  | 25-50\% | 0 |  |
| 277 |  |  | -50\% | 0 |  |
| 278 | F59 | Non-consumptive Uses - Actual or Potential | Assuming access permission was granted, select ALI statements that are true of the AA as it currently exists: |  | [PU, STR] |
| 279 |  |  | For an average person, walking is physically possible in (not just near) $>5 \%$ of the $A A$ during most of the growing season, e.g., free of deep water and dense shrub thickets. | 0 |  |
| 280 |  |  | Maintained roads, parking areas, or foot-trails are within 10 m of the $A A$, or the $A A$ can be accessed part of the year by boats arriving via contiguous waters. | 0 |  |
| 281 |  |  | Wthin or near the AA , there is an interpretive center, trails with interpretive signs or brochures, and/or regular guided interpretive tours. | 0 |  |


|  | A | B | C | D |  |
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| 282 | F60 | Unvisited Core Area | The percentage of the AA almost never visited by humans during an average growing season probably comprises: [ Note: Only include the part actually walked or driven (not simply viewed from) with a vehicle or boat. Do not include visitors on trails outside of the AA unless more than half the wetland is visible from the trails and they are within 30 mof the wetland edge. In that case include only the area occupied by the trail.] |  | [AM, FAv, PRv, PH, PU, SBM, STR, WBF, WBN] |
| 283 |  |  | -5\% and no inhabited building is within $100 \mathrm{mof} \mathrm{the} A$ A | 0 |  |
| 284 |  |  | -5\% and inhabited building is within 100 mof the $A$ A | 0 |  |
| 285 |  |  | $5-50 \%$ and no inhabited building is within 100 m of the $A$ A | 0 |  |
| 286 |  |  | $5-50 \%$ and inhabited building is within 100 m of the $A$ A | 0 |  |
| 287 |  |  | 50-95\%, with or without inhabited building nearby. | 0 |  |
| 288 |  |  | >95\% of the AA with or without inhabited building nearby. | 1 |  |
| 289 | F61 | Frequently Visited Area | The part of the AA visited by humans almost daily for several weeks during an average growing season probably comprises: [See note above.] |  | [AM, PH, PU, SBM, STR, WBF, WBN] |
| 290 |  |  | -5\% If F60 was answered ">95\%' (mostly never visited), SKIP to F64. | 1 |  |
| 291 |  |  | 5-50\% | 0 |  |
| 292 |  |  | 50-95\% | 0 |  |
| 293 |  |  | >95\% of the AA | 0 |  |
| 294 | F62 | BMP - Soils | Boardwalks, paved trails, fences or other infrastructure and/or well-enforced regulations appear to effectively prevent visitors from walking on soil within nearly all of the AA when the soil is unfrozen. Enter " 1 " if true. | 0 | [PH, PU] |
| 295 | F63 | BMP - Wildlife Protection | Fences, observation blinds, platforms, paved trails, exclusion periods, and/or well-enforced prohibitions on motorised boats, off-leash pets, and off road vehicles appear to effectively exclude or divert visitors and their pets from the $A A$ at critical times in order to minimize disturbance of wildlife (except during hunting seasons). Enter "1" if true. | 0 | [AM, PU, WBF, WBN] |
| 296 | F64 | Consumptive Uses (Provisioning Services) | Recent evidence was found within the AA of the following potentially-sustainable consumptive uses. Select ALL that apply. |  | [FAv, Rev, WBFV] |
| 297 |  |  | Low-impact commercial timber harvest (e.g., selective thinning). | 0 |  |
| 298 |  |  | Commercial or tracitional-use havesting of native plants, their fruits, or mushrooms. | 0 |  |
| 299 |  |  | Waterfowl hunting. | 0 |  |
| 300 |  |  | Fshing. | 0 |  |
| 301 |  |  | Trapping of furbearers. | 0 |  |
| 302 |  |  | None of the above. | 1 |  |
| 303 | F65 | Domestic Wells | The closest wells or water bodies that currently provide drinking water are: |  | [NRN] |
| 304 |  |  | Muthin 0-100 m of the AA | 0 |  |
| 305 |  |  | $100-500 \mathrm{~m}$ away. | 0 |  |
| 306 |  |  | -500 m away, or no information. | 1 |  |
| 307 | F66 | Calcareous Fen | The AA is, or is part of, a calcareous fen. See the Plants_Calcar worksheet in the accompanying Supplnfo file for list of plant indicators (calciphiles). Enter 1 If more than two Strong or more than five Moderate calciphile species are present; otherwise enter 0 , but if not able to identify those and no information, change to blank. | 0 | [ $\mathrm{PH}, \mathrm{PR}]$ |


| \|rivestigator: BL | Site Identifier: Cambridge Wetland 2 | Date: 19 Aug 2021 |
| :--- | :--- | :--- | :--- |
| Stressor (S) Data Form for Non-Tidal Wetlands. WESP-AC for Nova Scotia version 2. | Data |  |



| S3 | Accelerated Inputs of Nutrients |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | In the last column, place a check mark next to any item -- occurring in either the wetland or its CA - that is likely to have accelerated the inputs of nutrients to the wetland. [NRV, PRV, STR] |  |  |  |  |
|  | Stormwater or wastewater effluent (including failing septic systems), landfills. |  |  |  |  |
|  | Fertilizers applied to lamns, ag lands, or other areas in the CA |  |  |  | 1 |
|  | Livestock, dogs. |  |  |  |  |
|  | Artificial drainage of upslope lands. |  |  |  |  |
|  | If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly more nutrients, then leave the "O's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present. |  |  |  |  |
|  |  | Severe (3 points) | Medium (2 points) | Mild (1 point) |  |
|  | Type of loading: | High density of unmaintained septic, some types of industrial sources. | Moderate density septic, cropland, secondary wastewater treatment plant. | Livestock, pets, low density residential. | 2 |
|  | Frequency \& duration of input: | Frequent and year-round. | Frequent but mostly seasonal. | Infrequent \& during high runoff events mainly. | 1 |
|  | AA proximity to main sources (actual or potential): | 0-15m | $15-100 \mathrm{~m}$ or in groundwater. | In more distant part of contributing area. | 2 |
|  | Sum= |  |  |  | 5 |
|  | Stressor subscore= |  |  |  | 0.56 |


| S4 | Excessive Sediment Loading from Contributing Area |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | In the last column, place a check mark next to any item present in the CA that is likely to have elevated the load of waterborme or windborne sediment reaching the wetland fromits CA [FA PR, INW, PH, SRv, STR] |  |  |  |  |
|  | Erosion from plowed fields, fill, timber havest, dirt roads, vegetation clearing, fires. |  |  |  | 1 |
|  | Erosion from construction, in-channel machinery in the CA |  |  |  |  |
|  | Erosion from off-road vehicles in the CA |  |  |  |  |
|  | Erosion from livestock or foot traffic in the CA |  |  |  |  |
|  | Stormwater or wastewater effluent. |  |  |  |  |
|  | Sediment from road sanding, gravel mining, other mining, oil/ gas extraction. |  |  |  |  |
|  | Accelerated channel downcutting or headcutting of tributaries due to altered land use. |  |  |  |  |
|  | Other human-related disturbances within the CA |  |  |  |  |
|  |  then leave the "O's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present. |  |  |  |  |
|  |  | Severe (3 points) | Medium (2 points) | Mild (1 point) |  |
|  | Erosion in CA: | Extensive evidence, high intensity.* | Potentially (based on high-intensity ${ }^{\star}$ land use) or scattered evidence. | Potentially (based on low-intensity ${ }^{\star}$ land use) with little or no direct evidence. | 2 |
|  | Recentness of significant soil disturbance in the CA: | Current \& ongoing. | 1-12 months ago. | $>1$ y ago. | 1 |
|  | Duration of sediment inputs to the wetland: | Frequent and year-round. | Frequent but mostly seasonal. | Infrequent \& during high runoff events mainly. | 2 |
|  | AA proximity to actual or potential sources: | 0-15m. | 15-100 m. | In more distant part of contributing area. | 1 |
|  | * high-intensity= extensive off-road vehicle use, plowing, grading, excavation, erosion with or without veg removal; low-intensity= veg removal only with little or no apparent erosion or disturbance of soil or sediment. |  |  | Sum= | 6 |
|  |  |  |  | Stressor subscore= | 0.50 |
| S5 | Soil or Sediment Alteration Within the Assessment Area |  |  |  |  |
|  |  (whichever is less). [CS, IN $, ~ N R, P H, S R, S T R]$ |  |  |  |  |
|  | Compaction from machinery, off-road vehicles, livestock, or mountain bikes, especially during wetter periods. |  |  |  |  |
|  | Leveling or other grading not to the natural contour. |  |  |  |  |
|  | Tillage, plowing (but excluding disking for enhancement of native plants). |  |  |  |  |
|  | Fill or riprap, excluding small amounts of upland soils containing organic amendments (compost, etc.) or small amounts of topsoil imported from another wetland. |  |  |  |  |
|  | Excavation. |  |  |  |  |
|  | Ditch cleaning or dredging in or adjacent to the wetland. |  |  |  |  |
|  | Boat trafic in or adjacent to the wetland and sufficient to cause shore erosion or stir bottom sediments. |  |  |  |  |
|  | Artificial water level or flow manipulations sufficient to cause erosion or stir bottom sediments. |  |  |  |  |
|  |  effects, contrast the current condition with the condition if the checked items never occurred or were no longer present. |  |  |  |  |
|  |  | Severe (3 points) | Medium (2 points) | Mild (1 point) |  |
|  | Spatial extent of altered soil: | >95\% of wetland or >95\% of its upland edge (if any). | 5-95\% of wetland or 5-95\% of its upland edge (if any). | $<5 \%$ of wetland and $<5 \%$ of its upland edge (if any). | 0 |
|  | Recentness of significant soil alteration in wetland: | Current \& ongoing. | 1-12 months ago. | $>1 \mathrm{yr}$ ago. | 0 |
|  | Duration: | Long-lasting, minimal veg recovery. | Long-lasting but mostly revegetated. | Short-term, revegetated, not intense. | 0 |
|  | Timing of soil alteration: | Frequent and year-round. | Frequent but mostly seasonal. | Mainly during one-time or scattered events. | 0 |
|  | Sum= |  |  |  | 0 |


| Scores will appear below after data are entered in worksheets OF, F, and S. See Manual for definitions and descriptions of how scores were computed. <br> Wetland Functions or Other Attributes: |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  | Function Score (Normalised) | Function Rating | Benefits Score (Normalised) | Benefits Rating | Function Score (raw) | Benefits Score (raw) |
| Water Storage \& Delay (WS) | 2.08 | Lower | 8.91 | Higher | 3.50 | 3.95 |
| Stream Flow Support (SFS) | 1.66 | Moderate | 4.28 | Moderate | 1.33 | 2.79 |
| Water Cooling (WC) | 7.70 | Higher | 9.62 | Higher | 5.13 | 5.13 |
| Sediment Retention \& Stabilisation (SR) | 4.71 | Moderate | 10.00 | Higher | 5.87 | 5.25 |
| Phosphorus Retention (PR) | 0.74 | Lower | 9.73 | Higher | 4.21 | 7.57 |
| Nitrate Removal \& Retention (NR) | 4.78 | Higher | 10.00 | Higher | 6.28 | 10.00 |
| Carbon Sequestration (CS) | 2.52 | Lower |  |  | 6.39 |  |
| Organic Nutrient Export (OE) | 5.44 | Moderate |  |  | 4.86 |  |
| Anadromous Fish Habitat (FA) | 5.56 | Higher | 4.62 | Higher | 3.64 | 2.94 |
| Resident Fish Habitat (FR) | 7.44 | Higher | 4.22 | Moderate | 3.95 | 2.64 |
| Aquatic Invertebrate Habitat (INV) | 7.94 | Higher | 8.12 | Higher | 6.77 | 5.44 |
| Amphibian \& Turtle Habitat (AM) | 8.11 | Higher | 3.60 | Moderate | 7.33 | 5.06 |
| Waterbird Feeding Habitat (WBF) | 6.76 | Higher | 3.33 | Moderate | 5.19 | 3.33 |
| Waterbird Nesting Habitat (WBN) | 8.14 | Higher | 3.33 | Moderate | 5.91 | 3.33 |
| Songbird, Raptor, \& Mammal Habitat (SBM) | 7.72 | Higher | 3.33 | Moderate | 6.65 | 3.33 |
| Pollinator Habitat (POL) | 6.74 | Moderate | 3.33 | Moderate | 5.58 | 3.33 |
| Native Plant Habitat (PH) | 5.51 | Moderate | 5.19 | Lower | 6.10 | 5.19 |
| Public Use \& Recognition (PU) |  |  | 0.56 | Lower |  | 0.68 |
| Wetland Sensitivity (Sens) |  |  | 4.56 | Moderate |  | 4.13 |
| Wetland Ecological Condition (EC) |  |  | 6.52 | Higher |  | 8.33 |
| Wetland Stressors (STR) (higher score means more stress) |  |  | 7.80 | Higher |  | 3.93 |
| Summary Ratings for Grouped Functions: |  |  |  |  |  |  |
| HYDROLOGIC Group (WS) | 10.00 | Higher | 8.91 | Higher | 3.50 | 3.95 |
| WATER QUALITY SUPPORT Group (max+avg/2 of SR, PR, NR, CS) | 4.09 | Lower | 9.96 | Higher | 6.04 | 8.80 |
| AQUATIC SUPPORT Group (max+avg/2 of SFS, INV, OE, WC) | 6.81 | Higher | 8.48 | Higher | 5.65 | 4.95 |
| AQUATIC HABITAT Group (max+avg/2 of FA, FR, AM, WBF, WBN) | 7.67 | Higher | 4.22 | Moderate | 6.27 | 4.26 |
| TRANSITION HABITAT Group (max+avg/2 of SBM, PH, POL) | 7.19 | Higher | 4.57 | Lower | 6.38 | 4.57 |
| WETLAND CONDITION (EC) |  |  | 6.52 | Higher |  | 8.33 |
| WETLAND RISK (average of Sensitivity \& Stressors) |  |  | 6.18 | Higher |  | 4.03 |
|  | NOTE: A score of 0 does not mean the function or benefit is absent from the wetland. It means only that this wetland has a capacity that is equal or less than the lowest-scoring one, for that function or benefit, from among all the NS calibration wetlands that were assessed previously. |  |  |  |  |  |


| Cover Page: Basic Description of Assessment | WESP-AC version 2 |
| :---: | :---: |
| Site Name: | Cambridge Interchange Wetland 3 |
| Investigator Name: | BL |
| Date of Field Assessment: | 19 Aug 2021 |
| Nearest Town: | Waterville, NS |
| Latitude (decimal degrees): | 368964 |
| Longitude (decimal degrees): | 4989943 |
| Is a map based on a formal on-site wetland delineation available? | Yes |
| Approximate size of the Assessment Area (AA, in hectares): | 0.3 |
| AA as percent of entire wetland (approx.). Attach sketch map if AA is smaller than the entire contiguous wetland. | 100 |
| What percent (approx.) of the wetland were you able to visit? | 100 |
| What percent (approx.) of the AA were you able to visit? | 100 |
| Were you able to ask the site owner/manager about any of the questions? | No |
| Indicate here if you intentionally surveyed for rare plants, calciphile plants, or rare animals: | Yes |
| Have you attended a WESP-AC training session? If so, indicate approximate month \& year. | Yes |
| How many wetlands have you assessed previously using WESP-AC? (approx.) | >100 |
| Comments about the site or this WESP-AC assessment (attach extra page if desired): |  |


|  | A | B | C | D | E |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | Date: 19 Aug 2021 |  | Site Identifier: Cambridge Interchange Wetland 3 | Investigator: BL |  |
| 2 | Form OF (Office). Non-tidal Wetland Data Form. WESP-AC version 2 for Nova Scotia wetlands only. DIRECTIONS: Conduct an assessment only after reading the accompanying <br> Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answering many of the questions below will require using these online map viewers: <br> Google Earth Pro: https://www.google.com/earth/download/gep/agree.html <br> Provincial Landscape Viewer: https://nsgi.novascotia.ca/plv/ <br> For most wetlands, completing this office data form will require 1-2 hours. For a list of functions to which each question pertains, see bracketed abbreviations in the Definitions/Explanations column. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention \& Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV=Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM=Amphibian \& Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, \& Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use \& Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors. |  |  |  |  |
| 3 | \# | Indicators | Condition Choices | Data | Definitions/Explanations |
| 4 | OF1 | Province | Mark the province in which the AA is located by changing the 0 in the colurm next to it to a "1". Mark only one. |  | This determines to which province's calibration wetlands the raw score of any wetland is normalised. |
| 5 |  |  | New Brunswick | 0 | data exists in a particular province. |
| 6 |  |  | Nova Scotia | 1 |  |
| 7 |  |  | Prince Edward Island | 0 |  |
| 8 |  |  | Newfoundland-Labrador | 0 |  |
| 9 | OF2 | Ponded Area Wthin 1 km | The area of surface water ponded during most of the growing season that is both (1) in or adjacent to the $A A$ and (2) within 1 km is: |  | "Adjacent" means not separated from the AA by a wide expanse ( $>50 \mathrm{~m}$ ) of upland (including roads $>50 \mathrm{~m}$ wide). Include ponded areas likely to be hidden by wetland vegetation. If surface water |
| 10 |  |  | $<0.01$ hectare (about $10 \mathrm{~m} \times 10 \mathrm{~m}$ ). | 0 | extends beyond 1 km , include only the part within 1 km Do not include tidal areas. Measure the |
| 11 |  |  | 0.01-0.1 hectare. | 1 | ued |
| 12 |  |  | 0.1-1 hectare. | 0 |  |
| 13 |  |  | 1 to 10 hectares. | 0 |  |
| 14 |  |  | 10 to 100 hectares. | 0 |  |
| 15 |  |  | $>100$ hectares. | 0 |  |
| 16 | OF3 | Ponded Water \& Wetland Wthin 1 km | The area of wetlands and surface water ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: |  | See definition of adjacent in OF2. If the AA's wetland vegetation extends beyond 1 km , include only the part within 1 km "Ponded" means not flowing in rivers or streams. [Sens, WBF] |
| 17 |  |  | $<0.01$ hectare (about $10 \mathrm{~m} \mathrm{\times 10} \mathrm{~m}$ ). | 0 |  |
| 18 |  |  | 0.01-0.1 hectare. | 0 |  |
| 19 |  |  | 0.1-1 hectare. | 0 |  |
| 20 |  |  | 1 to 10 hectares. | 1 |  |
| 21 |  |  | 10 to 100 hectares. | 0 |  |
| 22 |  |  | >100 hectares. | 0 |  |
| 23 | OF4 | Size of Largest Nearby Vegetated Tract or | The largest vegetated patch or corridor that includes the AA's vegetation plus alladjacent upland vegetation that is not lamn, row crops, heavily grazed lands, conifer plantation is: |  | See definition of adjacent in OF2. Use Google Earth Pro's polygon ruler (as described above). <br> Exclude conifer plantations only if it is obvious that trees were planted in rows. [AM, PH, SBM, Sens] |
| 24 |  |  | $<0.01$ hectare (about $10 \mathrm{~m} \times 10 \mathrm{~m}$ ). | 0 |  |
| 25 |  |  | 0.01-0.1 hectare. | 0 |  |
| 26 |  |  | 0.1-1 hectare. | 0 |  |
| 27 |  |  | 1 to 10 hectares. | 0 |  |
| 28 |  |  | 10 to 100 hectares. | 0 |  |
| 29 |  |  | 100 to 1000 hectares. | 0 |  |
| 30 |  |  | $>1000$ hectares. [This is nearly always the answer in relatively undeveloped landscapes.] | 1 |  |


|  | A | B | C | D | E |
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| 31 | OFS | Distance to Large Vegetated Tract | The minimum distance from the edge of the AA to the edge of the closestvegetated land (but excluding row crops, lawn, conifer plantation) larger than 375 hectares (about 2 km on a side), is: |  | To measure distance, use Google Earth Pro (Ruler > Line tool). The 375 -ha criterion is from the Fundy Model Forest Project. [AM, PH, POL, SBM, Sens] |
| 32 |  |  | $<50 \mathrm{~m}$, and not separated from the 375 -ha vegetated area by any width ofpaved roads, stretches of open water, row crops, bare ground, lawn, or impervious surface. Or the $A A$ itself contains $>375$ ha of vegetation. [This is often the answer in relatively undeveloped landscapes.] | 0 |  |
|  |  |  | 40 m , but completely separated from the 375-ha vegetated area by those features, and AA does not contain $>375$ ha of vegetation. | 1 |  |
| 34 |  |  | 50-500 m, and not separated. | 0 |  |
| 35 |  |  | 50-500 m, but separated by those features. | 0 |  |
| 36 |  |  | $0.5-5 \mathrm{~km}$, and not separated. | 0 |  |
| 37 |  |  | $0.5-5 \mathrm{~km}$, but separated by those features. | 0 |  |
| 38 |  |  | None of the above (the closest patches or corridors which are that large are $>5 \mathrm{~km}$ away). | 0 |  |
| 39 | OF6 | Herbaceous Uniqueness | The AA's vegetation cover is $>10 \%$ herbaceous* but uplands within 5 km have $<10 \%$ herbaceous cover. If so, enter " 3 " and continue to OF7. If not, consider: <br> The AA's vegetation cover is $>10 \%$ herbaceous* but uplands within 1 km have $<10 \%$ herbaceous cover. If so enter " 2 " and continue to Of7. If not, consider: <br> The AA's vegetation cover is $>10 \%$ herbaceous* but uplands within 100 m of the wetland edge have $<10 \%$ herbaceous cover. If so, enter "1". <br> [* NOTE: Exclude lamns, row crops, heavily grazed lands, forest, shrublands. Include moss as well as grasslike plants in this use of "herbaceous vegetation'] | 0 | For this question only, consider moss to be herbaceous vegetation. Determine the score by vieving aerial imagery in Google Earth after successively drawing or estimating the boundaries of the buffers of $5 \mathrm{~km}, 1 \mathrm{~km}$, and 100 m radius focused on the center of the AA. Circles of specified radius can be dramn in Google Earth Pro by clicking on the Ruler icon, then Circle in the pop-up menu. [AMN, PHN, POLv, SBMN, WBFv, WBNv] |
| 40 | OF/ | Woody Uniqueness | The AA's vegetation cover is $>10 \%$ woody* but uplands within $5 \mathrm{kmhave}<10 \%$ woody cover. If so, enter " 3 " and continue to OF8. If not, consider: <br> The AA's vegetation is $>10 \%$ woody ${ }^{\star}$ but uplands within 1 km have $<10 \%$ woody cover. If so enter " 2 " and continue to OF8. If not, consider: <br> The AA's vegetation is $>10 \%$ woody ${ }^{\star}$ but uplands within 100 m of the wetland edge have $<10 \%$ woody cover. If so, enter " 1 " <br> [* NOTE: woody cover = trees \& shrubs taller than 1 m ] | 0 | See above. Do not consider conifer plantations to be forest if it is obvious that trees were planted in rows. [AMN, PHV, POLv, SBMN] |
| 41 | OF8 | Local Vegetated Cover Percentage | Draw a 5 -km radius circle measured from the center of the AA. Ignoring all permanent water in the circle, the percent of the remaining are that is wooded or unmanaged herbaceous vegetation (NOT lawn, row crops, bare or heavily grazed land, clearcuts, or conifer plantations) is: |  | In Google Earth, draw the 5 km buffer and then estimate land cover percentages, or do GIS analysis of an appropriate land cover layer. [AM, PH, POL, SBM, Sens] |
| 42 |  |  | -5\% of the land. | 0 |  |
| 43 |  |  | 5 to 20\% of the land. | 0 |  |
| 44 |  |  | 20 to 60\% of the land. | 1 |  |
| 45 |  |  | 60 to $90 \%$ of the land. | 0 |  |
| 46 |  |  | >90\% of the land. SKIP to OF10. | 0 |  |
| 47 | OF9 | Type of Land Cover Alteration | Wthin the 5 -km radius circle, and ignoring all permanent water, the land area that is bare or non-perennial cover is mostly: |  | [AM, SBM] |
| 48 |  |  | Impervious surface, e.g., paved road, parking lot, building, exposed rock. | 0 |  |
| 49 |  |  | Bare pervious surface, e.g., lawn, recent (< 5 yrs ago) clearcut, dirt or gravel road, cropland, landslide, conifer plantation. | 1 |  |
| 50 | OF10 | Distance by Road to Nearest Population Center | Measured along the maintained road nearest the A , the distance to the nearestpopulation center is: |  | "Population center" means a settled area with more than about 5 regularly- inhabited structures per square kilometer. In Google Earth Pro, click on the Ruler icon, then Path, and draw and measure the route. [FAv, FRV, NRv, PH, PU, SBM, WBFV] |
| 51 |  |  | $<100 \mathrm{~m}$. | 1 |  |
| 52 |  |  | 100-500m. | 0 |  |
| 53 |  |  | $0.5-1 \mathrm{~km}$ | 0 |  |
| 54 |  |  | $1-5 \mathrm{~km}$ | 0 |  |
| 55 |  |  | -5km | 0 |  |
| 56 | OF11 | Distance to Nearest Maintained Road | From the center of the AA, the distance to the nearest maintained public road (dirt or paved) is: |  | Determine this by viewing aerial imagery in Google Earth Pro and measuring with the Ruler>Line tool. [AM, FAv, FRv, NRv, PH, PU, SBM, STR, WBN] |
| 57 |  |  | $<10 \mathrm{~m}$ | 0 |  |
| 58 |  |  | 10-25m. | 1 |  |
| 59 |  |  | 25-50m. | 0 |  |
| 60 |  |  | 50-100 m. | 0 |  |
| 61 |  |  | 100-500m. | 0 |  |
| 62 |  |  | >500 m. | 0 |  |


|  | A | B | C | D | E |
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| 63 | OF12 | Wildifife Access | Draw a circle of radius of 5 km from the center of the $A A$ If marmals and amphibians can move from the center of the $A A$ to $A L L$ other separate wetlands and ponds located within the circle without being forced to cross pavement (any width), lawns, bare ground, and/or marine waters, mark $1=$ yes can move to all, $0=$ no. Change toblank if there are no other wetlands within 5 km . | 0 | Draw the 5 km circle in Google Earth Pro using the Circle tool and search for roads and wetlands within it, being alert for roads hidden under forest canopy. [AM, SBM, STR] |
| 64 | OF13 | Distance to Ponded Water | The distance from the AA center to the closest (but separate) ponded water body visible in Google Earth imagery is: |  | In Google Earth Pro, zoom in dosely to examine the surrounding landscape for ponds, lakes, and wetlands that appear to be permanently flooded. [AM, PH, SBM, Sens, WBF, WBN] |
| 65 |  |  | -50 m, and not separated by any width of paved roads, stretches of open water, row crops, lamn, bare ground, or impervious surface. | 0 |  |
| 66 |  |  | 50 m , but completely separated by those features. | 0 |  |
| 67 |  |  | $50-500 \mathrm{~m}$, and not separated. | 0 |  |
| 68 |  |  | $50-500 \mathrm{~m}$, but separated by those features. | 0 |  |
| 69 |  |  | $0.5-1 \mathrm{~km}$, and not separated. | 0 |  |
| 70 |  |  | $0.5-1 \mathrm{~km}$, but separated by those features. | 1 |  |
| 71 |  |  | None of the above (the closest patches or corridors that large are >1 km away). | 0 |  |
| 72 | OF14 | Distance to Large Ponded Water | The distance from the AA center to the closest (but separate)non-tidal body of water that is ponded during most of the year and islarger than 8 hectares during most of a normal year is: |  | Determine this by viewing aerial imagery in Google Earth. [Sens, WBF, WBN] |
| 73 |  |  | $<100 \mathrm{~m}$ | 0 |  |
| 74 |  |  | $100 \mathrm{~m}-1 \mathrm{~km}$ | 0 |  |
| 75 |  |  | 1-2km. | 0 |  |
| 76 |  |  | 2-5 km | 0 |  |
| 77 |  |  | $5-10 \mathrm{~km}$ | 1 |  |
| 78 |  |  | $>10 \mathrm{~km}$ | 0 |  |
| 79 | OF15 | Tidal Proximity | The distance from the AA edge to the closesttidal water body (regardless of its salinity) is: |  | In Google Earth, measure the distance to the ocean (including Bay of Fundy) or tidal river, whichever is closer. If you need to see howfar upriver a river is tidal, see the KNZ file provided with this calculator for NS (NS Headtide). Points shown in those files are only an approximation, so local information if available may be preferable. [FA, WBF] |
| 80 |  |  | $\angle 100 \mathrm{~m}$ | 0 |  |
| 81 |  |  | $100 \mathrm{~m}-1 \mathrm{~km}$ | 0 |  |
| 82 |  |  | $1-5 \mathrm{~km}$ | 0 |  |
| 83 |  |  | $5-10 \mathrm{~km}$ | 0 |  |
| 84 |  |  | $10-40 \mathrm{~km}$ | 1 |  |
| 85 |  |  | $>40 \mathrm{~km}$ | 0 |  |


|  | A | B | C | D | E |
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| 86 | OF16 | Upland Edge Contact | Select one: |  | [NR, SBM, Sens] |
|  |  |  | The AA has no upland edge (or upland is <1\% of perimeter). The AA is entirely surrounded by (\& contiguous with) other wetlands or water | 0 |  |
|  |  |  | 1-25\% of the AA's perimeter abuts upland (including filled areas). The rest adjoins other wetlands or water that is mostly wider than the Af | 0 |  |
| 89 |  |  | $25-50 \%$ of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA | 0 |  |
| 90 |  |  | $50-75 \%$ of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA. | 0 |  |
| 91 |  |  | More than $75 \%$ of the AA's perimeter abuts upland. Any remainder adjoins other wetlands or water that is mostly wider than the AA. This will be true for most assessments done with WESP-AC. | 1 |  |
| 92 | OF17 | Food Damage fromNon tidal Waters | Wthin 5 km downstream or downslope of the AA (select first true choice): |  | Contact local authories to determine if such maps exist. Where available, LiDAR imagery can provide finer elevational resolution useful for flood modeling. [WSV] |
| 93 |  |  | Maps show Flood Zone or Flood Risk areas and there appears to be infrastructure vulnerable to river flooding not caused by tidal storm surges. | 0 |  |
| 94 |  |  | Maps show Food Zone or Flood Risk areas, but infrastructure is absent or is not vulnerable to floods from a non-tidal river. In some cases levees, upriver dams, or other measures may partly limit damage or risk from smaller events. | 0 |  |
| 95 |  |  | Maps do not show Food Zone or Food Risk areas (or no such mapping has been done locally) and there appears to be infrastructure vulnerable to river flooding unrelated to tidal storm surges. | o |  |
| 96 |  |  | Maps do not show Flood Zone or Food Risk areas (or no such mapping has been done locally) and there isno infrastructure vulnerable to river flooding unrelated to tidal storm surges. | 1 |  |
| 97 | OF18 | Relative Đevation in Watershed | In Google Earth, enable the Terrain layer (lower left menu) and open the NS_Watersheds Secondary KNZ file that accompanies this calculator. Then determine the AA's approximate elevation (bottom right, NOT the "eye alt"). Then move cursor around to determine the watershed's maximum and minimum elevation. Divide the AA's elevation by the (max-min). | 0.13 | [FA, NR, Sens, SFSv, WCV, WSv] |
| 98 | OF19 | Water Quality Sensitive Watershed or Area | The AA is in a Protected Water Supply area (Designated Water Supply Area, Natural Watershed Municipal Surface Water Supply Area, or Municipal Water Supply Area) according to the provided KMZ overlay ('NS Protected Water Supply Areas'). Enter $1=$ yes, $0=$ no. | 0 | If an ACCDC report is available for this AA, it also may contain such information. [NRV] |


|  | A | B | C | D |  |
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| 99 |  | Degraded Water Upstream | Sampling indicates a problem with concentrations of metals, hydrocarbons, nutrients, or other substances (excluding bacteria, acidic water, high temperatures) being present at levels harmful to aquatic life or humans, and: |  | May use existing data, or sample those waters as part of this wetland assessment. "Harmful" should be evaluated with regard to current federal or provincial water quality standards. [AM, FA, FR, NRV, PRV, SRV, STR, WBF, WBN] |
| 100 |  |  | The condition is present within the AA | 0 |  |
| 101 |  |  | The condition is present in waters within 1 km that flowinto the AA, but has not been documented in the AA itself. | 0 |  |
| 102 |  |  | Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters. | 0 |  |
| 103 |  |  | Data are insufficient (no or inadequate sampling within 1 km , or condition exists only at $>1 \mathrm{~km}$ upstream). This is the situation for nearly all wetlands in this region. | 1 |  |
| 104 | OF21 | Degraded | The problem described above is downslope fromthe AA, and: |  | May use existing data, or monitor waters as part of this wetland assessment. [NRV, PRV, SRv] |
| 105 |  | Downstream | The condition is present within 1 km downslope and connected to the AA by a channel. | 0 |  |
| 106 |  |  | The condition is present within 5 km downslope and connected to the AA by a channel, or within 1 km but not connected to the AA by a channel. | 0 |  |
| 107 |  |  | Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters. | 0 |  |
| 108 |  |  | Data are insufficient (no or inadequate sampling within 1 km , or condition exists only at $>1 \mathrm{~km}$ upstream). This is the situation for nearly all wetlands in this region. | 1 |  |
| 109 | OF22 | Wetland as a \% of Its Contributing Area (Catchment) | From a topographic map and field observations, estimate the approximate boundaries of the catchment (CA) of the entire wetland of which the AA may be only a part. Then adjust those boundaries if necessary based on your field observations of the surrounding terrain, and/or by using procedures described in the Manual. Divide the area of the wetland (not just the $A A$ ) by the approximate area of its catchment excluding the area of the wetland itself. When doing the calculation, if ponded water is adjacent to the wetland, include that in the wetland area. The result is: |  | Topographic maps may be viewed online at the National Atlas of Canada (Toporama): http://atlas.gc.ca/toporama/en/index.html [NR, PR, Sens, SR, WS] |
| 110 |  |  | <0.01, or catchment size unknown due to stormwater pipes that collect water from an indeterminate area. | 1 |  |
| 111 |  |  | 0.01 to 0.1. | 0 |  |
| 112 |  |  | 0.1 to 1. | 0 |  |
| 113 |  |  |  | 0 |  |
| 114 | OF23 | Unvegetated Surface in the Contributing Area | The proportion of the AA's contributing area (measured to no more than 1000 m upslope) that is comprised of buildings, roads, parking lots other pavement, exposed bedrock, landslides, and other mostly-bare surface is about : |  | [FA, INV, NRV, PRV, SRv, STR, WCV, WSv] |
| 115 |  |  | <10\% | 0 |  |
| 116 |  |  | 10 to $25 \%$ | 0 |  |
| 117 |  |  | >25\% | 1 |  |
|  | OF24 | Transport From Upslope | A relatively large proportion of the precipitation that falls farther upslope in the CA reaches this wetland quickly as runoff (surface water), as indicated by the following: <br> (a) input channel is present, <br> (b) input channels have been straightened, <br> (c) upslope wetlands have been ditched extensively, <br> (d) land cover is mostly non-forest, <br> (e) CA slopes are steep, and/or <br> (f) most CA soils are shallow (bedrock near surface) and/or have high runoff coefficients. <br> This statement is: |  | [NRV, PRV, SRV, WSU] |
| 119 |  |  | Mostly true. | 0 |  |
| 120 |  |  | Somenhat true. | 0 |  |
| 121 |  |  | Mostly untrue. | 1 |  |
| 122 | OF25 | Aspect | The overland flow direction of most surface water (in streams, rivers, or runoff) that enters the AA is: |  | [AM, NR, SFS, WC, WS] |
| 123 |  |  | Northward (N, NE). north-facing contributing area | 0 |  |
| 124 |  |  | Southward (S, SW). south-facing contributing area. | 1 |  |
| 125 |  |  | Other (E, SE, W, MM), or no detectable uphill slope or input channel (flat). | 0 |  |
| 126 <br> 127 | OF26 | Internal Aow Distance (Path Length) | The horizontal flow distance from the wetland's inlet to outlet is: <br> 10 m | 0 | Identify inlets and outlets, if any, from topographic maps (use elevations to determine which are inlets and which are outlets) and augment by field inspection. Whth the Provincial Landscape Viewer, select NovaScotia Tonoas the Baseman_Also enable the laver Forestn W/AM Predicted Flow Then |




|  | A | B | C | D | E |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | Date: | 19 August 2021 | Site Identifier: Cambridge Interchange ML-3 | Investiga | ator: BL |
|  | Form F (Field). Non-tidal Wetland Data Form. WESP-AC version 2 for Nova Scotia. DIRECTIONS: Walk for no less than 10 minutes from the wetland edge towards its core, in the part of the AA that is proposed for alteration. If no alteration is proposed, walk in a portion that appears to be most representative of the wetland overall. Walk only where it is safe and legal to do so. Conduct the assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answer these questions primarily based on your onsite observations and interpretations. Do not write in shaded parts of this data form. Answering some questions accurately may require conferring with the landowner or other knowledgable persons, and/or reviewing aerial imagery. For most wetlands, completing this field data form will require 1-2 hours on a site. For a list of functions to which each question pertains, see the accompanying Interpretations form. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage \& Delay, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention \& Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV= Invertebrate Habitat, FA=Anadromous Fish Habitat, FR= Resident Fish Habitat, AM= Amphibian \& Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, \& Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use \& Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors. |  |  |  |  |
| 3 | \# | Indicators | Condition Choices | Data | Definitions/Explanations |
| 4 <br>  <br> 5 | F1 | Wetland Type | Follow the key below and mark the ONE row that best describes MOST of the vegetated part of the AA: <br> A. Moss and/or lichen cover more than $25 \%$ of the ground. Often dominated by ericaceous shrubs (e.g., Labrador tea) or other acid-tolerant plants (e.g., bog cranberry, pitcher plant, sundew, orchids). Substrate is mostly undecomposed peat. Choose between A1 and A2 and mark the choice with 1 in their adjoining colurnn. Othervise go to $B$ below. |  | Ericaceous shrubs are ones in the heather family (Ericaceae). Most have leathery evergreen leaves. They include rhododendron, azalea, swamp laurel, leatherleaf, Labrador tea, and others. Most require acidic soil. Athough not in the family Ericaceae, sweetgale (Myrica gale) should be counted also. [AM, CS, FA, FR, INN, NR, OE, PH, Sens, SFS, WBF, WBN] |
|  |  |  | A1. Surface water is usually absent or, if present, pH is typically $<4.5$ and conductivity is usually $<100 \mu \mathrm{~S} / \mathrm{cm}$ ( $<64 \mathrm{ppm}$ TDS). Trees are absent or nearly so. Sedge cover usually sparse or absent but cottongrass and/or lichen cover may be extensive, as well as cloudberry, lingonberry, sheep laurel, and a sedge (Carex rariflor a). Wetland surface and surrounding landscape are seldom sloping and wetland often is domed (convex). Inlet and outlet channels are usually absent. If known, pH of peat is $<4.0$. | 0 |  |
| 7 |  |  | A2 Not A1. Surface water, if present, has pH typically $>4.5$ and conductivity is usually $>100 \mu \mathrm{~S} / \mathrm{cm}$ ( $>64 \mathrm{ppm}$ TDS). Sedge cover is usually extensive, andor tree and tall shrub cover is extensive. Sometimes at toe of slope or edge of water body. An exit channel is usually present. Wetter than A1 and peat depth may be shallower ( $<2 \mathrm{~m}$ ). | 0 |  |
| 8 |  |  | B. Moss and/or lichen cover less than $25 \%$ of the ground. Soil is mineral or decomposed organic (muck). Choose between B1 and B2 and mark the choice with 11 in their adjoining column: |  |  |
| 9 |  |  | B1. Trees and shrubs taller than 1 m comprise more than $25 \%$ of the vegetated cover. Surface water is mostly absent or inundates the vegetation only seasonally (e.g., vernal pools or floodplain). | 1 |  |
| 10 |  |  | B2. Not B1. Tree \& tall shrubs comprise less than than $25 \%$ of the vegetated cover. Vegetation is mostly herbaceous, e.g., cattail, bulrush, burreed, pond lily, horsetail. Surface water may be extensive and fluctuates seasonally, being either persistent or drying up partly or entirely. | 0 |  |
|  | Reminder: For all questions, the AA should include all persistent waters in ponds smaller than 8 hectares ( -283 m on a side) that are adjacent to the $A \mathrm{~A}$ The AA should also include part of the water area of adjacent ponded water larger than 8 ha and adjacent rivers wider than 20 m . Specifically, the AA should include the open water part adjacent to wetland vegetation and equal in width to the average width of that vegetated zone. Throughout this data form, "adjacent " is used symonymously with abutting, adjoining, bordering, contiguous -- and means no upland (manmade or natural) completely separates the described features along their directly shared edge. Features joined only by a channel are not necessarily considered to be adjacent -- a large portion of their edges must match. The features do not have to be hydrologically connected in order to be considered adjacent. |  |  |  |  |
| 11 | F2 |  |  |  |  |
| 12 |  | Wetland Types - <br> Adjoining or Subordinate | If the $A A$ is smaller than 1 ha, mark all other types that occupy more than $1 \%$ of the vegetated $A A$. If the $A A$ is larger than 1 ha, mark all other types which are within or adjacent to the $A A$ and occupy more than 1 ha, as visible from the $A A$ or as interpreted from aerial imagery. Do not mark again the type marked in F1. |  | 1 hectare is 10,000 sq. m or about 2.5 acres. It could have dimensions of $100 \mathrm{mby} 100 \mathrm{~m}, 1000 \mathrm{mby}$ 10 m , or similar. [AM, INV, SBM, WBF] |
| 13 |  |  | A1. | 0 |  |
| 14 |  |  | A2. | 0 |  |
| 15 |  |  | B1. | 0 |  |
| 16 |  |  | B2. | 0 |  |
| 17 <br> 18 | F3 | Woody Height \& Form Diversity | Following EACH row below, indicate with a number code the percentage of the living vegetation in the AA which is occupied by that feature <br> ( $\mathbf{6}$ if $>95 \%, \mathbf{5}$ if $75-95 \%, \mathbf{4}$ if $50-75 \%, \mathbf{3}$ if $25-50 \%, \mathbf{2}$ if $5-25 \%, \mathbf{1}$ if $\angle 5 \%$, $\mathbf{0}$ if none). If the vegetated part of the AA is largely herbaceous (non- <br> woody) vegetation, these percentages should not sum to $100 \%$ <br> coniferous trees (may include tamarack) taller than 3 m | 2 | Deciduous shrubs in this region usually include buttonbush, Labrador tea, bayberry (Morella), huckleberry, cranberry, cloudberry, sweetgale, alder, willow, birch, ash, dogwood, and a few others. If you assigned a code of 3 or higher to any of the first four choices and the ground cover beneath the trees/shrubs is $<25 \%$ moss, then question F1 might be "B1". [CS, INN, NR, PH, POL, SBM, Sens] |


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| 19 |  |  | deciduous trees taller than 3 m | 2 |  |
| 20 |  |  | coniferous or ericaceous shrubs or trees 1-3 mtall not directly below the canopy of trees. | 2 |  |
| 21 |  |  | deciduous shrubs or trees 1-3 mtall not directly below the canopy of trees. | 3 |  |
| 22 |  |  | Coniferous or ericaceous shrubs <1 mtall not directly below the canopy of taller vegetation. | 2 |  |
| 23 |  |  | deciduous shrubs or trees $<1 \mathrm{mtall}$ (e.g., deciduous seedlings) not directly below the canopy of taller vegetation. | 2 |  |
| 24 | Note: If none of top 4 rous in F3 was marked 2 or greater, SKIP to F9 (N fixers). |  |  |  |  |
| 25 | F4 | Dominance of Most Abundant Shrub Species | Determine which two woody plant species comprise the greatest portion of the low ( $\langle<\mathrm{m}$ ) woody cover. Then choose one: |  | [PH, POL, SBM, Sens] |
| 26 |  |  | those species together comprise $>50 \%$ of such cover. | 1 |  |
| 27 |  |  | those species together do not comprise $>50 \%$ of such cover. | 0 |  |
| 28 | Fs | Woody Diameter Classes | Mark $\mathbf{A L L}$ the types that comprise $>5 \%$ of the woody canopy cover in the AA or $>5 \%$ of the wooded areas (if any) along its upland edge (perimeter). The edge should include only the trees whose canopies extend into the AA |  | Estimate the diameters at chest height. If small-diameter trees are overtopped (shaded) by larger ones, visualise a "subcanopy" at the average height of the smaller-dbh trees, to serve as a basis for the minimum 5\% canopy requirement in this question. The trees and shrubs need not be wetland species. [AM, CS, POL, SBM, Sens, WBN] |
| 29 |  |  | coniferous, $1-9 \mathrm{~cm}$ diameter and $>1 \mathrm{~m}$ tall. | 1 |  |
| 30 |  |  | broad-leaved deciduous $1-9 \mathrm{~cm}$ diameter and $>1 \mathrm{mtall}$. | 1 |  |
| 31 |  |  | coniferous, $10-19 \mathrm{~cm}$ diameter. | 1 |  |
| 32 |  |  | broad-leaved deciduous $10-19 \mathrm{~cm}$ diameter. | 1 |  |
| 33 |  |  | coniferous, $20-40 \mathrm{~cm}$ diameter. | 0 |  |
| 34 |  |  | broad-leaved deciduous $20-40 \mathrm{~cm}$ diameter. | 0 |  |
| 35 |  |  | coniferous, 740 cm diameter. | 0 |  |
| 36 |  |  | broad-leaved deciduous $>40 \mathrm{~cm}$ diameter. | 0 |  |
| 37 | F6 | Height Class Interspersion | Follow the key below and mark the ONE row that best describes MOST of the AA: |  | [AM, INV, NR, PH, SBM, Sens] |
|  |  |  | A. Neither the vegetation taller than 1 m nor the vegetation shorter than that comprise $>70 \%$ of the vegetated part of the $A A$. They each comprise $30-70 \%$ Choose between A 1 and A 2 and mark the choice with a 1 in the adjoining colum. Otherwise go to B below. |  |  |
| 38 |  |  |  |  |  |
| 39 |  |  | A1 The two height classes are mostly scattered and intermixed throughout the AA | 1 |  |
| 40 |  |  | A2 Not A1. The two height classes are mostly in separate zones or bands, or in proportionately large clumps. | 0 |  |
| 41 |  |  | B. Ether the vegetation shorter than 1 m comprises $>70 \%$ of the vegetated part of the $A A$, or the vegetation taller than that does. One size class might even be totally absent. Choose between B1 and B2 and mark the choice with a 1 in the adjoining column: |  |  |
| 42 |  |  | B1 The less prevalent height class is mostly scattered and intermixed within the prevalent one. | 0 |  |
| 43 |  |  | B2. Not B1. The less prevalent height class is mostly located apart from the prevalent one, in separate zones or clumps, or is completely absent. | 0 |  |
| 44 | 7 | Large Snags (Dead Standing Trees) | The number of large snags (diameter $\mathbf{2 0} \mathbf{~ c m}$ ) in the AA plus adjacent upland area within 10 m of the wetland edge is: |  | Snags are dead standing trees that often (not always) lack bark and foliage. Include only ones that are at least 2 m tall. [POL, SBM, WBN] |
| 45 |  |  | None, of fewer than $8 /$ hectare which exceed this diameter. | 1 |  |
| 46 |  |  | Several ( $>8 / \mathrm{hectare)}$ ) and a pond, lake, or slow-flowing water wider than 10 mis within 1 km | 0 |  |
| 47 |  |  | Several ( $>8$ hectare) but above not true. | 0 |  |
| 48 | F8 | Domned Wood | The number of downed wood pieces longer than 2 m and with diameter $>10 \mathrm{~cm}$, and not persistently submerged, is: |  | Exclude temporay "bum piles." [AM, INV, POL, SBM] |
| 49 |  |  | Few or none that meet these criteria. | 1 |  |
| 50 |  |  | Several ( $>5$ if $A$ A is $>5$ hectares, less for smaller $A$ As) meet these criteria | 0 |  |
| 51 | F9 | NFixers | The percentage of the AA's vegetated cover that contains nitrogen-fixing plants (e.g., alder, sweetgale, clover, lupine, alfalfa, other legumes) is: |  | Do not include N -fixing algae or lichens. [FA, $\mathrm{FR}, \mathrm{IN}, \mathrm{NRV}, \mathrm{OE}, \mathrm{PH}, \mathrm{SBM}$, Sens] |
| 52 |  |  | <1\% or none. | 0 |  |
| 53 |  |  | 1-25\% of the vegetated cover, in the AA or along its water edge (whichever has more). | 0 |  |
| 54 |  |  | $25-50 \%$ of the vegetated cover, in the AA or along its water edge (whichever has more). | 1 |  |
| 55 |  |  | $50-75 \%$ of the vegetated cover, in the AA or along its water edge (whichever has more). | 0 |  |
| 56 |  |  | $>75 \%$ of the vegetated cover, in the AA or along its water edge (whichever has more). | 0 |  |
| 57 | F10 | Sphagnum Moss Extent | The cover of Sphagnum moss (or any moss that forms a dense cushion many centimeters thick), including the moss obscured by taller sedges and other plants rooted in it, is: |  | Exclude moss growing on trees and rocks. [CS, PH] |
| 58 |  |  | -5\% of the vegetated part of the AA | 0 |  |
| 59 |  |  | $5-25 \%$ of the vegetated part of the $A$ A | 1 |  |
| 60 |  |  | $25-50 \%$ of the vegetated part of the AA | 0 |  |
| 61 |  |  | $50-95 \%$ of the vegetated part of the AA | 0 |  |
| 62 |  |  | >95\% of the vegetated part of the AA | 0 |  |



|  | A | B | C | D | E |
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| 103 |  |  | 50-95\% of the vegetated area | 0 |  |
| 104 |  |  | -95\% of the vegetated area | 0 |  |
| 105 | F19 | Dominance of Most Abundant Herbaceous | Determine which two herbaceous species comprise the greatest portion of the herbaceous cover (excluding mosses and floating-leaved aquatic plants). Then choose one of the following: |  | For this question, indude fems as well as graminoids and forbs. [EC, IN, PH, POL, Sens] |


|  | A | B | C | D | E |
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| 106 |  | Species | those species together comprise $>50 \%$ of the areal cover of herbaceous plants at any time during the year. | 1 |  |
| 107 |  |  | those species together do not comprise $>50 \%$ of the areal cover of herbaceous plants at any time during the year. | 0 |  |
| 108 | F20 | Invasive Plant Cover | How extensive is the cover of invasive plant species in the AA? For species, see Plants invasive worksheet in the accompanying Supplnfo file. |  | [EC, PH, POL, Sens] |
| 109 |  |  | invasive species appear to be absent in the AA, or are present only in trace amount (a few individuas). | 1 |  |
| 110 |  |  | invasive species are present in more than trace amounts, but comprise $<5 \%$ of herbaceous cover (or woody cover, if the invasives are moody). | 0 |  |
| 111 |  |  | invasive species comprise 5-20\% of the herb cover (or woody cover, if the invasives are woody). | 0 |  |
| 112 |  |  | invasive species comprise 20-50\% of the herb cover (or woody cover, if the invasives are woody). | 0 |  |
| 113 |  |  | invasive species comprise $>50 \%$ of the herb cover (or woody cover, if the irvasives are woody). | 0 |  |
| 114 | F21 | Invasive Cover Along Upland Edge | Along the wetland-upland boundary, the percent of the upland edge (within 3 mupslope from the wetland) that is occupied by invasive plant species is: |  | If a plant cannot be identified to species (e.g., winter conditions) but its genus contains an exotic species, assume the unidentified plant to also be exotic. If vegetation is so senesced that exotic species cannot be identified, answer "none". [PH, STR] |
| 115 |  |  | none of the upland edge (invasives apparently absent), or AA has no upland edge. | 1 |  |
| 116 |  |  | some (but -5\%) of the upland edge. | 0 |  |
| 117 |  |  | 5-50\% of the upland edge. | 0 |  |
| 118 |  |  | most ( $>50 \%$ ) of the upland edge. | 0 |  |
| 119 | F22 | Fringe Wetland | During most of the year, open water within or adjacent to the vegetated part of the wetland is much wider than the maximum width of the vegetated zone within the wetland. Enter "1" if true, "0" if false. | 0 | [MBF, WBN, WCV] |
| 120 | F23 | Lacustrine Wetland | The vegetated part of the AA is within or adjacent to a body of non-tidal standing open water whose size exceeds8 hectares during most of a normal year. | 0 | [ $\mathrm{F}, \mathrm{PR}, \mathrm{PU}, \mathrm{WBF}, \mathrm{WBN}$ ] |
| 121 | F24 | \% of AAWithout Surface Water | The percentage of the AA that never contains surface water during an average year (that is, except perhaps for a few hours after snowmelt on rainstorms), but which is still a wetland, is: |  | 1 hectare is 10,000 sq. mor about 2.5 acres. It could have dimensions of $100 \mathrm{mby} 100 \mathrm{~m}, 1000 \mathrm{mby}$ 10 m , or similar. [AM, FA, $\operatorname{FR}, \mathrm{IN}, \mathrm{NR}, \mathrm{PH}, \mathrm{PR}, \mathrm{SBM}$, Sens, SRv, WBF, WBN, WC] |
| 122 |  |  | <1\%. In other words, all or nearly all of the AA is covered by water permanently or at least seasonally. | 0 |  |
| 123 |  |  | 1-25\% of the AA , or $<1 \%$ but $>0.01$ ha never contains surface water. | 0 |  |
| 124 |  |  | 25-50\% of the AA never contains surface water. | 0 |  |
| 125 |  |  | 50-75\% of the AA never contains surface water. | 1 |  |
| 126 |  |  | 75-99\% of the AA never contains surface water, or $>99 \%$ AND there is at least one persistent water body larger than 1 ha in the AA | 0 |  |
| 127 |  |  | 99-100\% AND there is no persistent ponded water body larger than 1 ha vithin the AA Enter "1" andSKIP to F42 (Channel Connection). | 0 |  |
| 128 | F25 | \% of AA with <br> Persistent Surface Water | Identify the parts of the AA that still contain surface water (flowing or ponded, open or hidden beneath vegetation) even during the driest times of a normal year, i.e., when the AA's surface water is at its lowest annual level. At that time, the percentage of the AA that still contains surface water is: |  | If you are unable to determine the condition at the driest time of year, ask the land owner or neighbors about it if possible. Indicators of persistence may include fish, some dragonflies, beaver, and muskrat. [AM, CS, FA, FR, INN, NR, POL, PR, SBM, WBF, WBN] |
| 129 |  |  | None. The AA dries up completely (no water in channels either) or never has surface water during most years. SKIP to F27. | 0 |  |
| 130 |  |  | 1-20\% of the AA. | 1 |  |
| 131 |  |  | 20-50\% of the AA | 0 |  |
| 132 |  |  | 50-95\% of the AA | 0 |  |
| 133 |  |  | >95\% of the AA True for many fringe wetlands. | 0 |  |
| 134 | F26 | \% of Summertime Water that is Shaded | At mid-day during the warmest time of year, the area of surface waterwithin the $A A$ that is shaded by vegetation and other features that are within the $A A$ at that time is: |  | [FA, WC] |
| 135 |  |  | -5\% of the water is shaded, or no surface water is present then. | 0 |  |
| 136 |  |  | $5-25 \%$ of the water is shaded. | 0 |  |
| 137 |  |  | 25-50\% of the water is shaded. | 0 |  |
| 138 |  |  | 50-75\% of the water is shaded. | 0 |  |
| 139 |  |  | >75\% of the water is shaded. | 1 |  |
| 140 | F27 | \% of AA that is Fooded Only Seasonally | The percentage of the $A$ A's area that is between the annual high water and the annual low water (surface water) is: |  | Food marks (algal mats, adventitious roots, debris lines, ice scour, etc.) are often evident when not fully inundated. Aso, such areas often have a larger proportion of upland and annual (vs. perennial) plant species. In riverine systems, the extent of this zone can be estimated by multiplying by 2 the bankful height and visualising where that would intercept the land along the river. [CS, FA, INN, NR, OE, PH, SR, WBF, WBN, WS] |
| 141 |  |  | None, or <0.01 hectare and <1\% of the AA SKIP to F29. | 0 |  |
| 142 |  |  | 1-20\% of the AA, or <1\% but >0.01 ha. | 0 |  |
| 143 |  |  | 20-50\% of the AA | 0 |  |





|  | A | B | C | D | E |
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| 241 | F51 | Internal Gradient | The gracient along most of the flow path within the AA is: |  | This is not the same as the shoreline slope. It is the elevational difference between the AA's inlet and outlet, divided by the flow-distance between them and converted to percent. If available, use a clinometer to measure this. Free clinometer apps can be downloaded to smartphones. If the wetland is large (longer than $\sim 1 \mathrm{~km}$ ), this may be estimated using Google Earth to determine the minimum and maximum elevation within the $A A$, then dividing by length and multiplying by 100 . [CS, $N R, O E, P R$, SR, WBF, WBN, WS] |
| 242 |  |  | 2\% or the AA has no surface water outlet (not even seasonally). | 0 |  |
| 243 |  |  | 2-5\% | 1 |  |
| 244 |  |  | 6-10\% | 0 |  |
| 245 |  |  | >10\% | 0 |  |
|  | Note for the next three questions: If the AA lacks an upland edge, evaluate based on the AA's entire perimeter, and moving outward into whatever areas are adjacent. In many situations, these questions are best answered by measuring from aerial images. |  |  |  |  |
|  | F52 | Vegetated Buffer as \% of Perimeter | Wthin a zone extending 30 m laterally from the AA's edge with upland and/or other wetlands, the percentage that containsperennial vegetation cover (except lawns, row crops, heavily grazed land, conifer plantations) is: |  | [AM, FA, FR, INN, NRV, PH, POL, PRV, SBM, Sens, SRv, STR, WBN] |
|  |  |  | -5\% | 0 |  |
| 249 |  |  | 5 to 30\% | 0 |  |
| 250 |  |  | 30 to 60\% | 0 |  |
| 251 |  |  | 60 to 90\% | 1 |  |
| 252 |  |  | >90\%, or all the area within 30 m of the AA edge is other wetlands. SKIP to F55. | 0 |  |
| 253 | F53 | Type of Cover in Buffer | Wthin 30 m upslope of where the wetland transitions to upland, the upland land cover that is NOT perennial vegetation is mostly (mark ONE): |  | [AM, FA, INN, NRV, PH, POL, SBM, STR, WBN] |
| 254 |  |  | Impervious surface, e.g., paved road, parking lot, building, exposed rock. | 1 |  |
| 255 |  |  | Bare or nearly bare pervious surface or managed vegetation, e.g., lamn, row crops, unpaved road, dike, landside. | 0 |  |
| 256 | F54 | Buffer Slope | The steepest and/or most disturbed part of the upland area that is within 30 m of the wetland and occupies $>10 \%$ of that upland area has a percent slope of: |  | [NRV, PRV, Sens, SRV] |
| 257 |  |  | <1\% (flat -- almost no noticeable slope) or all the area within 30 mof the AA edge is other wetlands. | 0 |  |
| 258 |  |  | 2-5\% | 0 |  |
| 259 |  |  | 5-30\% | 0 |  |
| 260 |  |  | >30\% | 1 |  |
| 261 | F55 | Cliffs or Steep Banks | In the AA or within 100 m , there are elevated terrestrial features such as cliffs, talus slopes, stream banks, or excavated pits (but not riprap) that extend at least 2 m nearly vertically, are urvegetated, and potentially contain crevices or other substrate suitable for nesting or den areas. Enter 1 (yes) or 0 (no). | 0 | Do not include upturned trees as potential den sites. [POL, SBM] |
| 262 | F56 | New or Expanded Wetland | Human actions within or adjacent to the AA have persistently expanded a naturally occurring wetland or created a wetland where there previously was none (e.g., by excavation, impoundment): |  | Determine this using historical aerial photography, old maps, soil maps, or permit files as available [CS, NR, OE, PH, Sens] |
| 263 |  |  | No. | 0 |  |
| 264 |  |  | Yes, and created or expanded $20-100$ years ago. | 0 |  |
| 265 |  |  | Yes, and created or expanded 3 -20 years ago. | 0 |  |
| 266 |  |  | Yes, and created or expanded within last 3 years. | 0 |  |
| 267 |  |  | Yes, but time of origin or expansion unknown. | 0 |  |
| 268 |  |  | Unknown if new or expanded within 20 years or not. | 1 |  |
| 269 | F57 | Burn History | More than $1 \%$ of the AA's previously vegetated area: |  | Look for charred soil or stumps (in multiple widely-spaced locations) or ask landowner. [CS, PH, STR] |
| 270 |  |  | Burned within past 5 years. | 0 |  |
| 271 |  |  | Burned 6-10 years ago. | 0 |  |
| 272 |  |  | Burned 11-30 years ago. | 0 |  |
| 273 |  |  | Burned $>30$ years ago, or no evidence of a burn and no data. | 1 |  |
| 274 | F58 | Visibility | The maximum percentage of the wetland that is visible from the best vantage point on public roads, public parking lots, public buildings, or public maintained trails that intersect, adjoin, or are within 100 m of the $A A$ (select one) is: |  | [PU, STR, WBFV] |
| 275 |  |  | 25\% | 1 |  |
| 276 |  |  | 25-50\% | 0 |  |
| 277 |  |  | -50\% | 0 |  |
| 278 | F59 | Non-consumptive Uses - Actual or Potential | Assuming access permission was granted, select ALL statements that are true of the AA as it currently exists: |  | [PU, STR] |
| 279 |  |  | For an average person, walking is physically possible in (not just near) $>5 \%$ of the $A A$ during most of the growing season, e.g., free of deep water and dense shrub thickets. | 1 |  |
| 280 |  |  | Maintained roads, parking areas, or foot-trails are within 10 m of the $A A$, or the $A A$ can be accessed part of the year by boats arriving via contiguous waters. | 0 |  |
| 281 |  |  | Wthin or near the AA, there is an interpretive center, trails with interpretive signs or brochures, andor regular guided interpretive tours. | 0 |  |


|  | A | B | C | D |  |
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| 282 | F60 | Unvisited Core Area | The percentage of the AA almost never visited by humans during an average growing season probably comprises: [ Note: Only include the part actually walked or driven (not simply viewed from) with a vehicle or boat. Do not include visitors on trails outside of the AA unless more than half the wetland is visible from the trails and they are within 30 mof the wetland edge. In that case include only the area occupied by the trail.] |  | [AM, FAv, PRv, PH, PU, SBM, STR, WBF, WBN] |
| 283 |  |  | -5\% and no inhabited building is within $100 \mathrm{mof} \mathrm{the} A$ A | 0 |  |
| 284 |  |  | -5\% and inhabited building is within 100 mof the $A$ A | 0 |  |
| 285 |  |  | $5-50 \%$ and no inhabited building is within 100 m of the $A$ A | 0 |  |
| 286 |  |  | $5-50 \%$ and inhabited building is within 100 m of the $A$ A | 0 |  |
| 287 |  |  | 50-95\%, with or without inhabited building nearby. | 0 |  |
| 288 |  |  | >95\% of the AA with or without inhabited building nearby. | 1 |  |
| 289 | F61 | Frequently Visited Area | The part of the AA visited by humans almost daily for several weeks during an average growing season probably comprises: [See note above.] |  | [AM, PH, PU, SBM, STR, WBF, WBN] |
| 290 |  |  | -5\% If F60 was answered ">95\%' (mostly never visited), SKIP to F64. | 1 |  |
| 291 |  |  | 5-50\% | 0 |  |
| 292 |  |  | 50-95\% | 0 |  |
| 293 |  |  | >95\% of the AA | 0 |  |
| 294 | F62 | BMP - Soils | Boardwalks, paved trails, fences or other infrastructure and/or well-enforced regulations appear to effectively prevent visitors from walking on soil within nearly all of the AA when the soil is unfrozen. Enter " 1 " if true. | 0 | [PH, PU] |
| 295 | F63 | BMP - Wildlife Protection | Fences, observation blinds, platforms, paved trails, exclusion periods, and/or well-enforced prohibitions on motorised boats, off-leash pets, and off road vehicles appear to effectively exclude or divert visitors and their pets from the $A A$ at critical times in order to minimize disturbance of wildlife (except during hunting seasons). Enter "1" if true. | 0 | [AM, PU, WBF, WBN] |
| 296 | F64 | Consumptive Uses (Provisioning Services) | Recent evidence was found within the AA of the following potentially-sustainable consumptive uses. Select ALL that apply. |  | [FAv, Rev, WBFV] |
| 297 |  |  | Low-impact commercial timber harvest (e.g., selective thinning). | 0 |  |
| 298 |  |  | Cormmercial or traditional-use havesting of native plants, their fruits, or mushrooms. | 0 |  |
| 299 |  |  | Waterfowl hunting. | 0 |  |
| 300 |  |  | Fshing. | 0 |  |
| 301 |  |  | Trapping of furbearers. | 0 |  |
| 302 |  |  | None of the above. | 1 |  |
| 303 | F65 | Domestic Wells | The closest wells or water bodies that currently provide drinking water are: |  | [NRN] |
| 304 |  |  | Muthin 0-100 m of the AA | 1 |  |
| 305 |  |  | $100-500 \mathrm{~m}$ away. | 0 |  |
| 306 |  |  | -500 m away, or no information. | 0 |  |
| 307 | F66 | Calcareous Fen | The AA is, or is part of, a calcareous fen. See the Plants_Calcar worksheet in the accompanying Supplnfo file for list of plant indicators (calciphiles). Enter 1 If more than two Strong or more than five Moderate calciphile species are present; otherwise enter 0 , but if not able to identify those and no information, change to blank. | 0 | [ $\mathrm{PH}, \mathrm{PR}]$ |


| Irvestigator: BL | Site Identifier: Cambridge Wetland 3 | Date: 20 aug 2021 |
| :--- | :--- | :--- | :--- |
| Stressor (S) Data Form for Non-Tidal Wetlands. WESP-AC for Nova Scotia version 2. | Data |  |



| S3 | Accelerated Inputs of Nutrients |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | In the last column, place a check mark next to any item - occurring in either the wetland or its CA - that is likely to have accelerated the inputs of nutrients to the wetland. [NRV, PRV, STR] |  |  |  |  |
|  | Stormwater or wastewater effluent (including failing septic systems), landfills. |  |  |  |  |
|  | Fertilizers applied to lamns, ag lands, or other areas in the CA |  |  |  |  |
|  | Livestock, dogs. |  |  |  |  |
|  | Artificial drainage of upslope lands. |  |  |  |  |
|  | If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly more nutrients, then leave the "O's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present. |  |  |  |  |
|  |  | Severe (3 points) | Medium (2 points) | Mild (1 point) |  |
|  | Type of loading: | High density of unmaintained septic, some types of industrial sources. | Moderate density septic, cropland, secondary wastewater treatment plant. | Livestock, pets, low density residential. | 0 |
|  | Frequency \& duration of input: | Frequent and year-round. | Frequent but mostly seasonal. | Infrequent \& during high runoff events mainly. | 0 |
|  | AA proximity to main sources (actual or potential): | 0-15m | 15-100 m or in groundwater. | In more distant part of contributing area. | 0 |
|  | - Sume |  |  |  | 0 |
|  |  |  |  | Stressor subscore= | 0.00 |


| S4 | Excessive Sediment Loading from Contributing Area |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | In the last column, place a check mark next to any item present in the CA that is likely to have elevated the load of waterborme or windborne sediment reaching the wetland fromits CA [FA, FR, INW, PH, SRV, STR] |  |  |  |  |
|  | Erosion from plowed fields, fill, timber havest, dirt roads, vegetation clearing, fires. |  |  |  |  |
|  | Erosion from construction, in-channel machinery in the CA |  |  |  |  |
|  | Erosion from off-road vehicles in the CA |  |  |  |  |
|  | Erosion from livestock or foot traffic in the CA |  |  |  |  |
|  | Stormwater or wastewater effluent. |  |  |  |  |
|  | Sediment from road sanding, gravel mining, other mining, oil/ gas extraction. |  |  |  |  |
|  | Accelerated channel downcutting or headcutting of tributaries due to attered land use. |  |  |  |  |
|  | Other human-related disturbances within the CA |  |  |  |  |
|  |  then leave the "O's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present. |  |  |  |  |
|  |  | Severe (3 points) | Medium (2 points) | Mild (1 point) |  |
|  | Erosion in CA: | Extensive evidence, high intensity.* | Potentially (based on high-intensity ${ }^{\star}$ land use) or scattered evidence. | Potentially (based on low-intensity ${ }^{\star}$ land use) with little or no direct evidence. | 0 |
|  | Recentness of significant soil disturbance in the CA: | Current \& ongoing. | 1-12 months ago. | $>1$ y ago. | 0 |
|  | Duration of sediment inputs to the wetland: | Frequent and year-round. | Frequent but mostly seasonal. | Infrequent \& during high runoff events mainly. | 0 |
|  | AA proximity to actual or potential sources: | 0-15m. | 15-100 m. | In more distant part of contributing area. | 0 |
|  | * high-intensity= extensive off-road vehicle use, plowing, grading, excavation, erosion with or without veg removal; low-intensity= veg removal only with little or no apparent erosion or disturbance of soil or sediment. |  |  | Sum= | 0 |
|  |  |  |  | Stressor subscore= | 0.00 |
| S5 | Soil or Sediment Alteration Within the Assessment Area |  |  |  |  |
|  |  (whichever is less). [CS, IN $\mathrm{V}, \mathrm{NR}, \mathrm{PH}, \mathrm{SR}, \mathrm{STR}]$ |  |  |  |  |
|  | Compaction from machinery, off-road vehicles, livestock, or mountain bikes, especially during wetter periods. |  |  |  |  |
|  | Leveling or other grading not to the natural contour. |  |  |  |  |
|  | Tillage, plowing (but excluding disking for enhancement of native plants). |  |  |  |  |
|  | Fill or riprap, excluding small amounts of upland soils containing organic amendments (compost, etc.) or small amounts of topsoil imported from another wetland. |  |  |  |  |
|  | Excavation. |  |  |  |  |
|  | Ditch cleaning or dredging in or adjacent to the wetland. |  |  |  |  |
|  | Boat trafic in or adjacent to the wetland and sufficient to cause shore erosion or stir bottom sediments. |  |  |  |  |
|  | Artificial water level or flow manipulations sufficient to cause erosion or stir bottom sediments. |  |  |  |  |
|  |  effects, contrast the current condition with the condition if the checked items never occurred or were no longer present. |  |  |  |  |
|  |  | Severe (3 points) | Medium (2 points) | Mild (1 point) |  |
|  | Spatial extent of altered soil: | >95\% of wetland or >95\% of its upland edge (if any). | 5-95\% of wetland or 5-95\% of its upland edge (if any). | $<5 \%$ of wetland and $<5 \%$ of its upland edge (if any). | 0 |
|  | Recentness of significant soil alteration in wetland: | Current \& ongoing. | 1-12 months ago. | $>1 \mathrm{yr}$ ago. | 0 |
|  | Duration: | Long-lasting, minimal veg recovery. | Long-lasting but mostly revegetated. | Shor-term, revegetated, not intense. | 0 |
|  | Timing of soil alteration: | Frequent and year-round. | Frequent but mostly seasonal. | Mainly during one-time or scattered events. | 0 |
|  | Sum= |  |  |  | 0 |



| Cover Page: Basic Description of Assessment | WESP-AC version 2 |
| :---: | :---: |
| Site Name: | Cambridge interchange Wetland 4 |
| Investigator Name: | BL |
| Date of Field Assessment: | 19 Aug 2021 |
| Nearest Town: | Waterville |
| Latitude (decimal degrees): | 369030.96 m E |
| Longitude (decimal degrees): | 4991278.69 m N, UTM 20T |
| Is a map based on a formal on-site wetland delineation available? | Yes |
| Approximate size of the Assessment Area (AA, in hectares): | 450 m 2 |
| AA as percent of entire wetland (approx.). Attach sketch map if AA is smaller than the entire contiguous wetland. | 100 |
| What percent (approx.) of the wetland were you able to visit? | 100 |
| What percent (approx.) of the AA were you able to visit? | 100 |
| Were you able to ask the site owner/manager about any of the questions? | No |
| Indicate here if you intentionally surveyed for rare plants, calciphile plants, or rare animals: | Yes |
| Have you attended a WESP-AC training session? If so, indicate approximate month \& year. | Yes |
| How many wetlands have you assessed previously using WESP-AC? (approx.) | >100 |
| Comments about the site or this WESP-AC assessment (attach extra page if desired): |  |


|  | A | B | C | D | E |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | Date: 19 Aug 2021 |  | Site Identifier: Cambridge Wetland 4 | Investigator: BL, CP |  |
| 2 | Form OF (Office). Non-tidal Wetland Data Form. WESP-AC version 2 for Nova Scotia wetlands only. DIRECTIONS: Conduct an assessment only after reading the accompanying <br> Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answering many of the questions below will require using these online map viewers: <br> Google Earth Pro: https://www.google.com/earth/download/gep/agree.html <br> Provincial Landscape Viewer: https://nsgi.novascotia.ca/plv/ <br> For most wetlands, completing this office data form will require 1-2 hours. For a list of functions to which each question pertains, see bracketed abbreviations in the Definitions/Explanations column. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention \& Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV=Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM=Amphibian \& Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, \& Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use \& Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors. |  |  |  |  |
| 3 | \# | Indicators | Condition Choices | Data | Definitions/Explanations |
| 4 | OF1 | Province | Mark the province in which the AA is located by changing the 0 in the colurm next to it to a "1". Mark only one. |  | This determines to which province's calibration wetlands the raw score of any wetland is normalised. |
| 5 |  |  | New Brunswick | 0 | len |
| 6 |  |  | Nova Scotia | 1 |  |
| 7 |  |  | Prince Edward Island | 0 |  |
| 8 |  |  | Newfoundland-Labrador | 0 |  |
| 9 | OF2 | Ponded Area Wuthin 1 km | The area of surface water ponded during most of the growing season that is both (1) in or adjacent to the $A A$ and (2) within 1 km is: |  | "Adjacent" means not separated from the AA by a wide expanse (>50 m) of upland (including roads $>50 \mathrm{~m}$ wide). Include ponded areas likely to be hidden by wetland vegetation. If surface water |
| 10 |  |  | $<0.01$ hectare (about $10 \mathrm{~m} \times 10 \mathrm{~m}$ ). | 0 | extends beyond 1 km , include only the part within 1 km Do not include tidal areas. Measure the |
| 11 |  |  | 0.01-0.1 hectare. | 0 |  |
| 12 |  |  | 0.1-1 hectare. | 1 |  |
| 13 |  |  | 1 to 10 hectares. | 0 |  |
| 14 |  |  | 10 to 100 hectares. | 0 |  |
| 15 |  |  | $>100$ hectares. | 0 |  |
| 16 | OF3 | Ponded Water \& Wetland Wthin 1 km | The area of wetlands and surface water ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: |  | See definition of adjacent in OF2. If the AA's wetland vegetation extends beyond 1 km , include only the part within 1 km ."Ponded" means not flowing in rivers or streams. [Sens, WBF] |
| 17 |  |  | $<0.01$ hectare (about $10 \mathrm{~m} \times 10 \mathrm{~m}$ ). | 0 |  |
| 18 |  |  | 0.01-0.1 hectare. | 0 |  |
| 19 |  |  | 0.1-1 hectare. | 0 |  |
| 20 |  |  | 1 to 10 hectares. | 0 |  |
| 21 |  |  | 10 to 100 hectares. | 1 |  |
| 22 |  |  | >100 hectares. | 0 |  |
| 23 | OF4 | Size of Largest Nearby Vegetated Tract or | The largest vegetated patch or corridor that includes the AA's vegetation plus alladjacent upland vegetation that is not lamn, row crops, heavily grazed lands, conifer plantation is: |  | See definition of adjacent in OF2. Use Google Earth Pro's polygon ruler (as described above). <br> Exclude conifer plantations only if it is obvious that trees were planted in rows. [AM, PH, SBM, Sens] |
| 24 |  |  | $<0.01$ hectare (about $10 \mathrm{~m} \times 10 \mathrm{~m}$ ). | 0 |  |
| 25 |  |  | 0.01-0.1 hectare. | 0 |  |
| 26 |  |  | 0.1-1 hectare. | 0 |  |
| 27 |  |  | 1 to 10 hectares. | 0 |  |
| 28 |  |  | 10 to 100 hectares. | 0 |  |
| 29 |  |  | 100 to 1000 hectares. | 0 |  |
| 30 |  |  | $>1000$ hectares. [This is nearly always the answer in relatively undeveloped landscapes.] | 1 |  |


|  | A | B | C | D | E |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 31 | OFS | Distance to Large Vegetated Tract | The minimum distance from the edge of the AA to the edge of the closestvegetated land (but excluding row crops, lamn, conifer plantation) larger than 375 hectares (about 2 km on a side), is: |  | To measure distance, use Google Earth Pro (Ruler > Line tool). The 375 -ha criterion is from the Fundy Model Forest Project. [AM, PH, POL, SBM, Sens] |
| 32 |  |  | $<50 \mathrm{~m}$, and not separated from the 375 -ha vegetated area by any width ofpaved roads, stretches of open water, row crops, bare ground, lawn, or impervious surface. Or the $A A$ itself contains $>375$ ha of vegetation. [This is often the answer in relatively undeveloped landscapes.] | 1 |  |
|  |  |  | 40 m , but completely separated from the 375-ha vegetated area by those features, and AA does not contain $>375$ ha of vegetation. | 0 |  |
| 34 |  |  | 50-500 m, and not separated. | 0 |  |
| 35 |  |  | 50-500 m, but separated by those features. | 0 |  |
| 36 |  |  | $0.5-5 \mathrm{~km}$, and not separated. | 0 |  |
| 37 |  |  | $0.5-5 \mathrm{~km}$, but separated by those features. | 0 |  |
| 38 |  |  | None of the above (the closest patches or corridors which are that large are $>5 \mathrm{~km}$ away). | 0 |  |
| 39 | OF6 | Herbaceous Uniqueness | The AA's vegetation cover is $>10 \%$ herbaceous* but uplands within 5 km have $<10 \%$ herbaceous cover. If so, enter " 3 " and continue to OF7. If not, consider: <br> The AA's vegetation cover is $>10 \%$ herbaceous* but uplands within 1 km have $<10 \%$ herbaceous cover. If so enter " 2 " and continue to Of7. If not, consider: <br> The AA's vegetation cover is $>10 \%$ herbaceous* but uplands within 100 m of the wetland edge have $<10 \%$ herbaceous cover. If so, enter "1". <br> [* NOTE: Exclude lamns, row crops, heavily grazed lands, forest, shrublands. Include moss as well as grasslike plants in this use of "herbaceous vegetation'] | 1 | For this question only, consider moss to be herbaceous vegetation. Determine the score by vieving aerial imagery in Google Earth after successively drawing or estimating the boundaries of the buffers of $5 \mathrm{~km}, 1 \mathrm{~km}$, and 100 m radius focused on the center of the AA. Circles of specified radius can be dramn in Google Earth Pro by clicking on the Ruler icon, then Circle in the pop-up menu. [AMN, PHN, POLv, SBMN, WBFv, WBNv] |
| 40 | OF1 | Woody Uniqueness | The AA's vegetation cover is $>10 \%$ woody* but uplands within $5 \mathrm{kmhave}<10 \%$ woody cover. If so, enter " 3 " and continue to OF8. If not, consider: <br> The AA's vegetation is $>10 \%$ woody ${ }^{\star}$ but uplands within 1 km have $<10 \%$ woody cover. If so enter " 2 " and continue to OF8. If not, consider: <br> The AA's vegetation is $>10 \%$ woody ${ }^{\star}$ but uplands within 100 m of the wetland edge have $<10 \%$ woody cover. If so, enter " 1 " <br> [* NOTE: woody cover = trees \& shrubs taller than 1 m ] | 0 | See above. Do not consider conifer plantations to be forest if it is obvious that trees were planted in rows. [AMN, PHV, POLv, SBMN] |
| 41 | OF8 | Local Vegetated Cover Percentage | Draw a 5 -km radius circle measured from the center of the AA. Ignoring all permanent water in the circle, the percent of the remaining are that is wooded or unmanaged herbaceous vegetation (NOT lawn, row crops, bare or heavily grazed land, clearcuts, or conifer plantations) is: |  | In Google Earth, draw the 5 km buffer and then estimate land cover percentages, or do GIS analysis of an appropriate land cover layer. [AM, PH, POL, SBM, Sens] |
| 42 |  |  | -5\% of the land. | 0 |  |
| 43 |  |  | 5 to 20\% of the land. | 0 |  |
| 44 |  |  | 20 to 60\% of the land. | 1 |  |
| 45 |  |  | 60 to $90 \%$ of the land. | 0 |  |
| 46 |  |  | >90\% of the land. SKIP to OF10. | 0 |  |
| 47 | OF9 | Type of Land Cover | Wthin the 5 -km radius circle, and ignoring all permanent water, the land area that is bare or non-perennial cover is mostly: |  | [AM, SBM] |
| 48 |  |  | Impervious surface, e.g., paved road, parking lot, building, exposed rock. | 0 |  |
| 49 |  |  | Bare pervious surface, e.g., lawn, recent (< 5 yrs ago) clearcut, dirt or gravel road, cropland, landslide, conifer plantation. | 1 |  |
| 50 | OF10 | Distance by Road to Nearest Population | Measured along the maintained road nearest the A , the distance to the nearestpopulation center is: |  | "Population center" means a settled area with more than about 5 regularly- inhabited structures per square kilometer In Google Earth Pro, click on the Ruler icon, then Path, and draw and measure the |
| 51 |  | Center | $<100 \mathrm{~m}$. | 0 |  |
| 52 |  |  | 100-500m. | 0 |  |
| 53 |  |  | $0.5-1 \mathrm{~km}$ | 1 |  |
| 54 |  |  | $1-5 \mathrm{~km}$ | 0 |  |
| 55 |  |  | -5km | 0 |  |
| 56 | OF11 | Distance to Nearest Maintained Road | From the center of the AA, the distance to the nearest maintained public road (dirt or paved) is: |  | Determine this by viewing aerial imagery in Google Earth Pro and measuring with the Ruler>Line |
| 57 |  |  | $<10 \mathrm{~m}$ | 0 |  |
| 58 |  |  | 10-25m. | 0 |  |
| 59 |  |  | 25-50m. | 0 |  |
| 60 |  |  | 50-100 m. | 0 |  |
| 61 |  |  | 100-500m. | 0 |  |
| 62 |  |  | >500 m. | 1 |  |


|  | A | B | C | D | E |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 63 | OF12 | Wildife Access | Draw a circle of radius of 5 km from the center of the $A A$ If marmals and amphibians can move from the center of the $A A$ to $A L L$ other separate wetlands and ponds located within the circle without being forced to cross pavement (any width), lawns, bare ground, and/or marine waters, mark $1=$ yes can move to all, $0=$ no. Change toblank if there are no other wetlands within 5 km . | 0 | Draw the 5 km circle in Google Earth Pro using the Circle tool and search for roads and wetlands within it, being alert for roads hidden under forest canopy. [AM, SBM, STR] |
| 64 | OF13 | Distance to Ponded Water | The distance from the AA center to the closest (but separate) ponded water body visible in Google Earth imagery is: |  | In Google Earth Pro, zoom in closely to examine the surrounding landscape for ponds, lakes, and wetlands that appear to be permanently flooded. [AM, PH, SBM, Sens, WBF, WBN] |
| 65 |  |  | -50 m, and not separated by any width of paved roads, stretches of open water, row crops, lamn, bare ground, or impervious surface. | 0 |  |
| 66 |  |  | 50 m , but completely separated by those features. | 0 |  |
| 67 |  |  | $50-500 \mathrm{~m}$, and not separated. | 0 |  |
| 68 |  |  | $50-500 \mathrm{~m}$, but separated by those features. | 1 |  |
| 69 |  |  | $0.5-1 \mathrm{~km}$, and not separated. | 0 |  |
| 70 |  |  | $0.5-1 \mathrm{~km}$, but separated by those features. | 0 |  |
| 71 |  |  | None of the above (the closest patches or corridors that large are >1 km away). | 0 |  |
| 72 | OF14 | Distance to Large Ponded Water | The distance from the AA center to the closest (but separate)non-tidal body of water that is ponded during most of the year and islarger than 8 hectares during most of a normal year is: |  | Determine this by viewing aerial imagery in Google Earth. [Sens, WBF, WBN] |
| 73 |  |  | $<100 \mathrm{~m}$ | 0 |  |
| 74 |  |  | $100 \mathrm{~m}-1 \mathrm{~km}$ | 0 |  |
| 75 |  |  | 1-2km. | 0 |  |
| 76 |  |  | 2-5 km | 0 |  |
| 77 |  |  | $5-10 \mathrm{~km}$ | 1 |  |
| 78 |  |  | $>10 \mathrm{~km}$ | 0 |  |
| 79 | OF15 | Tidal Proximity | The distance from the AA edge to the closesttidal water body (regardless of its salinity) is: |  | In Google Earth, measure the distance to the ocean (including Bay of Fundy) or tidal river, whichever is closer. If you need to see how far upriver a river is tidal, see the KNZ file provided with this calculator for NS (NS Headtide). Points shown in those files are only an approximation, so local information if available may be preferable. [FA, WBF] |
| 80 |  |  | $\angle 100 \mathrm{~m}$ | 0 |  |
| 81 |  |  | $100 \mathrm{~m}-1 \mathrm{~km}$ | 0 |  |
| 82 |  |  | $1-5 \mathrm{~km}$ | 0 |  |
| 83 |  |  | $5-10 \mathrm{~km}$ | 0 |  |
| 84 |  |  | $10-40 \mathrm{~km}$ | 1 |  |
| 85 |  |  | $>40 \mathrm{~km}$ | 0 |  |


|  | A | B | C | D | E |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 86 | OF16 | Upland Edge Contact | Select one: |  | [ NR , SBM, Sens] |
|  |  |  | The AA has no upland edge (or upland is <1\% of perimeter). The AA is entirely surrounded by (\& contiguous with) other wetlands or water. | 0 |  |
|  |  |  | 1-25\% of the AA's perimeter abuts upland (including filled areas). The rest adjoins other wetlands or water that is mostly wider than the AA | 0 |  |
| 89 |  |  | 25-50\% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA. | 0 |  |
| 90 |  |  | $50-75 \%$ of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA | 0 |  |
| 91 |  |  | More than $75 \%$ of the AA's perimeter abuts upland. Any remainder adjoins other wetlands or water that is mostly wider than the AA. This will be true for most assessments done with WESP-AC. | 1 |  |
| 92 | OF17 | Food Damage fromNon tidal Waters | Wthin 5 km downstream or downslope of the AA (select first true choice): |  | Contact local authories to determine if such maps exist. Where available, LDAR imagery can provide finer elevational resolution useful for flood modeling. [WSV] |
| 93 |  |  | Maps show Flood Zone or Flood Risk areas and there appears to be infrastructure vulnerable to river flooding not caused by tidal storm surges. | 0 |  |
| 94 |  |  | Maps show Food Zone or Flood Risk areas, but infrastructure is absent or is not vulnerable to floods from a non-tidal river. In some cases levees, upriver dams, or other measures may partly limit damage or risk from smaller events. | 0 |  |
| 95 |  |  | Maps do not show Food Zone or Food Risk areas (or no such mapping has been done locally) and there appears to be infrastructure vulnerable to river flooding unrelated to tidal storm surges. | 0 |  |
| 96 |  |  | Maps do not show Flood Zone or Food Risk areas (or no such mapping has been done locally) and there isno infrastructure vulnerable to river flooding unrelated to tidal storm surges. | 1 |  |
| 97 | OF18 | Relative Elevation in Watershed | In Google Earth, enable the Terrain layer (lower left menu) and open the NS_Watersheds Secondary KMZ file that accompanies this calculator. Then determine the AA's approximate elevation (bottom right, NOT the "eye alt'). Then move cursor around to determine the watershed's maximum and minimum elevation. Divide the AA's elevation by the (max-min). | 0.01 | [FA, NR, Sens, SFSV, WCV, WSv] |
| 98 | OF19 | Water Quality Sensitive Watershed or Area | The AA is in a Protected Water Supply area (Designated Water Supply Area, Natural Watershed Municipal Surface Water Supply Area, or Municipal Water Supply Area) according to the provided KMZ overlay ("NS Protected Water Supply Areas'). Enter 1= yes, 0= no. | 0 | If an ACCDC report is available for this AA, it also may contain such information. [NRV] |


|  | A | B | C | D |  |
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| 99 |  | Degraded Water Upstream | Sampling indicates a problem with concentrations of metals, hydrocarbons, nutrients, or other substances (excluding bacteria, acidic water, high temperatures) being present at levels harmful to aquatic life or humans, and: |  | May use existing data, or sample those waters as part of this wetland assessment. "Harmful" should be evaluated with regard to current federal or provincial water quality standards. [AM, FA, FR, NRV, PRV, SRV, STR, WBF, WBN] |
| 100 |  |  | The condition is present within the AA | 0 |  |
| 101 |  |  | The condition is present in waters within 1 km that flowinto the AA, but has not been documented in the AA itself. | 0 |  |
| 102 |  |  | Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters. | 0 |  |
| 103 |  |  | Data are insufficient (no or inadequate sampling within 1 km , or condition exists only at $>1 \mathrm{~km}$ upstream). This is the situation for nearly all wetlands in this region. | 1 |  |
| 104 | OF21 | Degraded | The problem described above is downslope fromthe AA, and: |  | May use existing data, or monitor waters as part of this wetland assessment. [NRV, PRv, SRV] |
| 105 |  | Donnstream | The condition is present within 1 km downslope and connected to the AA by a channel. | 0 |  |
| 106 |  |  | The condition is present within 5 km downslope and connected to the AA by a channel, or within 1 km but not connected to the AA by a channel. | 0 |  |
| 107 |  |  | Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters. | 0 |  |
| 108 |  |  | Data are insufficient (no or inadequate sampling within 1 km , or condition exists only at $>1 \mathrm{~km}$ upstream). This is the situation for nearly all wetlands in this region. | 1 |  |
| 109 | OF22 | Wetland as a \% of Its Contributing Area (Catchment) | From a topographic map and field observations, estimate the approximate boundaries of the catchment (CA) of the entire wetland of which the AA may be only a part. Then adjust those boundaries if necessary based on your field observations of the surrounding terrain, and/or by using procedures described in the Manual. Divide the area of the wetland (not just the $A A$ ) by the approximate area of its catchment excluding the area of the wetland itself. When doing the calculation, if ponded water is adjacent to the wetland, include that in the wetland area. The result is: |  | Topographic maps may be viewed online at the National Atlas of Canada (Toporama): http://atlas.gc.ca/toporama/en/index.htmI [NR, PR, Sens, SR, WS] |
| 110 |  |  | <0.01, or catchment size unknown due to stormwater pipes that collect water from an indeterminate area. | 1 |  |
| 111 |  |  | 0.01 to 0.1. | 0 |  |
| 112 |  |  | 0.1 to 1. | 0 |  |
| 113 |  |  |  | 0 |  |
| 114 | OF23 | Unvegetated Surface in the Contributing Area | The proportion of the AA's contributing area (measured to no more than 1000 m upslope) that is comprised of buildings, roads, parking lots other pavement, exposed bedrock, landslides, and other mostly-bare surface is about : |  | [FA, INV, NRV, PRV, SRv, STR, WCV, WSV] |
| 115 |  |  | <10\% | 0 |  |
| 116 |  |  | 10 to $25 \%$ | 0 |  |
| 117 |  |  | >25\% | 1 |  |
| 118 | OF24 | Transport From Upslope | A relatively large proportion of the precipitation that falls farther upslope in the CA reaches this wetland quickly as runoff (surface water), as indicated by the following: <br> (a) input channel is present, <br> (b) input channels have been straightened, <br> (c) upslope wetlands have been ditched extensively, <br> (d) land cover is mostly non-forest, <br> (e) CA slopes are steep, and/or <br> (f) most CA soils are shallow (bedrock near surface) and/or have high runoff coefficients. <br> This statement is: |  | [NRV, PRV, SRv, WSU] |
| 119 |  |  | Mostly true. | 0 |  |
| 120 |  |  | Somenhat true. | 0 |  |
| 121 |  |  | Mostly untrue. | 1 |  |
| 122 | OF25 | Aspect | The overland flow direction of most surface water (in streams, rivers, or runoff) that enters the AA is: |  | [AM, NR, SFS, WC, WS] |
| 123 |  |  | Northward (N, NE). north-facing contributing area | 0 |  |
| 124 |  |  | Southward (S, SW). south-facing contributing area. | 0 |  |
| 125 |  |  | Other (E, SE, W, M M), or no detectable uphill slope or input channel (flat). | 1 |  |
| 126 <br> 127 | OF26 | Internal FowDistance (Path Length) | The horizontal flow distance from the wetland's inlet to outlet is: <br> 10 m | 0 | Identify inlets and outlets, if any, from topographic maps (use elevations to determine which are inlets and which are outlets) and augment by field inspection. With the Provincial Landscape Viewer, select Nova.Scotia Tonnas the Baseman Also enable the laver ForestnsW/AM Predicted Flow Then |







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| 103 |  |  | 50-95\% of the vegetated area | 1 |  |
| 104 |  |  | -25\% of the vegetated area | 0 |  |
| 105 | F19 | Dominance of Most Abundant Herbaceous | Determine which two herbaceous species comprise the greatest portion of the herbaceous cover (excluding mosses and floating-leaved aquatic plants). Then choose one of the following: |  | For this question, induce ferms as well as graminoids and forbs. [EC, IN, PH, POL, Sens $]$ |


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| 106 |  | Species | those species together comprise $>50 \%$ of the areal cover of herbaceous plants at any time during the year. | 1 |  |
| 107 |  |  | those species together do not comprise $>50 \%$ of the areal cover of herbaceous plants at any time during the year. | 0 |  |
| 108 | F20 | Invasive Plant Cover | How extensive is the cover of invasive plant species in the AA? For species, see Plants invasive worksheet in the accompanying Supplnfo file. |  | [EC, PH, POL, Sens] |
| 109 |  |  | invasive species appear to be absent in the AA, or are present only in trace amount (a few individuas). | 1 |  |
| 110 |  |  | invasive species are present in more than trace amounts, but comprise $<5 \%$ of herbaceous cover (or woody cover, if the invasives are moody). | 0 |  |
| 111 |  |  | invasive species comprise 5-20\% of the herb cover (or woody cover, if the invasives are woody). | 0 |  |
| 112 |  |  | invasive species comprise 20-50\% of the herb cover (or woody cover, if the invasives are woody). | 0 |  |
| 113 |  |  | invasive species comprise $>50 \%$ of the herb cover (or woody cover, if the irvasives are woody). | 0 |  |
| 114 | F21 | Invasive Cover Along Upland Edge | Along the wetland-upland boundary, the percent of the upland edge (within 3 mupslope from the wetland) that is occupied by invasive plant species is: |  | If a plant cannot be identified to species (e.g., winter conditions) but its genus contains an exotic species, assume the unidentified plant to also be exotic. If vegetation is so senesced that exotic species cannot be identified, answer "none". [PH, STR] |
| 115 |  |  | none of the upland edge (invasives apparently absent), or AA has no upland edge. | 1 |  |
| 116 |  |  | some (but -5\%) of the upland edge. | 0 |  |
| 117 |  |  | 5-50\% of the upland edge. | 0 |  |
| 118 |  |  | most ( $>50 \%$ ) of the upland edge. | 0 |  |
| 119 | F22 | Fringe Wetland | During most of the year, open water within or adjacent to the vegetated part of the wetland is much wider than the maximum width of the vegetated zone within the wetland. Enter "1" if true, "0" if false. | 0 | [MBF, WBN, WCV] |
| 120 | F23 | Lacustrine Wetland | The vegetated part of the AA is within or adjacent to a body of non-tidal standing open water whose size exceeds8 hectares during most of a normal year. | 0 | [ $\mathrm{F}, \mathrm{PR}, \mathrm{PU}, \mathrm{WBF}, \mathrm{WBN}$ ] |
| 121 | F24 | \% of AAWithout Surface Water | The percentage of the AA that never contains surface water during an average year (that is, except perhaps for a few hours after snowmelt on rainstorms), but which is still a wetland, is: |  | 1 hectare is 10,000 sq. mor about 2.5 acres. It could have dimensions of $100 \mathrm{mby} 100 \mathrm{~m}, 1000 \mathrm{mby}$ 10 m , or similar. [AM, FA, $\operatorname{FR}, \mathrm{IN}, \mathrm{NR}, \mathrm{PH}, \mathrm{PR}, \mathrm{SBM}$, Sens, SRv, WBF, WBN, WC] |
| 122 |  |  | $<1 \%$. In other words, all or nearly all of the AA is covered by water permanently or at least seasonally. | 0 |  |
| 123 |  |  | 1-25\% of the AA , or $<1 \%$ but $>0.01$ ha never contains surface water. | 1 |  |
| 124 |  |  | 25-50\% of the AA never contains surface water. | 0 |  |
| 125 |  |  | 50-75\% of the AA never contains surface water. | 0 |  |
| 126 |  |  | 75-99\% of the AA never contains surface water, or $>99 \%$ AND there is at least one persistent water body larger than 1 ha in the AA | 0 |  |
| 127 |  |  | 99-100\% AND there is no persistent ponded water body larger than 1 ha within the AA Enter "1" andSKIP to F42 (Channel Connection). | 0 |  |
| 128 | F25 | \% of AA with <br> Persistent Surface Water | Identify the parts of the AA that still contain surface water (flowing or ponded, open or hidden beneath vegetation) even during the driest times of a normal year, i.e., when the AA's surface water is at its lowest annual level. At that time, the percentage of the AA that still contains surface water is: |  | If you are unable to determine the condition at the driest time of year, ask the land owner or neighbors about it if possible. Indicators of persistence may include fish, some dragonflies, beaver, and muskrat. [AM, CS, FA, FR, INN, NR, POL, PR, SBM, WBF, WBN] |
| 129 |  |  | None. The AA dries up completely (no water in channels either) or never has surface water during most years. SKIP to F27. | 0 |  |
| 130 |  |  | 1-20\% of the AA. | 0 |  |
| 131 |  |  | 20-50\% of the AA | 1 |  |
| 132 |  |  | 50-95\% of the AA | 0 |  |
| 133 |  |  | >95\% of the AA True for many fringe wetlands. | 0 |  |
| 134 | F26 | \% of Summertime Water that is Shaded | At mid-day during the warmest time of year, the area of surface waterwithin the $A A$ that is shaded by vegetation and other features that are within the $A A$ at that time is: |  | [FA, WC] |
| 135 |  |  | -5\% of the water is shaded, or no surface water is present then. | 0 |  |
| 136 |  |  | $5-25 \%$ of the water is shaded. | 1 |  |
| 137 |  |  | 25-50\% of the water is shaded. | 0 |  |
| 138 |  |  | 50-75\% of the water is shaded. | 0 |  |
| 139 |  |  | >75\% of the water is shaded. | 0 |  |
| 140 | F27 | \% of AA that is Fooded Only Seasonally | The percentage of the $A$ A's area that is between the annual high water and the annual low water (surface water) is: |  | Flood marks (algal mats, adventitious roots, debris lines, ice scour, etc.) are often evident when not fully inundated. Aso, such areas often have a larger proportion of upland and annual (vs. perennial) plant species. In riverine systems, the extent of this zone can be estimated by multiplying by 2 the bankful height and visualising where that would intercept the land along the river. [CS, FA, IN, NR, OE, PH, SR, WBF, WBN, WS] |
| 141 |  |  | None, or <0.01 hectare and <1\% of the AA SKIP to F29. | 0 |  |
| 142 |  |  | 1-20\% of the AA, or <1\% but >0.01 ha. | 1 |  |
| 143 |  |  | 20-50\% of the AA | 0 |  |


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| 144 |  |  | 50-95\% of the AA | 0 |  |
| 145 |  |  | >95\% of the AA | 0 |  |
| 146 | F28 | Annual Water Auctuation Range | The annual fluctuation in surface water level within most of the parts of the $A$ A that contain surface water at least temporarily is: |  | Look for flood marks (see above). Because the annual range of water levels is difficult to estimate without multiple visits, consider asking the land owner or neighbors about it. [AM, CS, INV, NR, OE, PH, PR, SR, WBN, WS] |
| 147 |  |  | $<10$ cm change (stable or nearly so). | 0 |  |
| 148 |  |  | $10 \mathrm{~cm}-50 \mathrm{~cm}$ change. | 1 |  |
| 149 |  |  | 0.5-1 m change. | 0 |  |
| 150 |  |  | 1-2 m change. | 0 |  |
| 151 |  |  | >2m change. | 0 |  |
| 152 | Is the AA plus adjacent ponded water smaller than 0.01 hectare (about $10 \mathrm{~m} \times 10 \mathrm{~m}$, or $1 \mathrm{~m} \times 100 \mathrm{~m}$ )? If so, enter " 1 " in column D andSKIP TO F42 (Connection). |  |  | 0 |  |
|  | F29 | Predominant Depth Class | During most of the time when surface water is present during the growing season, its depth, averaged over the entire inundated part of the $A A$, is: |  | If a boat is unavailable, estimate this by considering wetland size and local topography. Or if timing and safety allow, depths may be measured by drilling through winter ice.This question is asking about the spatial median depth that occurs during most of that time, even if inundation is only seasonal or temporary. If inundation in most but not all of the wetland is brief, the answer will be based on the deptt of the most persistently inundated part of the wetland. Include surface water in channels and ditches as well as ponded areas. [CS, FA, FR, INV, OE, PH, PR, Sens, SFS, SR, WBF, WBN, WC] |
| 154 |  |  | $<10 \mathrm{~cm} \mathrm{deep} \mathrm{(but}>0$ ). | 0 |  |
| 155 |  |  | 10-50 cm deep. | 1 |  |
| 156 |  |  | 0.5-1 mdeep. | 0 |  |
| 157 |  |  | 1-2 mdeep. | 0 |  |
| 158 |  |  | >2 m deep. True for many fringe wetlands. | 0 |  |
| 159 | F30 | $\begin{array}{\|l} \hline \text { Depth Classes - } \\ \text { Evenness of } \\ \text { Proportions } \end{array}$ | When present, surface water in most of the AA usually consists of (select one): |  | Estimate these proportions by considering the gradient and microtopography of the site. [FR, INV, WBF, WBN] |
| 160 |  |  | One depth class that comprises >90\% of the AA 's inundated area (use the classes in the question above). | 1 |  |
| 161 |  |  | One depth class that comprises 50-90\% of the AA's inundated area | 0 |  |
| 162 |  |  | Neither of above. There are 3 or more depth classes and none occupy $>50 \%$ | 0 |  |
| 163 | F31 | $\%$ of Water That Is Ponded (not Flowing) | During most times when surface water is present, the percentage that is (1)ponded (stagnant, or flows so slowly that fine sediment is not held in suspension) AND (2) is likely to be deeper than 0.5 min some places, is: |  | Nearly all wetlands with surface water have some ponded water. [AM, CS, IN , NR, OE, PR, Sens, SR, WBF, WBN, WC, WS] |
| 164 |  |  | -5\% of the water, or it occupies $<100$ sq.m cumulatively. Nearly all the surface water is flowing. SKIP to F34. | 0 |  |
| 165 |  |  | 5-30\% of the water. | 0 |  |
| 166 |  |  | 30-70\% of the water. | 0 |  |
| 167 |  |  | 70-95\% of the water. | 0 |  |
| 168 |  |  | >95\% of the water. | 1 |  |
|  | F32 | Ponded Open Water Minimum Size | During most of the growing season, the largest patch of open water that is ponded and is in or bordering the $A A$ is $>0.01$ hectare (about 10 mby 10 m ) and mostly deeper than 0.5 m If true enter " 1 " and continue, If false, enter " 0 " andSKIP to F41 (Floating Algae \& Duckweed). | 0 | Open water is not obscured by vegetation in aerial ('duck's eye") view. It includes vegetation floating on the water surface or entirely submersed beneath it. |
| 169 |  |  |  |  |  |
| 170 | F33 | \% of Ponded Water that is Open | In ducks-eye aerial view, the percentage of the ponded water that isopen (lacking emergent vegetation during most of the growing season, and unhidden by a forest or shrub canopy) is: |  | [AM, CS, FA, FR, INV, NR, OE, PR, SR, WBF, WBN, WC] |
| 171 |  |  | None, or $<1 \%$ of the $A$ A and largest pool occupies $<0.01$ hectares. Enter "1" and SKIP to F41 (Foating Agae \& Duckweed). | 0 |  |
| 172 |  |  | 1-4\% of the ponded water. Enter "1" and SKIP to F41 (Floating Agae \& Duckweed). | 0 |  |
| 173 |  |  | 5-30\% of the ponded water. | 0 |  |
| 174 |  |  | 30-70\% of the ponded water. | 0 |  |
| 175 |  |  | 70-99\% of the ponded water. | 1 |  |
| 176 |  |  | 100\% of the ponded water. | 0 |  |
| 177 | F34 | Wdth of Vegetated Zone within Wetland | At the time during the growing season when the AA's water level is lowest, the average width of vegetated areain the AA that separates adjoining uplands from open water within the $A A$ is: |  | "Vegetated area" does not include underwater or floating-leaved plants, i.e., aquatic bed. Mdth may include wooded riparian areas if they have wetland soil or plant indicators. [AM, CS, $\mathrm{NR}, \mathrm{OE}, \mathrm{PH}, \mathrm{PR}$, SBM, Sens, SR, WBN] |
| 178 |  |  | <1m. | 1 |  |
| 179 |  |  | 1-9m | 0 |  |
| 180 |  |  | 10-29m | 0 |  |
| 181 |  |  | 30-49m | 0 |  |
| 182 |  |  | 50-100m. | 0 |  |
| 183 |  |  | $>100 \mathrm{~m}$, or open water is absent at that time. | 0 |  |
| 184 | F35 | Fat Shoreline Extent | During most of the part of the growing season when water is present, the percentage of the AA'swater edge length that is nearly flat (a slope less than about $5 \%$ measured within 5 mlandward of the water) is: |  | If several isolated pools are present in early summer, estimate the percent of their collective shorelines that has such a gentle slope. [SR, WBN] |
| 185 |  |  | $<1 \%$ of the water edge. | 1 |  |
| 186 |  |  | 1-25\% of the water edge. | 0 |  |
| 187 |  |  | 25-50\% of the water edge. | 0 |  |




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| 241 | F51 | Internal Gradient | The gradient along most of the flow path within the $A$ A is: |  | This is not the same as the shoreline slope. It is the elevational difference between the AA's inlet and outlet, divided by the flow-distance between them and corverted to percent. If available, use a clinometer to measure this. Free clinometer apps can be downloaded to smartphones. If the wetland is large (longer than $\sim 1 \mathrm{~km}$ ), this may be estimated using Google Earth to determine the minimum and maximum elevation within the $A A$, then dividing by length and multiplying by 100. [CS, NR, OE, PR, SR, WBF, WBN, WS] |
| 242 |  |  | 2\% or the AA has no surface water outlet (not even seasonally). | 0 |  |
| 243 |  |  | 2-5\% | 1 |  |
| 244 |  |  | 6-10\% | 0 |  |
| 245 |  |  | >10\% | 0 |  |
| Note for the next three questions: If the AA lacks an upland edge, evaluate based on the AA's entire perimeter, and moving outward into whatever areas 246 are adjacent. In many situations, these questions are best answered by measuring from aerial images. |  |  |  |  |  |
| 247 | F5 | Vegetated Buffer as \% of Perimeter | Wthin a zone extending 30 m laterally from the AA's edge with upland and/or other wetlands, the percentage that containsperennial vegetation cover (except lamns, row crops, heavily grazed land, conifer plantations) is: |  | [AM, FA, FR, INV, NRV, PH, POL, PRV, SBM, Sens, SRv, STR, WBN] |
| 248 |  |  | -5\% | 0 |  |
| 249 |  |  | 5 to 30\% | 0 |  |
| 250 |  |  | 30 to 60\% | 0 |  |
| 251 |  |  | 60 to 90\% | 0 |  |
| 252 |  |  | >90\%, or all the area within 30 m of the AA edge is other wetlands. SKIP to P55. | 1 |  |
| 253 | F53 | Type of Cover in Buffer | Wthin 30 m upslope of where the wetland transitions to upland, the upland land cover that is NOT perennial vegetation is mostly (mark ONE): |  | [AM, FA, INN, NRV, PH, POL, SBM, STR, WBN] |
| 254 |  |  | Impervious surface, e.g., paved road, parking lot, building, exposed rock. | 0 |  |
| 255 |  |  | Bare or nearly bare penious surface or managed vegetation, e.g., lamn, row crops, unpaved road, dike, landslide. | 1 |  |
| 256 | F54 | Buffer Slope | The steepest and/or most disturbed part of the upland area that is within 30 m of the wetland and occupies $>10 \%$ of that upland area has a percent slope of: |  | [NRV, PRV, Sens, SRV] |
| 257 |  |  | <1\% (flat -- almost no noticeable slope) or all the area within 30 mof the $A$ A edge is other wetlands. | 0 |  |
| 258 |  |  | 2-5\% | 0 |  |
| 259 |  |  | 5-30\% | 1 |  |
| 260 |  |  | -30\% | 0 |  |
| 261 | F55 | Cliffs or Steep Banks | In the AA or within 100 m , there are elevated terrestrial features such as cliffs, talus slopes, stream banks, or excavated pits (but not riprap) that extend at least 2 m nearly vertically, are urvegetated, and potentially contain crevices or other substrate suitable for nesting or den areas. Enter 1 (yes) or 0 (no). | 0 | Do not include upturned trees as potential den sites. [POL, SBM] |
| 262 | F56 | New or Expanded Wetland | Human actions within or adjacent to the AA have persistently expanded a naturally occurring wetland or created a wetland where there previously was none (e.g., by excavation, impoundment): |  | Determine this using historical aerial photography, old maps, soil maps, or permit files as available [CS, NR, OE, PH, Sens] |
| 263 |  |  | No. | 0 |  |
| 264 |  |  | Yes, and created or expanded 20-100 years ago. | 0 |  |
| 265 |  |  | Yes, and created or expanded $3-20$ years ago. | 0 |  |
| 266 |  |  | Yes, and created or expanded within last 3 years. | 0 |  |
| 267 |  |  | Yes, but time of origin or expansion unknown. | 0 |  |
| 268 |  |  | Unknown if new or expanded within 20 years or not. | 1 |  |
| 269 | F57 | Burn History | More than $1 \%$ of the AA's previously vegetated area: |  | Look for charred soil or stumps (in multiple widely-spaced locations) or ask landowner. [CS, PH, STR] |
| 270 |  |  | Burned within past 5 years. | 0 |  |
| 271 |  |  | Burned 6-10 years ago. | 0 |  |
| 272 |  |  | Burned 11-30 years ago. | 0 |  |
| 273 |  |  | Burned $>30$ years ago, or no evidence of a burn and no data. | 1 |  |
| 274 | F58 | Visibility | The maximum percentage of the wetland that is visible from the best vantage point on public roads, public parking lots, public buildings, or public maintained trails that intersect, adjoin, or are within 100 m of the $A A$ (select one) is: |  | [PU, STR, WBFV] |
| 275 |  |  | 25\% | 1 |  |
| 276 |  |  | 25-50\% | 0 |  |
| 277 |  |  | -50\% | 0 |  |
| 278 | F59 | Non-consumptive Uses - Actual or Potential | Assuming access permission was granted, select ALL statements that are true of the AA as it currently exists: |  | [PU, STR] |
| 279 |  |  | For an average person, walking is physically possible in (not just near) $>5 \%$ of the $A A$ during most of the growing season, e.g., free of deep water and dense shrub thickets. | 1 |  |
| 280 |  |  | Maintained roads, parking areas, or foot-trails are within 10 m of the $A A$, or the $A A$ can be accessed part of the year by boats arriving via contiguous waters. | 0 |  |
| 281 |  |  | Within or near the AA, there is an interpretive center, trails with interpretive signs or brochures, andor regular guided interpretive tours. | 0 |  |


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| 282 | F60 | Unvisited Core Area | The percentage of the AA almost never visited by humans during an average growing season probably comprises: [ Note: Only include the part actually walked or driven (not simply viewed from) with a vehicle or boat. Do not include visitors on trails outside of the AA unless more than half the wetland is visible from the trails and they are within 30 mof the wetland edge. In that case include only the area occupied by the trail.] |  | [AM, FAv, PRv, PH, PU, SBM, STR, WBF, WBN] |
| 283 |  |  | -5\% and no inhabited building is within $100 \mathrm{mof} \mathrm{the} A$ A | 0 |  |
| 284 |  |  | -5\% and inhabited building is within 100 mof the $A$ A | 0 |  |
| 285 |  |  | $5-50 \%$ and no inhabited building is within 100 m of the $A$ A | 0 |  |
| 286 |  |  | $5-50 \%$ and inhabited building is within 100 m of the $A$ A | 0 |  |
| 287 |  |  | 50-95\%, with or without inhabited building nearby. | 0 |  |
| 288 |  |  | >95\% of the AA with or without inhabited building nearby. | 1 |  |
| 289 | F61 | Frequently Visited Area | The part of the AA visited by humans almost daily for several weeks during an average growing season probably comprises: [See note above.] |  | [AM, PH, PU, SBM, STR, WBF, WBN] |
| 290 |  |  | -5\% If F60 was answered ">95\%' (mostly never visited), SKIP to F64. | 1 |  |
| 291 |  |  | 5-50\% | 0 |  |
| 292 |  |  | 50-95\% | 0 |  |
| 293 |  |  | >95\% of the AA | 0 |  |
| 294 | F62 | BMP - Soils | Boardwalks, paved trails, fences or other infrastructure and/or well-enforced regulations appear to effectively prevent visitors from walking on soil within nearly all of the AA when the soil is unfrozen. Enter " 1 " if true. | 0 | [PH, PU] |
| 295 | F63 | BMP - Wildlife Protection | Fences, observation blinds, platforms, paved trails, exclusion periods, and/or well-enforced prohibitions on motorised boats, off-leash pets, and off road vehicles appear to effectively exclude or divert visitors and their pets from the $A A$ at critical times in order to minimize disturbance of wildlife (except during hunting seasons). Enter "1" if true. | 0 | [AM, PU, WBF, WBN] |
| 296 | F64 | Consumptive Uses (Provisioning Services) | Recent evidence was found within the AA of the following potentially-sustainable consumptive uses. Select ALL that apply. |  | [FAv, Rev, WBFV] |
| 297 |  |  | Low-impact commercial timber harvest (e.g., selective thinning). | 0 |  |
| 298 |  |  | Commercial or tracitional-use havesting of native plants, their fruits, or mushrooms. | 0 |  |
| 299 |  |  | Waterfowl hunting. | 0 |  |
| 300 |  |  | Fshing. | 0 |  |
| 301 |  |  | Trapping of furbearers. | 0 |  |
| 302 |  |  | None of the above. | 1 |  |
| 303 | F65 | Domestic Wells | The closest wells or water bodies that currently provide drinking water are: |  | [NRN] |
| 304 |  |  | Muthin 0-100 m of the AA | 0 |  |
| 305 |  |  | $100-500 \mathrm{~m}$ away. | 0 |  |
| 306 |  |  | -500 m away, or no information. | 0 |  |
| 307 | F66 | Calcareous Fen | The AA is, or is part of, a calcareous fen. See the Plants_Calcar worksheet in the accompanying Supplnfo file for list of plant indicators (calciphiles). Enter 1 If more than two Strong or more than five Moderate calciphile species are present; otherwise enter 0 , but if not able to identify those and no information, change to blank. | 0 | [ $\mathrm{PH}, \mathrm{PR}]$ |


| Investigator: | Site Identifier: | Date: |
| :--- | :--- | :--- | :--- |
| Stressor (S) Data Form for Non-Tidal Wetlands. WESP-AC for Nova Scotia version 2. |  | Data |



| S3 | Accelerated Inputs of Nutrients |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | In the last column, place a check mark next to any item - occurring in either the wetland or its CA - that is likely to have accelerated the inputs of nutrients to the wetland. [NRV, PRV, STR] |  |  |  |  |
|  | Stormwater or wastewater effluent (including failing septic systems), landfills. |  |  |  |  |
|  | Fertilizers applied to lamns, ag lands, or other areas in the CA |  |  |  |  |
|  | Livestock, dogs. |  |  |  |  |
|  | Artificial drainage of upslope lands. |  |  |  |  |
|  | If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly more nutrients, then leave the "O's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present. |  |  |  |  |
|  |  | Severe (3 points) | Medium (2 points) | Mild (1 point) |  |
|  | Type of loading: | High density of unmaintained septic, some types of industrial sources. | Moderate density septic, cropland, secondary wastewater treatment plant. | Livestock, pets, low density residential. | 0 |
|  | Frequency \& duration of input: | Frequent and year-round. | Frequent but mostly seasonal. | Infrequent \& during high runoff events mainly. | 0 |
|  | AA proximity to main sources (actual or potential): | 0-15m | 15-100 m or in groundwater. | In more distant part of contributing area. | 0 |
|  | - Sume |  |  |  | 0 |
|  |  |  |  | Stressor subscore= | 0.00 |


| S4 | Excessive Sediment Loading from Contributing Area |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | In the last column, place a check mark next to any item present in the CA that is likely to have elevated the load of waterborne or windlorne sediment reaching the wetland fromits CA [FA, FR, IN, PH, SRV, STR] |  |  |  |  |
|  | Erosion from plowed fields, fill, timber harvest, dirt roads, vegetation clearing, fires. |  |  |  |  |
|  | Erosion from construction, in-channel machinery in the CA |  |  |  |  |
|  | Erosion from off-road vehicles in the CA |  |  |  |  |
|  | Erosion from livestock or foot traffic in the CA |  |  |  |  |
|  | Stormwater or wastewater effluent. |  |  |  |  |
|  | Sediment from road sanding, gravel mining, other mining, oil/ gas extraction. |  |  |  |  |
|  | Accelerated channel downcutting or headcutting of tributaries due to altered land use. |  |  |  |  |
|  | Other human-related disturbances within the CA |  |  |  |  |
|  | If any items were checked above, then for each row of the table below, assign points ( 3,2 , or 1 as shown in header) in the last column. However, if you believe the checked items did not cumulatively add significantly more sediment or suspended solids to the AA, then leave the "O's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present. |  |  |  |  |
|  |  | Severe (3 points) | Medium (2 points) | Mild (1 point) |  |
|  | Erosion in CA: | Extensive evidence, high intensity.* | Potentially (based on high-intensity ${ }^{\star}$ land use) or scattered evidence. | Potentially (based on low-intensity ${ }^{\star}$ land use) with little or no direct evidence. | 0 |
|  | Recentness of significant soil disturbance in the CA: | Current \& ongoing. | 1-12 months ago. | $>1$ y ago. | 0 |
|  | Duration of sediment inputs to the wetland: | Frequent and year-round. | Frequent but mostly seasonal. | Infrequent \& during high runoff events mainly. | 0 |
|  | AA proximity to actual or potential sources: | 0-15m. | 15-100 m. | In more distant part of contributing area. | 0 |
|  | * high-intensity= extensive off-road vehicle use, plowing, grading, excavation, erosion with or without veg removal; low-intensity= veg removal only with little or no apparent erosion or disturbance of soil or sediment. |  |  | Sum= | 0 |
|  |  |  |  | Stressor subscore= | 0.00 |
| S5 | Soil or Sediment Alteration Within the Assessment Area |  |  |  |  |
|  |  (whichever is less). [CS, IMV, NR, PH, SR, STR] |  |  |  |  |
|  | Compaction from machinery, off-road vehicles, livestock, or mountain bikes, especially during wetter periods. |  |  |  |  |
|  | Leveling or other grading not to the natural contour. |  |  |  |  |
|  | Tillage, plowing (but excluding disking for enhancement of native plants). |  |  |  |  |
|  | Fill or riprap, excluding small amounts of upland soils containing organic amendments (compost, etc.) or small amounts of topsoil imported from another wetland. |  |  |  |  |
|  | Excavation. |  |  |  |  |
|  | Ditch cleaning or dredging in or adjacent to the wetland. |  |  |  |  |
|  | Boat traffic in or adjacent to the wetland and sufficient to cause shore erosion or stir bottom sediments. |  |  |  |  |
|  | Artificial water level or flow manipulations sufficient to cause erosion or stir bottom sediments. |  |  |  |  |
|  | If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not measurably alter the soil structure andlor topography, then leave the "O's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present. |  |  |  |  |
|  |  | Severe (3 points) | Medium (2 points) | Mild (1 point) |  |
|  | Spatial extent of altered soil: | >95\% of wetland or >95\% of its upland edge (if any). | 5-95\% of wetland or 5-95\% of its upland edge (if any). | $<5 \%$ of wetland and $<5 \%$ of its upland edge (if any). | 0 |
|  | Recentness of significant soil alteration in wetland: | Current \& ongoing. | 1-12 months ago. | $>1 \mathrm{yr}$ ago. | 0 |
|  | Duration: | Long-lasting, minimal veg recovery. | Long-lasting but mostly revegetated. | Shor-term, revegetated, not intense. | 0 |
|  | Timing of soil alteration: | Frequent and year-round. | Frequent but mostly seasonal. | Mainly during one-time or scattered events. | 0 |
|  | Sum= |  |  |  | 0 |



| Cover Page: Basic Description of Assessment | WESP-AC version 2 |
| :---: | :---: |
| Site Name: | Cambridge Wetland 5 |
| Investigator Name: | BL |
| Date of Field Assessment: | 20 Aug 2021 |
| Nearest Town: | Waterville, NS |
| Latitude (decimal degrees): | 368842.27 m E |
| Longitude (decimal degrees): | 4992081.85 m N (UTM 20 T ) |
| Is a map based on a formal on-site wetland delineation available? | Yes |
| Approximate size of the Assessment Area (AA, in hectares): | 0.75 ha |
| AA as percent of entire wetland (approx.). Attach sketch map if AA is smaller than the entire contiguous wetland. | 15 |
| What percent (approx.) of the wetland were you able to visit? | 100 |
| What percent (approx.) of the AA were you able to visit? | 100 |
| Were you able to ask the site owner/manager about any of the questions? | No |
| Indicate here if you intentionally surveyed for rare plants, calciphile plants, or rare animals: | Yes |
| Have you attended a WESP-AC training session? If so, indicate approximate month \& year. | Yes |
| How many wetlands have you assessed previously using WESP-AC? (approx.) | >100 |
| Comments about the site or this WESP-AC assessment (attach extra page if desired): | wl-5 is part of a larger complex including wetlands 6 and 9 as well. |


|  | A | B | C | D | E |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | Date 20 Aug 2021 |  | Site Identifier: Cambridge Wetland 5 | Investigator: BL |  |
| 2 | Form OF (Office). Non-tidal Wetland Data Form. WESP-AC version 2 for Nova Scotia wetlands only. DIRECTIONS: Conduct an assessment only after reading the accompanying <br> Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answering many of the questions below will require using these online map viewers: <br> Google Earth Pro: https://www.google.com/earth/download/gep/agree.html <br> Provincial Landscape Viewer: https://nsgi.novascotia.ca/plv/ <br> For most wetlands, completing this office data form will require 1-2 hours. For a list of functions to which each question pertains, see bracketed abbreviations in the Definitions/Explanations column. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention \& Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV=Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM=Amphibian \& Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, \& Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use \& Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors. |  |  |  |  |
| 3 | \# | Indicators | Condition Choices | Data | Definitions/Explanations |
| 4 | OF1 | Province | Mark the province in which the A A is located by changing the 0 in the colum next to it to a "1". Mark only one. |  | This determines to which province's calibration wetlands the raw score of any wetland is normalised. In the function and benefits models, it also triggers the automatic exclusion of indicators for which no spatial data exists in a particular province. |
| 5 |  |  | New Brunswick | 0 |  |
| 6 |  |  | Nova Scotia | 1 |  |
| 7 |  |  | Prince Edward Island | 0 |  |
| 8 |  |  | Newfoundland-Labrador | 0 |  |
| 9 | OF2 | Ponded Area Wthin 1 km | The area of surface water ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: |  | "Adjacent" means not separated from the AA by a wide expanse ( $>50 \mathrm{~m}$ ) of upland (including roads >50 m wide). Include ponded areas likely to be hidden by wetland vegetation. If surface water extends beyond 1 km , include only the part within 1 km . Do not include tidal areas. Measure the area from aerial imagery using Google Earth Pro (click on Ruler icon in toolbar, then Polygon in popup menu). [PH, SBM, WBN] |
| 10 |  |  | 80.01 hectare (about $10 \mathrm{~m} \times 10 \mathrm{~m}$ ). | 0 |  |
| 11 |  |  | 0.01-0.1 hectare. | 1 |  |
| 12 |  |  | 0.1-1 hectare. | 0 |  |
| 13 |  |  | 1 to 10 hectares. | 0 |  |
| 14 |  |  | 10 to 100 hectares. | 0 |  |
| 15 |  |  | $>100$ hectares. | 0 |  |
| 16 | OF3 | Ponded Water \& Wetland Wthin 1 km | The area of wetlands and surface water ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) withir 1 km is: |  | See definition of adjacent in OF2. If the AA's wetland vegetation extends beyond 1 km , include only the part within 1 km "Ponded" means not flowing in rivers or streams. [Sens, WBF] |
| 17 |  |  | $<0.01$ hectare (about $10 \mathrm{~m} \mathrm{\times 10} \mathrm{~m}$ ). | 0 |  |
| 18 |  |  | 0.01-0.1 hectare. | 0 |  |
| 19 |  |  | 0.1-1 hectare. | 0 |  |
| 20 |  |  | 1 to 10 hectares. | 0 |  |
| 21 |  |  | 10 to 100 hectares. | 1 |  |
| 22 |  |  | $>100$ hectares. | 0 |  |
| 23 | OF4 | Size of Largest Nearby Vegetated Tract or Corridor | The largest vegetated patch or corridor that includes the AA's vegetation plus alladjacent upland vegetation that is not lamn, row crops, heavily grazed lands, conifer plantation is: |  | See definition of adjacent in OF2. Use Google Earth Pro's polygon ruler (as described above). <br> Exclude conifer plantations only if it is obvious that trees were planted in rows. [AM, PH, SBM, Sens] |
| 24 |  |  | $<0.01$ hectare (about $10 \mathrm{~m} \times 10 \mathrm{~m}$ ). | 0 |  |
| 25 |  |  | 0.01-0.1 hectare. | 0 |  |
| 26 |  |  | 0.1-1 hectare. | 0 |  |
| 27 |  |  | 1 to 10 hectares. | 0 |  |
| 28 |  |  | 10 to 100 hectares. | 1 |  |
| 29 |  |  | 100 to 1000 hectares. | 0 |  |
| 30 |  |  | >1000 hectares. [This is nearly always the answer in relatively undeveloped landscapes.] | 0 |  |


|  | A | B | C | D | E |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 31 | OFS | Distance to Large Vegetated Tract | The minimum distance from the edge of the AA to the edge of the closestvegetated land (but excluding row crops, lawn, conifer plantation) larger than 375 hectares (about 2 km on a side), is: |  | To measure distance, use Google Earth Pro (Ruler > Line tool). The 375 -ha criterion is from the Fundy Model Forest Project. [AM, PH, POL, SBM, Sens] |
| 32 |  |  | $<50 \mathrm{~m}$, and not separated from the 375 -ha vegetated area by any width ofpaved roads, stretches of open water, row crops, bare ground, lawn, or impervious surface. Or the $A A$ itself contains $>375$ ha of vegetation. [This is often the answer in relatively undeveloped landscapes.] | 0 |  |
|  |  |  | 40 m , but completely separated from the 375-ha vegetated area by those features, and AA does not contain $>375$ ha of vegetation. | 0 |  |
| 34 |  |  | 50-500 m, and not separated. | 0 |  |
| 35 |  |  | 50-500 m, but separated by those features. | 0 |  |
| 36 |  |  | $0.5-5 \mathrm{~km}$, and not separated. | 0 |  |
| 37 |  |  | $0.5-5 \mathrm{~km}$, but separated by those features. | 0 |  |
| 38 |  |  | None of the above (the closest patches or corridors which are that large are $>5 \mathrm{~km}$ away). | 1 |  |
| 39 | OF6 | Herbaceous Uniqueness | The AA's vegetation cover is $>10 \%$ herbaceous* but uplands within 5 km have $<10 \%$ herbaceous cover. If so, enter " 3 " and continue to OF7. If not, consider: <br> The AA's vegetation cover is $>10 \%$ herbaceous* but uplands within 1 km have $<10 \%$ herbaceous cover. If so enter " 2 " and continue to Of7. If not, consider: <br> The AA's vegetation cover is $>10 \%$ herbaceous* but uplands within 100 m of the wetland edge have $<10 \%$ herbaceous cover. If so, enter "1". <br> [* NOTE: Exclude lamns, row crops, heavily grazed lands, forest, shrublands. Include moss as well as grasslike plants in this use of "herbaceous vegetation'] | 1 | For this question only, consider moss to be herbaceous vegetation. Determine the score by vieving aerial imagery in Google Earth after successively drawing or estimating the boundaries of the buffers of $5 \mathrm{~km}, 1 \mathrm{~km}$, and 100 m radius focused on the center of the AA. Circles of specified radius can be dramn in Google Earth Pro by clicking on the Ruler icon, then Circle in the pop-up menu. [AMN, PHN, POLv, SBMN, WBFv, WBNv] |
| 40 | OF/ | Woody Uniqueness | The AA's vegetation cover is $>10 \%$ woody* but uplands within $5 \mathrm{kmhave}<10 \%$ woody cover. If so, enter " 3 " and continue to OF8. If not, consider: <br> The AA's vegetation is $>10 \%$ woody ${ }^{\star}$ but uplands within 1 km have $<10 \%$ woody cover. If so enter " 2 " and continue to OF8. If not, consider: <br> The AA's vegetation is $>10 \%$ woody ${ }^{\star}$ but uplands within 100 m of the wetland edge have $<10 \%$ woody cover. If so, enter " 1 " <br> [* NOTE: woody cover = trees \& shrubs taller than 1 m ] | 0 | See above. Do not consider conifer plantations to be forest if it is obvious that trees were planted in rows. [AMN, PHV, POLv, SBMN] |
| 41 | OF8 | Local Vegetated Cover Percentage | Draw a 5 -km radius circle measured from the center of the AA. Ignoring all permanent water in the circle, the percent of the remaining are that is wooded or unmanaged herbaceous vegetation (NOT lawn, row crops, bare or heavily grazed land, clearcuts, or conifer plantations) is: |  | In Google Earth, draw the 5 km buffer and then estimate land cover percentages, or do GIS analysis of an appropriate land cover layer. [AM, PH, POL, SBM, Sens] |
| 42 |  |  | -5\% of the land. | 0 |  |
| 43 |  |  | 5 to 20\% of the land. | 0 |  |
| 44 |  |  | 20 to 60\% of the land. | 1 |  |
| 45 |  |  | 60 to $90 \%$ of the land. | 0 |  |
| 46 |  |  | >90\% of the land. SKIP to OF10. | 0 |  |
| 47 | OF9 | Type of Land Cover Alteration | Wthin the 5 -km radius circle, and ignoring all permanent water, the land area that is bare or non-perennial cover is mostly: |  | [AM, SBM] |
| 48 |  |  | Impervious surface, e.g., paved road, parking lot, building, exposed rock. | 0 |  |
| 49 |  |  | Bare pervious surface, e.g., lawn, recent (< 5 yrs ago) clearcut, dirt or gravel road, cropland, landslide, conifer plantation. | 1 |  |
| 50 | OF10 | Distance by Road to Nearest Population Center | Measured along the maintained road nearest the A , the distance to the nearestpopulation center is: |  | "Population center" means a settled area with more than about 5 regularly- inhabited structures per square kilometer. In Google Earth Pro, click on the Ruler icon, then Path, and draw and measure the route. [FAv, FRV, NRv, PH, PU, SBM, WBFV] |
| 51 |  |  | $<100 \mathrm{~m}$. | 0 |  |
| 52 |  |  | 100-500m. | 0 |  |
| 53 |  |  | 0.5-1 km | 1 |  |
| 54 |  |  | $1-5 \mathrm{~km}$ | 0 |  |
| 55 |  |  | -5km | 0 |  |
| 56 | OF11 | Distance to Nearest Maintained Road | From the center of the AA, the distance to the nearest maintained public road (dirt or paved) is: |  | Determine this by viewing aerial imagery in Google Earth Pro and measuring with the Ruler>Line tool. [AM, FAv, FRv, NRv, PH, PU, SBM, STR, WBN] |
| 57 |  |  | $<10 \mathrm{~m}$ | 0 |  |
| 58 |  |  | 10-25m. | 0 |  |
| 59 |  |  | 25-50m. | 0 |  |
| 60 |  |  | 50-100 m. | 0 |  |
| 61 |  |  | 100-500m. | 0 |  |
| 62 |  |  | >500 m. | 1 |  |


|  | A | B | C | D | E |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 63 | OF12 | Wildife Access | Draw a circle of radius of 5 km from the center of the $A A$ If marmals and amphibians can move from the center of the $A A$ to $A L L$ other separate wetlands and ponds located within the circle without being forced to cross pavement (any width), lawns, bare ground, and/or marine waters, mark $1=$ yes can move to all, $0=$ no. Change toblank if there are no other wetlands within 5 km . | 0 | Draw the 5 km circle in Google Earth Pro using the Circle tool and search for roads and wetlands within it, being alert for roads hidden under forest canopy. [AM, SBM, STR] |
| 64 | OF13 | Distance to Ponded Water | The distance from the AA center to the closest (but separate) ponded water body visible in Google Earth imagery is: |  | In Google Earth Pro, zoom in closely to examine the surrounding landscape for ponds, lakes, and wetlands that appear to be permanently flooded. [AM, PH, SBM, Sens, WBF, WBN] |
| 65 |  |  | -50 m, and not separated by any width of paved roads, stretches of open water, row crops, lamn, bare ground, or impervious surface. | 0 |  |
| 66 |  |  | 50 m , but completely separated by those features. | 0 |  |
| 67 |  |  | $50-500 \mathrm{~m}$, and not separated. | 0 |  |
| 68 |  |  | $50-500 \mathrm{~m}$, but separated by those features. | 1 |  |
| 69 |  |  | $0.5-1 \mathrm{~km}$, and not separated. | 0 |  |
| 70 |  |  | $0.5-1 \mathrm{~km}$, but separated by those features. | 0 |  |
| 71 |  |  | None of the above (the closest patches or corridors that large are >1 km away). | 0 |  |
| 72 | OF14 | Distance to Large Ponded Water | The distance from the AA center to the closest (but separate)non-tidal body of water that is ponded during most of the year and islarger than 8 hectares during most of a normal year is: |  | Determine this by viewing aerial imagery in Google Earth. [Sens, WBF, WBN] |
| 73 |  |  | $<100 \mathrm{~m}$ | 0 |  |
| 74 |  |  | $100 \mathrm{~m}-1 \mathrm{~km}$ | 0 |  |
| 75 |  |  | 1-2km. | 0 |  |
| 76 |  |  | 2-5 km | 0 |  |
| 77 |  |  | $5-10 \mathrm{~km}$ | 1 |  |
| 78 |  |  | $>10 \mathrm{~km}$ | 0 |  |
| 79 | OF15 | Tidal Proximity | The distance from the AA edge to the closesttidal water body (regardless of its salinity) is: |  | In Google Earth, measure the distance to the ocean (including Bay of Fundy) or tidal river, whichever is closer. If you need to see how far upriver a river is tidal, see the KNZ file provided with this calculator for NS (NS Headtide). Points shown in those files are only an approximation, so local information if available may be preferable. [FA, WBF] |
| 80 |  |  | $\angle 100 \mathrm{~m}$ | 0 |  |
| 81 |  |  | $100 \mathrm{~m}-1 \mathrm{~km}$ | 0 |  |
| 82 |  |  | $1-5 \mathrm{~km}$ | 0 |  |
| 83 |  |  | $5-10 \mathrm{~km}$ | 0 |  |
| 84 |  |  | $10-40 \mathrm{~km}$ | 1 |  |
| 85 |  |  | $>40 \mathrm{~km}$ | 0 |  |


|  | A | B | C | D | E |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 86 | OF16 | Upland Edge Contact | Select one: |  | [ NR , SBM, Sens] |
|  |  |  | The AA has no upland edge (or upland is <1\% of perimeter). The AA is entirely surrounded by (\& contiguous with) other wetlands or water. | 0 |  |
|  |  |  | 1-25\% of the AA's perimeter abuts upland (including filled areas). The rest adjoins other wetlands or water that is mostly wider than the AA | 0 |  |
| 89 |  |  | 25-50\% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA. | 0 |  |
| 90 |  |  | $50-75 \%$ of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA | 0 |  |
| 91 |  |  | More than $75 \%$ of the AA's perimeter abuts upland. Any remainder adjoins other wetlands or water that is mostly wider than the AA. This will be true for most assessments done with WESP-AC. | 1 |  |
| 92 | OF17 | Food Damage fromNon tidal Waters | Wthin 5 km downstream or downslope of the AA (select first true choice): |  | Contact local authories to determine if such maps exist. Where available, LDAR imagery can provide finer elevational resolution useful for flood modeling. [WSV] |
| 93 |  |  | Maps show Flood Zone or Flood Risk areas and there appears to be infrastructure vulnerable to river flooding not caused by tidal storm surges. | 0 |  |
| 94 |  |  | Maps show Food Zone or Flood Risk areas, but infrastructure is absent or is not vulnerable to floods from a non-tidal river. In some cases levees, upriver dams, or other measures may partly limit damage or risk from smaller events. | 0 |  |
| 95 |  |  | Maps do not show Food Zone or Food Risk areas (or no such mapping has been done locally) and there appears to be infrastructure vulnerable to river flooding unrelated to tidal storm surges. | 0 |  |
| 96 |  |  | Maps do not show Flood Zone or Food Risk areas (or no such mapping has been done locally) and there isno infrastructure vulnerable to river flooding unrelated to tidal storm surges. | 1 |  |
| 97 | OF18 | Relative Elevation in Watershed | In Google Earth, enable the Terrain layer (lower left menu) and open the NS_Watersheds Secondary KMZ file that accompanies this calculator. Then determine the AA's approximate elevation (bottom right, NOT the "eye alt'). Then move cursor around to determine the watershed's maximum and minimum elevation. Divide the AA's elevation by the (max-min). | 0.10 | [FA, NR, Sens, SFSV, WCV, WSv] |
| 98 | OF19 | Water Quality Sensitive Watershed or Area | The AA is in a Protected Water Supply area (Designated Water Supply Area, Natural Watershed Municipal Surface Water Supply Area, or Municipal Water Supply Area) according to the provided KMZ overlay ("NS Protected Water Supply Areas'). Enter 1= yes, 0= no. | 0 | If an ACCDC report is available for this AA, it also may contain such information. [NRV] |


|  | A | B | C | D |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 99 |  | Degraded Water Upstream | Sampling indicates a problem with concentrations of metals, hydrocarbons, nutrients, or other substances (excluding bacteria, acidic water, high temperatures) being present at levels harmful to aquatic life or humans, and: |  | May use existing data, or sample those waters as part of this wetland assessment. "Harmful" should be evaluated with regard to current federal or provincial water quality standards. [AM, FA, FR, NRV, PRV, SRV, STR, WBF, WBN] |
| 100 |  |  | The condition is present within the AA | 0 |  |
| 101 |  |  | The condition is present in waters within 1 km that flowinto the AA, but has not been documented in the AA itself. | 0 |  |
| 102 |  |  | Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters. | 0 |  |
| 103 |  |  | Data are insufficient (no or inadequate sampling within 1 km , or condition exists only at $>1 \mathrm{~km}$ upstream). This is the situation for nearly all wetlands in this region. | 1 |  |
| 104 | OF21 | Degraded | The problem described above is downslope fromthe AA, and: |  | May use existing data, or monitor waters as part of this wetland assessment. [NRV, PRv, SRV] |
| 105 |  | Donnstream | The condition is present within 1 km downslope and connected to the AA by a channel. | 0 |  |
| 106 |  |  | The condition is present within 5 km downslope and connected to the AA by a channel, or within 1 km but not connected to the AA by a channel. | 0 |  |
| 107 |  |  | Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters. | 0 |  |
| 108 |  |  | Data are insufficient (no or inadequate sampling within 1 km , or condition exists only at $>1 \mathrm{~km}$ upstream). This is the situation for nearly all wetlands in this region. | 1 |  |
| 109 | OF22 | Wetland as a \% of Its Contributing Area (Catchment) | From a topographic map and field observations, estimate the approximate boundaries of the catchment (CA) of the entire wetland of which the AA may be only a part. Then adjust those boundaries if necessary based on your field observations of the surrounding terrain, and/or by using procedures described in the Manual. Divide the area of the wetland (not just the $A A$ ) by the approximate area of its catchment excluding the area of the wetland itself. When doing the calculation, if ponded water is adjacent to the wetland, include that in the wetland area. The result is: |  | Topographic maps may be viewed online at the National Atlas of Canada (Toporama): http://atlas.gc.ca/toporama/en/index.htmI [NR, PR, Sens, SR, WS] |
| 110 |  |  | <0.01, or catchment size unknown due to stormwater pipes that collect water from an indeterminate area. | 1 |  |
| 111 |  |  | 0.01 to 0.1. | 0 |  |
| 112 |  |  | 0.1 to 1. | 0 |  |
| 113 |  |  |  | 0 |  |
| 114 | OF23 | Unvegetated Surface in the Contributing Area | The proportion of the AA's contributing area (measured to no more than 1000 m upslope) that is comprised of buildings, roads, parking lots other pavement, exposed bedrock, landslides, and other mostly-bare surface is about : |  | [FA, INV, NRV, PRV, SRv, STR, WCV, WSV] |
| 115 |  |  | <10\% | 0 |  |
| 116 |  |  | 10 to $25 \%$ | 0 |  |
| 117 |  |  | >25\% | 1 |  |
| 118 | OF24 | Transport From Upslope | A relatively large proportion of the precipitation that falls farther upslope in the CA reaches this wetland quickly as runoff (surface water), as indicated by the following: <br> (a) input channel is present, <br> (b) input channels have been straightened, <br> (c) upslope wetlands have been ditched extensively, <br> (d) land cover is mostly non-forest, <br> (e) CA slopes are steep, and/or <br> (f) most CA soils are shallow (bedrock near surface) and/or have high runoff coefficients. <br> This statement is: |  | [NRV, PRV, SRv, WSU] |
| 119 |  |  | Mostly true. | 0 |  |
| 120 |  |  | Somenhat true. | 1 |  |
| 121 |  |  | Mostly untrue. | 0 |  |
| 122 | OF25 | Aspect | The overland flow direction of most surface water (in streams, rivers, or runoff) that enters the AA is: |  | [AM, NR, SFS, WC, WS] |
| 123 |  |  | Northward (N, NE). north-facing contributing area | 0 |  |
| 124 |  |  | Southward (S, SW). south-facing contributing area. | 0 |  |
| 125 |  |  | Other (E, SE, W, M M), or no detectable uphill slope or input channel (flat). | 0 |  |
| 126 <br> 127 | OF26 | Internal FowDistance (Path Length) | The horizontal flow distance from the wetland's inlet to outlet is: <br> 10 m | 0 | Identify inlets and outlets, if any, from topographic maps (use elevations to determine which are inlets and which are outlets) and augment by field inspection. With the Provincial Landscape Viewer, select Nova.Scotia Tonnas the Baseman Also enable the laver ForestnsW/AM Predicted Flow Then |


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| 128 |  |  | 10-50m. | 0 | measure the inlet-outlet distance. [NR, OE, PR, SR, WS] |
| 129 |  |  | 50-100 m. | 1 |  |
| 130 |  |  | 100-1000 m. | 0 |  |
| 131 |  |  | 1-2 km. | 0 |  |
| 132 |  |  | $>2 \mathrm{~km}$, or wetland lacks an inlet and outlet. | 0 |  |
| 133 | OF27 | Growing Degree Days | In Google Earth, open the KMZ file that accompanies this calculator, called NS_GrowingDegreeDays. Place your cursor over the AA and left-click. From the pop-up window, enter the GRIDCODE number in the next column. | 2200 | This layer was provided by Dr. Dan McKenney of the Canadian Forest Service [AM, CS, FR, INV, NR, OE, PH, PR, Sens, SR, WBF, WCV, WS] |
| 134 | OF28 | Fish Access or Use | According to agency biologists and/or your own observations, the AA [ N ark just the first choice that is true.]: |  | Regarding the last choice, if uncertain if an $A A$ is fishless, consider the possibility its waters have been stocked. [AM, FA, FR, INN, WBF, WBN] |
| 135 |  |  | Is known to support rearing and/or spawning by Atlantic salmon or other anadromous species or eels. Go to Provincial Landscape Viewer>Mildlife>Significant Habitat>Species at Risk. Contact local fishery biologists, review the ACCDC report, and visit these websites: http://wuw.salmonatlas.com/atlanticsalmon/canada-eastindex.1.html http://atlanticsalmonfederation.org/rivers/introduction.htm | 0 |  |
| 136 |  |  | Has not been documented to support Atlantic salmon rearing and/or spawning, but is connected to nearby waters likely to contain Atlantic salmon or other anadromous species or eels and is probably accessed by those during some conditions. | 0 |  |
| 137 |  |  | Is probably is not accessed by any anadromous fish species but is known or likely to haveother fish at least seasonally. | 0 |  |
| 138 |  |  | Is known or likely to be fishless (e.g., too small, dry, and/or not accessible even temporarily, and not stocked). | 1 |  |
| 139 | of29 | Species of Conservation Concern | Wthin the past 10 years, in the AA (or in its adjoining waters or wetland), qualified observers have documented ${ }^{\text {a }}$ ( ${ }^{\text {ark all applicable]: }}$ |  | Request information from ACCDC and/or conduct your own survey at an appropriate season using a approved protocol. For birds, also check eBird.org. [AMN, EC, PHN, POLv, SBMN, Sens, WBFV, wBN] |
|  |  |  | Presence of one or more of the plant species listed in the Plants_Rare worksheet of the accompanying Supplnfo file, or the AA is within a mapped Atlantic Coastal Plain Fora Buffer (go to Provincial Landscape Viewer> Wildlife> Special Management Practice Zones). | 0 |  |
| $\begin{array}{\|l\|} \hline 141 \\ \hline 142 \\ \hline \end{array}$ |  |  | Presence of one or more of the amphibian or reptile species (AM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying Supplnfo file. | 0 |  |
|  |  |  | Presence of one or more of thewaterbird species (MBF, WBN) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying Supplnfo file. | 0 |  |
| 143 |  |  | Presence of one or more of the nestingsongbird or raptor species (SBM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying Supplnfo file, during their nesting season (May-July for most species). | 0 |  |
| 144 |  |  | None of the above, or no data. | 1 |  |
| 145 | OF30 | Important Bird Area (IBA) | In Google Earth, open the KMZ file that accompanies this calculator, calledIBAs_Canada The AA is all or part of an officially designated IBA. Enter 1=yes, $0=$ no. | 0 | The source of this layer, which should be checked periodically for updates, is: http://umw.ibacanada.com/mapviewer.jsp?lang=EN [SBMN, WBFv, WBN] |
| 146 | OF31 | Black Duck Nesting Area | In Google Earth, open the KMZ file that accompanies this calculator, called BlackDuck. Adjust its alignment and opacity. Determine the predicted density (pairs per $25 \mathrm{sq} . \mathrm{km}$ ) of nesting American Black Duck in the AA's vicinity: $<10$ (enter 0), 10-20 (enter 1), 20-30 (enter 2), $>30$ (enter 3). If outside of region shown in map, change toblank | 0 | This was provided by Dr. David Leske. [WBNW] |
| 147 | OF32 | Wintering Deer or Moose Concentration Areas | If $A A$ is on private land with no information, change toblank (not 0). Otherwise: Wth the Provincial Landscape Viewer, for Wintering Moose, go to Wildilife> Significant Habitat. For Mainland Moose Concentration Areas, go to Wildlife> Special Management Practice Zones Enter: yes=1, no= 0 . | 0 | [SBM] |
| 148 | OF33 | Other Conservation Designation | The AA is all or part of an area designated by government, Frist Nations, or the Nature Conservancy of Canada (NCC) for its exceptional ecological features or highly intact natural conditions. With Provincial Landscape Viewer, see Protected Areas. Enter: yes=1, no=0. If uncertain, consult NCC and agencies for more recent information. | 0 | See: https://novascotia.ca/parksandiprotectedareas/plan/interactive-map/ [PU] |
| 149 | OF34 | Conservation Investment | The AA is part of or contiguous to a wetland on which public or private organizational funds were spent to preserve, create, restore, or enhance the wetland (excluding mitigation wetlands). Ask the property owner. Enter: yes=1, no= 0 . If no information, change tdblank (not 0). | 0 | [PU] |
| 150 | OF35 | Mtigation Investment | The AA is all or part of a mitigation site used explicitly to offset impacts elsewhere. Ask the property owner. Enter: yes=1, no= 0 . If no information, change toblank. | 0 | [PU] |
| 151 | OF36 | Sustained Scientific Use | Plants, animals, or water in the AA have been monitored for $>2$ years, unrelated to any regulatory requirements, and data are available to the public. Or the AA is part of an area that has been designated by an agency or institution as a benchmark, reference, or status-trends monitoring area. Ask the property owner. Enter: yes=1, no=0. If no information, change toblank | 0 | [PU] |
| 152 | OF37 | Calcareous Region | The AA is NOT in a subregion that has been heavily exposed to acid precipitation. Enter " 1 " if true (green or yellow in map in Appendix AO the Manual). Enter "O" if false. If no information, change toblank | 0 | [AM, FA, fR, INV, PH] |
| 153 | OF38 | Omership | Select the ONE ownership that covers the most of the AA. In Google Earth, open KMZ file called NS_CrownlandsUse more recent information if available. |  | "Private lands" may include those owned or leased by non-govermmental organizations, e.g., charitable conservation land trusts, DUC, TNC. [PU, STR] |




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| 19 |  |  | deciduous trees taller than 3 m | 2 |  |
| 20 |  |  | coniferous or ericaceous shrubs or trees 1-3 mtall not directly below the canopy of trees. | 1 |  |
| 21 |  |  | deciduous shrubs or trees 1-3 mtall not directly below the canopy of trees. | 3 |  |
| 22 |  |  | Coniferous or ericaceous shrubs <1 mtall not directly below the canopy of taller vegetation. | 2 |  |
| 23 |  |  | deciduous shrubs or trees $<1 \mathrm{mtall}$ (e.g., deciduous seedlings) not directly below the canopy of taller vegetation. | 3 |  |
| 24 | Note: If none of top 4 rous in F3 was marked 2 or greater, SKIP to F9 (N fixers). |  |  |  |  |
| 25 | F4 | Dominance of Most Abundant Shrub Species | Determine which two woody plant species comprise the greatest portion of the low ( $\langle<\mathrm{m}$ ) woody cover. Then choose one: |  | [PH, POL, SBM, Sens] |
| 26 |  |  | those species together comprise $>50 \%$ of such cover. | 1 |  |
| 27 |  |  | those species together do not comprise $>50 \%$ of such cover. | 0 |  |
| 28 | F | Woody Diameter Classes | Mark $A \amalg$ the types that comprise $>5 \%$ of the woody canopy cover in the $A A$ or $>5 \%$ of the wooded areas (if any) along its upland edge (perimeter). The edge should include only the trees whose canopies extend into the AA |  | Estimate the diameters at chest height. If small-diameter trees are overtopped (shaded) by larger ones, visualise a "subcanopy" at the average height of the smaller-dbh trees, to serve as a basis for the minimum $5 \%$ canopy requirement in this question. The trees and shrubs need not be wetland species. [AM, CS, POL, SBM, Sens, WBN] |
| 29 |  |  | coniferous, $1-9 \mathrm{~cm}$ diameter and $>1 \mathrm{~m}$ tall. | 1 |  |
| 30 |  |  | broad-leaved deciduous $1-9 \mathrm{~cm}$ diameter and $>1 \mathrm{mtall}$. | 1 |  |
| 31 |  |  | coniferous, $10-19 \mathrm{~cm}$ diameter. | 1 |  |
| 32 |  |  | broad-leaved deciduous $10-19 \mathrm{~cm}$ diameter. | 1 |  |
| 33 |  |  | coniferous, $20-40 \mathrm{~cm}$ diameter. | 1 |  |
| 34 |  |  | broad-leaved deciduous $20-40 \mathrm{~cm}$ diameter. | 1 |  |
| 35 |  |  | coniferous, 740 cm diameter. | 0 |  |
| 36 |  |  | broad-leaved deciduous $>40 \mathrm{~cm}$ diameter. | 0 |  |
| 37 | F6 | Height Class Interspersion | Follow the key below and mark the ONE row that best describes MOST of the AA: |  | [AM, INW, NR, PH, SBM, Sens] |
|  |  |  | A. Neither the vegetation taller than 1 m nor the vegetation shorter than that comprise $>70 \%$ of the vegetated part of the $A A$. They each comprise $30-70 \%$ Choose between A 1 and A 2 and mark the choice with a 1 in the adjoining colum. Otherwise go to B below. |  |  |
| 38 |  |  |  |  |  |
| 39 |  |  | A1 The two height classes are mostly scattered and intermixed throughout the AA | 1 |  |
| 40 |  |  | A2 Not A1. The two height classes are mostly in separate zones or bands, or in proportionately large clumps. | 0 |  |
| 41 |  |  | B. Ether the vegetation shorter than 1 m comprises $>70 \%$ of the vegetated part of the $A A$, or the vegetation taller than that does. One size class might even be totally absent. Choose between B1 and B2 and mark the choice with a 1 in the adjoining column: |  |  |
| 42 |  |  | B1 The less prevalent height class is mostly scattered and intermixed within the prevalent one. | 0 |  |
| 43 |  |  | B2. Not B1. The less prevalent height class is mostly located apart from the prevalent one, in separate zones or clumps, or is completely absent. | 0 |  |
| 44 | 7 | Large Snags (Dead Standing Trees) | The number of large snags (diameter $\mathbf{2 0} \mathbf{~ c m}$ ) in the AA plus adjacent upland area within 10 m of the wetland edge is: |  | Snags are dead standing trees that often (not always) lack bark and foliage. Include only ones that are at least 2 m tall. [POL, SBM, WBN] |
| 45 |  |  | None, of fewer than $8 /$ hectare which exceed this diameter. | 1 |  |
| 46 |  |  | Several ( $>8 / \mathrm{hectare)}$ ) and a pond, lake, or slow-flowing water wider than 10 mis within 1 km | 0 |  |
| 47 |  |  | Several ( $>8$ hectare) but above not true. | 0 |  |
| 48 | F8 | Downed Wood | The number of downed wood pieces longer than 2 m and with diameter $>10 \mathrm{~cm}$, and not persistently submerged, is: |  | Exclude temporay "bum piles." [AM, IN, POL, SBM] |
| 49 |  |  | Few or none that meet these criteria. | 1 |  |
| 50 |  |  | Several ( $>5$ if $A$ A is $>5$ hectares, less for smaller $A$ As) meet these criteria | 0 |  |
| 51 | F9 | NFixers | The percentage of the AA's vegetated cover that contains nitrogen-fixing plants (e.g., alder, sweetgale, clover, lupine, alfalfa, other legumes) is: |  | Do not include $N$-fixing algae or lichens. [FA, $\mathrm{PR}, \mathrm{IN}, \mathrm{NR}, \mathrm{N}, \mathrm{OE}, \mathrm{PH}, \mathrm{SBM}$, Sens] |
| 52 |  |  | <1\% or none. | 0 |  |
| 53 |  |  | 1-25\% of the vegetated cover, in the AA or along its water edge (whichever has more). | 0 |  |
| 54 |  |  | $25-50 \%$ of the vegetated cover, in the AA or along its water edge (whichever has more). | 1 |  |
| 55 |  |  | $50-75 \%$ of the vegetated cover, in the AA or along its water edge (whichever has more). | 0 |  |
| 56 |  |  | $>75 \%$ of the vegetated cover, in the AA or along its water edge (whichever has more). | 0 |  |
| 57 | F10 | Sphagnum Moss Extent | The cover of Sphagnum moss (or any moss that forms a dense cushion many centimeters thick), including the moss obscured by taller sedges and other plants rooted in it, is: |  | Exclude moss growing on trees and rocks. [CS, PH] |
| 58 |  |  | -5\% of the vegetated part of the AA | 0 |  |
| 59 |  |  | $5-25 \%$ of the vegetated part of the $A$ A | 1 |  |
| 60 |  |  | $25-50 \%$ of the vegetated part of the AA | 0 |  |
| 61 |  |  | $50-95 \%$ of the vegetated part of the AA | 0 |  |
| 62 |  |  | >95\% of the vegetated part of the AA | 0 |  |



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| 103 |  |  | 50-95\% of the vegetated area | 0 |  |
| 104 |  |  | -95\% of the vegetated area | 0 |  |
| 105 | F19 | Dominance of Most Abundant Herbaceous | Determine which two herbaceous species comprise the greatest portion of the herbaceous cover (excluding mosses and floating-leaved aquatic plants). Then choose one of the following: |  | For this question, indude fems as well as graminoids and forbs. [EC, IN, PH, POL, Sens] |


|  | A | B | C | D | E |
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| 106 |  | Species | those species together comprise $>50 \%$ of the areal cover of herbaceous plants at any time during the year. | 1 |  |
| 107 |  |  | those species together do not comprise $>50 \%$ of the areal cover of herbaceous plants at any time during the year. | 0 |  |
| 108 | F20 | Invasive Plant Cover | How extensive is the cover of invasive plant species in the AA? For species, see Plants invasive worksheet in the accompanying Supplnfo file. |  | [EC, PH, POL, Sens] |
| 109 |  |  | invasive species appear to be absent in the AA, or are present only in trace amount (a few individuas). | 1 |  |
| 110 |  |  | invasive species are present in more than trace amounts, but comprise $<5 \%$ of herbaceous cover (or woody cover, if the invasives are moody). | 0 |  |
| 111 |  |  | invasive species comprise 5-20\% of the herb cover (or woody cover, if the invasives are woody). | 0 |  |
| 112 |  |  | invasive species comprise 20-50\% of the herb cover (or woody cover, if the invasives are woody). | 0 |  |
| 113 |  |  | invasive species comprise $>50 \%$ of the herb cover (or woody cover, if the irvasives are woody). | 0 |  |
| 114 | F21 | Invasive Cover Along Upland Edge | Along the wetland-upland boundary, the percent of the upland edge (within 3 mupslope from the wetland) that is occupied by invasive plant species is: |  | If a plant cannot be identified to species (e.g., winter conditions) but its genus contains an exotic species, assume the unidentified plant to also be exotic. If vegetation is so senesced that exotic species cannot be identified, answer "none". [PH, STR] |
| 115 |  |  | none of the upland edge (invasives apparently absent), or AA has no upland edge. | 1 |  |
| 116 |  |  | some (but -5\%) of the upland edge. | 0 |  |
| 117 |  |  | 5-50\% of the upland edge. | 0 |  |
| 118 |  |  | most ( $>50 \%$ ) of the upland edge. | 0 |  |
| 119 | F22 | Fringe Wetland | During most of the year, open water within or adjacent to the vegetated part of the wetland is much wider than the maximum width of the vegetated zone within the wetland. Enter "1" if true, "0" if false. | 0 | [MBF, WBN, WCV] |
| 120 | F23 | Lacustrine Wetland | The vegetated part of the AA is within or adjacent to a body of non-tidal standing open water whose size exceeds8 hectares during most of a normal year. | 0 | [ $\mathrm{F}, \mathrm{PR}, \mathrm{PU}, \mathrm{WBF}, \mathrm{WBN}$ ] |
| 121 | F24 | \% of AAWithout Surface Water | The percentage of the AA that never contains surface water during an average year (that is, except perhaps for a few hours after snowmelt on rainstorms), but which is still a wetland, is: |  | 1 hectare is 10,000 sq. mor about 2.5 acres. It could have dimensions of $100 \mathrm{mby} 100 \mathrm{~m}, 1000 \mathrm{mby}$ 10 m , or similar. [AM, FA, $\operatorname{FR}, \mathrm{IN}, \mathrm{NR}, \mathrm{PH}, \mathrm{PR}, \mathrm{SBM}$, Sens, SRv, WBF, WBN, WC] |
| 122 |  |  | $<1 \%$. In other words, all or nearly all of the AA is covered by water permanently or at least seasonally. | 0 |  |
| 123 |  |  | 1-25\% of the AA , or $<1 \%$ but $>0.01$ ha never contains surface water. | 1 |  |
| 124 |  |  | 25-50\% of the AA never contains surface water. | 0 |  |
| 125 |  |  | 50-75\% of the AA never contains surface water. | 0 |  |
| 126 |  |  | 75-99\% of the AA never contains surface water, or $>99 \%$ AND there is at least one persistent water body larger than 1 ha in the AA | 0 |  |
| 127 |  |  | 99-100\% AND there is no persistent ponded water body larger than 1 ha within the AA Enter "1" andSKIP to F42 (Channel Connection). | 0 |  |
| 128 | F25 | \% of AA with <br> Persistent Surface Water | Identify the parts of the AA that still contain surface water (flowing or ponded, open or hidden beneath vegetation) even during the driest times of a normal year, i.e., when the AA's surface water is at its lowest annual level. At that time, the percentage of the AA that still contains surface water is: |  | If you are unable to determine the condition at the driest time of year, ask the land owner or neighbors about it if possible. Indicators of persistence may include fish, some dragonflies, beaver, and muskrat. [AM, CS, FA, FR, INN, NR, POL, PR, SBM, WBF, WBN] |
| 129 |  |  | None. The AA dries up completely (no water in channels either) or never has surface water during most years. SKIP to F27. | 0 |  |
| 130 |  |  | 1-20\% of the AA. | 1 |  |
| 131 |  |  | 20-50\% of the AA | 0 |  |
| 132 |  |  | 50-95\% of the AA | 0 |  |
| 133 |  |  | >95\% of the AA True for many fringe wetlands. | 0 |  |
| 134 | F26 | \% of Summertime Water that is Shaded | At mid-day during the warmest time of year, the area of surface waterwithin the $A A$ that is shaded by vegetation and other features that are within the $A A$ at that time is: |  | [FA, WC] |
| 135 |  |  | -5\% of the water is shaded, or no surface water is present then. | 0 |  |
| 136 |  |  | $5-25 \%$ of the water is shaded. | 0 |  |
| 137 |  |  | 25-50\% of the water is shaded. | 0 |  |
| 138 |  |  | 50-75\% of the water is shaded. | 0 |  |
| 139 |  |  | >75\% of the water is shaded. | 1 |  |
| 140 | F27 | \% of AA that is Fooded Only Seasonally | The percentage of the $A$ A's area that is between the annual high water and the annual low water (surface water) is: |  | Flood marks (algal mats, adventitious roots, debris lines, ice scour, etc.) are often evident when not fully inundated. Aso, such areas often have a larger proportion of upland and annual (vs. perennial) plant species. In riverine systems, the extent of this zone can be estimated by multiplying by 2 the bankful height and visualising where that would intercept the land along the river. [CS, FA, IN, NR, OE, PH, SR, WBF, WBN, WS] |
| 141 |  |  | None, or <0.01 hectare and <1\% of the AA SKIP to F29. | 0 |  |
| 142 |  |  | 1-20\% of the AA, or <1\% but >0.01 ha. | 0 |  |
| 143 |  |  | 20-50\% of the AA | 0 |  |


|  | A | B | C | D | E |
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| 144 |  |  | 50-95\% of the AA | 1 |  |
| 145 |  |  | >95\% of the AA | 0 |  |
| 146 <br> 147 <br> 148 <br> 149 <br> 150 <br> 151 | F28 | Annual Water Fuctuation Range | The annual fluctuation in surface water level within most of the parts of the AA that contain surface water at least temporarily is: |  | Look for flood marks (see above). Because the annual range of water levels is difficult to estimate without multiple visits, consider asking the land owner or neighbors about it. [AM, CS, INN, NR, OE, PH, PR, SR, WBN, WS] |
|  |  |  | 410 cm change (stable or nearly so ). | 1 |  |
|  |  |  | $10 \mathrm{~cm}-50 \mathrm{~cm}$ change. | 0 |  |
|  |  |  | 0.5-1 m change. | 0 |  |
|  |  |  | 1-2 m change. | 0 |  |
|  |  |  | $>2$ m change. | 0 |  |
| 152 | Is the AA plus adjacent ponded water smaller than 0.01 hectare (about $10 \mathrm{~m} \times 10 \mathrm{~m}$, or $1 \mathrm{~m} \times 100 \mathrm{~m}$ )? If so, enter " 1 " in column D andSKIP TO F42 (Connection). |  |  | 0 |  |
| 153 | F29 | Predominant Depth Class | During most of the time when surface water is present during the growing season, its depth, averaged over the entire inundated part of the AA, is: |  | If a boat is unavailable, estimate this by considering wetland size and local topography. Or if timing and safety allow, depths may be measured by drilling through winter ice.This question is asking about the spatial median depth that occurs during most of that time, even if inundation is only seasonal or temporary. If inundation in most but not all of the wetland is brief, the answer will be based on the dept of the most persistently inundated part of the wetland. Include surface water in channels and ditches as well as ponded areas. [CS, FA, FR, INN, OE, PH, PR, Sens, SFS, SR, WBF, WBN, WC] |
| 154 |  |  | $<10 \mathrm{~cm} \mathrm{deep} \mathrm{(but}>0$ ). | 1 |  |
| 155 |  |  | 10-50 cm deep. | 0 |  |
| 156 |  |  | 0.5-1 mdeep. | 0 |  |
| 157 |  |  | 1-2 mdeep. | 0 |  |
| 158 |  |  | >2 mdeep. True for many fringe wetlands. | 0 |  |
| 159 | F30 | $\begin{array}{\|l} \hline \text { Depth Classes - } \\ \text { Evenness of } \\ \text { Proportions } \end{array}$ | When present, surface water in most of the AA usually consists of (select one): |  | Estimate these proportions by considering the gradient and microtopography of the site. [FR, INV, WBF, WBN] |
| 160 |  |  | One depth class that comprises $>90 \%$ of the $A$ A's inundated area (use the classes in the question above). | 1 |  |
| 161 |  |  | One depth class that comprises 50-90\% of the A's's inundated area | 0 |  |
| 162 |  |  | Neither of above. There are 3 or more depth classes and none occupy $>50 \%$ a | 0 |  |
| 163 | F31 | \% of Water That Is Ponded (not Fowing) | During most times when surface water is present, the percentage that is (1) ponded (stagnant, or flows so slowly that fine sediment is not held in suspension) AND (2) is likely to be deeper than 0.5 m in some places, is: |  | Nearly all wetlands with surface water have some ponded water. [AM, CS, IN , NR, OE, PR, Sens, SR, WBF, WBN, WC, WS] |
| 164 |  |  | -5\% of the water, or it occupies <100 sq.m cumulatively. Nearly all the surface water is flowing. SKIP to F34. | 0 |  |
| 165 |  |  | 5-30\% of the water. | 0 |  |
| 166 |  |  | 30-70\% of the water. | 0 |  |
| 167 |  |  | 70-95\% of the water. | 1 |  |
| 168 |  |  | >95\% of the water. | 0 |  |
|  | F32 | $\begin{array}{\|l\|} \hline \text { Ponded Open Water - } \\ \text { Minimum Size } \end{array}$ | During most of the growing season, the largest patch of open water that is ponded and is in or bordering the $A A$ is $>0.01$ hectare (about 10 mby 10 m ) and mostly deeper than 0.5 m If true enter " 1 " and continue, If false, enter " O " andSKIP to F41 (Floating Algae \& Duckweed). | 0 | Open water is not obscured by vegetation in aerial ('duck's eye') view. It includes vegetation floating on the water surface or entirely submersed beneath it. |
| 169 |  |  |  |  |  |
| 170 | F33 | \% of Ponded Water that is Open | In ducks-eye aerial view, the percentage of the ponded water that isopen (lacking emergent vegetation during most of the growing season, and unhidden by a forest or shrub canopy) is: |  | [AM, CS, FA, FR, IN $\mathrm{N}, \mathrm{NR}, \mathrm{OE}, \mathrm{PR}, \mathrm{SR}, \mathrm{WBF}, \mathrm{WBN}, \mathrm{WC}]$ |
| 171 |  |  | None, or $<1 \%$ of the AA and largest pool occupies $<0.01$ hectares. Enter "1" and SKIP to F41 (Foating Agae \& Duckweed). | 0 |  |
| 172 |  |  | 1-4\% of the ponded water. Enter "1" and SKIP to F41 (Foating Agae \& Duckweed). | 0 |  |
| 173 |  |  | 5-30\% of the ponded water. | 0 |  |
| 174 |  |  | 30-70\% of the ponded water. | 0 |  |
| 175 |  |  | 70-99\% of the ponded water. | 0 |  |
| 176 |  |  | 100\% of the ponded water. | 0 |  |
| 177 | F34 | Wdth of Vegetated Zone within Wetland | At the time during the growing season when the AA's water level is lowest, the average width of vegetated areain the AA that separates adjoining uplands from open water within the $A A$ is: |  | "Vegetated area" does not indude underwater or floating-leaved plants, i.e., aquatic bed. Mdth may include wooded riparian areas if they have wetland soil or plant indicators. $[\mathrm{AM}, \mathrm{CS}, \mathrm{NR}, \mathrm{OE}, \mathrm{PH}, \mathrm{PR}$, SBM, Sens, SR, WBN] |
| 178 |  |  | $<1 \mathrm{~m}$ | 0 |  |
| 179 |  |  | 1-9m | 0 |  |
| 180 |  |  | 10-29m | 0 |  |
| 181 |  |  | 30-49m | 0 |  |
| 182 |  |  | 50-100m. | 0 |  |
| 183 |  |  | $>100 \mathrm{~m}$, or open water is absent at that time. | 0 |  |
| 184 | F35 | Fat Shoreline Extent | During most of the part of the growing season when water is present, the percentage of the AA'swater edge length that is nearly flat (a slope less than about $5 \%$ measured within 5 mlandward of the water) is: |  | If several isolated pools are present in early summer, estimate the percent of their collective shorelines that has such a gentle slope. [SR, WBN] |
| 185 |  |  | $<1 \%$ of the water edge. | 0 |  |
| 186 |  |  | 1-25\% of the water edge. | 0 |  |
| 187 |  |  | 25-50\% of the water edge. | 0 |  |


|  | A | B | C | D | E |
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| 188 |  |  | 50-75\% of the water edge. | 0 |  |
| 189 |  |  | $>75 \%$ of the water edge. | 0 |  |
| 190 | F36 | Robust Emergents | The percentage of the emergent vegetation cover in the AA that is cattail (Typha spp.), common reed (Phragmites), or tall (>1m) bulrush is: |  | Emergent vegetation is herbaceous plants whose stems are partly above and partly below the water surface during most of the time water is present. [WBN] |
| 191 |  |  | 4\% of the emergent vegetation, or emergent vegetation is absent. SKIP to F38. | 0 |  |
| 192 |  |  | 1-25\% of the emergent vegetation. | 0 |  |
| 193 |  |  | 25-75\% of the emergent vegetation. | 0 |  |
| 194 |  |  | $>75 \%$, of the emergent vegetation. | 0 |  |
| 195 | F37 | Interspersion of Emergents \& Open Water | During most of the part of the growing season when water is present, the spatial patternof emergent vegetation within the water is mostly: |  | [AM, FA, FR, INW, NR, OE, PH, PR, SBM, SR, WBF, WBN] |
| 196 |  |  | Scattered. More than $30 \%$ of such vegetation forms small islands or corridors surrounded by water. | 0 |  |
| 197 |  |  | Intermediate. | 0 |  |
| 198 |  |  | Cumped. More than $70 \%$ of such vegetation is in bands along the wetland perimeter or is clumped at one or a few sides of the surface water area. | 0 |  |
| 199 | F38 | Persistent Deepwater Area | If the deepest patch of surface water (flowing or ponded) in or directly adjacent to the $A A$ is mostly deeper than 0.5 m for $>2$ weeks during the growing season, enter "1" and continue. If not, enter " 0 " andSKIP to F42.(Connection). | 0 |  |
| 200 | F39 | Non-vegetated Aquatic Cover | During most of the growing season and in waters deeper than 0.5 m , the cover for fish, aquatic invertebrates, and/or amphibians that is provided NOT by living vegetation, but by accumulations of dead wood and undercut banks is: |  | For this question, consider only the wood that is at or above the water surface. Estimates of underwate wood based only on observations from terrestrial viewpoints are unreliable so should not be attempted. [AM, FA, FR, IMM] |
| 201 |  |  | Little or none. | 0 |  |
| 202 |  |  | Intermediate. | 0 |  |
| 203 |  |  | Extensive. | 0 |  |
| 204 | F40 | Isolated Island | The AA contains (or is part of) an island or beaver lodge within a lake, pond, or river, and is isolated from the shoreby water depths >1 m on all sides during an average June. The island may be solid, or it may be a floating vegetation mat that is sufficiently large and dense to support a waterbird nest. | 0 | [MBN] |
| 205 | F41 | Foating Algae \& Duckweed | At some time of the year, mats of algae and/or duckweed are likely to cover $>50 \%$ of the AA's otherwise-unshaded water surface, or blanket $>50 \%$ of the underwater substrate. If true, enter "1" in next column. If untrue or uncertain, enter " O ". | 0 | [EC, PR, WBF] |
| 206 | F42 | Channel Connection \& Outflow Duration | The most persistent surface water connection (outtet channel or pipe, ditch, or overbank water exchange) between the AA and a downslope stream network is: [Note: If the AA represents only part of a wetland, answer this according to whichever is theleast permanent surface connection: the one between the $A A$ and the rest of the wetland, or the surface connection between the wetland and the downslope stream network.] |  | Consider the connection regardless of whether the surface water is frozen. The "dounslope stream network" could consist of ditches, ivers, ponds, or lakes which eventually connect to the ocean. If this cannot be determined while visiting the $A A$, consult topographic maps perhaps by viewing these online with Toporama (http://atlas.nrcan.gc.ca/toporama/erlindex.html) [CS, FA, FR, NR, OE, PR, Sens, SFS, SR, WCV, WS] |
| 207 |  |  | Persistent (surface water flows out for >9 months/year). | 0 |  |
| 208 |  |  | Seasonal (surface water flows out for 14 days to 9 monthslyear, not necessarily consecutive). | 1 |  |



|  | A | B | C | D | E |
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| 241 | F51 | Internal Gradient | The gracient along most of the flow path within the $A A$ is: |  | This is not the same as the shoreline slope. It is the elevational difference between the AA's inlet and outlet, divided by the flow-distance between them and corverted to percent. If available, use a clinometer to measure this. Free clinometer apps can be downloaded to smartphones. If the wetland is large (longer than $\sim 1 \mathrm{~km}$ ), this may be estimated using Google Earth to determine the minimum and maximum elevation within the $A A$, then dividing by length and multiplying by 100. [CS, NR, OE, PR, SR, WBF, WBN, WS] |
| 242 |  |  | 2\%\% or the AA has no surface water outlet (not even seasonally). | 0 |  |
| 243 |  |  | 2-5\% | 1 |  |
| 244 |  |  | 6-10\% | 0 |  |
| 245 |  |  | >10\% | 0 |  |
| Note for the next three questions: If the AA lacks an upland edge, evaluate based on the AA's entire perimeter, and moving outward into whatever areas 246 are adjacent. In many situations, these questions are best answered by measuring from aerial images. |  |  |  |  |  |
| 247 | F5 | Vegetated Buffer as \% of Perimeter | Wthin a zone extending 30 m laterally from the AA's edge with upland and/or other wetlands, the percentage that containsperennial vegetation cover (except lamns, row crops, heavily grazed land, conifer plantations) is: |  | [AM, FA, FR, INV, NRV, PH, POL, PRV, SBM, Sens, SRv, STR, WBN] |
| 248 |  |  | -5\% | 0 |  |
| 249 |  |  | 5 to 30\% | 0 |  |
| 250 |  |  | 30 to 60\% | 0 |  |
| 251 |  |  | 60 to 90\% | 1 |  |
| 252 |  |  | >90\%, or all the area within 30 m of the AA edge is other wetlands. SKIP to F55. | 0 |  |
| 253 | F53 | Type of Cover in Buffer | Wthin 30 m upslope of where the wetland transitions to upland, the upland land cover that is NOT perennial vegetation is mostly (mark ONE): |  | [AM, FA, INV, NRv, PH, POL, SBM, STR, WBN] |
| 254 |  |  | Impervious surface, e.g., paved road, parking lot, building, exposed rock. | 0 |  |
| 255 |  |  | Bare or nearly bare pervious surface or managed vegetation, e.g., lamn, row crops, unpaved road, dike, landslide. | 1 |  |
| 256 | F54 | Buffer Slope | The steepest and/or most disturbed part of the upland area that is vithin 30 m of the wetland and occupies $>10 \%$ of that upland area has a percent slope of: |  | [NRV, PRV, Sens, SRV] |
| 257 |  |  | $<1 \%$ (flat -- almost no noticeable slope) or all the area within 30 mof the $A$ A edge is other wetlands. | 0 |  |
| 258 |  |  | 2-5\% | 1 |  |
| 259 |  |  | 5-30\% | 0 |  |
| 260 |  |  | >30\% | 0 |  |
| 261 | F55 | Cliffs or Steep Banks | In the AA or within 100 m , there are elevated terrestrial features such as cliffs, talus slopes, streambanks, or excavated pits (but not riprap) that extend at least 2 m nearly vertically, are unvegetated, and potentially contain crevices or other substrate suitable for nesting or den areas. Enter 1 (yes) or 0 (no). | 0 | Do not include upturned trees as potential den sites. [POL, SBM] |
| 262 | F56 | New or Expanded Wetland | Human actions within or adjacent to the AA have persistently expanded a naturally occurring wetland or created a wetland where there previously was none (e.g., by excavation, impoundment): |  | Determine this using historical aerial photography, old maps, soil maps, or permit files as available [CS, NR, OE, PH, Sens] |
| 263 |  |  | No. | 0 |  |
| 264 |  |  | Yes, and created or expanded 20-100 years ago. | 0 |  |
| 265 |  |  | Yes, and created or expanded $3-20$ years ago. | 0 |  |
| 266 |  |  | Yes, and created or expanded within last 3 years. | 0 |  |
| 267 |  |  | Yes, but time of origin or expansion unknown. | 0 |  |
| 268 |  |  | Unknown if new or expanded within 20 years or not. | 1 |  |
| 269 | F57 | Burn History | More than $1 \%$ of the AA's previously vegetated area: |  | Look for charred soil or stumps (in multiple widely-spaced locations) or ask landowner. [CS, PH, STR] |
| 270 |  |  | Burned within past 5 years. | 0 |  |
| 271 |  |  | Burned 6-10 years ago. | 0 |  |
| 272 |  |  | Burned 11-30 years ago. | 0 |  |
| 273 |  |  | Burned $>30$ years ago, or no evidence of a burn and no data. | 1 |  |
| 274 | F58 | Visibility | The maximum percentage of the wetland that is visible from the best vantage point on public roads, public parking lots, public buildings, or public maintained trails that intersect, adjoin, or are within 100 m of the $A A$ (select one) is: |  | [PU, STR, WBFV] |
| 275 |  |  | 25\%\% | 1 |  |
| 276 |  |  | 25-50\% | 0 |  |
| 277 |  |  | -50\% | 0 |  |
| 278 | F59 | Non-consumptive Uses - Actual or Potential | Assuming access permission was granted, select AL statements that are true of the AA as it currently exists: |  | [PU, STR] |
| 279 |  |  | For an average person, walking is physically possible in (not just near) $>5 \%$ of the $A A$ during most of the growing season, e.g., free of deep water and dense shrub thickets. | 1 |  |
| 280 |  |  | Maintained roads, parking areas, or foot-trails are within 10 m of the $A A$, or the $A A$ can be accessed part of the year by boats arriving via contiguous waters. | 0 |  |
| 281 |  |  | Wthin or near the AA , there is an interpretive center, trails with interpretive signs or brochures, and/or regular guided interpretive tours. | 0 |  |


|  | A | B | C | D |  |
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| 282 | F60 | Unvisited Core Area | The percentage of the AA almost never visited by humans during an average growing season probably comprises: [ Note: Only include the part actually walked or driven (not simply viewed from) with a vehicle or boat. Do not include visitors on trails outside of the AA unless more than half the wetland is visible from the trails and they are within 30 mof the wetland edge. In that case include only the area occupied by the trail.] |  | [AM, FAv, PRv, PH, PU, SBM, STR, WBF, WBN] |
| 283 |  |  | -5\% and no inhabited building is within $100 \mathrm{mof} \mathrm{the} A$ A | 0 |  |
| 284 |  |  | -5\% and inhabited building is within 100 mof the $A$ A | 0 |  |
| 285 |  |  | $5-50 \%$ and no inhabited building is within 100 m of the $A$ A | 0 |  |
| 286 |  |  | $5-50 \%$ and inhabited building is within 100 m of the $A$ A | 0 |  |
| 287 |  |  | 50-95\%, with or without inhabited building nearby. | 0 |  |
| 288 |  |  | >95\% of the AA with or without inhabited building nearby. | 1 |  |
| 289 | F61 | Frequently Visited Area | The part of the AA visited by humans almost daily for several weeks during an average growing season probably comprises: [See note above.] |  | [AM, PH, PU, SBM, STR, WBF, WBN] |
| 290 |  |  | -5\% If F60 was answered ">95\%' (mostly never visited), SKIP to F64. | 1 |  |
| 291 |  |  | 5-50\% | 0 |  |
| 292 |  |  | 50-95\% | 0 |  |
| 293 |  |  | >95\% of the AA | 0 |  |
| 294 | F62 | BMP - Soils | Boardwalks, paved trails, fences or other infrastructure and/or well-enforced regulations appear to effectively prevent visitors from walking on soil within nearly all of the AA when the soil is unfrozen. Enter " 1 " if true. | 0 | [PH, PU] |
| 295 | F63 | BMP - Wildlife Protection | Fences, observation blinds, platforms, paved trails, exclusion periods, and/or well-enforced prohibitions on motorised boats, off-leash pets, and off road vehicles appear to effectively exclude or divert visitors and their pets from the $A A$ at critical times in order to minimize disturbance of wildlife (except during hunting seasons). Enter "1" if true. | 0 | [AM, PU, WBF, WBN] |
| 296 | F64 | Consumptive Uses (Provisioning Services) | Recent evidence was found within the AA of the following potentially-sustainable consumptive uses. Select ALL that apply. |  | [FAv, Rev, WBFV] |
| 297 |  |  | Low-impact commercial timber harvest (e.g., selective thinning). | 0 |  |
| 298 |  |  | Commercial or tracitional-use havesting of native plants, their fruits, or mushrooms. | 0 |  |
| 299 |  |  | Waterfowl hunting. | 0 |  |
| 300 |  |  | Fshing. | 0 |  |
| 301 |  |  | Trapping of furbearers. | 0 |  |
| 302 |  |  | None of the above. | 1 |  |
| 303 | F65 | Domestic Wells | The closest wells or water bodies that currently provide drinking water are: |  | [NRN] |
| 304 |  |  | Muthin 0-100 m of the AA | 0 |  |
| 305 |  |  | $100-500 \mathrm{~m}$ away. | 0 |  |
| 306 |  |  | -500 m away, or no information. | 1 |  |
| 307 | F66 | Calcareous Fen | The AA is, or is part of, a calcareous fen. See the Plants_Calcar worksheet in the accompanying Supplnfo file for list of plant indicators (calciphiles). Enter 1 If more than two Strong or more than five Moderate calciphile species are present; otherwise enter 0 , but if not able to identify those and no information, change to blank. | 0 | [ $\mathrm{PH}, \mathrm{PR}]$ |


| \|rivestigator: BL | Site Identifier: Cambridge Wetland 5 | Date: 20 August 2021 |
| :--- | :--- | :--- | :--- |
| Stressor (S) Data Form for Non-Tidal Wetlands. WESP-AC for Nova Scotia version 2. | Data |  |



| S3 | Accelerated Inputs of Nutrients |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | In the last column, place a check mark next to any item -- occurring in either the wetland or its CA - that is likely to have accelerated the inputs of nutrients to the wetland. [NRV, PRR, STR] |  |  |  |  |
|  | Stormwater or wastewater effluent (including failing septic systems), landfills. |  |  |  |  |
|  | Fertilizers applied to lamns, ag lands, or other areas in the CA |  |  |  | 1 |
|  | Livestock, dogs. |  |  |  |  |
|  | Artificial drainage of upslope lands. |  |  |  |  |
|  | If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly more nutrients, then leave the "O's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present. |  |  |  |  |
|  |  | Severe (3 points) | Medium (2 points) | Mild (1 point) |  |
|  | Type of loading: | High density of unmaintained septic, some types of industrial sources. | Moderate density septic, cropland, secondary wastewater treatment plant. | Livestock, pets, low density residential. | 2 |
|  | Frequency \& duration of input: | Frequent and year-round. | Frequent but mostly seasonal. | Infrequent \& during high runoff events mainly. | 2 |
|  | AA proximity to main sources (actual or potential): | 0-15m | $15-100 \mathrm{~m}$ or in groundwater. | In more distant part of contributing area. | 2 |
|  | Sum= |  |  |  | 6 |
|  | Stressor subscore= |  |  |  | 0.67 |


| S4 | Excessive Sediment Loading from Contributing Area |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | In the last column, place a check mark next to any item present in the CA that is likely to have elevated the load of waterborme or windborne sediment reaching the wetland fromits CA [FA PR, INW, PH, SRv, STR] |  |  |  |  |
|  | Erosion from plowed fields, fill, timber havest, dirt roads, vegetation clearing, fires. |  |  |  | 1 |
|  | Erosion from construction, in-channel machinery in the CA |  |  |  |  |
|  | Erosion from off-road vehicles in the CA |  |  |  |  |
|  | Erosion from livestock or foot traffic in the CA |  |  |  |  |
|  | Stormwater or wastewater effluent. |  |  |  |  |
|  | Sediment from road sanding, gravel mining, other mining, oil/ gas extraction. |  |  |  |  |
|  | Accelerated channel downcutting or headcutting of tributaries due to altered land use. |  |  |  |  |
|  | Other human-related disturbances within the CA |  |  |  |  |
|  |  then leave the "O's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present. |  |  |  |  |
|  |  | Severe (3 points) | Medium (2 points) | Mild (1 point) |  |
|  | Erosion in CA: | Extensive evidence, high intensity.* | Potentially (based on high-intensity ${ }^{\star}$ land use) or scattered evidence. | Potentially (based on low-intensity ${ }^{\star}$ land use) with little or no direct evidence. | 2 |
|  | Recentness of significant soil disturbance in the CA: | Current \& ongoing. | 1-12 months ago. | $>1$ y ago. | 2 |
|  | Duration of sediment inputs to the wetland: | Frequent and year-round. | Frequent but mostly seasonal. | Infrequent \& during high runoff events mainly. | 2 |
|  | AA proximity to actual or potential sources: | 0-15m. | 15-100 m. | In more distant part of contributing area. | 2 |
|  | * high-intensity= extensive off-road vehicle use, plowing, grading, excavation, erosion with or without veg removal; low-intensity= veg removal only with little or no apparent erosion or disturbance of soil or sediment. |  |  | Sum= | 8 |
|  |  |  |  | Stressor subscore= | 0.67 |
| S5 | Soil or Sediment Alteration Within the Assessment Area |  |  |  |  |
|  |  (whichever is less). [CS, IM $, ~ N R, ~ P H, ~ S R, ~ S T R] ~] ~$ |  |  |  |  |
|  | Compaction from machinery, off-road vehicles, livestock, or mountain bikes, especially during wetter periods. |  |  |  |  |
|  | Leveling or other grading not to the natural contour. |  |  |  |  |
|  | Tillage, plowing (but excluding disking for enhancement of native plants). |  |  |  |  |
|  | Fill or riprap, excluding small amounts of upland soils containing organic amendments (compost, etc.) or small amounts of topsoil imported from another wetland. |  |  |  |  |
|  | Excavation. |  |  |  |  |
|  | Ditch cleaning or dredging in or adjacent to the wetland. |  |  |  |  |
|  | Boat traffic in or adjacent to the wetland and sufficient to cause shore erosion or stir bottom sediments. |  |  |  |  |
|  | Avtificial water level or flow manipulations sufficient to cause erosion or stir bottom sediments. |  |  |  |  |
|  |  effects, contrast the current condition with the condition if the checked items never occurred or were no longer present. |  |  |  |  |
|  |  | Severe (3 points) | Medium (2 points) | Mild (1 point) |  |
|  | Spatial extent of altered soil: | >95\% of wetland or >95\% of its upland edge (if any). | 5-95\% of wetland or 5-95\% of its upland edge (if any). | $<5 \%$ of wetland and $<5 \%$ of its upland edge (if any). | 0 |
|  | Recentness of significant soil alteration in wetland: | Current \& ongoing. | 1-12 months ago. | $>1 \mathrm{yr}$ ago. | 0 |
|  | Duration: | Long-lasting, minimal veg recovery. | Long-lasting but mostly revegetated. | Short-term, revegetated, not intense. | 0 |
|  | Timing of soil alteration: | Frequent and year-round. | Frequent but mostly seasonal. | Mainly during one-time or scattered events. | 0 |
|  | Sum= |  |  |  | 0 |



| Cover Page: Basic Description of Assessment | WESP-AC version 2 |
| :---: | :---: |
| Site Name: | Cambridge Wetland 6 |
| Investigator Name: | BL, CP |
| Date of Field Assessment: | 20 Aug 2021 |
| Nearest Town: | Waterville, NS |
| Latitude (decimal degrees): | 369196.52 m E |
| Longitude (decimal degrees): | 4992295.66 m N (UTM 20T) |
| Is a map based on a formal on-site wetland delineation available? | Yes |
| Approximate size of the Assessment Area (AA, in hectares): | ~ 1 ha |
| AA as percent of entire wetland (approx.). Attach sketch map if AA is smaller than the entire contiguous wetland. | 20\% |
| What percent (approx.) of the wetland were you able to visit? | 100\% |
| What percent (approx.) of the AA were you able to visit? | 100\% |
| Were you able to ask the site owner/manager about any of the questions? | Yes |
| Indicate here if you intentionally surveyed for rare plants, calciphile plants, or rare animals: | Yes |
| Have you attended a WESP-AC training session? If so, indicate approximate month \& year. | Yes |
| How many wetlands have you assessed previously using WESP-AC? (approx.) | >100 |
| Comments about the site or this WESP-AC assessment (attach extra page if desired): | wl-6 is part of a larger complex including wetlands 5 and 9 as well. |


|  | A | B | C | D | E |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | Date: 20 Aug 2021 |  | Site Identifier: Cambridge Wetland 6 | Investigator: BL, CP |  |
| 2 | Form OF (Office). Non-tidal Wetland Data Form. WESP-AC version 2 for Nova Scotia wetlands only. DIRECTIONS: Conduct an assessment only after reading the accompanying <br> Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answering many of the questions below will require using these online map viewers: <br> Google Earth Pro: https://www.google.com/earth/download/gep/agree.html <br> Provincial Landscape Viewer: https://nsgi.novascotia.ca/plv/ <br> For most wetlands, completing this office data form will require 1-2 hours. For a list of functions to which each question pertains, see bracketed abbreviations in the Definitions/Explanations column. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention \& Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV=Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM=Amphibian \& Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, \& Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use \& Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors. |  |  |  |  |
| 3 | \# | Indicators | Condition Choices | Data | Definitions/Explanations |
| 4 | OF1 | Province | Mark the province in which the A A is located by changing the 0 in the colum next to it to a "1". Mark only one. |  | This determines to which province's calibration wetlands the raw score of any wetland is normalised. In the function and benefits models, it also triggers the automatic exclusion of indicators for which no spatial data exists in a particular province. |
| 5 |  |  | New Brunswick | 0 |  |
| 6 |  |  | Nova Scotia | 1 |  |
| 7 |  |  | Prince Edward Island | 0 |  |
| 8 |  |  | Newfoundland-Labrador | 0 |  |
| 9 | OF2 | Ponded Area Wthin 1 km | The area of surface water ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: |  | "Adjacent" means not separated from the AA by a vide expanse (>50 m) of upland (induding roads $>50 \mathrm{~m}$ wide). Include ponded areas likely to be hidden by wetland vegetation. If surface water extends beyond 1 km , include only the part within 1 km Do not include tidal areas. Measure the area from aerial imagery using Google Earth Pro (click on Ruler icon in toolbar, then Polygon in popup menu). [PH, SBM, WBN] |
| 10 |  |  | 80.01 hectare (about $10 \mathrm{~m} \times 10 \mathrm{~m}$ ). | 0 |  |
| 11 |  |  | 0.01-0.1 hectare. | 0 |  |
| 12 |  |  | 0.1-1 hectare. | 1 |  |
| 13 |  |  | 1 to 10 hectares. | 0 |  |
| 14 |  |  | 10 to 100 hectares. | 0 |  |
| 15 |  |  | $>100$ hectares. | 0 |  |
| 16 | OF3 | Ponded Water \& Wetland Wthin 1 km | The area of wetlands and surface water ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) withir 1 km is: |  | See definition of adjacent in OF2. If the AA's wetland vegetation extends beyond 1 km , include only the part within 1 km "Ponded" means not flowing in rivers or streams. [Sens, WBF] |
| 17 |  |  | $<0.01$ hectare (about $10 \mathrm{~m} \mathrm{\times 10} \mathrm{~m}$ ). | 0 |  |
| 18 |  |  | 0.01-0.1 hectare. | 1 |  |
| 19 |  |  | 0.1-1 hectare. | 0 |  |
| 20 |  |  | 1 to 10 hectares. | 0 |  |
| 21 |  |  | 10 to 100 hectares. | 0 |  |
| 22 |  |  | $>100$ hectares. | 0 |  |
| 23 | OF4 | Size of Largest Nearby <br> Vegetated Tract or Corridor | The largest vegetated patch or corridor that includes the AA's vegetation plus alladjacent upland vegetation that is not lamn, row crops, heavily grazed lands, conifer plantation is: |  | See definition of adjacent in OF2. Use Google Earth Pro's polygon ruler (as described above). <br> Exclude conifer plantations only if it is obvious that trees were planted in rows. [AM, PH, SBM, Sens] |
| 24 |  |  | $<0.01$ hectare (about $10 \mathrm{~m} \times 10 \mathrm{~m}$ ). | 0 |  |
| 25 |  |  | 0.01-0.1 hectare. | 0 |  |
| 26 |  |  | 0.1-1 hectare. | 0 |  |
| 27 |  |  | 1 to 10 hectares. | 0 |  |
| 28 |  |  | 10 to 100 hectares. | 1 |  |
| 29 |  |  | 100 to 1000 hectares. | 0 |  |
| 30 |  |  | >1000 hectares. [This is nearly always the answer in relatively undeveloped landscapes.] | 0 |  |


|  | A | B | C | D | E |
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| 31 | OFS | Distance to Large Vegetated Tract | The minimum distance from the edge of the AA to the edge of the closestvegetated land (but excluding row crops, lawn, conifer plantation) larger than 375 hectares (about 2 km on a side), is: |  | To measure distance, use Google Earth Pro (Ruler > Line tool). The 375 -ha criterion is from the Fundy Model Forest Project. [AM, PH, POL, SBM, Sens] |
| 32 |  |  | $<50 \mathrm{~m}$, and not separated from the 375 -ha vegetated area by any width ofpaved roads, stretches of open water, row crops, bare ground, lawn, or impervious surface. Or the $A A$ itself contains $>375$ ha of vegetation. [This is often the answer in relatively undeveloped landscapes.] | 0 |  |
|  |  |  | 40 m , but completely separated from the 375-ha vegetated area by those features, and AA does not contain $>375$ ha of vegetation. | 0 |  |
| 34 |  |  | 50-500 m, and not separated. | 0 |  |
| 35 |  |  | 50-500 m, but separated by those features. | 0 |  |
| 36 |  |  | $0.5-5 \mathrm{~km}$, and not separated. | 0 |  |
| 37 |  |  | $0.5-5 \mathrm{~km}$, but separated by those features. | 1 |  |
| 38 |  |  | None of the above (the closest patches or corridors which are that large are $>5 \mathrm{~km}$ away). | 0 |  |
| 39 | OF6 | Herbaceous Uniqueness | The AA's vegetation cover is $>10 \%$ herbaceous* but uplands within 5 km have $<10 \%$ herbaceous cover. If so, enter " 3 " and continue to OF7. If not, consider: <br> The AA's vegetation cover is $>10 \%$ herbaceous* but uplands within 1 km have $<10 \%$ herbaceous cover. If so enter " 2 " and continue to Of7. If not, consider: <br> The AA's vegetation cover is $>10 \%$ herbaceous* but uplands within 100 m of the wetland edge have $<10 \%$ herbaceous cover. If so, enter "1". <br> [* NOTE: Exclude lamns, row crops, heavily grazed lands, forest, shrublands. Include moss as well as grasslike plants in this use of "herbaceous vegetation'] | 1 | For this question only, consider moss to be herbaceous vegetation. Determine the score by vieving aerial imagery in Google Earth after successively drawing or estimating the boundaries of the buffers of $5 \mathrm{~km}, 1 \mathrm{~km}$, and 100 m radius focused on the center of the AA. Circles of specified radius can be dramn in Google Earth Pro by clicking on the Ruler icon, then Circle in the pop-up menu. [AMN, PHN, POLv, SBMN, WBFv, WBNv] |
| 40 | OF/ | Woody Uniqueness | The AA's vegetation cover is $>10 \%$ woody* but uplands within $5 \mathrm{kmhave}<10 \%$ woody cover. If so, enter " 3 " and continue to OF8. If not, consider: <br> The AA's vegetation is $>10 \%$ woody ${ }^{\star}$ but uplands within 1 km have $<10 \%$ woody cover. If so enter " 2 " and continue to OF8. If not, consider: <br> The AA's vegetation is $>10 \%$ woody ${ }^{\star}$ but uplands within 100 m of the wetland edge have $<10 \%$ woody cover. If so, enter " 1 " <br> [* NOTE: woody cover = trees \& shrubs taller than 1 m ] | 0 | See above. Do not consider conifer plantations to be forest if it is obvious that trees were planted in rows. [AMN, PHV, POLv, SBMN] |
| 41 | OF8 | Local Vegetated Cover Percentage | Draw a 5 -km radius circle measured from the center of the AA. Ignoring all permanent water in the circle, the percent of the remaining are that is wooded or unmanaged herbaceous vegetation (NOT lawn, row crops, bare or heavily grazed land, clearcuts, or conifer plantations) is: |  | In Google Earth, draw the 5 km buffer and then estimate land cover percentages, or do GIS analysis of an appropriate land cover layer. [AM, PH, POL, SBM, Sens] |
| 42 |  |  | -5\% of the land. | 0 |  |
| 43 |  |  | 5 to 20\% of the land. | 0 |  |
| 44 |  |  | 20 to 60\% of the land. | 1 |  |
| 45 |  |  | 60 to $90 \%$ of the land. | 0 |  |
| 46 |  |  | >90\% of the land. SKIP to OF10. | 0 |  |
| 47 | OF9 | Type of Land Cover Alteration | Wthin the 5 -km radius circle, and ignoring all permanent water, the land area that is bare or non-perennial cover is mostly: |  | [AM, SBM] |
| 48 |  |  | Impervious surface, e.g., paved road, parking lot, building, exposed rock. | 0 |  |
| 49 |  |  | Bare pervious surface, e.g., lawn, recent (< 5 yrs ago) clearcut, dirt or gravel road, cropland, landslide, conifer plantation. | 1 |  |
| 50 | OF10 | Distance by Road to Nearest Population Center | Measured along the maintained road nearest the A , the distance to the nearestpopulation center is: |  | "Population center" means a settled area with more than about 5 regularly- inhabited structures per square kilometer. In Google Earth Pro, click on the Ruler icon, then Path, and draw and measure the route. [FAv, FRV, NRv, PH, PU, SBM, WBFV] |
| 51 |  |  | $<100 \mathrm{~m}$. | 0 |  |
| 52 |  |  | 100-500m. | 0 |  |
| 53 |  |  | $0.5-1 \mathrm{~km}$ | 1 |  |
| 54 |  |  | $1-5 \mathrm{~km}$ | 0 |  |
| 55 |  |  | -5km | 0 |  |
| 56 | OF11 | Distance to Nearest Maintained Road | From the center of the AA, the distance to the nearest maintained public road (dirt or paved) is: |  | Determine this by viewing aerial imagery in Google Earth Pro and measuring with the Ruler>Line tool. [AM, FAv, FRv, NRv, PH, PU, SBM, STR, WBN] |
| 57 |  |  | $<10 \mathrm{~m}$ | 0 |  |
| 58 |  |  | 10-25m. | 0 |  |
| 59 |  |  | 25-50m. | 0 |  |
| 60 |  |  | 50-100 m. | 0 |  |
| 61 |  |  | 100-500m. | 0 |  |
| 62 |  |  | >500 m. | 1 |  |


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| 63 | OF12 | Wildife Access | Draw a circle of radius of 5 km from the center of the $A A$ If marmals and amphibians can move from the center of the $A A$ to $A L L$ other separate wetlands and ponds located within the circle without being forced to cross pavement (any width), lawns, bare ground, and/or marine waters, mark $1=$ yes can move to all, $0=$ no. Change toblank if there are no other wetlands within 5 km . | 0 | Draw the 5 km circle in Google Earth Pro using the Circle tool and search for roads and wetlands within it, being alert for roads hidden under forest canopy. [AM, SBM, STR] |
| 64 | OF13 | Distance to Ponded Water | The distance from the AA center to the closest (but separate) ponded water body visible in Google Earth imagery is: |  | In Google Earth Pro, zoom in closely to examine the surrounding landscape for ponds, lakes, and wetlands that appear to be permanently flooded. [AM, PH, SBM, Sens, WBF, WBN] |
| 65 |  |  | -50 m, and not separated by any width of paved roads, stretches of open water, row crops, lamn, bare ground, or impervious surface. | 0 |  |
| 66 |  |  | 50 m , but completely separated by those features. | 0 |  |
| 67 |  |  | $50-500 \mathrm{~m}$, and not separated. | 0 |  |
| 68 |  |  | $50-500 \mathrm{~m}$, but separated by those features. | 1 |  |
| 69 |  |  | $0.5-1 \mathrm{~km}$, and not separated. | 0 |  |
| 70 |  |  | $0.5-1 \mathrm{~km}$, but separated by those features. | 0 |  |
| 71 |  |  | None of the above (the closest patches or corridors that large are >1 km away). | 0 |  |
| 72 | OF14 | Distance to Large Ponded Water | The distance from the AA center to the closest (but separate)non-tidal body of water that is ponded during most of the year and islarger than 8 hectares during most of a normal year is: |  | Determine this by viewing aerial imagery in Google Earth. [Sens, WBF, WBN] |
| 73 |  |  | $<100 \mathrm{~m}$ | 0 |  |
| 74 |  |  | $100 \mathrm{~m}-1 \mathrm{~km}$ | 0 |  |
| 75 |  |  | 1-2km. | 0 |  |
| 76 |  |  | 2-5 km | 0 |  |
| 77 |  |  | $5-10 \mathrm{~km}$ | 1 |  |
| 78 |  |  | $>10 \mathrm{~km}$ | 0 |  |
| 79 | OF15 | Tidal Proximity | The distance from the AA edge to the closesttidal water body (regardless of its salinity) is: |  | In Google Earth, measure the distance to the ocean (including Bay of Fundy) or tidal river, whichever is closer. If you need to see how far upriver a river is tidal, see the KNZ file provided with this calculator for NS (NS Headtide). Points shown in those files are only an approximation, so local information if available may be preferable. [FA, WBF] |
| 80 |  |  | $\angle 100 \mathrm{~m}$ | 0 |  |
| 81 |  |  | $100 \mathrm{~m}-1 \mathrm{~km}$ | 0 |  |
| 82 |  |  | $1-5 \mathrm{~km}$ | 0 |  |
| 83 |  |  | $5-10 \mathrm{~km}$ | 0 |  |
| 84 |  |  | $10-40 \mathrm{~km}$ | 1 |  |
| 85 |  |  | $>40 \mathrm{~km}$ | 0 |  |


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| 86 | OF16 | Upland Edge Contact | Select one: |  | [NR, SBM, Sens] |
|  |  |  | The AA has no upland edge (or upland is <1\% of perimeter). The AA is entirely surrounded by (\& contiguous with) other wetlands or water | 0 |  |
|  |  |  | 1-25\% of the AA's perimeter abuts upland (including filled areas). The rest adjoins other wetlands or water that is mostly wider than the Af | 0 |  |
| 89 |  |  | $25-50 \%$ of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA | 0 |  |
| 90 |  |  | $50-75 \%$ of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA. | 0 |  |
| 91 |  |  | More than $75 \%$ of the AA's perimeter abuts upland. Any remainder adjoins other wetlands or water that is mostly wider than the AA. This will be true for most assessments done with WESP-AC. | 1 |  |
| 92 | OF17 | Food Damage fromNon tidal Waters | Wthin 5 km downstream or downslope of the AA (select first true choice): |  | Contact local authories to determine if such maps exist. Where available, LDAR imagery can provide finer elevational resolution useful for flood modeling. [WSV] |
| 93 |  |  | Maps show Flood Zone or Flood Risk areas and there appears to be infrastructure vulnerable to river flooding not caused by tidal storm surges. | 0 |  |
| 94 |  |  | Maps show Food Zone or Flood Risk areas, but infrastructure is absent or is not vulnerable to floods from a non-tidal river. In some cases levees, upriver dams, or other measures may partly limit damage or risk from smaller events. | 0 |  |
| 95 |  |  | Maps do not show Food Zone or Food Risk areas (or no such mapping has been done locally) and there appears to be infrastructure vulnerable to river flooding unrelated to tidal storm surges. | o |  |
| 96 |  |  | Maps do not show Flood Zone or Food Risk areas (or no such mapping has been done locally) and there isno infrastructure vulnerable to river flooding unrelated to tidal storm surges. | 1 |  |
| 97 | OF18 | Relative Đevation in Watershed | In Google Earth, enable the Terrain layer (lower left menu) and open the NS_Watersheds Secondary KNZ file that accompanies this calculator. Then determine the AA's approximate elevation (bottom right, NOT the "eye alt"). Then move cursor around to determine the watershed's maximum and minimum elevation. Divide the AA's elevation by the (max-min). | 0.09 | [FA, NR, Sens, SFSv, WCV, WSv] |
| 98 | OF19 | Water Quality Sensitive Watershed or Area | The AA is in a Protected Water Supply area (Designated Water Supply Area, Natural Watershed Municipal Surface Water Supply Area, or Municipal Water Supply Area) according to the provided KNZ overlay ('NS Protected Water Supply Areas'). Enter $1=$ yes, $0=$ no. | 0 | If an ACCDC report is available for this AA, it also may contain such information. [NRV] |


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| 99 |  | Degraded Water Upstream | Sampling indicates a problem with concentrations of metals, hydrocarbons, nutrients, or other substances (excluding bacteria, acidic water, high temperatures) being present at levels harmful to aquatic life or humans, and: |  | May use existing data, or sample those waters as part of this wetland assessment. "Harmful" should be evaluated with regard to current federal or provincial water quality standards. [AM, FA, FR, NRV, PRV, SRV, STR, WBF, WBN] |
| 100 |  |  | The condition is present within the AA | 0 |  |
| 101 |  |  | The condition is present in waters within 1 km that flowinto the AA, but has not been documented in the AA itself. | 0 |  |
| 102 |  |  | Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters. | 0 |  |
| 103 |  |  | Data are insufficient (no or inadequate sampling within 1 km , or condition exists only at $>1 \mathrm{~km}$ upstream). This is the situation for nearly all wetlands in this region. | 1 |  |
| 104 | OF21 | Degraded | The problem described above is downslope fromthe AA, and: |  | May use existing data, or monitor waters as part of this wetland assessment. [NRV, PRV, SRv] |
| 105 |  | Downstream | The condition is present within 1 km downslope and connected to the AA by a channel. | 0 |  |
| 106 |  |  | The condition is present within 5 km downslope and connected to the AA by a channel, or within 1 km but not connected to the AA by a channel. | 0 |  |
| 107 |  |  | Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters. | 0 |  |
| 108 |  |  | Data are insufficient (no or inadequate sampling within 1 km , or condition exists only at $>1 \mathrm{~km}$ upstream). This is the situation for nearly all wetlands in this region. | 1 |  |
| 109 | OF22 | Wetland as a \% of Its Contributing Area (Catchment) | From a topographic map and field observations, estimate the approximate boundaries of the catchment (CA) of the entire wetland of which the AA may be only a part. Then adjust those boundaries if necessary based on your field observations of the surrounding terrain, and/or by using procedures described in the Manual. Divide the area of the wetland (not just the $A A$ ) by the approximate area of its catchment excluding the area of the wetland itself. When doing the calculation, if ponded water is adjacent to the wetland, include that in the wetland area. The result is: |  | Topographic maps may be viewed online at the National Atlas of Canada (Toporama): http://atlas.gc.ca/toporama/en/index.html [NR, PR, Sens, SR, WS] |
| 110 |  |  | <0.01, or catchment size unknown due to stormwater pipes that collect water from an indeterminate area. | 1 |  |
| 111 |  |  | 0.01 to 0.1. | 0 |  |
| 112 |  |  | 0.1 to 1. | 0 |  |
| 113 |  |  |  | 0 |  |
| 114 | OF23 | Unvegetated Surface in the Contributing Area | The proportion of the AA's contributing area (measured to no more than 1000 m upslope) that is comprised of buildings, roads, parking lots other pavement, exposed bedrock, landslides, and other mostly-bare surface is about : |  | [FA, INV, NRV, PRV, SRv, STR, WCV, WSv] |
| 115 |  |  | <10\% | 0 |  |
| 116 |  |  | 10 to $25 \%$ | 0 |  |
| 117 |  |  | >25\% | 1 |  |
|  | OF24 | Transport From Upslope | A relatively large proportion of the precipitation that falls farther upslope in the CA reaches this wetland quickly as runoff (surface water), as indicated by the following: <br> (a) input channel is present, <br> (b) input channels have been straightened, <br> (c) upslope wetlands have been ditched extensively, <br> (d) land cover is mostly non-forest, <br> (e) CA slopes are steep, and/or <br> (f) most CA soils are shallow (bedrock near surface) and/or have high runoff coefficients. <br> This statement is: |  | [NRV, PRV, SRV, WSU] |
| 119 |  |  | Mostly true. | 0 |  |
| 120 |  |  | Somenhat true. | 1 |  |
| 121 |  |  | Mostly untrue. | 0 |  |
| 122 | OF25 | Aspect | The overland flow direction of most surface water (in streams, rivers, or runoff) that enters the AA is: |  | [AM, NR, SFS, WC, WS] |
| 123 |  |  | Northward (N, NE). north-facing contributing area | 0 |  |
| 124 |  |  | Southward (S, SW). south-facing contributing area. | 1 |  |
| 125 |  |  | Other (E, SE, W, MM), or no detectable uphill slope or input channel (flat). | 0 |  |
| 126 <br> 127 | OF26 | Internal Fow Distance (Path Length) | The horizontal flow distance from the wetland's inlet to outlet is: <br> 10 m | 0 | Identify inlets and outlets, if any, from topographic maps (use elevations to determine which are inlets and which are outlets) and augment by field inspection. Whth the Provincial Landscape Viewer, select NovaScotia Tonoas the Baseman_Also enable the laver Forestn W/AM Predicted Flow Then |





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| 19 |  |  | deciduous trees taller than 3 m | 2 |  |
| 20 |  |  | coniferous or ericaceous shrubs or trees 1-3 mtall not directly below the canopy of trees. | 2 |  |
| 21 |  |  | deciduous shrubs or trees 1-3 mtall not directly below the canopy of trees. | 3 |  |
| 22 |  |  | Coniferous or ericaceous shrubs <1 mtall not directly below the canopy of taller vegetation. | 2 |  |
| 23 |  |  | deciduous shrubs or trees $<1 \mathrm{mtall}$ (e.g., deciduous seedlings) not directly below the canopy of taller vegetation. | 3 |  |
| 24 | Note: If none of top 4 rows in F3 was marked 2 or greater, SKIP to F9 ( N fixers). |  |  |  |  |
| 25 | F4 | Dominance of Most Abundant Shrub Species | Determine which two woody plant species comprise the greatest portion of the low ( $\langle<\mathrm{m}$ ) woody cover. Then choose one: |  | [PH, POL, SBM, Sens] |
| 26 |  |  | those species together comprise $>50 \%$ of such cover. | 1 |  |
| 27 |  |  | those species together do not comprise $>50 \%$ of such cover. | 0 |  |
| 28 | F | Woody Diameter Classes | Mark $A \amalg$ the types that comprise $>5 \%$ of the woody canopy cover in the $A A$ or $>5 \%$ of the wooded areas (if any) along its upland edge (perimeter). The edge should include only the trees whose canopies extend into the AA |  | Estimate the diameters at chest height. If small-diameter trees are overtopped (shaded) by larger ones, visualise a "subcanopy" at the average height of the smaller-dbh trees, to serve as a basis for the minimum $5 \%$ canopy requirement in this question. The trees and shrubs need not be wetland species. [AM, CS, POL, SBM, Sens, WBN] |
| 29 |  |  | coniferous, $1-9 \mathrm{~cm}$ diameter and $>1 \mathrm{~m}$ tall. | 1 |  |
| 30 |  |  | broad-leaved deciduous $1-9 \mathrm{~cm}$ diameter and $>1 \mathrm{mtall}$. | 1 |  |
| 31 |  |  | coniferous, $10-19 \mathrm{~cm}$ diameter. | 1 |  |
| 32 |  |  | broad-leaved deciduous $10-19 \mathrm{~cm}$ diameter. | 1 |  |
| 33 |  |  | coniferous, $20-40 \mathrm{~cm}$ diameter. | 1 |  |
| 34 |  |  | broad-leaved deciduous $20-40 \mathrm{~cm}$ diameter. | 1 |  |
| 35 |  |  | coniferous, 740 cm diameter. | 0 |  |
| 36 |  |  | broad-leaved deciduous $>40 \mathrm{~cm}$ diameter. | 0 |  |
| 37 | F6 | Height Class Interspersion | Follow the key below and mark the ONE row that best describes MOST of the AA: |  | [AM, INW, NR, PH, SBM, Sens] |
|  |  |  | A. Neither the vegetation taller than 1 m nor the vegetation shorter than that comprise $>70 \%$ of the vegetated part of the $A A$. They each comprise $30-70 \%$ Choose between A 1 and A 2 and mark the choice with a 1 in the adjoining colum. Otherwise go to B below. |  |  |
| 38 |  |  |  |  |  |
| 39 |  |  | A1 The two height classes are mostly scattered and intermixed throughout the AA | 1 |  |
| 40 |  |  | A2 Not A1. The two height classes are mostly in separate zones or bands, or in proportionately large clumps. | 0 |  |
| 41 |  |  | B. Ether the vegetation shorter than 1 m comprises $>70 \%$ of the vegetated part of the $A A$, or the vegetation taller than that does. One size class might even be totally absent. Choose between B1 and B2 and mark the choice with a 1 in the adjoining column: |  |  |
| 42 |  |  | B1 The less prevalent height class is mostly scattered and intermixed within the prevalent one. | 0 |  |
| 43 |  |  | B2. Not B1. The less prevalent height class is mostly located apart from the prevalent one, in separate zones or clumps, or is completely absent. | 0 |  |
| 44 | 7 | Large Snags (Dead Standing Trees) | The number of large snags (diameter $\mathbf{2 0} \mathbf{~ c m}$ ) in the AA plus adjacent upland area within 10 m of the wetland edge is: |  | Snags are dead standing trees that often (not always) lack bark and foliage. Include only ones that are at least 2 m tall. [POL, SBM, WBN] |
| 45 |  |  | None, of fewer than $8 /$ hectare which exceed this diameter. | 1 |  |
| 46 |  |  | Several ( $>8 / \mathrm{hectare)}$ ) and a pond, lake, or slow-flowing water wider than 10 mis within 1 km | 0 |  |
| 47 |  |  | Several ( $>8$ hectare) but above not true. | 0 |  |
| 48 | F8 | Downed Wood | The number of downed wood pieces longer than 2 m and with diameter $>10 \mathrm{~cm}$, and not persistently submerged, is: |  | Exclude temporay "bum piles." [AM, IN, POL, SBM] |
| 49 |  |  | Few or none that meet these criteria. | 1 |  |
| 50 |  |  | Several ( $>5$ if $A$ A is $>5$ hectares, less for smaller $A$ As) meet these criteria | 0 |  |
| 51 | F9 | NFixers | The percentage of the AA's vegetated cover that contains nitrogen-fixing plants (e.g., alder, sweetgale, clover, lupine, alfalfa, other legumes) is: |  | Do not include $N$-fixing algae or lichens. [FA, $\mathrm{PR}, \mathrm{IN}, \mathrm{NR}, \mathrm{N}, \mathrm{OE}, \mathrm{PH}, \mathrm{SBM}$, Sens] |
| 52 |  |  | <1\% or none. | 0 |  |
| 53 |  |  | 1-25\% of the vegetated cover, in the AA or along its water edge (whichever has more). | 0 |  |
| 54 |  |  | $25-50 \%$ of the vegetated cover, in the AA or along its water edge (whichever has more). | 1 |  |
| 55 |  |  | $50-75 \%$ of the vegetated cover, in the AA or along its water edge (whichever has more). | 0 |  |
| 56 |  |  | $>75 \%$ of the vegetated cover, in the AA or along its water edge (whichever has more). | 0 |  |
| 57 | F10 | Sphagnum Moss Extent | The cover of Sphagnum moss (or any moss that forms a dense cushion many centimeters thick), including the moss obscured by taller sedges and other plants rooted in it, is: |  | Exclude moss growing on trees and rocks. [CS, PH] |
| 58 |  |  | -5\% of the vegetated part of the AA | 0 |  |
| 59 |  |  | $5-25 \%$ of the vegetated part of the $A$ A | 0 |  |
| 60 |  |  | $25-50 \%$ of the vegetated part of the AA | 0 |  |
| 61 |  |  | $50-95 \%$ of the vegetated part of the AA | 1 |  |
| 62 |  |  | >95\% of the vegetated part of the AA | 0 |  |



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| 103 |  |  | 50-95\% of the vegetated area | 0 |  |
| 104 |  |  | -95\% of the vegetated area | 0 |  |
| 105 | F19 | Dominance of Most Abundant Herbaceous | Determine which two herbaceous species comprise the greatest portion of the herbaceous cover (excluding mosses and floating-leaved aquatic plants). Then choose one of the following: |  | For this question, indude fems as well as graminoids and forbs. [EC, IN, PH, POL, Sens] |


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| 106 |  | Species | those species together comprise $>50 \%$ of the areal cover of herbaceous plants at any time during the year. | 1 |  |
| 107 |  |  | those species together do not comprise $>50 \%$ of the areal cover of herbaceous plants at any time during the year. | 0 |  |
| 108 | F20 | Invasive Plant Cover | How extensive is the cover of invasive plant species in the AA? For species, see Plants invasive worksheet in the accompanying Supplnfo file. |  | [EC, PH, POL, Sens] |
| 109 |  |  | invasive species appear to be absent in the AA, or are present only in trace amount (a few individuas). | 1 |  |
| 110 |  |  | invasive species are present in more than trace amounts, but comprise $<5 \%$ of herbaceous cover (or woody cover, if the invasives are moody). | 0 |  |
| 111 |  |  | invasive species comprise 5-20\% of the herb cover (or woody cover, if the invasives are woody). | 0 |  |
| 112 |  |  | invasive species comprise 20-50\% of the herb cover (or woody cover, if the invasives are woody). | 0 |  |
| 113 |  |  | invasive species comprise $>50 \%$ of the herb cover (or woody cover, if the irvasives are woody). | 0 |  |
| 114 | F21 | Invasive Cover Along Upland Edge | Along the wetland-upland boundary, the percent of the upland edge (within 3 mupslope from the wetland) that is occupied by invasive plant species is: |  | If a plant cannot be identified to species (e.g., winter conditions) but its genus contains an exotic species, assume the unidentified plant to also be exotic. If vegetation is so senesced that exotic species cannot be identified, answer "none". [PH, STR] |
| 115 |  |  | none of the upland edge (invasives apparently absent), or AA has no upland edge. | 1 |  |
| 116 |  |  | some (but -5\%) of the upland edge. | 0 |  |
| 117 |  |  | 5-50\% of the upland edge. | 0 |  |
| 118 |  |  | most ( $>50 \%$ ) of the upland edge. | 0 |  |
| 119 | F22 | Fringe Wetland | During most of the year, open water within or adjacent to the vegetated part of the wetland is much wider than the maximum width of the vegetated zone within the wetland. Enter "1" if true, "0" if false. | 0 | [MBF, WBN, WCV] |
| 120 | F23 | Lacustrine Wetland | The vegetated part of the AA is within or adjacent to a body of non-tidal standing open water whose size exceeds8 hectares during most of a normal year. | 0 | [ $\mathrm{F}, \mathrm{PR}, \mathrm{PU}, \mathrm{WBF}, \mathrm{WBN}$ ] |
| 121 | F24 | \% of AAWithout Surface Water | The percentage of the AA that never contains surface water during an average year (that is, except perhaps for a few hours after snowmelt on rainstorms), but which is still a wetland, is: |  | 1 hectare is 10,000 sq. mor about 2.5 acres. It could have dimensions of $100 \mathrm{mby} 100 \mathrm{~m}, 1000 \mathrm{mby}$ 10 m , or similar. [AM, FA, $\operatorname{FR}, \mathrm{IN}, \mathrm{NR}, \mathrm{PH}, \mathrm{PR}, \mathrm{SBM}$, Sens, SRv, WBF, WBN, WC] |
| 122 |  |  | <1\%. In other words, all or nearly all of the AA is covered by water permanently or at least seasonally. | 0 |  |
| 123 |  |  | 1-25\% of the AA , or $<1 \%$ but $>0.01$ ha never contains surface water. | 0 |  |
| 124 |  |  | 25-50\% of the AA never contains surface water. | 0 |  |
| 125 |  |  | 50-75\% of the AA never contains surface water. | 0 |  |
| 126 |  |  | 75-99\% of the AA never contains surface water, or $>99 \%$ AND there is at least one persistent water body larger than 1 ha in the AA | 0 |  |
| 127 |  |  | 99-100\% AND there is no persistent ponded water body larger than 1 ha within the AA Enter "1" andSKIP to F42 (Channel Connection). | 1 |  |
| 128 | F25 | \% of AA with <br> Persistent Surface Water | Identify the parts of the AA that still contain surface water (flowing or ponded, open or hidden beneath vegetation) even during the driest times of a normal year, i.e., when the AA's surface water is at its lowest annual level. At that time, the percentage of the AA that still contains surface water is: |  | If you are unable to determine the condition at the driest time of year, ask the land owner or neighbors about it if possible. Indicators of persistence may include fish, some dragonflies, beaver, and muskrat. [AM, CS, FA, FR, INV, NR, POL, PR, SBM, WBF, WBN] |
| 129 |  |  | None. The AA dries up completely (no water in channels either) or never has surface water during most years. SKIP to F27. | 0 |  |
| 130 |  |  | 1-20\% of the AA. | 0 |  |
| 131 |  |  | 20-50\% of the AA | 0 |  |
| 132 |  |  | 50-95\% of the AA | 0 |  |
| 133 |  |  | >95\% of the AA True for many fringe wetlands. | 0 |  |
| 134 | F26 | \% of Summertime Water that is Shaded | At mid-day during the warmest time of year, the area of surface waterwithin the $A A$ that is shaded by vegetation and other features that are within the $A A$ at that time is: |  | [FA, WC] |
| 135 |  |  | -5\% of the water is shaded, or no surface water is present then. | 0 |  |
| 136 |  |  | $5-25 \%$ of the water is shaded. | 0 |  |
| 137 |  |  | 25-50\% of the water is shaded. | 0 |  |
| 138 |  |  | 50-75\% of the water is shaded. | 0 |  |
| 139 |  |  | >75\% of the water is shaded. | 0 |  |
| 140 | F27 | \% of AA that is Fooded Only Seasonally | The percentage of the $A$ A's area that is between the annual high water and the annual low water (surface water) is: |  | Flood marks (algal mats, adventitious roots, debris lines, ice scour, etc.) are often evident when not fully inundated. Aso, such areas often have a larger proportion of upland and annual (vs. perennial) plant species. In riverine systems, the extent of this zone can be estimated by multiplying by 2 the bankful height and visualising where that would intercept the land along the river. [CS, FA, IN, NR, OE, PH, SR, WBF, WBN, WS] |
| 141 |  |  | None, or <0.01 hectare and <1\% of the AA SKIP to F29. | 0 |  |
| 142 |  |  | 1-20\% of the AA, or <1\% but >0.01 ha. | 0 |  |
| 143 |  |  | 20-50\% of the AA | 0 |  |


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| 144 |  |  | 50-95\% of the AA | 0 |  |
| 145 |  |  | >95\% of the AA | 0 |  |
| 146 <br> 147 <br> 148 <br> 149 <br> 150 <br> 151 | F28 | Annual Water Fuctuation Range | The annual fluctuation in surface water level within most of the parts of the AA that contain surface water at least temporarily is: |  | Look for flood marks (see above). Because the annual range of water levels is difficult to estimate without multiple visits, consider asking the land owner or neighbors about it. [AM, CS, INV, NR, OE, PH, PR, SR, WBN, WS] |
|  |  |  | $<10$ cm change (stable or nearly so). | 0 |  |
|  |  |  | $10 \mathrm{~cm}-50 \mathrm{~cm}$ change. | 0 |  |
|  |  |  | 0.5-1 m change. | 0 |  |
|  |  |  | 1-2 m change. | 0 |  |
|  |  |  | >2 m change. | 0 |  |
|  | Is the AA plus adjacent ponded water smaller than 0.01 hectare (about $10 \mathrm{~m} \times 10 \mathrm{~m}$, or $1 \mathrm{~m} \times 100 \mathrm{~m}$ )? If so, enter " 1 " in column D andSKIP TO F42 (Connection). |  |  | 0 |  |
| 153 | F29 | Predominant Depth Class | During most of the time when surface water is present during the growing season, its depth, averaged over the entire inundated part of the AA , is: |  | If a boat is unavailable, estimate this by considering wetland size and local topography. Or if timing and safety allow, depths may be measured by drilling through winter ice. This question is asking about the spatial median depth that occurs during most of that time, even if inundation is only seasonal or temporary. If inundation in most but not all of the wetland is brief, the answer will be based on the deptr of the most persistently inundated part of the wetland. Include surface water in channels and ditches as well as ponded areas. [CS, FA, FR, INV, OE, PH, PR, Sens, SFS, SR, WBF, WBN, WC] |
| 154 |  |  | $<10 \mathrm{~cm} \mathrm{deep} \mathrm{(but}>0$ ). | 0 |  |
| 155 |  |  | 10-50 cm deep. | 0 |  |
| 156 |  |  | 0.5-1 mdeep. | 0 |  |
| 157 |  |  | 1-2 mdeep. | 0 |  |
| 158 |  |  | >2 deep. True for many fringe wetlands. | 0 |  |
| 159 | F30 | $\begin{array}{\|l} \hline \text { Depth Classes - } \\ \text { Evenness of } \\ \text { Proportions } \end{array}$ | When present, surface water in most of the AA usually consists of (select one): |  | Estimate these proportions by considering the gradient and microtopography of the site. [FR, INV, WBF, WBN] |
| 160 |  |  | One depth class that comprises >90\% of the AA's inundated area (use the classes in the question above). | 0 |  |
| 161 |  |  | One depth class that comprises 50-90\% of the AA's inundated area | 0 |  |
| 162 |  |  | Neither of above. There are 3 or more depth classes and none occupy $>50 \%$ a | 0 |  |
| 163 | F31 | \% of Water That Is Ponded (not Fowing) | During most times when surface water is present, the percentage that is (1)ponded (stagnant, or flows so slowly that fine sediment is not held in suspension) AND (2) is likely to be deeper than 0.5 min some places, is: |  | Nearly all wetlands with surface water have some ponded water. [AM, CS, INN, NR, OE, PR, Sens, SR, WBF, WBN, WC, WS] |
| 164 |  |  | -5\% of the water, or it occupies $<100$ sq.m cumulatively. Nearly all the surface water is flowing. SKIP to F34. | 0 |  |
| 165 |  |  | 5-30\% of the water. | 0 |  |
| 166 |  |  | 30-70\% of the water. | 0 |  |
| 167 |  |  | 70-95\% of the water. | 0 |  |
| 168 |  |  | >95\% of the water. | 0 |  |
|  | F32 | Ponded Open Water Minimum Size | During most of the growing season, the largest patch of open water that is ponded and is in or bordering the $A A$ is $>0.01$ hectare (about 10 mby 10 m ) and mostly deeper than 0.5 m If true enter " 1 " and continue, If false, enter " 0 " andSKIP to F41 (Floating Algae \& Duckweed). | 0 | Open water is not obscured by vegetation in aerial ('duck's eye') view. It includes vegetation floating on the water surface or entirely submersed beneath it. |
| 169 |  |  |  |  |  |
| 170 | F33 | \% of Ponded Water that is Open | In ducks-eye aerial view, the percentage of the ponded water that isopen (lacking emergent vegetation during most of the growing season, and unhidden by a forest or shrub canopy) is: |  | [AM, CS, FA, FR, INN, NR, OE, PR, SR, WBF, WBN, WC] |
| 171 |  |  | None, or $<1 \%$ of the AA and largest pool occupies $<0.01$ hectares. Enter "1" and SKIP to F41 (Hoating Algae \& Duckweed). | 0 |  |
| 172 |  |  | 1-4\% of the ponded water. Enter "1" and SKIP to F41 (Floating Agae \& Duckweed). | 0 |  |
| 173 |  |  | 5-30\% of the ponded water. | 0 |  |
| 174 |  |  | 30-70\% of the ponded water. | 0 |  |
| 175 |  |  | 70-99\% of the ponded water. | 0 |  |
| 176 |  |  | 100\% of the ponded water. | 0 |  |
| 177 | F34 | Wdth of Vegetated Zone within Wetland | At the time during the growing season when the AA's water level is lowest, the average width of vegetated areain the AA that separates adjoining uplands from open water within the $A A$ is: |  | "Vegetated area" does not include underwater or floating-leaved plants, i.e., aquatic bed. Mdth may include wooded riparian areas if they have wetland soil or plant indicators. [AM, CS, $\mathrm{NR}, \mathrm{OE}, \mathrm{PH}, \mathrm{PR}$, SBM, Sens, SR, WBN] |
| 178 |  |  | <1m | 0 |  |
| 179 |  |  | 1-9m | 0 |  |
| 180 |  |  | 10-29m | 0 |  |
| 181 |  |  | 30-49m | 0 |  |
| 182 |  |  | 50-100m. | 0 |  |
| 183 |  |  | $>100 \mathrm{~m}$, or open water is absent at that time. | 0 |  |
| 184 | F35 | Fat Shoreline Extent | During most of the part of the growing season when water is present, the percentage of the AA'swater edge length that is nearly flat (a slope less than about $5 \%$ measured within 5 mlandward of the water) is: |  | If several isolated pools are present in early summer, estimate the percent of their collective shorelines that has such a gentle slope. [SR, WBN] |
| 185 |  |  | $<1 \%$ of the water edge. | 0 |  |
| 186 |  |  | 1-25\% of the water edge. | 0 |  |
| 187 |  |  | 25-50\% of the water edge. | 0 |  |


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| 188 |  |  | 50-75\% of the water edge. | 0 |  |
| 189 |  |  | $>75 \%$ of the water edge. | 0 |  |
| 190 | F36 | Robust Emergents | The percentage of the emergent vegetation cover in the AA that is cattail (Typha spp.), common reed (Phragmites), or tall ( $>1 \mathrm{~m}$ ) bulrush is: |  | Emergent vegetation is herbaceous plants whose stems are partly above and partly below the water surface during most of the time water is present. [MBN] |
| 191 |  |  | <1\% of the emergent vegetation, or emergent vegetation is absent. SKIP to F38. | 0 |  |
| 192 |  |  | 1-25\% of the emergent vegetation. | 0 |  |
| 193 |  |  | 25-75\% of the emergent vegetation. | 0 |  |
| 194 |  |  | >75\%, of the emergent vegetation. | 0 |  |
| 195 <br> 196 <br> 197 | F37 | Interspersion of <br> Emergents \& Open <br> Water | During most of the part of the growing season when water is present, the spatial patternof emergent vegetation within the water is mostly. |  | [AM, FA, FR, INN, NR, OE, PH, PR, SBM, SR, WBF, WBN] |
|  |  |  |  |  |  |
|  |  |  | Scattered. More than 30\% of such vegetation forms small islands or corridors surrounded by water. | 0 |  |
|  |  |  | Intermediate. | 0 |  |
| 198 |  |  | Clumped. More than $70 \%$ of such vegetation is in bands along the wetland perimeter or is clumped at one or a few sides of the surface water area. | 0 |  |
| 199 | F38 | Persistent Deepwater Area | If the deepest patch of surface water (flowing or ponded) in or directly adjacent to the $A A$ is mostly deeper than 0.5 m for $>2$ weeks during the growing season, enter "1" and continue. If not, enter " 0 " andSKIP to F42.(Connection). | 0 |  |
| 200 | F39 | Non-vegetated Aquatic Cover | During most of the growing season and in waters deeper than 0.5 m , the cover for fish, aquatic invertebrates, and/or amphibians that is provided NOT by living vegetation, but by accumulations of dead wood and undercut banks is: |  | For this question, consider only the wood that is at or above the water surface. Estimates of underwate wood based only on observations from terrestrial viempoints are unreliable so should not be attempted. [AM, FA, FR, INM] |
| 201 |  |  | Little or none. | 0 |  |
| 202 |  |  | Intermediate. | 0 |  |
| 203 |  |  | Extensive. | 0 |  |
| 204 | F40 | Isolated Island | The AA contains (or is part of) an island or beaver lodge within a lake, pond, or river, and is isolated from the shoreby water depths >1 m on all sides during an average June. The island may be solid, or it may be a floating vegetation mat that is sufficiently large and dense to support a waterbird nest. | 0 | [MBN] |
| 205 | F41 | Floating Algae \& Duckweed | At some time of the year, mats of algae and/or duckweed are likely to cover $>50 \%$ of the $A A^{\prime}$ s otherwise-unshaded water surface, or blanket $>50 \%$ of the underwater substrate. If true, enter " 1 " in next colurm. If untrue or uncertain, enter " 0 ". | 0 | [EC, PR, WBA] |
| 206 | F42 | Channel Connection \& Outflow Duration | The most persistent surface water connection (outlet channel or pipe, ditch, or overbank water exchange) between the AA and a downslope stream network is: [Note: If the AA represents only part of a wetland, answer this according to whichever is theleast permanent surface connection: the one between the AA and the rest of the wetland, or the surface connection between the wetland and the domnslope stream network] |  | Consider the connection regardless of whether the surface water is frozen. The "downslope stream network" could consist of ditches, rivers, ponds, or lakes which eventually connect to the ocean. If this cannot be determined while visiting the AA , consult topographic maps perhaps by vieving these online with Toporama (http://atlas.nrcan.gc.ca/toporama/enVindex.html) [CS, FA, FR, NR, OE, PR, Sens, SFS, SR, WCV, WS] |
| 207 |  |  | Persistent (surface water flows out for $>9$ months/year). | 0 |  |
| 208 |  |  | Seasonal (surface water flows out for 14 days to 9 monthslyear, not necessarily consecutive). | 0 |  |



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| 241 | F51 | Internal Gradient | The gracient along most of the flow path within the AA is: |  | This is not the same as the shoreline slope. It is the elevational difference between the AA's inlet and outlet, divided by the flow-distance between them and converted to percent. If available, use a clinometer to measure this. Free clinometer apps can be downloaded to smartphones. If the wetland is large (longer than $\sim 1 \mathrm{~km}$ ), this may be estimated using Google Earth to determine the minimum and maximum elevation within the $A A$, then dividing by length and multiplying by 100. [CS, NR, OE, PR, SR, WBF, WBN, WS] |
| 242 |  |  | 2\% or the AA has no surface water outlet (not even seasonally). | 0 |  |
| 243 |  |  | 2-5\% | 1 |  |
| 244 |  |  | 6-10\% | 0 |  |
| 245 |  |  | >10\% | 0 |  |
|  | Note for the next three questions: If the AA lacks an upland edge, evaluate based on the AA's entire perimeter, and moving outward into whatever areas are adjacent. In many situations, these questions are best answered by measuring from aerial images. |  |  |  |  |
|  | F52 | Vegetated Buffer as \% of Perimeter | Wthin a zone extending 30 m laterally from the AA's edge with upland and/or other wetlands, the percentage that containsperennial vegetation cover (except lawns, row crops, heavily grazed land, conifer plantations) is: |  | [AM, FA, FR, INN, NRV, PH, POL, PRV, SBM, Sens, SRv, STR, WBN] |
|  |  |  | -5\% | 0 |  |
| 249 |  |  | 5 to 30\% | 0 |  |
| 250 |  |  | 30 to 60\% | 1 |  |
| 251 |  |  | 60 to 90\% | 0 |  |
| 252 |  |  | >90\%, or all the area within 30 m of the AA edge is other wetlands. SKIP to F55. | 0 |  |
| 253 | $\stackrel{F}{53}$ | Type of Cover in Buffer | Wthin 30 m upslope of where the wetland transitions to upland, the upland land cover that is NOT perennial vegetation is mostly (mark ONE): |  | [AM, FA, INN, NRV, PH, POL, SBM, STR, WBN] |
| 254 |  |  | Impervious surface, e.g., paved road, parking lot, building, exposed rock. | 0 |  |
| 255 |  |  | Bare or nearly bare pervious surface or managed vegetation, e.g., lamn, row crops, unpaved road, dike, landside. | 1 |  |
| 256 | F54 | Buffer Slope | The steepest and/or most disturbed part of the upland area that is within 30 m of the wetland and occupies $>10 \%$ of that upland area has a percent slope of: |  | [NRV, PRV, Sens, SRV] |
| 257 |  |  | <1\% (flat -- almost no noticeable slope) or all the area within 30 mof the AA edge is other wetlands. | 0 |  |
| 258 |  |  | 2-5\% | 0 |  |
| 259 |  |  | 5-30\% | 1 |  |
| 260 |  |  | >30\% | 0 |  |
| 261 | F55 | Cliffs or Steep Banks | In the AA or within 100 m , there are elevated terrestrial features such as cliffs, talus slopes, stream banks, or excavated pits (but not riprap) that extend at least 2 m nearly vertically, are urvegetated, and potentially contain crevices or other substrate suitable for nesting or den areas. Enter 1 (yes) or 0 (no). | 0 | Do not include upturned trees as potential den sites. [POL, SBM] |
| 262 | F56 | New or Expanded Wetland | Human actions within or adjacent to the AA have persistently expanded a naturally occurring wetland or created a wetland where there previously was none (e.g., by excavation, impoundment): |  | Determine this using historical aerial photography, old maps, soil maps, or permit files as available [CS, NR, OE, PH, Sens] |
| 263 |  |  | No. | 0 |  |
| 264 |  |  | Yes, and created or expanded $20-100$ years ago. | 0 |  |
| 265 |  |  | Yes, and created or expanded 3 -20 years ago. | 0 |  |
| 266 |  |  | Yes, and created or expanded within last 3 years. | 0 |  |
| 267 |  |  | Yes, but time of origin or expansion unknown. | 0 |  |
| 268 |  |  | Unknown if new or expanded within 20 years or not. | 1 |  |
| 269 | F57 | Burn History | More than $1 \%$ of the AA's previously vegetated area: |  | Look for charred soil or stumps (in multiple widely-spaced locations) or ask landowner. [CS, PH, STR] |
| 270 |  |  | Burned within past 5 years. | 0 |  |
| 271 |  |  | Burned 6-10 years ago. | 0 |  |
| 272 |  |  | Burned 11-30 years ago. | 0 |  |
| 273 |  |  | Burned $>30$ years ago, or no evidence of a burn and no data. | 1 |  |
| 274 | F58 | Visibility | The maximum percentage of the wetland that is visible from the best vantage point on public roads, public parking lots, public buildings, or public maintained trails that intersect, adjoin, or are within 100 m of the $A A$ (select one) is: |  | [PU, STR, WBFV] |
| 275 |  |  | 25\% | 1 |  |
| 276 |  |  | 25-50\% | 0 |  |
| 277 |  |  | -50\% | 0 |  |
| 278 | F59 | Non-consumptive Uses - Actual or Potential | Assuming access permission was granted, select ALL statements that are true of the AA as it currently exists: |  | [PU, STR] |
| 279 |  |  | For an average person, walking is physically possible in (not just near) $>5 \%$ of the $A A$ during most of the growing season, e.g., free of deep water and dense shrub thickets. | 1 |  |
| 280 |  |  | Maintained roads, parking areas, or foot-trails are within 10 m of the $A A$, or the $A A$ can be accessed part of the year by boats arriving via contiguous waters. | 0 |  |
| 281 |  |  | Wthin or near the AA, there is an interpretive center, trails with interpretive signs or brochures, andor regular guided interpretive tours. | 0 |  |


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| 282 | F60 | Unvisited Core Area | The percentage of the AA almost never visited by humans during an average growing season probably comprises: [ Note: Only include the part actually walked or driven (not simply viewed from) with a vehicle or boat. Do not include visitors on trails outside of the AA unless more than half the wetland is visible from the trails and they are within 30 mof the wetland edge. In that case include only the area occupied by the trail.] |  | [AM, FAv, PRv, PH, PU, SBM, STR, WBF, WBN] |
| 283 |  |  | -5\% and no inhabited building is within $100 \mathrm{mof} \mathrm{the} A$ A | 0 |  |
| 284 |  |  | -5\% and inhabited building is within 100 mof the $A$ A | 0 |  |
| 285 |  |  | $5-50 \%$ and no inhabited building is within 100 m of the $A$ A | 0 |  |
| 286 |  |  | $5-50 \%$ and inhabited building is within 100 m of the $A$ A | 0 |  |
| 287 |  |  | 50-95\%, with or without inhabited building nearby. | 0 |  |
| 288 |  |  | >95\% of the AA with or without inhabited building nearby. | 1 |  |
| 289 | F61 | Frequently Visited Area | The part of the AA visited by humans almost daily for several weeks during an average growing season probably comprises: [See note above.] |  | [AM, PH, PU, SBM, STR, WBF, WBN] |
| 290 |  |  | -5\% If F60 was answered ">95\%' (mostly never visited), SKIP to F64. | 1 |  |
| 291 |  |  | 5-50\% | 0 |  |
| 292 |  |  | 50-95\% | 0 |  |
| 293 |  |  | >95\% of the AA | 0 |  |
| 294 | F62 | BMP - Soils | Boardwalks, paved trails, fences or other infrastructure and/or well-enforced regulations appear to effectively prevent visitors from walking on soil within nearly all of the AA when the soil is unfrozen. Enter " 1 " if true. | 0 | [PH, PU] |
| 295 | F63 | BMP - Wildlife Protection | Fences, observation blinds, platforms, paved trails, exclusion periods, and/or well-enforced prohibitions on motorised boats, off-leash pets, and off road vehicles appear to effectively exclude or divert visitors and their pets from the $A A$ at critical times in order to minimize disturbance of wildlife (except during hunting seasons). Enter "1" if true. | 0 | [AM, PU, WBF, WBN] |
| 296 | F64 | Consumptive Uses (Provisioning Services) | Recent evidence was found within the AA of the following potentially-sustainable consumptive uses. Select ALL that apply. |  | [FAv, Rev, WBFV] |
| 297 |  |  | Low-impact commercial timber harvest (e.g., selective thinning). | 0 |  |
| 298 |  |  | Commercial or tracitional-use havesting of native plants, their fruits, or mushrooms. | 0 |  |
| 299 |  |  | Waterfowl hunting. | 0 |  |
| 300 |  |  | Fshing. | 0 |  |
| 301 |  |  | Trapping of furbearers. | 0 |  |
| 302 |  |  | None of the above. | 1 |  |
| 303 | F65 | Domestic Wells | The closest wells or water bodies that currently provide drinking water are: |  | [NRN] |
| 304 |  |  | Muthin 0-100 m of the AA | 0 |  |
| 305 |  |  | $100-500 \mathrm{~m}$ away. | 0 |  |
| 306 |  |  | -500 m away, or no information. | 1 |  |
| 307 | F66 | Calcareous Fen | The AA is, or is part of, a calcareous fen. See the Plants_Calcar worksheet in the accompanying Supplnfo file for list of plant indicators (calciphiles). Enter 1 If more than two Strong or more than five Moderate calciphile species are present; otherwise enter 0 , but if not able to identify those and no information, change to blank. | 0 | [ $\mathrm{PH}, \mathrm{PR}]$ |

Stressor (S) Data Form for Non-Tidal Wetlands. WESP-AC for Nova Scotia version 2.


| S3 | Accelerated Inputs of Nutrients |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | In the last column, place a check mark next to any item -- occurring in either the wetland or its CA - that is likely to have accelerated the inputs of nutrients to the wetland. [NRV, PRR, STR] |  |  |  |  |
|  | Stormwater or wastewater effluent (including failing septic systems), landfills. |  |  |  |  |
|  | Fertilizers applied to lamns, ag lands, or other areas in the CA |  |  |  | 1 |
|  | Livestock, dogs. |  |  |  |  |
|  | Artificial drainage of upslope lands. |  |  |  |  |
|  | If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly more nutrients, then leave the "O's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present. |  |  |  |  |
|  |  | Severe (3 points) | Medium (2 points) | Mild (1 point) |  |
|  | Type of loading: | High density of unmaintained septic, some types of industrial sources. | Moderate density septic, cropland, secondary wastewater treatment plant. | Livestock, pets, low density residential. | 2 |
|  | Frequency \& duration of input: | Frequent and year-round. | Frequent but mostly seasonal. | Infrequent \& during high runoff events mainly. | 2 |
|  | AA proximity to main sources (actual or potential): | 0-15m | $15-100 \mathrm{~m}$ or in groundwater. | In more distant part of contributing area. | 2 |
|  | Sum= |  |  |  | 6 |
|  | Stressor subscore= |  |  |  | 0.67 |


| S4 | Excessive Sediment Loading from Contributing Area |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | In the last column, place a check mark next to any item present in the CA that is likely to have elevated the load of waterborme or windborne sediment reaching the wetland fromits CA [FA PR, INW, PH, SRv, STR] |  |  |  |  |
|  | Erosion from plowed fields, fill, timber havest, dirt roads, vegetation clearing, fires. |  |  |  | 1 |
|  | Erosion from construction, in-channel machinery in the CA |  |  |  |  |
|  | Erosion from off-road vehicles in the CA |  |  |  |  |
|  | Erosion from livestock or foot traffic in the CA |  |  |  |  |
|  | Stormwater or wastewater effluent. |  |  |  |  |
|  | Sediment from road sanding, gravel mining, other mining, oil/ gas extraction. |  |  |  |  |
|  | Accelerated channel downcutting or headcutting of tributaries due to altered land use. |  |  |  |  |
|  | Other human-related disturbances within the CA |  |  |  |  |
|  |  then leave the "O's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present. |  |  |  |  |
|  |  | Severe (3 points) | Medium (2 points) | Mild (1 point) |  |
|  | Erosion in CA: | Extensive evidence, high intensity.* | Potentially (based on high-intensity ${ }^{\star}$ land use) or scattered evidence. | Potentially (based on low-intensity ${ }^{\star}$ land use) with little or no direct evidence. | 2 |
|  | Recentness of significant soil disturbance in the CA: | Current \& ongoing. | 1-12 months ago. | $>1$ y ago. | 2 |
|  | Duration of sediment inputs to the wetland: | Frequent and year-round. | Frequent but mostly seasonal. | Infrequent \& during high runoff events mainly. | 2 |
|  | AA proximity to actual or potential sources: | 0-15m. | 15-100 m. | In more distant part of contributing area. | 2 |
|  | * high-intensity= extensive off-road vehicle use, plowing, grading, excavation, erosion with or without veg removal; low-intensity= veg removal only with little or no apparent erosion or disturbance of soil or sediment. |  |  | Sum= | 8 |
|  |  |  |  | Stressor subscore= | 0.67 |
| S5 | Soil or Sediment Alteration Within the Assessment Area |  |  |  |  |
|  |  (whichever is less). [CS, IM $, ~ N R, ~ P H, ~ S R, ~ S T R] ~] ~$ |  |  |  |  |
|  | Compaction from machinery, off-road vehicles, livestock, or mountain bikes, especially during wetter periods. |  |  |  |  |
|  | Leveling or other grading not to the natural contour. |  |  |  |  |
|  | Tillage, plowing (but excluding disking for enhancement of native plants). |  |  |  |  |
|  | Fill or riprap, excluding small amounts of upland soils containing organic amendments (compost, etc.) or small amounts of topsoil imported from another wetland. |  |  |  |  |
|  | Excavation. |  |  |  |  |
|  | Ditch cleaning or dredging in or adjacent to the wetland. |  |  |  |  |
|  | Boat traffic in or adjacent to the wetland and sufficient to cause shore erosion or stir bottom sediments. |  |  |  |  |
|  | Avtificial water level or flow manipulations sufficient to cause erosion or stir bottom sediments. |  |  |  |  |
|  |  effects, contrast the current condition with the condition if the checked items never occurred or were no longer present. |  |  |  |  |
|  |  | Severe (3 points) | Medium (2 points) | Mild (1 point) |  |
|  | Spatial extent of altered soil: | >95\% of wetland or >95\% of its upland edge (if any). | 5-95\% of wetland or 5-95\% of its upland edge (if any). | $<5 \%$ of wetland and $<5 \%$ of its upland edge (if any). | 0 |
|  | Recentness of significant soil alteration in wetland: | Current \& ongoing. | 1-12 months ago. | $>1 \mathrm{yr}$ ago. | 0 |
|  | Duration: | Long-lasting, minimal veg recovery. | Long-lasting but mostly revegetated. | Short-term, revegetated, not intense. | 0 |
|  | Timing of soil alteration: | Frequent and year-round. | Frequent but mostly seasonal. | Mainly during one-time or scattered events. | 0 |
|  | Sum= |  |  |  | 0 |



| Cover Page: Basic Description of Assessment | WESP-AC version 2 |
| :---: | :---: |
| Site Name: | Cambridge wetland 7 |
| Investigator Name: | BL, CP |
| Date of Field Assessment: | 28 Sept 2021 |
| Nearest Town: | Waterville, NS |
| Latitude (decimal degrees): | 369903.85 m E |
| Longitude (decimal degrees): | 4992163.41 m N (UTM 20 T ) |
| Is a map based on a formal on-site wetland delineation available? | Yes |
| Approximate size of the Assessment Area (AA, in hectares): | ~ 3 ha |
| AA as percent of entire wetland (approx.). Attach sketch map if AA is smaller than the entire contiguous wetland. | 100 |
| What percent (approx.) of the wetland were you able to visit? | 100 |
| What percent (approx.) of the AA were you able to visit? | 100 |
| Were you able to ask the site owner/manager about any of the questions? | No |
| Indicate here if you intentionally surveyed for rare plants, calciphile plants, or rare animals: | Yes |
| Have you attended a WESP-AC training session? If so, indicate approximate month \& year. | Yes |
| How many wetlands have you assessed previously using WESP-AC? (approx.) | >100 |
| Comments about the site or this WESP-AC assessment (attach extra page if desired): |  |


|  | A | B | C | D | E |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | Date: | 28 Sept 2021 | Site Identifier: Cambridge Wetland 7 | Investig | tor: BL, CP |
| 2 | Form OF (Office). Non-tidal Wetland Data Form. WESP-AC version 2 for Nova Scotia wetlands only. DIRECTIONS: Conduct an assessment only after reading the accompanying <br>  require using these online map viewers: <br> Google Earth Pro: https://www.google.com/earth/download/gep/agree.html <br> Provincial Landscape Viewer: https://nsgi.novascotia.ca/plv/ <br>  <br>  <br>  <br>  Sensitivity, STR= Stressors. |  |  |  |  |
| 3 | \# | Indicators | Condition Choices | Data | Definitions/Explanations |
| 4 | OF1 | Province | Mark the province in which the A A is located by changing the 0 in the colum next to it to a "1". Mark only one. |  | This determines to which province's calibration wetlands the raw score of any wetland is normalised. In the function and benefits models, it also triggers the automatic exclusion of indicators for which no spatial data exists in a particular province. |
| 5 |  |  | New Brunswick | 0 |  |
| 6 |  |  | Nova Scotia | 1 |  |
| 7 |  |  | Prince Edward Island | 0 |  |
| 8 |  |  | Newfoundland-Labrador | 0 |  |
| 9 | OF2 | $\begin{aligned} & \text { Ponded Area Wthin } 1 \\ & \mathrm{~km} \end{aligned}$ | The area of surface water ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: |  | "Adjacent" means not separated from the AA by a wide expanse ( $>50 \mathrm{~m}$ ) of upland (including roads >50 m wide). Include ponded areas likely to be hidden by wetland vegetation. If surface water extends beyond 1 km , include only the part within 1 km . Do not include tidal areas. Measure the area from aerial imagery using Google Earth Pro (click on Ruler icon in toolbar, then Polygon in popup menu). [PH, SBM, WBN] |
| 10 |  |  | 80.01 hectare (about $10 \mathrm{~m} \times 10 \mathrm{~m}$ ). | 0 |  |
| 11 |  |  | 0.01-0.1 hectare. | 1 |  |
| 12 |  |  | 0.1-1 hectare. | 0 |  |
| 13 |  |  | 1 to 10 hectares. | 0 |  |
| 14 |  |  | 10 to 100 hectares. | 0 |  |
| 15 |  |  | $>100$ hectares. | 0 |  |
| 16 | OF3 | Ponded Water \& Wetland Wthin 1 km | The area of wetlands and surface water ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) withir 1 km is: |  | See definition of adjacent in OF2. If the AA's wetland vegetation extends beyond 1 km , include only the part within 1 km "Ponded" means not flowing in rivers or streams. [Sens, WBF] |
| 17 |  |  | 40.01 hectare (about $10 \mathrm{~m} \mathrm{\times 10} \mathrm{~m}$ ). | 0 |  |
| 18 |  |  | 0.01-0.1 hectare. | 0 |  |
| 19 |  |  | 0.1-1 hectare. | 0 |  |
| 20 |  |  | 1 to 10 hectares. | 0 |  |
| 21 |  |  | 10 to 100 hectares. | 1 |  |
| 22 |  |  | $>100$ hectares. | 0 |  |
| 23 | OF4 | Size of Largest Nearby Vegetated Tract or Corridor | The largest vegetated patch or corridor that includes the AA's vegetation plus alladjacent upland vegetation that is not lamn, row crops, heavily grazed lands, conifer plantation is: |  | See definition of adjacent in OF2. Use Google Earth Pro's polygon ruler (as described above). <br> Exclude conifer plantations only if it is obvious that trees were planted in rows. [AM, PH, SBM, Sens] |
| 24 |  |  | $<0.01$ hectare (about $10 \mathrm{~m} \mathrm{\times 10} \mathrm{~m}$ ). | 0 |  |
| 25 |  |  | 0.01-0.1 hectare. | 0 |  |
| 26 |  |  | 0.1-1 hectare. | 0 |  |
| 27 |  |  | 1 to 10 hectares. | 0 |  |
| 28 |  |  | 10 to 100 hectares. | 0 |  |
| 29 |  |  | 100 to 1000 hectares. | 1 |  |
| 30 |  |  | >1000 hectares. [This is nearly a/ways the answer in relatively undeveloped landscapes.] | 0 |  |


|  | A | B | C | D | E |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 31 | OFS | Distance to Large Vegetated Tract | The minimum distance from the edge of the AA to the edge of the closestvegetated land (but excluding row crops, lamn, conifer plantation) larger than 375 hectares (about 2 km on a side), is: |  | To measure distance, use Google Earth Pro (Ruler > Line tool). The 375 -ha criterion is from the Fundy Model Forest Project. [AM, PH, POL, SBM, Sens] |
| 32 |  |  | $<50 \mathrm{~m}$, and not separated from the 375 -ha vegetated area by any width ofpaved roads, stretches of open water, row crops, bare ground, lawn, or impervious surface. Or the $A A$ itself contains $>375$ ha of vegetation. [This is often the answer in relatively undeveloped landscapes.] | 0 |  |
|  |  |  | 40 m , but completely separated from the 375-ha vegetated area by those features, and AA does not contain $>375$ ha of vegetation. | 0 |  |
| 34 |  |  | 50-500 m, and not separated. | 0 |  |
| 35 |  |  | 50-500 m, but separated by those features. | 0 |  |
| 36 |  |  | $0.5-5 \mathrm{~km}$, and not separated. | 0 |  |
| 37 |  |  | $0.5-5 \mathrm{~km}$, but separated by those features. | 1 |  |
| 38 |  |  | None of the above (the closest patches or corridors which are that large are $>5 \mathrm{~km}$ away). | 0 |  |
| 39 | OF6 | Herbaceous Uniqueness | The AA's vegetation cover is $>10 \%$ herbaceous* but uplands within 5 km have $<10 \%$ herbaceous cover. If so, enter " 3 " and continue to OF7. If not, consider: <br> The AA's vegetation cover is $>10 \%$ herbaceous* but uplands within 1 km have $<10 \%$ herbaceous cover. If so enter " 2 " and continue to Of7. If not, consider: <br> The AA's vegetation cover is $>10 \%$ herbaceous* but uplands within 100 m of the wetland edge have $<10 \%$ herbaceous cover. If so, enter "1". <br> [* NOTE: Exclude lamns, row crops, heavily grazed lands, forest, shrublands. Include moss as well as grasslike plants in this use of "herbaceous vegetation'] | 1 | For this question only, consider moss to be herbaceous vegetation. Determine the score by vieving aerial imagery in Google Earth after successively drawing or estimating the boundaries of the buffers of $5 \mathrm{~km}, 1 \mathrm{~km}$, and 100 m radius focused on the center of the AA. Circles of specified radius can be dramn in Google Earth Pro by clicking on the Ruler icon, then Circle in the pop-up menu. [AMN, PHN, POLv, SBMN, WBFv, WBNv] |
| 40 | OF1 | Woody Uniqueness | The AA's vegetation cover is $>10 \%$ woody* but uplands within $5 \mathrm{kmhave}<10 \%$ woody cover. If so, enter " 3 " and continue to OF8. If not, consider: <br> The AA's vegetation is $>10 \%$ woody ${ }^{\star}$ but uplands within 1 km have $<10 \%$ woody cover. If so enter " 2 " and continue to OF8. If not, consider: <br> The AA's vegetation is $>10 \%$ woody ${ }^{\star}$ but uplands within 100 m of the wetland edge have $<10 \%$ woody cover. If so, enter " 1 " <br> [* NOTE: woody cover = trees \& shrubs taller than 1 m ] | 0 | See above. Do not consider conifer plantations to be forest if it is obvious that trees were planted in rows. [AMN, PHV, POLv, SBMN] |
| 41 | OF8 | Local Vegetated Cover Percentage | Draw a 5 -km radius circle measured from the center of the AA. Ignoring all permanent water in the circle, the percent of the remaining are that is wooded or unmanaged herbaceous vegetation (NOT lawn, row crops, bare or heavily grazed land, clearcuts, or conifer plantations) is: |  | In Google Earth, draw the 5 km buffer and then estimate land cover percentages, or do GIS analysis of an appropriate land cover layer. [AM, PH, POL, SBM, Sens] |
| 42 |  |  | -5\% of the land. | 0 |  |
| 43 |  |  | 5 to 20\% of the land. | 0 |  |
| 44 |  |  | 20 to 60\% of the land. | 1 |  |
| 45 |  |  | 60 to $90 \%$ of the land. | 0 |  |
| 46 |  |  | >90\% of the land. SKIP to OF10. | 0 |  |
| 47 | OF9 | Type of Land Cover | Wthin the 5 -km radius circle, and ignoring all permanent water, the land area that is bare or non-perennial cover is mostly: |  | [AM, SBM] |
| 48 |  |  | Impervious surface, e.g., paved road, parking lot, building, exposed rock. | 0 |  |
| 49 |  |  | Bare pervious surface, e.g., lawn, recent (< 5 yrs ago) clearcut, dirt or gravel road, cropland, landslide, conifer plantation. | 1 |  |
| 50 | OF10 | Distance by Road to Nearest Population | Measured along the maintained road nearest the A , the distance to the nearestpopulation center is: |  | "Population center" means a settled area with more than about 5 regularly- inhabited structures per square kilometer In Google Earth Pro, click on the Ruler icon, then Path, and draw and measure the |
| 51 |  | Center | $<100 \mathrm{~m}$. | 0 |  |
| 52 |  |  | 100-500 m. | 1 |  |
| 53 |  |  | $0.5-1 \mathrm{~km}$ | 0 |  |
| 54 |  |  | $1-5 \mathrm{~km}$ | 0 |  |
| 55 |  |  | -5km | 0 |  |
| 56 | OF11 | Distance to Nearest Maintained Road | From the center of the AA, the distance to the nearest maintained public road (dirt or paved) is: |  | Determine this by viewing aerial imagery in Google Earth Pro and measuring with the Ruler>Line |
| 57 |  |  | $<10 \mathrm{~m}$ | 0 |  |
| 58 |  |  | 10-25m. | 1 |  |
| 59 |  |  | 25-50m. | 0 |  |
| 60 |  |  | 50-100 m. | 0 |  |
| 61 |  |  | 100-500m. | 0 |  |
| 62 |  |  | >500 m. | 0 |  |


|  | A | B | C | D | E |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 63 | OF12 | Wildife Access | Draw a circle of radius of 5 km from the center of the $A A$ If marmals and amphibians can move from the center of the $A A$ to $A L L$ other separate wetlands and ponds located within the circle without being forced to cross pavement (any width), lawns, bare ground, and/or marine waters, mark $1=$ yes can move to all, $0=$ no. Change toblank if there are no other wetlands within 5 km . | 0 | Draw the 5 km circle in Google Earth Pro using the Circle tool and search for roads and wetlands within it, being alert for roads hidden under forest canopy. [AM, SBM, STR] |
| 64 | OF13 | Distance to Ponded Water | The distance from the AA center to the closest (but separate) ponded water body visible in Google Earth imagery is: |  | In Google Earth Pro, zoom in closely to examine the surrounding landscape for ponds, lakes, and wetlands that appear to be permanently flooded. [AM, PH, SBM, Sens, WBF, WBN] |
| 65 |  |  | -50 m, and not separated by any width of paved roads, stretches of open water, row crops, lamn, bare ground, or impervious surface. | 0 |  |
| 66 |  |  | 50 m , but completely separated by those features. | 0 |  |
| 67 |  |  | $50-500 \mathrm{~m}$, and not separated. | 0 |  |
| 68 |  |  | $50-500 \mathrm{~m}$, but separated by those features. | 0 |  |
| 69 |  |  | $0.5-1 \mathrm{~km}$, and not separated. | 0 |  |
| 70 |  |  | $0.5-1 \mathrm{~km}$, but separated by those features. | 1 |  |
| 71 |  |  | None of the above (the closest patches or corridors that large are >1 km away). | 0 |  |
| 72 | OF14 | Distance to Large Ponded Water | The distance from the AA center to the closest (but separate)non-tidal body of water that is ponded during most of the year and islarger than 8 hectares during most of a normal year is: |  | Determine this by viewing aerial imagery in Google Earth. [Sens, WBF, WBN] |
| 73 |  |  | $<100 \mathrm{~m}$ | 0 |  |
| 74 |  |  | $100 \mathrm{~m}-1 \mathrm{~km}$ | 0 |  |
| 75 |  |  | 1-2km. | 0 |  |
| 76 |  |  | 2-5 km | 0 |  |
| 77 |  |  | $5-10 \mathrm{~km}$ | 1 |  |
| 78 |  |  | $>10 \mathrm{~km}$ | 0 |  |
| 79 | OF15 | Tidal Proximity | The distance from the AA edge to the closesttidal water body (regardless of its salinity) is: |  | In Google Earth, measure the distance to the ocean (including Bay of Fundy) or tidal river, whichever is closer. If you need to see how far upriver a river is tidal, see the KNZ file provided with this calculator for NS (NS Headtide). Points shown in those files are only an approximation, so local information if available may be preferable. [FA, WBF] |
| 80 |  |  | $\angle 100 \mathrm{~m}$ | 0 |  |
| 81 |  |  | $100 \mathrm{~m}-1 \mathrm{~km}$ | 0 |  |
| 82 |  |  | $1-5 \mathrm{~km}$ | 0 |  |
| 83 |  |  | $5-10 \mathrm{~km}$ | 0 |  |
| 84 |  |  | $10-40 \mathrm{~km}$ | 1 |  |
| 85 |  |  | $>40 \mathrm{~km}$ | 0 |  |


|  | A | B | C | D | E |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 86 | OF16 | Upland Edge Contact | Select one: |  | [ NR , SBM, Sens] |
|  |  |  | The AA has no upland edge (or upland is <1\% of perimeter). The AA is entirely surrounded by (\& contiguous with) other wetlands or water. | 0 |  |
|  |  |  | 1-25\% of the AA's perimeter abuts upland (including filled areas). The rest adjoins other wetlands or water that is mostly wider than the AA | 0 |  |
| 89 |  |  | 25-50\% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA. | 0 |  |
| 90 |  |  | $50-75 \%$ of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA | 0 |  |
| 91 |  |  | More than $75 \%$ of the AA's perimeter abuts upland. Any remainder adjoins other wetlands or water that is mostly wider than the AA. This will be true for most assessments done with WESP-AC. | 1 |  |
| 92 | OF17 | Food Damage fromNon tidal Waters | Wthin 5 km downstream or downslope of the AA (select first true choice): |  | Contact local authories to determine if such maps exist. Where available, LDAR imagery can provide finer elevational resolution useful for flood modeling. [WSV] |
| 93 |  |  | Maps show Flood Zone or Flood Risk areas and there appears to be infrastructure vulnerable to river flooding not caused by tidal storm surges. | 0 |  |
| 94 |  |  | Maps show Food Zone or Flood Risk areas, but infrastructure is absent or is not vulnerable to floods from a non-tidal river. In some cases levees, upriver dams, or other measures may partly limit damage or risk from smaller events. | 0 |  |
| 95 |  |  | Maps do not show Food Zone or Food Risk areas (or no such mapping has been done locally) and there appears to be infrastructure vulnerable to river flooding unrelated to tidal storm surges. | 0 |  |
| 96 |  |  | Maps do not show Flood Zone or Food Risk areas (or no such mapping has been done locally) and there isno infrastructure vulnerable to river flooding unrelated to tidal storm surges. | 1 |  |
| 97 | OF18 | Relative Elevation in Watershed | In Google Earth, enable the Terrain layer (lower left menu) and open the NS_Watersheds Secondary KMZ file that accompanies this calculator. Then determine the AA's approximate elevation (bottom right, NOT the "eye alt'). Then move cursor around to determine the watershed's maximum and minimum elevation. Divide the AA's elevation by the (max-min). | 0.01 | [FA, NR, Sens, SFSV, WCV, WSv] |
| 98 | OF19 | Water Quality Sensitive Watershed or Area | The AA is in a Protected Water Supply area (Designated Water Supply Area, Natural Watershed Municipal Surface Water Supply Area, or Municipal Water Supply Area) according to the provided KMZ overlay ("NS Protected Water Supply Areas'). Enter 1= yes, 0= no. | 0 | If an ACCDC report is available for this AA, it also may contain such information. [NRV] |


|  | A | B | C | D |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 99 |  | Degraded Water Upstream | Sampling indicates a problem with concentrations of metals, hydrocarbons, nutrients, or other substances (excluding bacteria, acidic water, high temperatures) being present at levels harmful to aquatic life or humans, and: |  | May use existing data, or sample those waters as part of this wetland assessment. "Harmful" should be evaluated with regard to current federal or provincial water quality standards. [AM, FA, FR, NRV, PRV, SRV, STR, WBF, WBN] |
| 100 |  |  | The condition is present within the AA | 0 |  |
| 101 |  |  | The condition is present in waters within 1 km that flowinto the AA, but has not been documented in the AA itself. | 0 |  |
| 102 |  |  | Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters. | 0 |  |
| 103 |  |  | Data are insufficient (no or inadequate sampling within 1 km , or condition exists only at $>1 \mathrm{~km}$ upstream). This is the situation for nearly all wetlands in this region. | 1 |  |
| 104 | OF21 | Degraded | The problem described above is downslope fromthe AA, and: |  | May use existing data, or monitor waters as part of this wetland assessment. [NRV, PRv, SRV] |
| 105 |  | Donnstream | The condition is present within 1 km downslope and connected to the AA by a channel. | 0 |  |
| 106 |  |  | The condition is present within 5 km downslope and connected to the AA by a channel, or within 1 km but not connected to the AA by a channel. | 0 |  |
| 107 |  |  | Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters. | 0 |  |
| 108 |  |  | Data are insufficient (no or inadequate sampling within 1 km , or condition exists only at $>1 \mathrm{~km}$ upstream). This is the situation for nearly all wetlands in this region. | 1 |  |
| 109 | OF22 | Wetland as a \% of Its Contributing Area (Catchment) | From a topographic map and field observations, estimate the approximate boundaries of the catchment (CA) of the entire wetland of which the AA may be only a part. Then adjust those boundaries if necessary based on your field observations of the surrounding terrain, and/or by using procedures described in the Manual. Divide the area of the wetland (not just the $A A$ ) by the approximate area of its catchment excluding the area of the wetland itself. When doing the calculation, if ponded water is adjacent to the wetland, include that in the wetland area. The result is: |  | Topographic maps may be viewed online at the National Atlas of Canada (Toporama): http://atlas.gc.ca/toporama/en/index.htmI [NR, PR, Sens, SR, WS] |
| 110 |  |  | <0.01, or catchment size unknown due to stormwater pipes that collect water from an indeterminate area. | 1 |  |
| 111 |  |  | 0.01 to 0.1. | 0 |  |
| 112 |  |  | 0.1 to 1. | 0 |  |
| 113 |  |  |  | 0 |  |
| 114 | OF23 | Unvegetated Surface in the Contributing Area | The proportion of the AA's contributing area (measured to no more than 1000 m upslope) that is comprised of buildings, roads, parking lots other pavement, exposed bedrock, landslides, and other mostly-bare surface is about : |  | [FA, INV, NRV, PRV, SRv, STR, WCV, WSV] |
| 115 |  |  | <10\% | 0 |  |
| 116 |  |  | 10 to $25 \%$ | 0 |  |
| 117 |  |  | >25\% | 1 |  |
| 118 | OF24 | Transport From Upslope | A relatively large proportion of the precipitation that falls farther upslope in the CA reaches this wetland quickly as runoff (surface water), as indicated by the following: <br> (a) input channel is present, <br> (b) input channels have been straightened, <br> (c) upslope wetlands have been ditched extensively, <br> (d) land cover is mostly non-forest, <br> (e) CA slopes are steep, and/or <br> (f) most CA soils are shallow (bedrock near surface) and/or have high runoff coefficients. <br> This statement is: |  | [NRV, PRV, SRv, WSU] |
| 119 |  |  | Mostly true. | 0 |  |
| 120 |  |  | Somenhat true. | 1 |  |
| 121 |  |  | Mostly untrue. | 0 |  |
| 122 | OF25 | Aspect | The overland flow direction of most surface water (in streams, rivers, or runoff) that enters the AA is: |  | [AM, NR, SFS, WC, WS] |
| 123 |  |  | Northward (N, NE). north-facing contributing area | 0 |  |
| 124 |  |  | Southward (S, SW). south-facing contributing area. | 0 |  |
| 125 |  |  | Other (E, SE, W, M M), or no detectable uphill slope or input channel (flat). | 1 |  |
| 126 <br> 127 | OF26 | Internal FowDistance (Path Length) | The horizontal flow distance from the wetland's inlet to outlet is: <br> 10 m | 0 | Identify inlets and outlets, if any, from topographic maps (use elevations to determine which are inlets and which are outlets) and augment by field inspection. With the Provincial Landscape Viewer, select Nova.Scotia Tonnas the Baseman Also enable the laver ForestnsW/AM Predicted Flow Then |





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| 19 |  |  | deciduous trees taller than 3 m | 3 |  |
| 20 |  |  | coniferous or ericaceous shrubs or trees 1-3 mtall not directly below the canopy of trees. | 1 |  |
| 21 |  |  | deciduous shrubs or trees 1-3 mtall not directly below the canopy of trees. | 4 |  |
| 22 |  |  | Coniferous or ericaceous shrubs <1 mtall not directly below the canopy of taller vegetation. | 1 |  |
| 23 |  |  | deciduous shrubs or trees $<1 \mathrm{mtall}$ (e.g., deciduous seedlings) not directly below the canopy of taller vegetation. | 2 |  |
| 24 | Note: If none of top 4 rows in F3 was marked 2 or greater, SKIP to F9 ( N fixers). |  |  |  |  |
| 25 | F4 | Dominance of Most Abundant Shrub Species | Determine which two woody plant species comprise the greatest portion of the low ( $\langle<\mathrm{m}$ ) woody cover. Then choose one: |  | [PH, POL, SBM, Sens] |
| 26 |  |  | those species together comprise $>50 \%$ of such cover. | 1 |  |
| 27 |  |  | those species together do not comprise $>50 \%$ of such cover. | 0 |  |
| 28 | F | Woody Diameter Classes | Mark $A \amalg$ the types that comprise $>5 \%$ of the woody canopy cover in the $A A$ or $>5 \%$ of the wooded areas (if any) along its upland edge (perimeter). The edge should include only the trees whose canopies extend into the AA |  | Estimate the diameters at chest height. If small-diameter trees are overtopped (shaded) by larger ones, visualise a "subcanopy" at the average height of the smaller-dbh trees, to serve as a basis for the minimum $5 \%$ canopy requirement in this question. The trees and shrubs need not be wetland species. [AM, CS, POL, SBM, Sens, WBN] |
| 29 |  |  | coniferous, $1-9 \mathrm{~cm}$ diameter and $>1 \mathrm{~m}$ tall. | 1 |  |
| 30 |  |  | broad-leaved deciduous $1-9 \mathrm{~cm}$ diameter and $>1 \mathrm{mtall}$. | 1 |  |
| 31 |  |  | coniferous, $10-19 \mathrm{~cm}$ diameter. | 1 |  |
| 32 |  |  | broad-leaved deciduous $10-19 \mathrm{~cm}$ diameter. | 1 |  |
| 33 |  |  | coniferous, $20-40 \mathrm{~cm}$ diameter. | 1 |  |
| 34 |  |  | broad-leaved deciduous $20-40 \mathrm{~cm}$ diameter. | 1 |  |
| 35 |  |  | coniferous, 740 cm diameter. | 1 |  |
| 36 |  |  | broad-leaved deciduous $>40 \mathrm{~cm}$ diameter. | 1 |  |
| 37 | F6 | Height Class Interspersion | Follow the key below and mark the ONE row that best describes MOST of the AA: |  | [AM, INW, NR, PH, SBM, Sens] |
|  |  |  | A. Neither the vegetation taller than 1 m nor the vegetation shorter than that comprise $>70 \%$ of the vegetated part of the $A A$. They each comprise $30-70 \%$ Choose between A 1 and A 2 and mark the choice with a 1 in the adjoining colum. Otherwise go to B below. |  |  |
| 38 |  |  |  |  |  |
| 39 |  |  | A1 The two height classes are mostly scattered and intermixed throughout the AA | 1 |  |
| 40 |  |  | A2 Not A1. The two height classes are mostly in separate zones or bands, or in proportionately large clumps. | 0 |  |
| 41 |  |  | B. Ether the vegetation shorter than 1 m comprises $>70 \%$ of the vegetated part of the $A A$, or the vegetation taller than that does. One size class might even be totally absent. Choose between B1 and B2 and mark the choice with a 1 in the adjoining column: |  |  |
| 42 |  |  | B1 The less prevalent height class is mostly scattered and intermixed within the prevalent one. | 0 |  |
| 43 |  |  | B2. Not B1. The less prevalent height class is mostly located apart from the prevalent one, in separate zones or clumps, or is completely absent. | 0 |  |
| 44 | 7 | Large Snags (Dead Standing Trees) | The number of large snags (diameter $\mathbf{2 0} \mathbf{~ c m}$ ) in the AA plus adjacent upland area within 10 m of the wetland edge is: |  | Snags are dead standing trees that often (not always) lack bark and foliage. Include only ones that are at least 2 m tall. [POL, SBM, WBN] |
| 45 |  |  | None, or fever than $8 /$ hectare which exceed this diameter. | 1 |  |
| 46 |  |  | Several ( $>8 / \mathrm{hectare)}$ ) and a pond, lake, or slow-flowing water wider than 10 mis within 1 km | 0 |  |
| 47 |  |  | Several ( $>8$ hectare) but above not true. | 0 |  |
| 48 | F8 | Domned Wood | The number of downed wood pieces longer than $\mathbf{2 m}$ and with diameter $>10 \mathrm{~cm}$, and not persistently submerged, is: |  | Exclude temporay "bum piles." [AM, INV, POL, SBM] |
| 49 |  |  | Few or none that meet these criteria. | 0 |  |
| 50 |  |  | Several ( $>5$ if $A$ A is $>5$ hectares, less for smaller $A$ As) meet these criteria | 1 |  |
| 51 | F9 | NFixers | The percentage of the AA's vegetated cover that contains nitrogen-fixing plants (e.g., alder, sweetgale, clover, lupine, alfalfa, other legumes) is: |  | Do not include $N$-fixing algae or lichens. [FA, $\mathrm{PR}, \mathrm{IN}, \mathrm{NR}, \mathrm{N}, \mathrm{OE}, \mathrm{PH}, \mathrm{SBM}$, Sens] |
| 52 |  |  | <1\% or none. | 0 |  |
| 53 |  |  | 1-25\% of the vegetated cover, in the AA or along its water edge (whichever has more). | 0 |  |
| 54 |  |  | $25-50 \%$ of the vegetated cover, in the AA or along its water edge (whichever has more). | 0 |  |
| 55 |  |  | $50-75 \%$ of the vegetated cover, in the AA or along its water edge (whichever has more). | 1 |  |
| 56 |  |  | $>75 \%$ of the vegetated cover, in the AA or along its water edge (whichever has more). | 0 |  |
| 57 | F10 | Sphagnum Moss Extent | The cover of Sphagnum moss (or any moss that forms a dense cushion many centimeters thick), including the moss obscured by taller sedges and other plants rooted in it, is: |  | Exclude moss growing on trees and rocks. [CS, PH] |
| 58 |  |  | -5\% of the vegetated part of the AA | 0 |  |
| 59 |  |  | $5-25 \%$ of the vegetated part of the $A$ A | 1 |  |
| 60 |  |  | $25-50 \%$ of the vegetated part of the AA | 0 |  |
| 61 |  |  | $50-95 \%$ of the vegetated part of the AA | 0 |  |
| 62 |  |  | >95\% of the vegetated part of the AA | 0 |  |



|  | A | B | C | D | E |
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| 103 |  |  | 50-95\% of the vegetated area | 0 |  |
| 104 |  |  | -95\% of the vegetated area | 0 |  |
| 105 | F19 | Dominance of Most Abundant Herbaceous | Determine which two herbaceous species comprise the greatest portion of the herbaceous cover (excluding mosses and floating-leaved aquatic plants). Then choose one of the following: |  | For this question, indude fems as well as graminoids and forbs. [EC, IN, PH, POL, Sens] |


|  | A | B | C | D | E |
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| 106 |  | Species | those species together comprise $>50 \%$ of the areal cover of herbaceous plants at any time during the year. | 0 |  |
| 107 |  |  | those species together do not comprise $>50 \%$ of the areal cover of herbaceous plants at any time during the year. | 1 |  |
| 108 | F20 | Invasive Plant Cover | How extensive is the cover of invasive plant species in the AA? For species, see Plants_irvasive worksheet in the accompanying Supplnfo file. |  | [EC, PH, POL, Sens] |
| 109 |  |  | invasive species appear to be absent in the AA, or are present only in trace amount (a few individuals). | 1 |  |
| 110 |  |  | invasive species are present in more than trace amounts, but comprise $<5 \%$ of herbaceous cover (or woody cover, if the invasives are woody). | 0 |  |
| 111 |  |  | invasive species comprise 5-20\% of the herb cover (or woody cover, if the invasives are woody). | 0 |  |
| 112 |  |  | invasive species comprise $20-50 \%$ of the herb cover (or woody cover, if the invasives are woody). | 0 |  |
| 113 |  |  | invasive species comprise $>50 \%$ of the herb cover (or woody cover, if the invasives are woody). | 0 |  |
| 114 | F21 | Invasive Cover Along Upland Edge | Along the wetland-upland boundary, the percent of the upland edge (within 3 m upslope from the wetland) that is occupied by invasive plant species is: |  | If a plant cannot be identified to species (e.g., winter conditions) but its genus contains an exotic species, assume the unidentified plant to also be exotic. If vegetation is so senesced that exotic species cannot be identified, answer "none". [PH, STR] |
| 115 |  |  | none of the upland edge (irvasives apparently absent), or $A \mathrm{~A}$ has no upland edge. | 0 |  |
| 116 |  |  | some (but $<5 \%$ ) of the upland edge. | 1 |  |
| 117 |  |  | 5-50\% of the upland edge. | 0 |  |
| 118 |  |  | most ( $>50 \%$ ) of the upland edge. | 0 |  |
| 119 | F22 | Fringe Wetland | During most of the year, open water within or adjacent to the vegetated part of the wetland is much wider than the maximum width of the vegetated zone within the wetland. Enter " 1 " if true, " 0 " if false. | 0 | [WBF, WBN, WCV] |
| 120 | F23 | Lacustrine Wetland | The vegetated part of the AA is within or adjacent to a body of non-tidal standing open water whose size exceeds8 hectares during most of a normal year. | 0 | [ $\mathrm{FR}, \mathrm{PR}, \mathrm{PU}, \mathrm{WBF}, \mathrm{WBN}$ ] |
| 121 | F24 | \% of AA Without Surface Water | The percentage of the AA that never contains surface water during an average year (that is, except perhaps for a few hours after snommelt on rainstorms), but which is still a wetland, is: |  | 1 hectare is 10,000 sq. mor about 2.5 acres. It could have dimensions of $100 \mathrm{mby} 100 \mathrm{~m}, 1000 \mathrm{mby}$ 10 m , or similar. [AM, FA, $\nrightarrow \mathrm{R}, \mathrm{IN}, \mathrm{NR}, \mathrm{PH}, \mathrm{PR}, \mathrm{SBM}$, Sens, SRv, WBF, WBN, WC] |
| 122 |  |  | <1\%. In other words, all or nearly all of the AA is covered by water permanently or at least seasonally. | 0 |  |
| 123 |  |  | $1-25 \%$ of the AA , or $<1 \%$ but $>0.01$ ha never contains surface water. | 0 |  |
| 124 |  |  | 25-50\% of the AA never contains surface water. | 0 |  |
| 125 |  |  | $50.75 \%$ of the AA never contains surface water. | 1 |  |
|  |  |  | 75-99\% of the AA never contains surface water, or >99\%AND there is at least one persistent water body larger than 1 ha in the AA | 0 |  |
| 127 |  |  | 99-100\% AND there is no persistent ponded water body larger than 1 ha within the AA. Enter "1" andSKIP to F42 (Channel Connection). | 0 |  |
| 128 | F25 | \% of AA vith Persistent Surface Water | Identify the parts of the AA that still contain surface water (flowing or ponded, open or hidden beneath vegetation) even during the driest times of a normal year, i.e., when the AA's surface water is at its lowest annual level. At that time, the percentage of the AA that still contains surface water is: |  | If you are unable to determine the condition at the driest time of year, ask the land owner or neighbors about it if possible. Indicators of persistence may include fish, some dragonflies, beaver, and muskrat. [AM, CS, FA, FR, INV, NR, POL, PR, SBM, WBF, WBN] |
| 129 |  |  | None. The AA dries up completely (no water in channels either) or never has surface water during most years. SKAP to F27. | 0 |  |
| 130 |  |  | 1-20\% of the AA | 0 |  |
| 131 |  |  | 20-50\% of the AA | 1 |  |
| 132 |  |  | 50-95\% of the AA | 0 |  |
| 133 |  |  | >95\% of the AA True for many fringe wetlands. | 0 |  |
| 134 | F26 | \% of SurmertimeWater that Is Shaded | At mid-day during the warmest time of year, the area of surface waterwithin the AA that is shaded by vegetation and other features that are within the AA at that time is: |  | [FA, WC] |
| 135 |  |  | -5\% of the water is shaded, or no surface water is present then. | 0 |  |
| 136 |  |  | $5-25 \%$ of the water is shaded. | 1 |  |
| 137 |  |  | 25-50\% of the water is shaded. | 0 |  |
| 138 |  |  | 50-75\% of the water is shaded. | 0 |  |
| 139 |  |  | >75\% of the water is shaded. | 0 |  |
| 140 | F27 | \% of AA that is fooded Only Seasonally | The percentage of the AA's area that is between the annual high water and the annual low water (surface water) is: |  | Flood marks (algal mats, adventitious roots, debris lines, ice scour, etc.) are often evident when not fully inundated. Aso, such areas often have a larger proportion of upland and annual (vs. perennial) plant species. In riverine systems, the extent of this zone can be estimated by multiplying by 2 the bankful height and visualising where that would intercept the land along the river. [CS, FA, INV, NR, OE, PH, SR, WBF, WBN, WS] |
| 141 |  |  | None, or <0.01 hectare and <1\% of the AA SKIP to F29. | 0 |  |
| 142 |  |  | 1-20\% of the AA, or $<1 \%$ but $>0.01$ ha | 0 |  |
| 143 |  |  | 20-50\% of the AA | 0 |  |





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| 24 | F51 | Internal Gradient | The gracient along most of the flow path within the $A$ A is: |  | This is not the same as the shoreline slope. It is the elevational difference between the AA's inlet and outlet, divided by the flow-distance between them and corverted to percent. If available, use a clinometer to measure this. Free clinometer apps can be downloaded to smartphones. If the wetland is large (longer than $\sim 1 \mathrm{~km}$ ), this may be estimated using Google Earth to determine the minimum and maximum elevation within the $A A$, then dividing by length and multiplying by 100 . [CS, $N R, O E, P R$, SR, WBF, WBN, WS] |
| 242 |  |  | < $2 \%$ or the AA has no surface water outtet (not even seasonally). | 0 |  |
| 243 |  |  | 2-5\% | 1 |  |
| 244 |  |  | 6-10\% | 0 |  |
| 245 |  |  | >10\% | 0 |  |
| Note for the next three questions: If the AA lacks an upland edge, evaluate based on the AA's entire perimeter, and moving outward into whatever areas 246 are adjacent. In many situations, these questions are best answered by measuring from aerial images. |  |  |  |  |  |
|  | F52 | Vegetated Buffer as \% of Perimeter | Wthin a zone extending 30 m laterally from the AA's edge with upland and/or other wetlands, the percentage that containsperennial vegetation cover (except lamns, row crops, heavily grazed land, conifer plantations) is: |  | [AM, FA, FR, INV, NRV, PH, POL, PRV, SBM, Sens, SRv, STR, WBN] |
|  |  |  | -5\% | 0 |  |
| 249 |  |  | 5 to 30\% | 0 |  |
| 250 |  |  | 30 to 60\% | 0 |  |
| 251 |  |  | 60 to 90\%/ | 1 |  |
| 252 |  |  | >90\%, or all the area within 30 m of the AA edge is other wetlands. SKIP to F55. | 0 |  |
| 253 | F53 | Type of Cover in Buffer | Wthin 30 m upslope of where the wetland transitions to upland, the upland land cover that is NOT perennial vegetation is mostly (mark ONE): |  | [AM, FA, INN, NRV, PH, POL, SBM, STR, WBN] |
| 254 |  |  | Impervious surface, e.g., paved road, parking lot, building, exposed rock. | 1 |  |
| 255 |  |  | Bare or nearly bare pervious surface or managed vegetation, e.g., lamn, row crops, unpaved road, dike, landslide. | 0 |  |
| 256 | F54 | Buffer Slope | The steepest and/or most disturbed part of the upland area that is within 30 m of the wetland and occupies $>10 \%$ of that upland area has a percent slope of: |  | [NRN, PRN, Sens, SRV] |
| 257 |  |  | $<1 \%$ (flat -- almost no noticeable slope) or all the area within 30 mof the $A$ A edge is other wetlands. | 0 |  |
| 258 |  |  | 2-5\% | 0 |  |
| 259 |  |  | 5-30\% | 0 |  |
| 260 |  |  | >30\% | 1 |  |
| 261 | F55 | Cliffs or Steep Banks | In the AA or within 100 m , there are elevated terrestrial features such as cliffs, talus slopes, stream banks, or excavated pits (but not riprap) that extend at least 2 m nearly vertically, are unvegetated, and potentially contain crevices or other substrate suitable for nesting or den areas. Enter 1 (yes) or 0 (no). | 0 | Do not include upturned trees as potential den sites. [POL, SBM] |
| 262 | F56 | New or Expanded Wetland | Human actions within or adjacent to the AA have persistently expanded a naturally occurring wetland or created a wetland where there previously was none (e.g., by excavation, impoundment): |  | Determine this using historical aerial photography, old maps, soil maps, or permit files as available [CS, NR, OE, PH, Sens] |
| 263 |  |  | No. | 0 |  |
| 264 |  |  | Yes, and created or expanded 20-100 years ago. | 0 |  |
| 265 |  |  | Yes, and created or expanded $3-20$ years ago. | 0 |  |
| 266 |  |  | Yes, and created or expanded within last 3 years. | 0 |  |
| 267 |  |  | Yes, but time of origin or expansion unknown. | 0 |  |
| 268 |  |  | Unknown if new or expanded within 20 years or not. | 1 |  |
| 269 | F57 | Burn History | More than $1 \%$ of the AA's previously vegetated area: |  | Look for chared soil or stumps (in multiple widely-spaced locations) or ask landowner. [CS, PH, STR] |
| 270 |  |  | Burned within past 5 years. | 0 |  |
| 271 |  |  | Burned 6-10 years ago. | 0 |  |
| 272 |  |  | Burned 11-30 years ago. | 0 |  |
| 273 |  |  | Burned $>30$ years ago, or no evidence of a burn and no data. | 1 |  |
| 274 | F58 | Visibility | The maximum percentage of the wetland that is visible from the best vantage point on public roads, public parking lots, public buildings, or public maintained trails that intersect, adjoin, or are within 100 m of the $A A$ (select one) is: |  | [PU, STR, WBFV] |
| 275 |  |  | 25\%/ | 0 |  |
| 276 |  |  | 25-50\%/ | 0 |  |
| 277 |  |  | -50\% | 1 |  |
| 278 | F59 | Non-consumptive Uses - Actual or Potential | Assuming access permission was granted, select $A \amalg$ statements that are true of the $A A$ as it currently exists: |  | [PU, STR] |
| 279 |  |  | For an average person, walking is physically possible in (not just near) $>5 \%$ of the AA during most of the growing season, e.g., free of deep water and dense shrub thickets. | 1 |  |
| 280 |  |  | Maintained roads, parking areas, or foot-trails are within 10 m of the $A A$, or the $A A$ can be accessed part of the year by boats arriving via contiguous waters. | 1 |  |
| 281 |  |  | Wthin or near the AA , there is an interpretive center, trails with interpretive signs or brochures, and/or regular guided interpretive tours. | 0 |  |


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| 282 | F60 | Unvisited Core Area | The percentage of the AA almost never visited by humans during an average growing season probably comprises: [ Note: Only include the part actually walked or driven (not simply viewed from) with a vehicle or boat. Do not include visitors on trails outside of the AA unless more than half the wetland is visible from the trails and they are within 30 mof the wetland edge. In that case include only the area occupied by the trail.] |  | [AM, FAv, PRv, PH, PU, SBM, STR, WBF, WBN] |
| 283 |  |  | -5\% and no inhabited building is within $100 \mathrm{mof} \mathrm{the} A$ A | 0 |  |
| 284 |  |  | -5\% and inhabited building is within 100 mof the $A$ A | 0 |  |
| 285 |  |  | $5-50 \%$ and no inhabited building is within 100 m of the $A$ A | 0 |  |
| 286 |  |  | $5-50 \%$ and inhabited building is within 100 m of the $A$ A | 0 |  |
| 287 |  |  | 50-95\%, with or without inhabited building nearby. | 0 |  |
| 288 |  |  | >95\% of the AA with or without inhabited building nearby. | 1 |  |
| 289 | F61 | Frequently Visited Area | The part of the AA visited by humans almost daily for several weeks during an average growing season probably comprises: [See note above.] |  | [AM, PH, PU, SBM, STR, WBF, WBN] |
| 290 |  |  | -5\% If F60 was answered ">95\%' (mostly never visited), SKIP to F64. | 1 |  |
| 291 |  |  | 5-50\% | 0 |  |
| 292 |  |  | 50-95\% | 0 |  |
| 293 |  |  | >95\% of the AA | 0 |  |
| 294 | F62 | BMP - Soils | Boardwalks, paved trails, fences or other infrastructure and/or well-enforced regulations appear to effectively prevent visitors from walking on soil within nearly all of the AA when the soil is unfrozen. Enter " 1 " if true. | 0 | [PH, PU] |
| 295 | F63 | BMP - Wildlife Protection | Fences, observation blinds, platforms, paved trails, exclusion periods, and/or well-enforced prohibitions on motorised boats, off-leash pets, and off road vehicles appear to effectively exclude or divert visitors and their pets from the $A A$ at critical times in order to minimize disturbance of wildlife (except during hunting seasons). Enter "1" if true. | 0 | [AM, PU, WBF, WBN] |
| 296 | F64 | Consumptive Uses (Provisioning Services) | Recent evidence was found within the AA of the following potentially-sustainable consumptive uses. Select ALL that apply. |  | [FAv, Rev, WBFV] |
| 297 |  |  | Low-impact commercial timber harvest (e.g., selective thinning). | 0 |  |
| 298 |  |  | Commercial or tracitional-use havesting of native plants, their fruits, or mushrooms. | 0 |  |
| 299 |  |  | Waterfowl hunting. | 0 |  |
| 300 |  |  | Fshing. | 0 |  |
| 301 |  |  | Trapping of furbearers. | 0 |  |
| 302 |  |  | None of the above. | 1 |  |
| 303 | F65 | Domestic Wells | The closest wells or water bodies that currently provide drinking water are: |  | [NRN] |
| 304 |  |  | Muthin 0-100 m of the AA | 0 |  |
| 305 |  |  | $100-500 \mathrm{~m}$ away. | 0 |  |
| 306 |  |  | -500 m away, or no information. | 1 |  |
| 307 | F66 | Calcareous Fen | The AA is, or is part of, a calcareous fen. See the Plants_Calcar worksheet in the accompanying Supplnfo file for list of plant indicators (calciphiles). Enter 1 If more than two Strong or more than five Moderate calciphile species are present; otherwise enter 0 , but if not able to identify those and no information, change to blank. | 0 | [ $\mathrm{PH}, \mathrm{PR}]$ |



| S3 | Accelerated Inputs of Nutrients |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | In the last column, place a check mark next to any item - occurring in either the wetland or its CA - that is likely to have accelerated the inputs of nutrients to the wetland. [NRV, PRV, STR] |  |  |  |  |
|  | Stormwater or wastewater effluent (including failing septic systems), landfills. |  |  |  |  |
|  | Fertilizers applied to lamns, ag lands, or other areas in the CA |  |  |  |  |
|  | Livestock, dogs. |  |  |  |  |
|  | Artificial drainage of upslope lands. |  |  |  |  |
|  | If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly more nutrients, then leave the "O's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present. |  |  |  |  |
|  |  | Severe (3 points) | Medium (2 points) | Mild (1 point) |  |
|  | Type of loading: | High density of unmaintained septic, some types of industrial sources. | Moderate density septic, cropland, secondary wastewater treatment plant. | Livestock, pets, low density residential. | 0 |
|  | Frequency \& duration of input: | Frequent and year-round. | Frequent but mostly seasonal. | Infrequent \& during high runoff events mainly. | 0 |
|  | AA proximity to main sources (actual or potential): | 0-15m | 15-100 m or in groundwater. | In more distant part of contributing area. | 0 |
|  | - Sume |  |  |  | 0 |
|  |  |  |  | Stressor subscore= | 0.00 |


| S4 | Excessive Sediment Loading from Contributing Area |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | In the last column, place a check mark next to any item present in the CA that is likely to have elevated the load of waterborne or windlorne sediment reaching the wetland fromits CA [FA, FR, IN, PH, SRV, STR] |  |  |  |  |
|  | Erosion from plowed fields, fill, timber harvest, dirt roads, vegetation clearing, fires. |  |  |  |  |
|  | Erosion from construction, in-channel machinery in the CA |  |  |  |  |
|  | Erosion from off-road vehicles in the CA |  |  |  | 1 |
|  | Erosion from livestock or foot traffic in the CA |  |  |  |  |
|  | Stormwater or wastewater effluent. |  |  |  |  |
|  | Sediment from road sanding, gravel mining, other mining, oil/ gas extraction. |  |  |  |  |
|  | Accelerated channel downcutting or headcutting of tributaries due to altered land use. |  |  |  |  |
|  | Other human-related disturbances within the CA |  |  |  |  |
|  | If any items were checked above, then for each row of the table below, assign points ( 3,2 , or 1 as shown in header) in the last column. However, if you believe the checked items did not cumulatively add significantly more sediment or suspended solids to the AA, then leave the "O's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present. |  |  |  |  |
|  |  | Severe (3 points) | Medium (2 points) | Mild (1 point) |  |
|  | Erosion in CA: | Extensive evidence, high intensity.* | Potentially (based on high-intensity ${ }^{\star}$ land use) or scattered evidence. | Potentially (based on low-intensity ${ }^{\star}$ land use) with little or no direct evidence. | 1 |
|  | Recentness of significant soil disturbance in the CA: | Current \& ongoing. | 1-12 months ago. | >1 yr ago. | 1 |
|  | Duration of sediment inputs to the wetland: | Frequent and year-round. | Frequent but mostly seasonal. | Infrequent \& during high runoff events mainly. | 1 |
|  | AA proximity to actual or potential sources: | 0-15m. | 15-100 m. | In more distant part of contributing area. | 1 |
|  | * high-intensity= extensive off-road vehicle use, plowing, grading, excavation, erosion with or without veg removal; low-intensity= veg removal only with little or no apparent erosion or disturbance of soil or sediment. |  |  | Sum= | 4 |
|  |  |  |  | Stressor subscore= | 0.33 |
| S5 | Soil or Sediment Alteration Within the Assessment Area |  |  |  |  |
|  |  (whichever is less). [CS, IMV, NR, PH, SR, STR] |  |  |  |  |
|  | Compaction from machinery, off-road vehicles, livestock, or mountain bikes, especially during wetter periods. |  |  |  |  |
|  | Leveling or other grading not to the natural contour. |  |  |  |  |
|  | Tillage, plowing (but excluding disking for enhancement of native plants). |  |  |  |  |
|  | Fill or riprap, excluding small amounts of upland soils containing organic amendments (compost, etc.) or small amounts of topsoil imported from another wetland. |  |  |  |  |
|  | Excavation. |  |  |  |  |
|  | Ditch cleaning or dredging in or adjacent to the wetland. |  |  |  |  |
|  | Boat traffic in or adjacent to the wetland and sufficient to cause shore erosion or stir bottom sediments. |  |  |  |  |
|  | Artificial water level or flow manipulations sufficient to cause erosion or stir bottom sediments. |  |  |  |  |
|  | If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not measurably alter the soil structure andlor topography, then leave the "O's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present. |  |  |  |  |
|  |  | Severe (3 points) | Medium (2 points) | Mild (1 point) |  |
|  | Spatial extent of altered soil: | >95\% of wetland or >95\% of its upland edge (if any). | 5-95\% of wetland or 5-95\% of its upland edge (if any). | $<5 \%$ of wetland and $<5 \%$ of its upland edge (if any). | 0 |
|  | Recentness of significant soil alteration in wetland: | Current \& ongoing. | 1-12 months ago. | $>1 \mathrm{yr}$ ago. | 0 |
|  | Duration: | Long-lasting, minimal veg recovery. | Long-lasting but mostly revegetated. | Shor-term, revegetated, not intense. | 0 |
|  | Timing of soil alteration: | Frequent and year-round. | Frequent but mostly seasonal. | Mainly during one-time or scattered events. | 0 |
|  | Sum= |  |  |  | 0 |



NOTE: A score of 0 does not mean the function or benefit is absent from the wetland. It means only that this wetland has a capacity that is equal or less than the lowest-scoring one, for that function or benefit, from among all the NS calibration wetlands that were assessed previously.

| Cover Page: Basic Description of Assessment | WESP-AC version 2 |
| :--- | :---: |
| Site Name: | 101 Cambridge WL-8 |
| Investigator Name: | BL, CP |
| Date of Field Assessment: | Coldbrook, NS |
| Nearest Town: | 369406.86 m E |
| Latitude (decimal degrees): |  |
| Longitude (decimal degrees): | 4991734.08 m N |
| Is a map based on a formal on-site wetland delineation available? | 891 m 2 |
| Approximate size of the Assessment Area (AA, in hectares): | 100 |
| AA as percent of entire wetland (approx.). Attach sketch map if AA is <br> smaller than the entire contiguous wetland. | 100 |
| What percent (approx.) of the wetland were you able to visit? | No |
| What percent (approx.) of the AA were you able to visit? | Yes |
| Were you able to ask the site owner/manager about any of the <br> questions? | Yes <br> Indicate here if you intentionally surveyed for rare plants, calciphile <br> plants, or rare animals: <br> Have you attended a WESP-AC training session? If so, indicate <br> approximate month \& year. <br> How many wetlands have you assessed previously using WESP-AC? <br> (approx.) <br> Comments about the site or this WESP-AC assessment (attach extra <br> page if desired): |


|  | A | B | C | D | E |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | Date: $\mathbf{2 8}$ Sept 2021 |  | Site Identifier: Cambridge wetland 8 | Investigator: BL, CP |  |
| 2 | Form OF (Office). Non-tidal Wetland Data Form. WESP-AC version 2 for Nova Scotia wetlands only. DIRECTIONS: Conduct an assessment only after reading the accompanying <br> Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answering many of the questions below will require using these online map viewers: <br> Google Earth Pro: https://www.google.com/earth/download/gep/agree.html <br> Provincial Landscape Viewer: https://nsgi.novascotia.ca/plv/ <br> For most wetlands, completing this office data form will require 1-2 hours. For a list of functions to which each question pertains, see bracketed abbreviations in the Definitions/Explanations column. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention \& Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV=Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM=Amphibian \& Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, \& Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use \& Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors. |  |  |  |  |
| 3 | \# | Indicators | Condition Choices | Data | Definitions/Explanations |
| 4 | OF1 | Province | Mark the province in which the A A is located by changing the 0 in the colum next to it to a "1". Mark only one. |  | This determines to which province's calibration wetlands the raw score of any wetland is normalised. In the function and benefits models, it also triggers the automatic exclusion of indicators for which no spatial data exists in a particular province. |
| 5 |  |  | New Brunswick | 0 |  |
| 6 |  |  | Nova Scotia | 1 |  |
| 7 |  |  | Prince Edward Island | 0 |  |
| 8 |  |  | Newfoundland-Labrador | 0 |  |
| 9 | OF2 | Ponded Area Wthin 1 km | The area of surface water ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: |  | "Adjacent" means not separated from the AA by a wide expanse ( $>50 \mathrm{~m}$ ) of upland (including roads $>50 \mathrm{~m}$ wide). Include ponded areas likely to be hidden by wetland vegetation. If surface water extends beyond 1 km , include only the part within 1 km . Do not include tidal areas. Measure the area from aerial imagery using Google Earth Pro (click on Ruler icon in toolbar, then Polygon in popup menu). [PH, SBM, WBN] |
| 10 |  |  | 80.01 hectare (about $10 \mathrm{~m} \times 10 \mathrm{~m}$ ). | 0 |  |
| 11 |  |  | 0.01-0.1 hectare. | 0 |  |
| 12 |  |  | 0.1-1 hectare. | 1 |  |
| 13 |  |  | 1 to 10 hectares. | 0 |  |
| 14 |  |  | 10 to 100 hectares. | 0 |  |
| 15 |  |  | $>100$ hectares. | 0 |  |
| 16 | OF3 | Ponded Water \& Wetland Wthin 1 km | The area of wetlands and surface water ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) withir 1 km is: |  | See definition of adjacent in OF2. If the AA's wetland vegetation extends beyond 1 km , include only the part within 1 km "Ponded" means not flowing in rivers or streams. [Sens, WBF] |
| 17 |  |  | $<0.01$ hectare (about $10 \mathrm{~m} \mathrm{\times 10} \mathrm{~m}$ ). | 0 |  |
| 18 |  |  | 0.01-0.1 hectare. | 0 |  |
| 19 |  |  | 0.1-1 hectare. | 0 |  |
| 20 |  |  | 1 to 10 hectares. | 0 |  |
| 21 |  |  | 10 to 100 hectares. | 1 |  |
| 22 |  |  | $>100$ hectares. | 0 |  |
| 23 | OF4 | Size of Largest Nearby <br> Vegetated Tract or Corridor | The largest vegetated patch or corridor that includes the AA's vegetation plus alladjacent upland vegetation that is not lamn, row crops, heavily grazed lands, conifer plantation is: |  | See definition of adjacent in OF2. Use Google Earth Pro's polygon ruler (as described above). <br> Exclude conifer plantations only if it is obvious that trees were planted in rows. [AM, PH, SBM, Sens] |
| 24 |  |  | $<0.01$ hectare (about $10 \mathrm{~m} \times 10 \mathrm{~m}$ ). | 0 |  |
| 25 |  |  | 0.01-0.1 hectare. | 0 |  |
| 26 |  |  | 0.1-1 hectare. | 0 |  |
| 27 |  |  | 1 to 10 hectares. | 0 |  |
| 28 |  |  | 10 to 100 hectares. | 1 |  |
| 29 |  |  | 100 to 1000 hectares. | 0 |  |
| 30 |  |  | >1000 hectares. [This is nearly always the answer in relatively undeveloped landscapes.] | 0 |  |


|  | A | B | C | D | E |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 31 | OFS | Distance to Large Vegetated Tract | The minimum distance from the edge of the AA to the edge of the closestvegetated land (but excluding row crops, lamn, conifer plantation) larger than 375 hectares (about 2 km on a side), is: |  | To measure distance, use Google Earth Pro (Ruler > Line tool). The 375 -ha criterion is from the Fundy Model Forest Project. [AM, PH, POL, SBM, Sens] |
| 32 |  |  | $<50 \mathrm{~m}$, and not separated from the 375 -ha vegetated area by any width ofpaved roads, stretches of open water, row crops, bare ground, lawn, or impervious surface. Or the $A A$ itself contains $>375$ ha of vegetation. [This is often the answer in relatively undeveloped landscapes.] | 0 |  |
|  |  |  | 40 m , but completely separated from the 375-ha vegetated area by those features, and AA does not contain $>375$ ha of vegetation. | 0 |  |
| 34 |  |  | 50-500 m, and not separated. | 0 |  |
| 35 |  |  | 50-500 m, but separated by those features. | 0 |  |
| 36 |  |  | $0.5-5 \mathrm{~km}$, and not separated. | 0 |  |
| 37 |  |  | $0.5-5 \mathrm{~km}$, but separated by those features. | 0 |  |
| 38 |  |  | None of the above (the closest patches or corridors which are that large are $>5 \mathrm{~km}$ away). | 1 |  |
| 39 | OF6 | Herbaceous Uniqueness | The AA's vegetation cover is $>10 \%$ herbaceous* but uplands within 5 km have $<10 \%$ herbaceous cover. If so, enter " 3 " and continue to OF7. If not, consider: <br> The AA's vegetation cover is $>10 \%$ herbaceous* but uplands within 1 km have $<10 \%$ herbaceous cover. If so enter " 2 " and continue to Of7. If not, consider: <br> The AA's vegetation cover is $>10 \%$ herbaceous* but uplands within 100 m of the wetland edge have $<10 \%$ herbaceous cover. If so, enter "1". <br> [* NOTE: Exclude lamns, row crops, heavily grazed lands, forest, shrublands. Include moss as well as grasslike plants in this use of "herbaceous vegetation'] | 0 | For this question only, consider moss to be herbaceous vegetation. Determine the score by vieving aerial imagery in Google Earth after successively drawing or estimating the boundaries of the buffers of $5 \mathrm{~km}, 1 \mathrm{~km}$, and 100 m radius focused on the center of the AA. Circles of specified radius can be dramn in Google Earth Pro by clicking on the Ruler icon, then Circle in the pop-up menu. [AMN, PHN, POLv, SBMN, WBFv, WBNv] |
| 40 | OF/ | Woody Uniqueness | The AA's vegetation cover is $>10 \%$ woody* but uplands within $5 \mathrm{kmhave}<10 \%$ woody cover. If so, enter " 3 " and continue to OF8. If not, consider: <br> The AA's vegetation is $>10 \%$ woody ${ }^{\star}$ but uplands within 1 km have $<10 \%$ woody cover. If so enter " 2 " and continue to OF8. If not, consider: <br> The AA's vegetation is $>10 \%$ woody ${ }^{\star}$ but uplands within 100 m of the wetland edge have $<10 \%$ woody cover. If so, enter " 1 " <br> [* NOTE: woody cover = trees \& shrubs taller than 1 m ] | 0 | See above. Do not consider conifer plantations to be forest if it is obvious that trees were planted in rows. [AMN, PHV, POLv, SBMN] |
| 41 | OF8 | Local Vegetated Cover Percentage | Draw a 5 -km radius circle measured from the center of the AA. Ignoring all permanent water in the circle, the percent of the remaining are that is wooded or unmanaged herbaceous vegetation (NOT lawn, row crops, bare or heavily grazed land, clearcuts, or conifer plantations) is: |  | In Google Earth, draw the 5 km buffer and then estimate land cover percentages, or do GIS analysis of an appropriate land cover layer. [AM, PH, POL, SBM, Sens] |
| 42 |  |  | -5\% of the land. | 0 |  |
| 43 |  |  | 5 to 20\% of the land. | 0 |  |
| 44 |  |  | 20 to 60\% of the land. | 1 |  |
| 45 |  |  | 60 to $90 \%$ of the land. | 0 |  |
| 46 |  |  | >90\% of the land. SKIP to OF10. | 0 |  |
| 47 | OF9 | Type of Land Cover | Wthin the 5 -km radius circle, and ignoring all permanent water, the land area that is bare or non-perennial cover is mostly: |  | [AM, SBM] |
| 48 |  |  | Impervious surface, e.g., paved road, parking lot, building, exposed rock. | 0 |  |
| 49 |  |  | Bare pervious surface, e.g., lawn, recent (< 5 yrs ago) clearcut, dirt or gravel road, cropland, landslide, conifer plantation. | 1 |  |
| 50 | OF10 | Distance by Road to Nearest Population | Measured along the maintained road nearest the A , the distance to the nearestpopulation center is: |  | "Population center" means a settled area with more than about 5 regularly- inhabited structures per square kilometer In Google Earth Pro, click on the Ruler icon, then Path, and draw and measure the |
| 51 |  | Center | $<100 \mathrm{~m}$. | 0 |  |
| 52 |  |  | 100-500m. | 1 |  |
| 53 |  |  | $0.5-1 \mathrm{~km}$ | 0 |  |
| 54 |  |  | $1-5 \mathrm{~km}$ | 0 |  |
| 55 |  |  | -5km | 0 |  |
| 56 | OF11 | Distance to Nearest Maintained Road | From the center of the AA, the distance to the nearest maintained public road (dirt or paved) is: |  | Determine this by viewing aerial imagery in Google Earth Pro and measuring with the Ruler>Line |
| 57 |  |  | $<10 \mathrm{~m}$ | 0 |  |
| 58 |  |  | 10-25m. | 0 |  |
| 59 |  |  | 25-50m. | 0 |  |
| 60 |  |  | 50-100 m. | 0 |  |
| 61 |  |  | 100-500m. | 1 |  |
| 62 |  |  | >500 m. | 0 |  |


|  | A | B | C | D | E |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 63 | OF12 | Wildife Access | Draw a circle of radius of 5 km from the center of the $A A$ If marmals and amphibians can move from the center of the $A A$ to $A L L$ other separate wetlands and ponds located within the circle without being forced to cross pavement (any width), lawns, bare ground, and/or marine waters, mark $1=$ yes can move to all, $0=$ no. Change toblank if there are no other wetlands within 5 km . | 0 | Draw the 5 km circle in Google Earth Pro using the Circle tool and search for roads and wetlands within it, being alert for roads hidden under forest canopy. [AM, SBM, STR] |
| 64 | OF13 | Distance to Ponded Water | The distance from the AA center to the closest (but separate) ponded water body visible in Google Earth imagery is: |  | In Google Earth Pro, zoom in closely to examine the surrounding landscape for ponds, lakes, and wetlands that appear to be permanently flooded. [AM, PH, SBM, Sens, WBF, WBN] |
| 65 |  |  | -50 m, and not separated by any width of paved roads, stretches of open water, row crops, lamn, bare ground, or impervious surface. | 0 |  |
| 66 |  |  | 50 m , but completely separated by those features. | 0 |  |
| 67 |  |  | $50-500 \mathrm{~m}$, and not separated. | 0 |  |
| 68 |  |  | $50-500 \mathrm{~m}$, but separated by those features. | 0 |  |
| 69 |  |  | $0.5-1 \mathrm{~km}$, and not separated. | 0 |  |
| 70 |  |  | $0.5-1 \mathrm{~km}$, but separated by those features. | 1 |  |
| 71 |  |  | None of the above (the closest patches or corridors that large are >1 km away). | 0 |  |
| 72 | OF14 | Distance to Large Ponded Water | The distance from the AA center to the closest (but separate)non-tidal body of water that is ponded during most of the year and islarger than 8 hectares during most of a normal year is: |  | Determine this by viewing aerial imagery in Google Earth. [Sens, WBF, WBN] |
| 73 |  |  | $<100 \mathrm{~m}$ | 0 |  |
| 74 |  |  | $100 \mathrm{~m}-1 \mathrm{~km}$ | 0 |  |
| 75 |  |  | 1-2km. | 0 |  |
| 76 |  |  | 2-5 km | 0 |  |
| 77 |  |  | $5-10 \mathrm{~km}$ | 1 |  |
| 78 |  |  | $>10 \mathrm{~km}$ | 0 |  |
| 79 | OF15 | Tidal Proximity | The distance from the AA edge to the closesttidal water body (regardless of its salinity) is: |  | In Google Earth, measure the distance to the ocean (including Bay of Fundy) or tidal river, whichever is closer. If you need to see how far upriver a river is tidal, see the KNZ file provided with this calculator for NS (NS Headtide). Points shown in those files are only an approximation, so local information if available may be preferable. [FA, WBF] |
| 80 |  |  | $\angle 100 \mathrm{~m}$ | 0 |  |
| 81 |  |  | $100 \mathrm{~m}-1 \mathrm{~km}$ | 0 |  |
| 82 |  |  | $1-5 \mathrm{~km}$ | 0 |  |
| 83 |  |  | $5-10 \mathrm{~km}$ | 0 |  |
| 84 |  |  | $10-40 \mathrm{~km}$ | 1 |  |
| 85 |  |  | $>40 \mathrm{~km}$ | 0 |  |


|  | A | B | C | D | E |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 86 | OF16 | Upland Edge Contact | Select one: |  | [ NR , SBM, Sens] |
|  |  |  | The AA has no upland edge (or upland is <1\% of perimeter). The AA is entirely surrounded by (\& contiguous with) other wetlands or water. | 0 |  |
|  |  |  | 1-25\% of the AA's perimeter abuts upland (including filled areas). The rest adjoins other wetlands or water that is mostly wider than the AA | 0 |  |
| 89 |  |  | 25-50\% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA. | 0 |  |
| 90 |  |  | $50-75 \%$ of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA | 0 |  |
| 91 |  |  | More than $75 \%$ of the AA's perimeter abuts upland. Any remainder adjoins other wetlands or water that is mostly wider than the AA. This will be true for most assessments done with WESP-AC. | 1 |  |
| 92 | OF17 | Food Damage fromNon tidal Waters | Wthin 5 km downstream or downslope of the AA (select first true choice): |  | Contact local authories to determine if such maps exist. Where available, LDAR imagery can provide finer elevational resolution useful for flood modeling. [WSV] |
| 93 |  |  | Maps show Flood Zone or Flood Risk areas and there appears to be infrastructure vulnerable to river flooding not caused by tidal storm surges. | 0 |  |
| 94 |  |  | Maps show Food Zone or Flood Risk areas, but infrastructure is absent or is not vulnerable to floods from a non-tidal river. In some cases levees, upriver dams, or other measures may partly limit damage or risk from smaller events. | 0 |  |
| 95 |  |  | Maps do not show Food Zone or Food Risk areas (or no such mapping has been done locally) and there appears to be infrastructure vulnerable to river flooding unrelated to tidal storm surges. | 0 |  |
| 96 |  |  | Maps do not show Flood Zone or Food Risk areas (or no such mapping has been done locally) and there isno infrastructure vulnerable to river flooding unrelated to tidal storm surges. | 1 |  |
| 97 | OF18 | Relative Elevation in Watershed | In Google Earth, enable the Terrain layer (lower left menu) and open the NS_Watersheds Secondary KMZ file that accompanies this calculator. Then determine the AA's approximate elevation (bottom right, NOT the "eye alt'). Then move cursor around to determine the watershed's maximum and minimum elevation. Divide the AA's elevation by the (max-min). | 0.13 | [FA, NR, Sens, SFSV, WCV, WSv] |
| 98 | OF19 | Water Quality Sensitive Watershed or Area | The AA is in a Protected Water Supply area (Designated Water Supply Area, Natural Watershed Municipal Surface Water Supply Area, or Municipal Water Supply Area) according to the provided KMZ overlay ("NS Protected Water Supply Areas'). Enter 1= yes, 0= no. | 0 | If an ACCDC report is available for this AA, it also may contain such information. [NRV] |


|  | A | B | C | D |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 99 |  | Degraded Water Upstream | Sampling indicates a problem with concentrations of metals, hydrocarbons, nutrients, or other substances (excluding bacteria, acidic water, high temperatures) being present at levels harmful to aquatic life or humans, and: |  | May use existing data, or sample those waters as part of this wetland assessment. "Harmful" should be evaluated with regard to current federal or provincial water quality standards. [AM, FA, FR, NRV, PRV, SRV, STR, WBF, WBN] |
| 100 |  |  | The condition is present within the AA | 0 |  |
| 101 |  |  | The condition is present in waters within 1 km that flowinto the AA, but has not been documented in the AA itself. | 0 |  |
| 102 |  |  | Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters. | 0 |  |
| 103 |  |  | Data are insufficient (no or inadequate sampling within 1 km , or condition exists only at $>1 \mathrm{~km}$ upstream). This is the situation for nearly all wetlands in this region. | 1 |  |
| 104 | OF21 | Degraded | The problem described above is downslope fromthe AA, and: |  | May use existing data, or monitor waters as part of this wetland assessment. [NRV, PRV, SRv] |
| 105 |  | Downstream | The condition is present within 1 km downslope and connected to the AA by a channel. | 0 |  |
| 106 |  |  | The condition is present within 5 km downslope and connected to the AA by a channel, or within 1 km but not connected to the AA by a channel. | 0 |  |
| 107 |  |  | Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters. | 0 |  |
| 108 |  |  | Data are insufficient (no or inadequate sampling within 1 km , or condition exists only at $>1 \mathrm{~km}$ upstream). This is the situation for nearly all wetlands in this region. | 1 |  |
| 109 | OF22 | Wetland as a \% of Its Contributing Area (Catchment) | From a topographic map and field observations, estimate the approximate boundaries of the catchment (CA) of the entire wetland of which the AA may be only a part. Then adjust those boundaries if necessary based on your field observations of the surrounding terrain, and/or by using procedures described in the Manual. Divide the area of the wetland (not just the $A A$ ) by the approximate area of its catchment excluding the area of the wetland itself. When doing the calculation, if ponded water is adjacent to the wetland, include that in the wetland area. The result is: |  | Topographic maps may be viewed online at the National Atlas of Canada (Toporama): http://atlas.gc.ca/toporama/en/index.html [NR, PR, Sens, SR, WS] |
| 110 |  |  | <0.01, or catchment size unknown due to stormwater pipes that collect water from an indeterminate area. | 1 |  |
| 111 |  |  | 0.01 to 0.1. | 0 |  |
| 112 |  |  | 0.1 to 1. | 0 |  |
| 113 |  |  |  | 0 |  |
| 114 | OF23 | Unvegetated Surface in the Contributing Area | The proportion of the AA's contributing area (measured to no more than 1000 m upslope) that is comprised of buildings, roads, parking lots other pavement, exposed bedrock, landslides, and other mostly-bare surface is about : |  | [FA, INV, NRV, PRV, SRv, STR, WCV, WSv] |
| 115 |  |  | <10\% | 0 |  |
| 116 |  |  | 10 to $25 \%$ | 0 |  |
| 117 |  |  | >25\% | 1 |  |
|  | OF24 | Transport From Upslope | A relatively large proportion of the precipitation that falls farther upslope in the CA reaches this wetland quickly as runoff (surface water), as indicated by the following: <br> (a) input channel is present, <br> (b) input channels have been straightened, <br> (c) upslope wetlands have been ditched extensively, <br> (d) land cover is mostly non-forest, <br> (e) CA slopes are steep, and/or <br> (f) most CA soils are shallow (bedrock near surface) and/or have high runoff coefficients. <br> This statement is: |  | [NRV, PRV, SRV, WSU] |
| 119 |  |  | Mostly true. | 0 |  |
| 120 |  |  | Somenhat true. | 0 |  |
| 121 |  |  | Mostly untrue. | 1 |  |
| 122 | OF25 | Aspect | The overland flow direction of most surface water (in streams, rivers, or runoff) that enters the AA is: |  | [AM, NR, SFS, WC, WS] |
| 123 |  |  | Northward (N, NE). north-facing contributing area | 0 |  |
| 124 |  |  | Southward (S, SW). south-facing contributing area. | 1 |  |
| 125 |  |  | Other (E, SE, W, MM), or no detectable uphill slope or input channel (flat). | 0 |  |
| 126 <br> 127 | OF26 | Internal Aow Distance (Path Length) | The horizontal flow distance from the wetland's inlet to outlet is: <br> 10 m | 0 | Identify inlets and outlets, if any, from topographic maps (use elevations to determine which are inlets and which are outlets) and augment by field inspection. Whth the Provincial Landscape Viewer, select NovaScotia Tonoas the Baseman_Also enable the laver Forestn W/AM Predicted Flow Then |


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| 128 |  |  | 10-50m. | 0 | measure the inlet-outlet distance. [NR, OE, PR, SR, WS] |
| 129 |  |  | 50-100m. | 0 |  |
| 130 |  |  | 100-1000m. | 0 |  |
| 131 |  |  | 1-2km | 0 |  |
| 132 |  |  | >2 km, or wetland lacks an inlet and outlet. | 1 |  |
| 133 | OF27 | Growing Degree Days | In Google Earth, open the KMZ file that accompanies this calculator, called NS_GrowingDegreeDays. Place your cursor over the AA and left-click. From the pop-up window, enter the GRIDCODE number in the next column. | 1800 | This layer was provided by Dr. Dan McKenney of the Canadian Forest Service [AM, CS, FR, INV, NR, OE, PH, PR, Sens, SR, WBF, WCV, WS] |
| 134 | OF28 | Fish Access or Use | According to agency biologists and/or your own observations, the AA [ N rrk just the first choice that is true.]: |  | Regarding the last choice, if uncertain if an AA is fishless, consider the possibility its waters have been stocked. [AM, FA, FR, INN, WBF, WBN] |
| 135 |  |  | Is known to support rearing and/or spawning by Atlantic salmon or other anadromous species or eels. Go to Provincial Landscape Viewer>Mildlife>Significant Habitat>Species at Risk. Contact local fishery biologists, review the ACCDC report, and visit these websites: $\mathrm{http}: / / \mathrm{mw}$.salmonatlas.com/atlanticsalmor/canada-east/index.1.htmI http://atlanticsalmonfederation.org/rivers/introduction.htm | 0 |  |
| 136 |  |  | Has not been documented to support Atlantic salmon rearing and/or spawning, but is connected to nearby waters likely to contain Atlantic salmon or other anadromous species or eels and is probably accessed by those during some conditions. | 0 |  |
| 137 |  |  | Is probably is not accessed by any anadromous fish species but is known or likely to haveother fish at least seasonally. | 0 |  |
| 138 |  |  | Is known or likely to be fishless (e.g., too small, dry, and/or not accessible even temporarily, and not stocked). | 1 |  |
| 139 | OF29 | Species of Conservation Concern | Wuthin the past 10 years, in the AA (or in its adjoining waters or wetland), qualified observers have documented ${ }^{\text {a mark all applicable ]: }}$ |  | Request information from ACCDC and/or conduct your own survey at an appropriate season using a approved protocol. For birds, also check eBird.org. [AMN, EC, PHN, POLv, SBMN, Sens, WBFV, wBN] |
|  |  |  | Presence of one or more of the plant species listed in the Plants_Rare worksheet of the accompanying Supplnfo file, or the AA is within a mapped Atlantic Coastal Plain Fora Buffer (go to Provincial Landscape Viewer> Wildlife> Special Management Practice Zones). | 0 |  |
| 141 |  |  | Presence of one or more of theamphibian or reptile species (AM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying Supplnfo file. | 0 |  |
| 142 |  |  | Presence of one or more of the waterbird species (MBF, WBN) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying Supplnfo file. | 0 |  |
| 143 |  |  | Presence of one or more of the nestingsongbird or raptor species (SBM) of conservation concern as listed in the Wildlife_Rare worksheet of the accompanying Supplnfo file, during their nesting season (May-July for most species). | 0 |  |
| 144 |  |  | None of the above, or no data. | 1 |  |
| 145 | OF30 | Important Bird Area (IBA) | In Google Earth, open the KNZ file that accompanies this calculator, calledIBAs_Canada The AA is all or part of an officially designated IBA. Enter $1=$ yes, $0=$ no. | 0 | The source of this layer, which should be checked periodically for updates, is: http://umw.ibacanada.com/mapviewer.jsp?lang=EN [SBMN, WBFV, WBN]] |
| 146 | OF31 | Black Duck Nesting Area | In Google Earth, open the KMZ file that accompanies this calculator, called BlackDuck. Adjust its alignment and opacity. Determine the predicted density (pairs per $25 \mathrm{sq} . \mathrm{km}$ ) of nesting American Black Duck in the AA's vicinity: $<10$ (enter 0), 10-20 (enter 1), 20-30 (enter 2), $>30$ (enter 3). If outside of region shown in map, change toblank | 0 | This was provided by Dr. David Leske. [WBNN] |
| 147 | OF32 | Wintering Deer or Moose Concentration Areas | If AA is on private land with no information, change toblank (not 0). Otherwise: With the Provincial Landscape Viewer, for Wintering Moose, go to Wildlife> Significant Habitat. For Mainland Moose Concentration Areas, go to Wildlife> Special Management Practice Zones Enter: yes=1, no=0. | 0 | [SBM] |
| 148 | OF33 | $\begin{array}{\|l\|} \hline \text { Other Conservation } \\ \text { Designation } \end{array}$ | The AA is all or part of an area designated by government, Frst Nations, or the Nature Conservancy of Canada (NCC) for its exceptional ecological features or highly intact natural conditions. With Provincial Landscape Viewer, see Protected Areas. Enter: yes=1, no=0. If uncertain, consult NCC and agencies for more recent information. | 0 | See: https://novascotia.ca/parksandprotectedareas/plan/interactive-map/ [PU] |
| 149 | OF34 | Conservation Investment | The AA is part of or contiguous to a wetland on which public or private organizational funds were spent to preserve, create, restore, or enhance the wetland (excluding mitigation wetlands). Ask the property owner. Enter: yes=1, no=0. If no information, change tdolank (not 0 ). | 0 | [PU] |
| 150 | OF35 | Mtigation Investment | The AA is all or part of a mitigation site used explicitly to offset impacts elsewhere. Ask the property owner. Enter: yes=1,no=0. If no information, change to blank. | 0 | [PU] |
| 151 | OF36 | Sustained Scientific Use | Plants, animals, or water in the AA have been monitored for $>2$ years, unrelated to any regulatory requirements, and data are available to the public. Or the AA is part of an area that has been designated by an agency or institution as a benchmark, reference, or status-trends monitoring area. Ask the property owner. Enter: yes=1, no $=0$. If no information, change toblank | 0 | [PU] |
| 152 | OF37 | Calcareous Region | The AA is NOT in a subregion that has been heavily exposed to acid precipitation. Enter "1" if true (green or yellow in map in Appendix Ao the Manual). Enter "O" if false. If no information, change toblank | 0 | [AM, FA, RR, INV, PH] |
| 153 | OF38 | Omership | Select the ONE ownership that covers the most of the AA. In Google Earth, open KMZ file called NS_CrownlandsUse more recent information if available. |  | "Private lands" may include those owned or leased by non-govermmental organizations, e.g., charitable conservation land trusts, DUC, TNC. [PU, STR] |




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| 19 |  |  | deciduous trees taller than 3 m | 3 |  |
| 20 |  |  | coniferous or ericaceous shrubs or trees 1-3 mtall not directly below the canopy of trees. | 2 |  |
| 21 |  |  | deciduous shrubs or trees 1-3 mtall not directly below the canopy of trees. | 2 |  |
| 22 |  |  | Coniferous or ericaceous shrubs <1 mtall not directly below the canopy of taller vegetation. | 2 |  |
| 23 |  |  | deciduous shrubs or trees $<1 \mathrm{mtall}$ (e.g., deciduous seedlings) not directly below the canopy of taller vegetation. | 2 |  |
| 24 | Note: If none of top 4 rous in F3 was marked 2 or greater, SKIP to F9 (N fixers). |  |  |  |  |
| 25 | F4 | Dominance of Most Abundant Shrub Species | Determine which two woody plant species comprise the greatest portion of the low ( $\langle<\mathrm{m}$ ) woody cover. Then choose one: |  | [PH, POL, SBM, Sens] |
| 26 |  |  | those species together comprise $>50 \%$ of such cover. | 1 |  |
| 27 |  |  | those species together do not comprise $>50 \%$ of such cover. | 0 |  |
| 28 | F | Woody Diameter Classes | Mark $A \amalg$ the types that comprise $>5 \%$ of the woody canopy cover in the $A A$ or $>5 \%$ of the wooded areas (if any) along its upland edge (perimeter). The edge should include only the trees whose canopies extend into the AA |  | Estimate the diameters at chest height. If small-diameter trees are overtopped (shaded) by larger ones, visualise a "subcanopy" at the average height of the smaller-dbh trees, to serve as a basis for the minimum $5 \%$ canopy requirement in this question. The trees and shrubs need not be wetland species. [AM, CS, POL, SBM, Sens, WBN] |
| 29 |  |  | coniferous, $1-9 \mathrm{~cm}$ diameter and $>1 \mathrm{~m}$ tall. | 1 |  |
| 30 |  |  | broad-leaved deciduous $1-9 \mathrm{~cm}$ diameter and $>1 \mathrm{mtall}$. | 1 |  |
| 31 |  |  | coniferous, $10-19 \mathrm{~cm}$ diameter. | 1 |  |
| 32 |  |  | broad-leaved deciduous $10-19 \mathrm{~cm}$ diameter. | 1 |  |
| 33 |  |  | coniferous, $20-40 \mathrm{~cm}$ diameter. | 1 |  |
| 34 |  |  | broad-leaved deciduous $20-40 \mathrm{~cm}$ diameter. | 0 |  |
| 35 |  |  | coniferous, 740 cm diameter. | 0 |  |
| 36 |  |  | broad-leaved deciduous $>40 \mathrm{~cm}$ diameter. | 0 |  |
| 37 | F6 | Height Class Interspersion | Follow the key below and mark the ONE row that best describes MOST of the AA: |  | [AM, IN, NR, PH, SBM, Sens] |
|  |  |  | A. Neither the vegetation taller than 1 m nor the vegetation shorter than that comprise $>70 \%$ of the vegetated part of the $A A$. They each comprise $30-70 \%$ Choose between A 1 and A 2 and mark the choice with a 1 in the adjoining colum. Otherwise go to B below. |  |  |
| 38 |  |  |  |  |  |
| 39 |  |  | A1 The two height classes are mostly scattered and intermixed throughout the AA | 1 |  |
| 40 |  |  | A2 Not A1. The two height classes are mostly in separate zones or bands, or in proportionately large clumps. | 0 |  |
| 41 |  |  | B. Ether the vegetation shorter than 1 m comprises $>70 \%$ of the vegetated part of the $A A$, or the vegetation taller than that does. One size class might even be totally absent. Choose between B1 and B2 and mark the choice with a 1 in the adjoining column: |  |  |
| 42 |  |  | B1 The less prevalent height class is mostly scattered and intermixed within the prevalent one. | 0 |  |
| 43 |  |  | B2. Not B1. The less prevalent height class is mostly located apart from the prevalent one, in separate zones or clumps, or is completely absent. | 0 |  |
| 44 | 7 | Large Snags (Dead Standing Trees) | The number of large snags (diameter $\mathbf{2 0} \mathbf{~ c m}$ ) in the AA plus adjacent upland area within 10 m of the wetland edge is: |  | Snags are dead standing trees that often (not always) lack bark and foliage. Include only ones that are at least 2 m tall. [POL, SBM, WBN] |
| 45 |  |  | None, of fewer than $8 /$ hectare which exceed this diameter. | 0 |  |
| 46 |  |  |  | 0 |  |
| 47 |  |  | Several ( $>8$ hectare) but above not true. | 0 |  |
| 48 | F8 | Domned Wood | The number of downed wood pieces longer than 2 m and with diameter $>10 \mathrm{~cm}$, and not persistently submerged, is: |  | Exclude temporay "bum piles." [AM, INV, POL, SBM] |
| 49 |  |  | Few or none that meet these criteria. | 0 |  |
| 50 |  |  | Several ( $>5$ if $A$ A is $>5$ hectares, less for smaller $A$ As) meet these criteria | 0 |  |
| 51 | F9 | NFixers | The percentage of the AA's vegetated cover that contains nitrogen-fixing plants (e.g., alder, sweetgale, clover, lupine, alfalfa, other legumes) is: |  | Do not include $N$-fixing algae or lichens. [FA, $\mathrm{PR}, \mathrm{IN}, \mathrm{NR}, \mathrm{N}, \mathrm{OE}, \mathrm{PH}, \mathrm{SBM}$, Sens] |
| 52 |  |  | <1\% or none. | 0 |  |
| 53 |  |  | 1-25\% of the vegetated cover, in the AA or along its water edge (whichever has more). | 0 |  |
| 54 |  |  | 25-50\% of the vegetated cover, in the AA or along its water edge (whichever has more). | 0 |  |
| 55 |  |  | $50-75 \%$ of the vegetated cover, in the AA or along its water edge (whichever has more). | 0 |  |
| 56 |  |  | $>75 \%$ of the vegetated cover, in the AA or along its water edge (whichever has more). | 0 |  |
| 57 | F10 | Sphagnum Moss Extent | The cover of Sphagnum moss (or any moss that forms a dense cushion many centimeters thick), including the moss obscured by taller sedges and other plants rooted in it, is: |  | Exclude moss growing on trees and rocks. [CS, PH] |
| 58 |  |  | -5\% of the vegetated part of the AA | 0 |  |
| 59 |  |  | $5-25 \%$ of the vegetated part of the $A$ A | 0 |  |
| 60 |  |  | $25-50 \%$ of the vegetated part of the AA | 1 |  |
| 61 |  |  | $50-95 \%$ of the vegetated part of the AA | 0 |  |
| 62 |  |  | >95\% of the vegetated part of the AA | 0 |  |



|  | A | B | C | D | E |
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| 103 |  |  | 50-95\% of the vegetated area | 0 |  |
| 104 |  |  | -95\% of the vegetated area | 0 |  |
| 105 | F19 | Dominance of Most Abundant Herbaceous | Determine which two herbaceous species comprise the greatest portion of the herbaceous cover (excluding mosses and floating-leaved aquatic plants). Then choose one of the following: |  | For this question, indude fems as well as graminoids and forbs. [EC, IN, PH, POL, Sens] |


|  | A | B | C | D | E |
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| 106 |  | Species | those species together comprise $>50 \%$ of the areal cover of herbaceous plants at any time during the year. | 1 |  |
| 107 |  |  | those species together do not comprise $>50 \%$ of the areal cover of herbaceous plants at any time during the year. | 0 |  |
| 108 | F20 | Invasive Plant Cover | How extensive is the cover of invasive plant species in the AA? For species, see Plants_invasive worksheet in the accompanying Supplnfo file. |  | [EC, PH, POL, Sens] |
| 109 |  |  | invasive species appear to be absent in the AA, or are present only in trace amount (a few individuals). | 1 |  |
| 110 |  |  | invasive species are present in more than trace amounts, but comprise $<5 \%$ of herbaceous cover (or woody cover, if the invasives are woody). | 0 |  |
| 111 |  |  | invasive species comprise 5-20\% of the herb cover (or woody cover, if the invasives are woody). | 0 |  |
| 112 |  |  | irvasive species comprise $20-50 \%$ of the herb cover (or woody cover, if the invasives are woody). | 0 |  |
| 113 |  |  | invasive species comprise $>50 \%$ of the herb cover (or woody cover, if the invasives are woody). | 0 |  |
| 114 | F21 | Invasive Cover Along Upland Edge | Along the wetland-upland boundary, the percent of the upland edge (within 3 m upslope from the wetland) that is occupied by invasive plant species is: |  | If a plant cannot be identified to species (e.g., winter conditions) but its genus contains an exotic species, assume the unidentified plant to also be exotic. If vegetation is so senesced that exotic species cannot be identified, answer "none". [PH, STR] |
| 115 |  |  | none of the upland edge (irvasives apparently absent), or AA has no upland edge. | 1 |  |
| 116 |  |  | some (but -5\%) of the upland edge. | 0 |  |
| 117 |  |  | $5-50 \%$ of the upland edge. | 0 |  |
| 118 |  |  | most ( $>50 \%$ ) of the upland edge. | 0 |  |
| 119 | F22 | Fringe Wetland | During most of the year, open water within or adjacent to the vegetated part of the wetland is much wider than the maximum width of the vegetated zone within the wetland. Enter " 1 " if true, " 0 " if false. | 0 | [MBF, WBN, WCV] |
| 120 | F23 | Lacustrine Wetland | The vegetated part of the AA is within or adjacent to a body of non-tidal standing open water whose size exceeds 8 hectares during most of a normal year. | 0 | [ $\mathrm{F}, \mathrm{PR}, \mathrm{PU}, \mathrm{WBF}, \mathrm{WBN}$ ] |
| 121 | F24 | \% of AA Without Surface Water | The percentage of the AA that never contains surface water during an average year (that is, except perhaps for a few hours after snommelt on rainstorms), but which is still a wetland, is: |  | 1 hectare is 10,000 sq. mor about 2.5 acres. It could have dimensions of $100 \mathrm{mby} 100 \mathrm{~m}, 1000 \mathrm{mby}$ 10 m , or similar. [AM, FA, $\operatorname{FR}, \mathrm{IN}, \mathrm{NR}, \mathrm{PH}, \mathrm{PR}, \mathrm{SBM}$, Sens, SRv, WBF, WBN, WC] |
| 122 |  |  | $<1 \%$. In other words, all or nearly all of the AA is covered by water permanently or at least seasonally. | 0 |  |
| 123 |  |  | 1-25\% of the AA, or $<1 \%$ but $>0.01$ ha never contains surface water. | 0 |  |
| 124 |  |  | 25-50\% of the AA never contains surface water. | 0 |  |
| 125 |  |  | 50-75\% of the AA never contains surface water. | 0 |  |
| 126 |  |  | $75-99 \%$ of the $A A$ never contains surface water, $O R>99 \%$ and there is at least one persistently ponded water body larger than 1 ha in the AA | 0 |  |
| 127 |  |  | 99-100\% AND there is no persistently ponded water body larger than 1 ha within the AA Enter "1" andSKIP to F42 (Channel Connection). | 1 |  |
| 128 | F25 | \% of AA with Persistent Surface Water | Identify the parts of the $A A$ that still contain surface water (flowing or ponded, open or hidden beneath vegetation) even during the driest times of a normal year, i.e., when the AA's surface water is at its lowest annual level. At that time, the percentage of the AA that still contains surface water is: |  | If you are unable to determine the condition at the driest time of year, ask the land owner or neighbors about it if possible. Indicators of persistence may include fish, some dragonflies, beaver, and muskrat. [AM, CS, FA, FR, INV, NR, POL, PR, SBM, WBF, WBN] |
| 129 |  |  | None. The AA dries up completely (no water in channels either) or never has surface water during most years. SKIP to F27. | 1 |  |
| 130 |  |  | 1-20\% of the AA | 0 |  |
| 131 |  |  | 20-50\% of the AA | 0 |  |
| 132 |  |  | 50-95\% of the AA | 0 |  |
| 133 |  |  | >95\% of the AA True for many fringe wetlands. | 0 |  |
| 134 | F26 | \% of Summertime Water that is Shaded | At mid-day during the warmest time of year, the area of surface waterwithin the AA that is shaded by vegetation and other features that are within the AA at that time is: |  | [FA, WC] |
| 135 |  |  | -5\% of the water is shaded, or no surface water is present then. | 0 |  |
| 136 |  |  | $5-25 \%$ of the water is shaded. | 0 |  |
| 137 |  |  | 25-50\% of the water is shaded. | 0 |  |
| 138 |  |  | 50-75\% of the water is shaded. | 0 |  |
| 139 |  |  | >75\% of the water is shaded. | 0 |  |
| 140 | F27 | \% of AA that is Fooded Only Seasonally | The percentage of the AA's area that is between the annual high water and the annual low water (surface water) is: |  | Flood marks (algal mats, adventitious roots, debris lines, ice scour, etc.) are often evident when not fully inundated. Aso, such areas often have a larger proportion of upland and annual (vs. perennial) plant species. In riverine systems, the extent of this zone can be estimated by multiplying by 2 the bankful height and visualising where that would intercept the land along the river. [CS, FA, IN, NR, OE, PH, SR, WBF, WBN, WS] |
| 141 |  |  | None, or $<0.01$ hectare and <1\% of the AA. SKIP to F29. | 0 |  |
| 142 |  |  | 1-20\% of the AA , or $<1 \%$ but $>0.01$ ha | 1 |  |
| 143 |  |  | 20-50\% of the AA | 0 |  |


|  | A | B | C | D | E |
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| 144 |  |  | 50-95\% of the AA | 0 |  |
| 145 |  |  | >95\% of the AA | 0 |  |
| 146 <br> 147 <br> 148 <br> 149 <br> 150 <br> 151 | F28 | Annual Water Auctuation Range | The annual fluctuation in surface water level within most of the parts of the AA that contain surface water at least temporarily is: |  | Look for flood marks (see above). Because the annual range of water levels is difficult to estimate without multiple visits, consider asking the land owner or neighbors about it. [AM, CS, INN, NR, OE, PH, PR, SR, WBN, WS] |
|  |  |  | $<10$ cm change (stable or nearly so). | 1 |  |
|  |  |  | $10 \mathrm{~cm}-50 \mathrm{~cm}$ change. | 0 |  |
|  |  |  | 0.5-1 m change. | 0 |  |
|  |  |  | 1-2 m change. | 0 |  |
|  |  |  | >2 m change. | 0 |  |
|  | Is the AA plus adjacent ponded water smaller than 0.01 hectare (about $10 \mathrm{~m} \times 10 \mathrm{~m}$, or $1 \mathrm{~m} \times 100 \mathrm{~m}$ )? If so, enter " 1 " in column D andSKIP TO F42 (Connection). |  |  | 1 |  |
| 153 | F29 | Predominant Depth Class | During most of the time when surface water is present during the growing season, its depth, averaged over the entire inundated part of the AA , is: |  | If a boat is unavailable, estimate this by considering wetland size and local topography. Or if timing and safety allow, depths may be measured by drilling through winter ice. This question is asking about the spatial median depth that occurs during most of that time, even if inundation is only seasonal or temporary. If inundation in most but not all of the wetland is brief, the answer will be based on the deptr of the most persistently inundated part of the wetland. Include surface water in channels and ditches as well as ponded areas. [CS, FA, FR, INV, OE, PH, PR, Sens, SFS, SR, WBF, WBN, WC] |
| 154 |  |  | $<10 \mathrm{~cm} \mathrm{deep} \mathrm{(but}>0$ ). | 0 |  |
| 155 |  |  | 10-50 cm deep. | 0 |  |
| 156 |  |  | 0.5-1 mdeep. | 0 |  |
| 157 |  |  | 1-2 mdeep. | 0 |  |
| 158 |  |  | >2 deep. True for many fringe wetlands. | 0 |  |
| 159 | F30 | $\begin{array}{\|l} \hline \text { Depth Classes - } \\ \text { Evenness of } \\ \text { Proportions } \end{array}$ | When present, surface water in most of the AA usually consists of (select one): |  | Estimate these proportions by considering the gradient and microtopography of the site. [FR, INV, WBF, WBN] |
| 160 |  |  | One depth class that comprises >90\% of the AA's inundated area (use the classes in the question above). | 0 |  |
| 161 |  |  | One depth class that comprises 50-90\% of the AA's inundated area | 0 |  |
| 162 |  |  | Neither of above. There are 3 or more depth classes and none occupy $>50 \%$ a | 0 |  |
| 163 | F31 | \% of Water That Is Ponded (not Fowing) | During most times when surface water is present, the percentage that is (1)ponded (stagnant, or flows so slowly that fine sediment is not held in suspension) AND (2) is likely to be deeper than 0.5 min some places, is: |  | Nearly all wetlands with surface water have some ponded water. [AM, CS, IN $, ~ N R, O E, P R$, Sens, SR, WBF, WBN, WC, WS] |
| 164 |  |  | -5\% of the water, or it occupies $<100$ sq.m cumulatively. Nearly all the surface water is flowing. SKIP to F34. | 0 |  |
| 165 |  |  | 5-30\% of the water. | 0 |  |
| 166 |  |  | 30-70\% of the water. | 0 |  |
| 167 |  |  | 70-95\% of the water. | 0 |  |
| 168 |  |  | >95\% of the water. | 0 |  |
|  | F32 | $\begin{array}{\|l\|} \hline \text { Ponded Open Water - } \\ \text { Minimum Size } \end{array}$ | During most of the growing season, the largest patch of open water that is ponded and is in or bordering the $A A$ is $>0.01$ hectare (about 10 mby 10 m ) and mostly deeper than 0.5 m If true enter " 1 " and continue, If false, enter " 0 " andSKIP to F41 (Floating Algae \& Duckweed). | 0 | Open water is not obscured by vegetation in aerial ('duck's eye') view. It includes vegetation floating on the water surface or entirely submersed beneath it. |
| 169 |  |  |  |  |  |
| 170 | F33 | \% of Ponded Water that is Open | In ducks-eye aerial view, the percentage of the ponded water that isopen (lacking emergent vegetation during most of the growing season, and unhidden by a forest or shrub canopy) is: |  | [AM, CS, FA, FR, INN, NR, OE, PR, SR, WBF, WBN, WC] |
| 171 |  |  | None, or $<1 \%$ of the AA and largest pool occupies $<0.01$ hectares. Enter "1" and SKIP to F41 (Hoating Algae \& Duckweed). | 0 |  |
| 172 |  |  | 1-4\% of the ponded water. Enter "1" and SKIP to F41 (Floating Agae \& Duckweed). | 0 |  |
| 173 |  |  | 5-30\% of the ponded water. | 0 |  |
| 174 |  |  | 30-70\% of the ponded water. | 0 |  |
| 175 |  |  | 70-99\% of the ponded water. | 0 |  |
| 176 |  |  | 100\% of the ponded water. | 0 |  |
| 177 | F34 | Wdth of Vegetated Zone within Wetland | At the time during the growing season when the AA's water level is lowest, the average width of vegetated areain the AA that separates adjoining uplands from open water within the $A A$ is: |  | "Vegetated area" does not include underwater or floating-leaved plants, i.e., aquatic bed. Mdth may include wooded riparian areas if they have wetland soil or plant indicators. [AM, CS, $\mathrm{NR}, \mathrm{OE}, \mathrm{PH}, \mathrm{PR}$, SBM, Sens, SR, WBN] |
| 178 |  |  | <1m. | 0 |  |
| 179 |  |  | 1-9m | 0 |  |
| 180 |  |  | 10-29m | 0 |  |
| 181 |  |  | 30-49m | 0 |  |
| 182 |  |  | 50-100m. | 0 |  |
| 183 |  |  | $>100 \mathrm{~m}$, or open water is absent at that time. | 0 |  |
| 184 | F35 | Fat Shoreline Extent | During most of the part of the growing season when water is present, the percentage of the AA'swater edge length that is nearly flat (a slope less than about $5 \%$ measured within 5 mlandward of the water) is: |  | If several isolated pools are present in early summer, estimate the percent of their collective shorelines that has such a gentle slope. [SR, WBN] |
| 185 |  |  | $<1 \%$ of the water edge. | 0 |  |
| 186 |  |  | 1-25\% of the water edge. | 0 |  |
| 187 |  |  | 25-50\% of the water edge. | 0 |  |


|  | A | B | C | D | E |
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| 188 |  |  | 50-75\% of the water edge. | 0 |  |
| 189 |  |  | $>75 \%$ of the water edge. | 0 |  |
| 190 | F36 | Robust Emergents | The percentage of the emergent vegetation cover in the AA that is cattail (Typha spp.), common reed (Phragmites), or tall ( $>1 \mathrm{~m}$ ) bulrush is: |  | Emergent vegetation is herbaceous plants whose stems are partly above and partly below the water surface during most of the time water is present. [MBN] |
| 191 |  |  | <1\% of the emergent vegetation, or emergent vegetation is absent. SKIP to F38. | 0 |  |
| 192 |  |  | 1-25\% of the emergent vegetation. | 0 |  |
| 193 |  |  | 25-75\% of the emergent vegetation. | 0 |  |
| 194 |  |  | >75\%, of the emergent vegetation. | 0 |  |
| 195 <br> 196 <br> 197 | F37 | Interspersion of <br> Emergents \& Open <br> Water | During most of the part of the growing season when water is present, the spatial patternof emergent vegetation within the water is mostly. |  | [AM, FA, FR, INN, NR, OE, PH, PR, SBM, SR, WBF, WBN] |
|  |  |  |  |  |  |
|  |  |  | Scattered. More than 30\% of such vegetation forms small islands or corridors surrounded by water. | 0 |  |
|  |  |  | Intermediate. | 0 |  |
| 198 |  |  | Clumped. More than $70 \%$ of such vegetation is in bands along the wetland perimeter or is clumped at one or a few sides of the surface water area. | 0 |  |
| 199 | F38 | Persistent Deepwater Area | If the deepest patch of surface water (flowing or ponded) in or directly adjacent to the $A A$ is mostly deeper than 0.5 m for $>2$ weeks during the growing season, enter "1" and continue. If not, enter " 0 " andSKIP to F42.(Connection). | 0 |  |
| 200 | F39 | Non-vegetated Aquatic Cover | During most of the growing season and in waters deeper than 0.5 m , the cover for fish, aquatic invertebrates, and/or amphibians that is provided NOT by living vegetation, but by accumulations of dead wood and undercut banks is: |  | For this question, consider only the wood that is at or above the water surface. Estimates of underwate wood based only on observations from terrestrial viempoints are unreliable so should not be attempted. [AM, FA, FR, INM] |
| 201 |  |  | Little or none. | 0 |  |
| 202 |  |  | Intermediate. | 0 |  |
| 203 |  |  | Extensive. | 0 |  |
| 204 | F40 | Isolated Island | The AA contains (or is part of) an island or beaver lodge within a lake, pond, or river, and is isolated from the shoreby water depths >1 m on all sides during an average June. The island may be solid, or it may be a floating vegetation mat that is sufficiently large and dense to support a waterbird nest. | 0 | [MBN] |
| 205 | F41 | Floating Algae \& Duckweed | At some time of the year, mats of algae and/or duckweed are likely to cover $>50 \%$ of the $A A^{\prime}$ s otherwise-unshaded water surface, or blanket $>50 \%$ of the underwater substrate. If true, enter " 1 " in next colurm. If untrue or uncertain, enter " 0 ". | 0 | [EC, PR, WBA] |
| 206 | F42 | Channel Connection \& Outflow Duration | The most persistent surface water connection (outlet channel or pipe, ditch, or overbank water exchange) between the AA and a downslope stream network is: [Note: If the AA represents only part of a wetland, answer this according to whichever is theleast permanent surface connection: the one between the AA and the rest of the wetland, or the surface connection between the wetland and the domnslope stream network] |  | Consider the connection regardless of whether the surface water is frozen. The "downslope stream network" could consist of ditches, rivers, ponds, or lakes which eventually connect to the ocean. If this cannot be determined while visiting the AA , consult topographic maps perhaps by vieving these online with Toporama (http://atlas.nrcan.gc.ca/toporama/enVindex.html) [CS, FA, FR, NR, OE, PR, Sens, SFS, SR, WCV, WS] |
| 207 |  |  | Persistent (surface water flows out for $>9$ months/year). | 0 |  |
| 208 |  |  | Seasonal (surface water flows out for 14 days to 9 monthslyear, not necessarily consecutive). | 0 |  |



|  | A | B | C | D | E |
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| 241 | F51 | Internal Gradient | The gradient along most of the flow path within the $A$ A is: |  | This is not the same as the shoreline slope. It is the elevational difference between the AA's inlet and outlet, divided by the flow-distance between them and converted to percent. If available, use a clinometer to measure this. Free clinometer apps can be downloaded to smartphones. If the wetland is large (longer than $\sim 1 \mathrm{~km}$ ), this may be estimated using Google Earth to determine the minimum and maximum elevation within the $A A$, then dividing by length and multiplying by 100. [CS, NR, OE, PR, SR, WBF, WBN, WS] |
| 242 |  |  | 2\% or the AA has no surface water outlet (not even seasonally). | 1 |  |
| 243 |  |  | 2-5\% | 0 |  |
| 244 |  |  | 6-10\% | 0 |  |
| 245 |  |  | >10\% | 0 |  |
| Note for the next three questions: If the AA lacks an upland edge, evaluate based on the AA's entire perimeter, and moving outward into whatever areas 246 are adjacent. In many situations, these questions are best answered by measuring from aerial images. |  |  |  |  |  |
| 247 | F5 | Vegetated Buffer as \% of Perimeter | Wthin a zone extending 30 m laterally from the AA's edge with upland and/or other wetlands, the percentage that containsperennial vegetation cover (except lamns, row crops, heavily grazed land, conifer plantations) is: |  | [AM, FA, FR, INN, NRV, PH, POL, PRV, SBM, Sens, SRv, STR, WBN] |
| 248 |  |  | -5\% | 0 |  |
| 249 |  |  | 5 to 30\% | 0 |  |
| 250 |  |  | 30 to 60\% | 0 |  |
| 251 |  |  | 60 to 90\% | 1 |  |
| 252 |  |  | >90\%, or all the area within 30 m of the AA edge is other wetlands. SKIP to P55. | 0 |  |
| 253 | F53 | Type of Cover in Buffer | Wthin 30 m upslope of where the wetland transitions to upland, the upland land cover that is NOT perennial vegetation is mostly (mark ONE): |  | [AM, FA, INN, NRV, PH, POL, SBM, STR, WBN] |
| 254 |  |  | Impervious surface, e.g., paved road, parking lot, building, exposed rock. | 0 |  |
| 255 |  |  | Bare or nearly bare penious surface or managed vegetation, e.g., lamn, row crops, unpaved road, dike, landslide. | 1 |  |
| 256 | F54 | Buffer Slope | The steepest and/or most disturbed part of the upland area that is within 30 m of the wetland and occupies $>10 \%$ of that upland area has a percent slope of: |  | [NRV, PRV, Sens, SRV] |
| 257 |  |  | <1\% (flat -- almost no noticeable slope) or all the area within 30 mof the $A$ A edge is other wetlands. | 0 |  |
| 258 |  |  | 2-5\% | 1 |  |
| 259 |  |  | 5-30\% | 0 |  |
| 260 |  |  | -30\% | 0 |  |
| 261 | F55 | Cliffs or Steep Banks | In the AA or within 100 m , there are elevated terrestrial features such as cliffs, talus slopes, stream banks, or excavated pits (but not riprap) that extend at least 2 m nearly vertically, are urvegetated, and potentially contain crevices or other substrate suitable for nesting or den areas. Enter 1 (yes) or 0 (no). | 0 | Do not include upturned trees as potential den sites. [POL, SBM] |
| 262 | F56 | New or Expanded Wetland | Human actions within or adjacent to the AA have persistently expanded a naturally occurring wetland or created a wetland where there previously was none (e.g., by excavation, impoundment): |  | Determine this using historical aerial photography, old maps, soil maps, or permit files as available [CS, NR, OE, PH, Sens] |
| 263 |  |  | No. | 0 |  |
| 264 |  |  | Yes, and created or expanded 20-100 years ago. | 0 |  |
| 265 |  |  | Yes, and created or expanded $3-20$ years ago. | 0 |  |
| 266 |  |  | Yes, and created or expanded within last 3 years. | 0 |  |
| 267 |  |  | Yes, but time of origin or expansion unknown. | 0 |  |
| 268 |  |  | Unknown if new or expanded within 20 years or not. | 1 |  |
| 269 | F57 | Burn History | More than $1 \%$ of the AA's previously vegetated area: |  | Look for charred soil or stumps (in multiple widely-spaced locations) or ask landowner. [CS, PH, STR] |
| 270 |  |  | Burned within past 5 years. | 0 |  |
| 271 |  |  | Burned 6-10 years ago. | 0 |  |
| 272 |  |  | Burned 11-30 years ago. | 0 |  |
| 273 |  |  | Burned $>30$ years ago, or no evidence of a burn and no data. | 1 |  |
| 274 | F58 | Visibility | The maximum percentage of the wetland that is visible from the best vantage point on public roads, public parking lots, public buildings, or public maintained trails that intersect, adjoin, or are within 100 m of the $A A$ (select one) is: |  | [PU, STR, WBFV] |
| 275 |  |  | 25\% | 1 |  |
| 276 |  |  | 25-50\% | 0 |  |
| 277 |  |  | -50\% | 0 |  |
| 278 | F59 | Non-consumptive Uses - Actual or Potential | Assuming access permission was granted, select ALL statements that are true of the AA as it currently exists: |  | [PU, STR] |
| 279 |  |  | For an average person, walking is physically possible in (not just near) $>5 \%$ of the $A A$ during most of the growing season, e.g., free of deep water and dense shrub thickets. | 1 |  |
| 280 |  |  | Maintained roads, parking areas, or foot-trails are within 10 m of the $A A$, or the $A A$ can be accessed part of the year by boats arriving via contiguous waters. | 1 |  |
| 281 |  |  | Within or near the AA, there is an interpretive center, trails with interpretive signs or brochures, andor regular guided interpretive tours. | 0 |  |


|  | A | B | C | D |  |
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| 282 | F60 | Unvisited Core Area | The percentage of the AA almost never visited by humans during an average growing season probably comprises: [ Note: Only include the part actually walked or driven (not simply viewed from) with a vehicle or boat. Do not include visitors on trails outside of the AA unless more than half the wetland is visible from the trails and they are within 30 mof the wetland edge. In that case include only the area occupied by the trail.] |  | [AM, FAv, PRv, PH, PU, SBM, STR, WBF, WBN] |
| 283 |  |  | -5\% and no inhabited building is within $100 \mathrm{mof} \mathrm{the} A$ A | 0 |  |
| 284 |  |  | -5\% and inhabited building is within 100 mof the $A$ A | 0 |  |
| 285 |  |  | $5-50 \%$ and no inhabited building is within 100 m of the $A$ A | 0 |  |
| 286 |  |  | $5-50 \%$ and inhabited building is within 100 m of the $A$ A | 0 |  |
| 287 |  |  | 50-95\%, with or without inhabited building nearby. | 0 |  |
| 288 |  |  | >95\% of the AA with or without inhabited building nearby. | 1 |  |
| 289 | F61 | Frequently Visited Area | The part of the AA visited by humans almost daily for several weeks during an average growing season probably comprises: [See note above.] |  | [AM, PH, PU, SBM, STR, WBF, WBN] |
| 290 |  |  | -5\% If F60 was answered ">95\%' (mostly never visited), SKIP to F64. | 1 |  |
| 291 |  |  | 5-50\% | 0 |  |
| 292 |  |  | 50-95\% | 0 |  |
| 293 |  |  | >95\% of the AA | 0 |  |
| 294 | F62 | BMP - Soils | Boardwalks, paved trails, fences or other infrastructure and/or well-enforced regulations appear to effectively prevent visitors from walking on soil within nearly all of the AA when the soil is unfrozen. Enter " 1 " if true. | 0 | [PH, PU] |
| 295 | F63 | BMP - Wildlife Protection | Fences, observation blinds, platforms, paved trails, exclusion periods, and/or well-enforced prohibitions on motorised boats, off-leash pets, and off road vehicles appear to effectively exclude or divert visitors and their pets from the $A A$ at critical times in order to minimize disturbance of wildlife (except during hunting seasons). Enter "1" if true. | 0 | [AM, PU, WBF, WBN] |
| 296 | F64 | Consumptive Uses (Provisioning Services) | Recent evidence was found within the AA of the following potentially-sustainable consumptive uses. Select ALL that apply. |  | [FAv, Rev, WBFV] |
| 297 |  |  | Low-impact commercial timber harvest (e.g., selective thinning). | 0 |  |
| 298 |  |  | Commercial or tracitional-use havesting of native plants, their fruits, or mushrooms. | 0 |  |
| 299 |  |  | Waterfowl hunting. | 0 |  |
| 300 |  |  | Fshing. | 0 |  |
| 301 |  |  | Trapping of furbearers. | 0 |  |
| 302 |  |  | None of the above. | 1 |  |
| 303 | F65 | Domestic Wells | The closest wells or water bodies that currently provide drinking water are: |  | [NRN] |
| 304 |  |  | Muthin 0-100 m of the AA | 0 |  |
| 305 |  |  | $100-500 \mathrm{~m}$ away. | 0 |  |
| 306 |  |  | -500 m away, or no information. | 1 |  |
| 307 | F66 | Calcareous Fen | The AA is, or is part of, a calcareous fen. See the Plants_Calcar worksheet in the accompanying Supplnfo file for list of plant indicators (calciphiles). Enter 1 If more than two Strong or more than five Moderate calciphile species are present; otherwise enter 0 , but if not able to identify those and no information, change to blank. | 0 | [ $\mathrm{PH}, \mathrm{PR}]$ |



| S3 | Accelerated Inputs of Nutrients |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | In the last column, place a check mark next to any item -- occurring in either the wetland or its CA - that is likely to have accelerated the inputs of nutrients to the wetland. [NRV, PRV, STR] |  |  |  |  |
|  | Stormwater or wastewater effluent (including failing septic systems), landfills. |  |  |  |  |
|  | Fertilizers applied to lamns, ag lands, or other areas in the CA. |  |  |  |  |
|  | Livestock, dogs. |  |  |  | 1 |
|  | Artificial drainage of upslope lands. |  |  |  |  |
|  | If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly more nutrients, then leave the "O's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present. |  |  |  |  |
|  |  | Severe (3 points) | Medium (2 points) | Mild (1 point) |  |
|  | Type of loading: | High density of unmaintained septic, some types of industrial sources. | Moderate density septic, cropland, secondary wastewater treatment plant. | Livestock, pets, low density residential. | 2 |
|  | Frequency \& duration of input: | Frequent and year-round. | Frequent but mostly seasonal. | Infrequent \& during high runoff events mainly. | 2 |
|  | AA proximity to main sources (actual or potential): | 0-15m | $15-100 \mathrm{~m}$ or in groundwater. | In more distant part of contributing area. | 2 |
|  | Sum= |  |  |  | 6 |
|  | Stressor subscore= |  |  |  | 0.67 |


| S4 | Excessive Sediment Loading from Contributing Area |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | In the last column, place a check mark next to any item present in the CA that is likely to have elevated the load of waterborme or windborne sediment reaching the wetland fromits CA [FA PR, INW, PH, SRv, STR] |  |  |  |  |
|  | Erosion from plowed fields, fill, timber havest, dirt roads, vegetation clearing, fires. |  |  |  | 1 |
|  | Erosion from construction, in-channel machinery in the CA |  |  |  |  |
|  | Erosion from off-road vehicles in the CA |  |  |  |  |
|  | Erosion from livestock or foot traffic in the CA |  |  |  |  |
|  | Stormwater or wastewater effluent. |  |  |  |  |
|  | Sediment from road sanding, gravel mining, other mining, oil/ gas extraction. |  |  |  |  |
|  | Accelerated channel downcutting or headcutting of tributaries due to altered land use. |  |  |  |  |
|  | Other human-related disturbances within the CA |  |  |  |  |
|  |  then leave the "O's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present. |  |  |  |  |
|  |  | Severe (3 points) | Medium (2 points) | Mild (1 point) |  |
|  | Erosion in CA: | Extensive evidence, high intensity.* | Potentially (based on high-intensity ${ }^{\star}$ land use) or scattered evidence. | Potentially (based on low-intensity ${ }^{\star}$ land use) with little or no direct evidence. | 2 |
|  | Recentness of significant soil disturbance in the CA: | Current \& ongoing. | 1-12 months ago. | $>1$ y ago. | 3 |
|  | Duration of sediment inputs to the wetland: | Frequent and year-round. | Frequent but mostly seasonal. | Infrequent \& during high runoff events mainly. | 2 |
|  | AA proximity to actual or potential sources: | 0-15m. | 15-100 m. | In more distant part of contributing area. | 2 |
|  | * high-intensity= extensive off-road vehicle use, plowing, grading, excavation, erosion with or without veg removal; low-intensity= veg removal only with little or no apparent erosion or disturbance of soil or sediment. |  |  | Sum= | 9 |
|  |  |  |  | Stressor subscore= | 0.75 |
| S5 | Soil or Sediment Alteration Within the Assessment Area |  |  |  |  |
|  |  (whichever is less). [CS, IN $, ~ N R, P H, S R, S T R]$ |  |  |  |  |
|  | Compaction from machinery, off-road vehicles, livestock, or mountain bikes, especially during wetter periods. |  |  |  |  |
|  | Leveling or other grading not to the natural contour. |  |  |  |  |
|  | Tillage, plowing (but excluding disking for enhancement of native plants). |  |  |  |  |
|  | Fill or riprap, excluding small amounts of upland soils containing organic amendments (compost, etc.) or small amounts of topsoil imported from another wetland. |  |  |  |  |
|  | Excavation. |  |  |  |  |
|  | Ditch cleaning or dredging in or adjacent to the wetland. |  |  |  |  |
|  | Boat traffic in or adjacent to the wetland and sufficient to cause shore erosion or stir bottom sediments. |  |  |  |  |
|  | Avtificial water level or flow manipulations sufficient to cause erosion or stir bottom sediments. |  |  |  |  |
|  |  effects, contrast the current condition with the condition if the checked items never occurred or were no longer present. |  |  |  |  |
|  |  | Severe (3 points) | Medium (2 points) | Mild (1 point) |  |
|  | Spatial extent of altered soil: | >95\% of wetland or >95\% of its upland edge (if any). | 5-95\% of wetland or 5-95\% of its upland edge (if any). | $<5 \%$ of wetland and $<5 \%$ of its upland edge (if any). | 0 |
|  | Recentness of significant soil alteration in wetland: | Current \& ongoing. | 1-12 months ago. | $>1 \mathrm{yr}$ ago. | 0 |
|  | Duration: | Long-lasting, minimal veg recovery. | Long-lasting but mostly revegetated. | Short-term, revegetated, not intense. | 0 |
|  | Timing of soil alteration: | Frequent and year-round. | Frequent but mostly seasonal. | Mainly during one-time or scattered events. | 0 |
|  | Sum= |  |  |  | 0 |



| Cover Page: Basic Description of Assessment | WESP-AC version 2 |
| :---: | :---: |
| Site Name: | Cambridge Interchange Wetland 9 |
| Investigator Name: | BL, CP |
| Date of Field Assessment: | 28 Aug 2021 |
| Nearest Town: | Waterville, NS |
| Latitude (decimal degrees): | 369019.73 m E |
| Longitude (decimal degrees): | 4992168.61 m N (UTM 20T) |
| Is a map based on a formal on-site wetland delineation available? | Yes |
| Approximate size of the Assessment Area (AA, in hectares): | ~ 8 ha |
| AA as percent of entire wetland (approx.). Attach sketch map if AA is smaller than the entire contiguous wetland. | 85 |
| What percent (approx.) of the wetland were you able to visit? | 100 |
| What percent (approx.) of the AA were you able to visit? | 100 |
| Were you able to ask the site owner/manager about any of the questions? | No |
| Indicate here if you intentionally surveyed for rare plants, calciphile plants, or rare animals: | Yes |
| Have you attended a WESP-AC training session? If so, indicate approximate month \& year. | Yes |
| How many wetlands have you assessed previously using WESP-AC? (approx.) | >100 |
| Comments about the site or this WESP-AC assessment (attach extra page if desired): | Wetland 9 is part of a complex including wetlands 5 \& 6 as well. |


|  | A | B | C | D | E |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | Site Identifier: Cambridge Interchange Wetland 9 | Investigator: BL, CP |  |
| 2 | Form OF (Office). Non-tidal Wetland Data Form. WESP-AC version 2 for Nova Scotia wetlands only. DIRECTIONS: Conduct an assessment only after reading the accompanying <br> Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answering many of the questions below will require using these online map viewers: <br> Google Earth Pro: https://www.google.com/earth/download/gep/agree.html <br> Provincial Landscape Viewer: https://nsgi.novascotia.ca/plv/ <br> For most wetlands, completing this office data form will require 1-2 hours. For a list of functions to which each question pertains, see bracketed abbreviations in the Definitions/Explanations column. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention \& Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV=Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM=Amphibian \& Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, \& Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use \& Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors. |  |  |  |  |
| 3 | \# | Indicators | Condition Choices | Data | Definitions/Explanations |
| 4 | OF1 | Province | Mark the province in which the AA is located by changing the 0 in the colurn next to it to a "1". Mark only one. |  | This determines to which province's calibration wetlands the raw score of any wetland is normalise |
| 5 |  |  | New Brunswick | 0 | In the function and benefits models, it also triggers the automatic exclusion of indicators for which no spatial data exists in a particular province. |
| 6 |  |  | Nova Scotia | 1 |  |
| 7 |  |  | Prince Edward Island | 0 |  |
| 8 |  |  | Newfoundland-Labrador | 0 |  |
| 9 | OF2 | Ponded Area Wthin 1 km. | The area of surface water ponded during most of the growing season that is both (1) in or adjacent to the $A A$ and (2) within 1 km is: |  | "Adjacent" means not separated from the AA by a wide expanse (>50 m) of upland (including roads $>50 \mathrm{~m}$ wide). Include ponded areas likely to be hidden by wetland vegetation. If surface water |
| 10 |  |  | <0.01 hectare (about $10 \mathrm{~m} \mathrm{\times 10} \mathrm{~m}$ ). | 0 | extends beyond 1 km , include only the part vithin 1 km . Do not include tidal areas. Measure the |
| 11 |  |  | 0.01-0.1 hectare. | 0 | area from aenial imagery using Google Eart Pro (dick on Ruler icon in toolbar, then Polygon in pop- up menu). $[\mathrm{PH}, \mathrm{SBM}, \mathrm{WBN}]$ |
| 12 |  |  | 0.1-1 hectare. | 1 |  |
| 13 |  |  | 1 to 10 hectares. | 0 |  |
| 14 |  |  | 10 to 100 hectares. | 0 |  |
| 15 |  |  | >100 hectares. | 0 |  |
| 16 | OF3 | Ponded Water \& Wetland Wthin 1 km | The area of wetlands and surface water ponded during most of the growing season that is both (1) in or adjacent to the $A A$ and (2) within 1 km is: |  | See definition of adjacent in OF2. If the AA's wetland vegetation extends beyond 1 km , include only the part within 1 km . "Ponded" means not flowing in rivers or streams. [Sens, WBF] |
| 17 |  |  | 40.01 hectare (about $10 \mathrm{~m} \mathrm{\times 10} \mathrm{~m}$ ). | 0 |  |
| 18 |  |  | 0.01-0.1 hectare. | 0 |  |
| 19 |  |  | 0.1-1 hectare. | 0 |  |
| 20 |  |  | 1 to 10 hectares. | 0 |  |
| 21 |  |  | 10 to 100 hectares. | 1 |  |
| 22 |  |  | $>100$ hectares. | 0 |  |
| 23 | OF4 | Size of Largest Nearby Vegetated Tract or | The largest vegetated patch or corridor that includes the AA's vegetation plus alladjacent upland vegetation that is not lawn, row crops, heavily grazed lands, conifer plantation is: |  | See definition of adjacent in OF2. Use Google Earth Pro's polygon ruler (as described above). <br> Exclude conifer plantations only if it is obvious that trees were planted in rows. [AM, PH, SBM, Sens] |
| 24 |  |  | $<0.01$ hectare (about $10 \mathrm{~m} \times 10 \mathrm{~m}$ ). | 0 |  |
| 25 |  |  | 0.01-0.1 hectare. | 0 |  |
| 26 |  |  | 0.1-1 hectare. | 0 |  |
| 27 |  |  | 1 to 10 hectares. | 0 |  |
| 28 |  |  | 10 to 100 hectares. | 0 |  |
| 29 |  |  | 100 to 1000 hectares. | 1 |  |
| 30 |  |  | >1000 hectares. [This is nearly always the answer in relatively undeveloped landscapes.] | 0 |  |


|  | A | B | C | D | E |
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| 31 | OFS | Distance to Large Vegetated Tract | The minimum distance from the edge of the AA to the edge of the closestvegetated land (but excluding row crops, lamn, conifer plantation) larger than 375 hectares (about 2 km on a side), is: |  | To measure distance, use Google Earth Pro (Ruler > Line tool). The 375 -ha criterion is from the Fundy Model Forest Project. [AM, PH, POL, SBM, Sens] |
| 32 |  |  | $<50 \mathrm{~m}$, and not separated from the 375 -ha vegetated area by any width ofpaved roads, stretches of open water, row crops, bare ground, lawn, or impervious surface. Or the $A A$ itself contains $>375$ ha of vegetation. [This is often the answer in relatively undeveloped landscapes.] | 0 |  |
|  |  |  | 40 m , but completely separated from the 375-ha vegetated area by those features, and AA does not contain $>375$ ha of vegetation. | 0 |  |
| 34 |  |  | 50-500 m, and not separated. | 0 |  |
| 35 |  |  | 50-500 m, but separated by those features. | 0 |  |
| 36 |  |  | $0.5-5 \mathrm{~km}$, and not separated. | 0 |  |
| 37 |  |  | $0.5-5 \mathrm{~km}$, but separated by those features. | 0 |  |
| 38 |  |  | None of the above (the closest patches or corridors which are that large are $>5 \mathrm{~km}$ away). | 1 |  |
| 39 | OF6 | Herbaceous Uniqueness | The AA's vegetation cover is $>10 \%$ herbaceous* but uplands within 5 km have $<10 \%$ herbaceous cover. If so, enter " 3 " and continue to OF7. If not, consider: <br> The AA's vegetation cover is $>10 \%$ herbaceous* but uplands within 1 km have $<10 \%$ herbaceous cover. If so enter " 2 " and continue to Of7. If not, consider: <br> The AA's vegetation cover is $>10 \%$ herbaceous* but uplands within 100 m of the wetland edge have $<10 \%$ herbaceous cover. If so, enter "1". <br> [* NOTE: Exclude lamns, row crops, heavily grazed lands, forest, shrublands. Include moss as well as grasslike plants in this use of "herbaceous vegetation'] | 1 | For this question only, consider moss to be herbaceous vegetation. Determine the score by vieving aerial imagery in Google Earth after successively drawing or estimating the boundaries of the buffers of $5 \mathrm{~km}, 1 \mathrm{~km}$, and 100 m radius focused on the center of the AA. Circles of specified radius can be dramn in Google Earth Pro by clicking on the Ruler icon, then Circle in the pop-up menu. [AMN, PHN, POLv, SBMN, WBFv, WBNv] |
| 40 | OF1 | Woody Uniqueness | The AA's vegetation cover is $>10 \%$ woody* but uplands within $5 \mathrm{kmhave}<10 \%$ woody cover. If so, enter " 3 " and continue to OF8. If not, consider: <br> The AA's vegetation is $>10 \%$ woody ${ }^{\star}$ but uplands within 1 km have $<10 \%$ woody cover. If so enter " 2 " and continue to OF8. If not, consider: <br> The AA's vegetation is $>10 \%$ woody ${ }^{\star}$ but uplands within 100 m of the wetland edge have $<10 \%$ woody cover. If so, enter " 1 " <br> [* NOTE: woody cover = trees \& shrubs taller than 1 m ] | 0 | See above. Do not consider conifer plantations to be forest if it is obvious that trees were planted in rows. [AMN, PHV, POLv, SBMN] |
| 41 | OF8 | Local Vegetated Cover Percentage | Draw a 5 -km radius circle measured from the center of the AA. Ignoring all permanent water in the circle, the percent of the remaining are that is wooded or unmanaged herbaceous vegetation (NOT lawn, row crops, bare or heavily grazed land, clearcuts, or conifer plantations) is: |  | In Google Earth, draw the 5 km buffer and then estimate land cover percentages, or do GIS analysis of an appropriate land cover layer. [AM, PH, POL, SBM, Sens] |
| 42 |  |  | -5\% of the land. | 0 |  |
| 43 |  |  | 5 to 20\% of the land. | 0 |  |
| 44 |  |  | 20 to 60\% of the land. | 1 |  |
| 45 |  |  | 60 to $90 \%$ of the land. | 0 |  |
| 46 |  |  | >90\% of the land. SKIP to OF10. | 0 |  |
| 47 | OF9 | Type of Land Cover | Wthin the 5 -km radius circle, and ignoring all permanent water, the land area that is bare or non-perennial cover is mostly: |  | [AM, SBM] |
| 48 |  |  | Impervious surface, e.g., paved road, parking lot, building, exposed rock. | 0 |  |
| 49 |  |  | Bare pervious surface, e.g., lawn, recent (< 5 yrs ago) clearcut, dirt or gravel road, cropland, landslide, conifer plantation. | 1 |  |
| 50 | OF10 | Distance by Road to Nearest Population | Measured along the maintained road nearest the A , the distance to the nearestpopulation center is: |  | "Population center" means a settled area with more than about 5 regularly- inhabited structures per square kilometer In Google Earth Pro, click on the Ruler icon, then Path, and draw and measure the |
| 51 |  | Center | $<100 \mathrm{~m}$. | 0 |  |
| 52 |  |  | 100-500m. | 0 |  |
| 53 |  |  | 0.5-1 km | 1 |  |
| 54 |  |  | $1-5 \mathrm{~km}$ | 0 |  |
| 55 |  |  | -5km | 0 |  |
| 56 | OF11 | Distance to Nearest Maintained Road | From the center of the AA, the distance to the nearest maintained public road (dirt or paved) is: |  | Determine this by viewing aerial imagery in Google Earth Pro and measuring with the Ruler>Line |
| 57 |  |  | $<10 \mathrm{~m}$ | 0 |  |
| 58 |  |  | 10-25m. | 0 |  |
| 59 |  |  | 25-50m. | 0 |  |
| 60 |  |  | 50-100 m. | 0 |  |
| 61 |  |  | 100-500m. | 1 |  |
| 62 |  |  | >500 m. | 0 |  |


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| 63 | OF12 | Wildife Access | Draw a circle of radius of 5 km from the center of the $A A$ If marmals and amphibians can move from the center of the $A A$ to $A L L$ other separate wetlands and ponds located within the circle without being forced to cross pavement (any width), lawns, bare ground, and/or marine waters, mark $1=$ yes can move to all, $0=$ no. Change toblank if there are no other wetlands within 5 km . | 0 | Draw the 5 km circle in Google Earth Pro using the Circle tool and search for roads and wetlands within it, being alert for roads hidden under forest canopy. [AM, SBM, STR] |
| 64 | OF13 | Distance to Ponded Water | The distance from the AA center to the closest (but separate) ponded water body visible in Google Earth imagery is: |  | In Google Earth Pro, zoom in closely to examine the surrounding landscape for ponds, lakes, and wetlands that appear to be permanently flooded. [AM, PH, SBM, Sens, WBF, WBN] |
| 65 |  |  | -50 m, and not separated by any width of paved roads, stretches of open water, row crops, lamn, bare ground, or impervious surface. | 0 |  |
| 66 |  |  | 50 m , but completely separated by those features. | 0 |  |
| 67 |  |  | $50-500 \mathrm{~m}$, and not separated. | 0 |  |
| 68 |  |  | $50-500 \mathrm{~m}$, but separated by those features. | 1 |  |
| 69 |  |  | $0.5-1 \mathrm{~km}$, and not separated. | 0 |  |
| 70 |  |  | $0.5-1 \mathrm{~km}$, but separated by those features. | 0 |  |
| 71 |  |  | None of the above (the closest patches or corridors that large are >1 km away). | 0 |  |
| 72 | OF14 | Distance to Large Ponded Water | The distance from the AA center to the closest (but separate)non-tidal body of water that is ponded during most of the year and islarger than 8 hectares during most of a normal year is: |  | Determine this by viewing aerial imagery in Google Earth. [Sens, WBF, WBN] |
| 73 |  |  | $<100 \mathrm{~m}$ | 0 |  |
| 74 |  |  | $100 \mathrm{~m}-1 \mathrm{~km}$ | 0 |  |
| 75 |  |  | 1-2km. | 0 |  |
| 76 |  |  | 2-5 km | 0 |  |
| 77 |  |  | $5-10 \mathrm{~km}$ | 1 |  |
| 78 |  |  | $>10 \mathrm{~km}$ | 0 |  |
| 79 | OF15 | Tidal Proximity | The distance from the AA edge to the closesttidal water body (regardless of its salinity) is: |  | In Google Earth, measure the distance to the ocean (including Bay of Fundy) or tidal river, whichever is closer. If you need to see how far upriver a river is tidal, see the KNZ file provided with this calculator for NS (NS Headtide). Points shown in those files are only an approximation, so local information if available may be preferable. [FA, WBF] |
| 80 |  |  | $\angle 100 \mathrm{~m}$ | 0 |  |
| 81 |  |  | $100 \mathrm{~m}-1 \mathrm{~km}$ | 0 |  |
| 82 |  |  | $1-5 \mathrm{~km}$ | 0 |  |
| 83 |  |  | $5-10 \mathrm{~km}$ | 0 |  |
| 84 |  |  | $10-40 \mathrm{~km}$ | 1 |  |
| 85 |  |  | $>40 \mathrm{~km}$ | 0 |  |


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| 86 | OF16 | Upland Edge Contact | Select one: |  | [ NR , SBM, Sens] |
|  |  |  | The AA has no upland edge (or upland is <1\% of perimeter). The AA is entirely surrounded by (\& contiguous with) other wetlands or water. | 0 |  |
|  |  |  | 1-25\% of the AA's perimeter abuts upland (including filled areas). The rest adjoins other wetlands or water that is mostly wider than the AA | 0 |  |
| 89 |  |  | 25-50\% of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA. | 0 |  |
| 90 |  |  | $50-75 \%$ of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA | 0 |  |
| 91 |  |  | More than $75 \%$ of the AA's perimeter abuts upland. Any remainder adjoins other wetlands or water that is mostly wider than the AA. This will be true for most assessments done with WESP-AC. | 1 |  |
| 92 | OF17 | Food Damage fromNon tidal Waters | Wthin 5 km downstream or downslope of the AA (select first true choice): |  | Contact local authories to determine if such maps exist. Where available, LDAR imagery can provide finer elevational resolution useful for flood modeling. [WSV] |
| 93 |  |  | Maps show Flood Zone or Flood Risk areas and there appears to be infrastructure vulnerable to river flooding not caused by tidal storm surges. | 0 |  |
| 94 |  |  | Maps show Food Zone or Flood Risk areas, but infrastructure is absent or is not vulnerable to floods from a non-tidal river. In some cases levees, upriver dams, or other measures may partly limit damage or risk from smaller events. | 0 |  |
| 95 |  |  | Maps do not show Food Zone or Food Risk areas (or no such mapping has been done locally) and there appears to be infrastructure vulnerable to river flooding unrelated to tidal storm surges. | 0 |  |
| 96 |  |  | Maps do not show Flood Zone or Food Risk areas (or no such mapping has been done locally) and there isno infrastructure vulnerable to river flooding unrelated to tidal storm surges. | 1 |  |
| 97 | OF18 | Relative Elevation in Watershed | In Google Earth, enable the Terrain layer (lower left menu) and open the NS_Watersheds Secondary KMZ file that accompanies this calculator. Then determine the AA's approximate elevation (bottom right, NOT the "eye alt'). Then move cursor around to determine the watershed's maximum and minimum elevation. Divide the AA's elevation by the (max-min). | 0.13 | [FA, NR, Sens, SFSV, WCV, WSv] |
| 98 | OF19 | Water Quality Sensitive Watershed or Area | The AA is in a Protected Water Supply area (Designated Water Supply Area, Natural Watershed Municipal Surface Water Supply Area, or Municipal Water Supply Area) according to the provided KMZ overlay ("NS Protected Water Supply Areas'). Enter 1= yes, 0= no. | 0 | If an ACCDC report is available for this AA, it also may contain such information. [NRV] |


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| 99 |  | Degraded Water Upstream | Sampling indicates a problem with concentrations of metals, hydrocarbons, nutrients, or other substances (excluding bacteria, acidic water, high temperatures) being present at levels harmful to aquatic life or humans, and: |  | May use existing data, or sample those waters as part of this wetland assessment. "Harmful" should be evaluated with regard to current federal or provincial water quality standards. [AM, FA, FR, NRV, PRV, SRV, STR, WBF, WBN] |
| 100 |  |  | The condition is present within the AA | 0 |  |
| 101 |  |  | The condition is present in waters within 1 km that flowinto the AA, but has not been documented in the AA itself. | 0 |  |
| 102 |  |  | Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters. | 0 |  |
| 103 |  |  | Data are insufficient (no or inadequate sampling within 1 km , or condition exists only at $>1 \mathrm{~km}$ upstream). This is the situation for nearly all wetlands in this region. | 1 |  |
| 104 | OF21 | Degraded | The problem described above is downslope fromthe AA, and: |  | May use existing data, or monitor waters as part of this wetland assessment. [NRV, PRV, SRv] |
| 105 |  | Downstream | The condition is present within 1 km downslope and connected to the AA by a channel. | 0 |  |
| 106 |  |  | The condition is present within 5 km downslope and connected to the AA by a channel, or within 1 km but not connected to the AA by a channel. | 0 |  |
| 107 |  |  | Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters. | 0 |  |
| 108 |  |  | Data are insufficient (no or inadequate sampling within 1 km , or condition exists only at $>1 \mathrm{~km}$ upstream). This is the situation for nearly all wetlands in this region. | 1 |  |
| 109 | OF22 | Wetland as a \% of Its Contributing Area (Catchment) | From a topographic map and field observations, estimate the approximate boundaries of the catchment (CA) of the entire wetland of which the AA may be only a part. Then adjust those boundaries if necessary based on your field observations of the surrounding terrain, and/or by using procedures described in the Manual. Divide the area of the wetland (not just the $A A$ ) by the approximate area of its catchment excluding the area of the wetland itself. When doing the calculation, if ponded water is adjacent to the wetland, include that in the wetland area. The result is: |  | Topographic maps may be viewed online at the National Atlas of Canada (Toporama): http://atlas.gc.ca/toporama/en/index.html [NR, PR, Sens, SR, WS] |
| 110 |  |  | <0.01, or catchment size unknown due to stormwater pipes that collect water from an indeterminate area. | 1 |  |
| 111 |  |  | 0.01 to 0.1. | 0 |  |
| 112 |  |  | 0.1 to 1. | 0 |  |
| 113 |  |  |  | 0 |  |
| 114 | OF23 | Unvegetated Surface in the Contributing Area | The proportion of the AA's contributing area (measured to no more than 1000 m upslope) that is comprised of buildings, roads, parking lots other pavement, exposed bedrock, landslides, and other mostly-bare surface is about : |  | [FA, INV, NRV, PRV, SRv, STR, WCV, WSv] |
| 115 |  |  | <10\% | 0 |  |
| 116 |  |  | 10 to $25 \%$ | 0 |  |
| 117 |  |  | >25\% | 1 |  |
|  | OF24 | Transport From Upslope | A relatively large proportion of the precipitation that falls farther upslope in the CA reaches this wetland quickly as runoff (surface water), as indicated by the following: <br> (a) input channel is present, <br> (b) input channels have been straightened, <br> (c) upslope wetlands have been ditched extensively, <br> (d) land cover is mostly non-forest, <br> (e) CA slopes are steep, and/or <br> (f) most CA soils are shallow (bedrock near surface) and/or have high runoff coefficients. <br> This statement is: |  | [NRV, PRV, SRV, WSU] |
| 119 |  |  | Mostly true. | 0 |  |
| 120 |  |  | Somenhat true. | 1 |  |
| 121 |  |  | Mostly untrue. | 0 |  |
| 122 | OF25 | Aspect | The overland flow direction of most surface water (in streams, rivers, or runoff) that enters the AA is: |  | [AM, NR, SFS, WC, WS] |
| 123 |  |  | Northward (N, NE). north-facing contributing area | 0 |  |
| 124 |  |  | Southward (S, SW). south-facing contributing area. | 1 |  |
| 125 |  |  | Other (E, SE, W, MM), or no detectable uphill slope or input channel (flat). | 0 |  |
| 126 <br> 127 | OF26 | Internal Fow Distance (Path Length) | The horizontal flow distance from the wetland's inlet to outlet is: <br> 10 m | 0 | Identify inlets and outlets, if any, from topographic maps (use elevations to determine which are inlets and which are outlets) and augment by field inspection. Whth the Provincial Landscape Viewer, select NovaScotia Tonoas the Baseman_Also enable the laver Forestn W/AM Predicted Flow Then |




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|  | Date: | t 28, 2021 | Site Identifier: Cambridge Interchange Wetland 9 | Investic | tor: BL, CP |
|  | Form F (Field). Non-tidal Wetland Data Form. WESP-AC version 2 for Nova Scotia. DIRECTIONS: Walk for no less than 10 minutes from the wetland edge towards its core, in the part of the AA that is proposed for alteration. If no alteration is proposed, walk in a portion that appears to be most representative of the wetland overall. Walk only where it is safe and legal to do so. Conduct the assessment only after reading the accompanying Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answer these questions primarily based on your onsite observations and interpretations. Do not write in shaded parts of this data form. Answering some questions accurately may require conferring with the landowner or other knowledgable persons, and/or reviewing aerial imagery. For most wetlands, completing this field data form will require 1-2 hours on a site. For a list of functions to which each question pertains, see the accompanying Interpretations form. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage \& Delay, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention \& Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV=Invertebrate Habitat, FA=Anadromous Fish Habitat, FR= Resident Fish Habitat, AM=Amphibian \& Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, \& Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use \& Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors. |  |  |  |  |
| 3 | \# | Indicators | Condition Choices | Data | Definitions/Explanations |
| 4 5 | F1 | Wetland Type | Follow the key below and mark the ONE row that best describes MOST of the vegetated part of the AA: <br> A. Moss and/or lichen cover more than $25 \%$ of the ground. Often dominated by ericaceous shrubs (e.g., Labrador tea) or other acid-tolerant plants (e.g., bog cranberry, pitcher plant, sundew, orchids). Substrate is mostly undecomposed peat. Choose between A1 and A2 and mark the choice with a 1 in their adjoining column. Otherwise go to $B$ below. |  | Ericaceous shrubs are ones in the heather family (Ericaceae). Most have leathery evergreen leaves. They include rhododendron, azalea, swamp laurel, leatherleaf, Labrador tea, and others. Most require acidic soil. Athough not in the family Ericaceae, sweetgale (Myrica gale) should be counted also. [AM, CS, FA, FR, INN, NR, OE, PH, Sens, SFS, WBF, WBN] |
|  |  |  | A1. Surface water is usually absent or, if present, pH is typically $<4.5$ and conductivity is usually $<100 \mu \mathrm{~S} / \mathrm{cm}$ ( $<64 \mathrm{ppm}$ TDS). Trees are absent or nearly so. Sedge cover usually sparse or absent but cottongrass and/or lichen cover may be extensive, as well as cloudberry, lingonberry, sheep laurel, and a sedge (Carex raviflora). Wetland surface and surrounding landscape are seldom sloping and wetland often is domed (convex). Inlet and outlet channels are usually absent. If known, pH of peat is $<4.0$. | 0 |  |
| 7 |  |  | A2. Not A1. Surface water, if present, has pH typically $>4.5$ and conductivity is usually $>100 \mu \mathrm{~S} / \mathrm{cm}(>64 \mathrm{ppm}$ TDS). Sedge cover is usually extensive, andor tree and tall shrub cover is extensive. Sometimes at toe of slope or edge of water body. An exit channel is usually present. Wetter than A 1 and peat depth may be shallower ( $<2 \mathrm{~m}$ ). | 0 |  |
| 8 |  |  | B. Moss and/or lichen cover less than $\mathbf{2 5 \%}$ of the ground. Soil is mineral or decomposed organic (muck). Choose between B1 and B2 and mark the choice with a 1 in their adjoining column: |  |  |
| 9 |  |  | B1 Trees and shrubs taller than 1 m comprise more than $25 \%$ of the vegetated cover. Surface water is mostly absent or inundates the vegetation only seasonally (e.g., vermal pools or floodiplain). | 1 |  |
| 10 |  |  | B2. Not B1. Tree \& tall shrubs comprise less than than $25 \%$ of the vegetated cover. Vegetation is mostly herbaceous, e.g., cattail, bulrush, burreed, pond lily, horsetail. Surface water may be extensive and fluctuates seasonally, being either persistent or drying up partly or entirely. | 0 |  |
|  | Reminder: For all questions, the AA should include all persistent waters in ponds smaller than 8 hectares ( -283 m on a side) that are adjacent to the $A A$ <br> The AA should also include part of the water area of adjacent ponded water larger than 8 ha and adjacent rivers wider than 20 m . Specifically, the AA should include the open water part adjacent to wetland vegetation and equal in width to the average width of that vegetated zone. Throughout this data form, "adjacent " is used synonymously with abutting, adjoining, bordering, contiguous -- and means no upland (manmade or natural) completely separates the described features along their directly shared edge. Features joined only by a channel are not necessarily considered to be adjacent -- a large portion of their edges must match. The features do not have to be hydrologically connected in order to be considered adjacent. |  |  |  |  |
| 11 |  |  |  |  |  |
| 12 | F2 | Wetland Types Adjoining or Subordinate | If the $A A$ is smaller than 1 ha, mark all other types that occupy more than $1 \%$ of the vegetated $A A$. If the $A A$ is larger than 1 ha, mark all other types which are within or adjacent to the AA and occupy more than 1 ha, as visible from the AA or as interpreted from aerial imagery. Do not mark again the type marked in F1. |  | 1 hectare is $10,000 \mathrm{sq}$. mor about 2.5 acres. It could have dimensions of $100 \mathrm{mby} 100 \mathrm{~m}, 1000 \mathrm{mby}$ 10 m , or similar. [AM, INN, SBM, WBF] |
| 13 |  |  | A1. | 0 |  |
| 14 |  |  | A2. | 1 |  |
| 15 |  |  | B1. | 0 |  |
| 16 |  |  | B2. | 0 |  |
| 17 | F3 | Woody Height \& Form Diversity | Following EACH row below, indicate with a number code the percentage of the living vegetation in the AA which is occupied by that feature ( $\mathbf{6}$ if $>95 \%$, $\mathbf{5}$ if $75-95 \%, \mathbf{4}$ if $50-75 \%$, $\mathbf{3}$ if $25-50 \%$, $\mathbf{2}$ if $5-25 \%$, $\mathbf{1}$ if $-5 \%, \mathbf{0}$ if none). If the vegetated part of the AA is largely herbaceous (nonwoody) vegetation, these percentages should not sum to $100 \%$ <br> coniferous trees (may include tamarack) taller than 3 m |  | Deciduous shrubs in this region usually include buttonbush, Labrador tea, bayberry (Morella), huckleberry, cranberry, cloudbery, sweetgale, alder, willow, birch, ash, dogwood, and a few others. If you assigned a code of 3 or higher to any of the first four choices and the ground cover beneath the trees/shrubs is $<25 \%$ moss, then question F1 might be "B1". [CS, IN $, ~ N R, ~ P H, ~ P O L, ~ S B M, ~ S e n s] ~$ |
| 18 |  |  |  | 3 |  |


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| 19 |  |  | deciduous trees taller than 3 m | 3 |  |
| 20 |  |  | coniferous or ericaceous shrubs or trees 1-3 mtall not directly below the canopy of trees. | 2 |  |
| 21 |  |  | deciduous shrubs or trees 1-3 mtall not directly below the canopy of trees. | 3 |  |
| 22 |  |  | Coniferous or ericaceous shrubs <1 mtall not directly below the canopy of taller vegetation. | 2 |  |
| 23 |  |  | deciduous shrubs or trees $<1 \mathrm{mtall}$ (e.g., deciduous seedlings) not directly below the canopy of taller vegetation. | 2 |  |
| 24 | Note: If none of top 4 rows in F3 was marked 2 or greater, SKIP to F9 (N fixers). |  |  |  |  |
| 25 | F4 | Dominance of Most Abundant Shrub Species | Determine which two woody plant species comprise the greatest portion of the low ( $\langle 3 \mathrm{~m}$ ) woody cover. Then choose one: |  | [PH, POL, SBM, Sens] |
| 26 |  |  | those species together comprise $>50 \%$ of such cover. | 0 |  |
| 27 |  |  | those species together do not comprise $>50 \%$ of such cover. | 1 |  |
| 28 | F5 | woody Diameter Classes | Mark $A \amalg$ the types that comprise $>5 \%$ of the woody canopy cover in the $A A$ or $>5 \%$ of the wooded areas (if any) along its upland edge (perimeter). The edge should include only the trees whose canopies extend into the AA |  | Estimate the diameters at chest height. If small-diameter trees are overtopped (shaded) by larger ones, visualise a "subcanopy" at the average height of the smaller-dbh trees, to serve as a basis for the minimum $5 \%$ canopy requirement in this question. The trees and shrubs need not be wetland species. [AM, CS, POL, SBM, Sens, WBN] |
| 29 |  |  | Coniferous, $1-9 \mathrm{~cm}$ diameter and $>1 \mathrm{mtall}$. | 1 |  |
| 30 |  |  | broad-leaved deciduous $1-9 \mathrm{~cm}$ diameter and $>1 \mathrm{mtall}$. | 1 |  |
| 31 |  |  | coniferous, $10-19 \mathrm{~cm}$ diameter. | 1 |  |
| 32 |  |  | broad-leaved deciduous $10-19 \mathrm{~cm}$ diameter. | 1 |  |
| 33 |  |  | coniferous, $20-40 \mathrm{~cm}$ diameter. | 1 |  |
| 34 |  |  | broad-leaved deciduous $20-40 \mathrm{~cm}$ diameter. | 0 |  |
| 35 |  |  | coniferous, $>40 \mathrm{~cm}$ diameter. | 0 |  |
| 36 |  |  | broad-leaved deciduous $>40 \mathrm{~cm}$ diameter. | 0 |  |
| 37 | F6 | Height Class Interspersion | Follow the key below and mark the ONE row that best describes MOST of the AA: |  | [AM, INW, NR, PH, SBM, Sens] |
|  |  |  | A. Neither the vegetation taller than 1 m nor the vegetation shorter than that comprise $>70 \%$ of the vegetated part of the AA. They each comprise $30-70 \%$ Choose between A 1 and A 2 and mark the choice with 1 in the adjoining column. Otherwise go to B below. |  |  |
| 39 |  |  | A1 The two height classes are mostly scattered and intermixed throughout the AA | 0 |  |
| 40 |  |  | A2 Not A1. The two height classes are mostly in separate zones or bands, or in proportionately large clumps. | 1 |  |
| 41 |  |  | B. Either the vegetation shorter than 1 m comprises $>70 \%$ of the vegetated part of the $A A$, or the vegetation taller than that does. One size class might even be totally absent. Choose between B 1 and B 2 and mark the choice with 1 in the adjoining column: |  |  |
| 42 |  |  | B1 The less prevalent height class is mostly scattered and intermixed within the prevalent one. | 0 |  |
| 43 |  |  | B2. Not B1. The less prevalent height class is mostly located apart from the prevalent one, in separate zones or clumps, or is completely absent. | 0 |  |
| 44 | 7 | Large Snags (Dead Standing Trees) | The number of large snags (diameter $\mathbf{2 0} \mathbf{~ c m}$ ) in the AAplus adjacent upland area within 10 m of the wetland edge is: |  | Snags are dead standing trees that often (not always) lack bark and foliage. Include only ones that are at least 2 mtall . [POL, SBM, WBN] |
| 45 |  |  | None, or fever than 8 hectare which exceed this diameter. | 1 |  |
| 46 |  |  | Several ( $>8$ hectare) and a pond, lake, or slow-flowing water wider than 10 mis within 1 km | 0 |  |
| 47 |  |  | Several ( $>8 / \mathrm{hectare} \mathrm{)}$ but above not true. | 0 |  |
| 48 | F8 | Downed Wood | The number of downed wood pieces longer than 2 m and with diameter $>10 \mathrm{~cm}$, and not persistently submerged, is: |  | Exclude temporary "bum piles." [AM, IN, POL, SBM] |
| 49 |  |  | Few or none that meet these criteria. | 0 |  |
| 50 |  |  | Several ( $>5$ if $A$ A is $>5$ hectares, less for smaller $A$ As) meet these criteria | 1 |  |
| 51 | F9 | NFixers | The percentage of the AA's vegetated cover that contains nitrogen-fixing plants (e.g., alder, sweetgale, clover, lupine, alfalfa, other legumes) is: |  | Do not include $N$-fixing algae or lichens. [FA, $\mathrm{FR}, \mathrm{IN} \mathrm{N}, \mathrm{NRV}, \mathrm{OE}, \mathrm{PH}, \mathrm{SBM}$, Sens] |
| 52 |  |  | <1\%or none. | 0 |  |
| 53 |  |  | 1-25\% of the vegetated cover, in the $A$ A or along its water edge (whichever has more). | 1 |  |
| 54 |  |  | $25-50 \%$ of the vegetated cover, in the AA or along its water edge (whichever has more). | 0 |  |
| 55 |  |  | $50-75 \%$ of the vegetated cover, in the AA or along its water edge (whichever has more). | 0 |  |
| 56 |  |  | $>75 \%$ of the vegetated cover, in the AA or along its water edge (whichever has more). | 0 |  |
| 57 | F10 | Sphagnum Moss Extent | The cover of Sphagnum moss (or any moss that forms a dense cushion many centimeters thick), including the moss obscured by taller sedges and other plants rooted in it, is: |  | Exclude moss growing on trees and rocks. [CS, PH] |
| 58 |  |  | -5\% of the vegetated part of the AA | 0 |  |
| 59 |  |  | 5-25\% of the vegetated part of the AA | 1 |  |
| 60 |  |  | 25-50\% of the vegetated part of the AA | 0 |  |
| 61 |  |  | 50-95\% of the vegetated part of the AA | 0 |  |
| 62 |  |  | >95\% of the vegetated part of the AA. | 0 |  |



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| 103 |  |  | 50-95\% of the vegetated area | 0 |  |
| 104 |  |  | -95\% of the vegetated area | 0 |  |
| 105 | F19 | Dominance of Most Abundant Herbaceous | Determine which two herbaceous species comprise the greatest portion of the herbaceous cover (excluding mosses and floating-leaved aquatic plants). Then choose one of the following: |  | For this question, indude fems as well as graminoids and forbs. [EC, IN, PH, POL, Sens] |


|  | A | B | C | D | E |
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| 106 |  | Species | those species together comprise $>50 \%$ of the areal cover of herbaceous plants at any time during the year. | 1 |  |
| 107 |  |  | those species together do not comprise $>50 \%$ of the areal cover of herbaceous plants at any time during the year. | 0 |  |
| 108 | F20 | Invasive Plant Cover | How extensive is the cover of irvasive plant species in the AA? For species, see Plants invasive worksheet in the accompanying Supplinfo file. |  | [EC, PH, POL, Sens] |
| 109 |  |  | invasive species appear to be absent in the AA, or are present only in trace amount (a few individuals). | 1 |  |
| 110 |  |  | invasive species are present in more than trace amounts, but comprise $<5 \%$ of herbaceous cover (or woody cover, if the invasives are woody). | 0 |  |
| 111 |  |  | invasive species comprise 5-20\% of the herb cover (or woody cover, if the invasives are woody). | 0 |  |
| 112 |  |  | irvasive species comprise $20-50 \%$ of the herb cover (or woody cover, if the invasives are woody). | 0 |  |
| 113 |  |  | invasive species comprise $>50 \%$ of the herb cover (or woody cover, if the invasives are woody). | 0 |  |
| 114 | F21 | Invasive Cover Along Upland Edge | Along the wetland-upland boundary, the percent of the upland edge (within 3 m upslope from the wetland) that is occupied by invasive plant species is: |  | If a plant cannot be identified to species (e.g., winter conditions) but its genus contains an exotic species, assume the unidentified plant to also be exotic. If vegetation is so senesced that exotic species cannot be identified, answer "none". [PH, STR] |
| 115 |  |  | none of the upland edge (irvasives apparently absent), or AA has no upland edge. | 1 |  |
| 116 |  |  | some (but -5\%) of the upland edge. | 0 |  |
| 117 |  |  | 5-50\% of the upland edge. | 0 |  |
| 118 |  |  | most ( $>50 \%$ ) of the upland edge. | 0 |  |
| 119 | F22 | Fringe Wetland | During most of the year, open water within or adjacent to the vegetated part of the wetland is much wider than the maximum width of the vegetated zone within the wetland. Enter " 1 " if true, " 0 " if false. | 0 | [MBF, WBN, WCV] |
| 120 | F23 | Lacustrine Wetland | The vegetated part of the AA is within or adjacent to a body of non-tidal standing open water whose size exceeds 8 hectares during most of a normal year. | 0 | [ $\mathrm{F}, \mathrm{PR}, \mathrm{PU}, \mathrm{WBF}, \mathrm{WBN}$ ] |
| 121 | F24 | \% of AAWithout Surface Water | The percentage of the AA that never contains surface water during an average year (that is, except perhaps for a few hours after snommelt on rainstorms), but which is still a wetland, is: |  | 1 hectare is 10,000 sq. mor about 2.5 acres. It could have dimensions of $100 \mathrm{mby} 100 \mathrm{~m}, 1000 \mathrm{mby}$ 10 m , or similar. [AM, FA, $\operatorname{FR}, \mathrm{IN}, \mathrm{NR}, \mathrm{PH}, \mathrm{PR}, \mathrm{SBM}$, Sens, SRv, WBF, WBN, WC] |
| 122 |  |  | $<1 \%$. In other words, all or nearly all of the AA is covered by water permanently or at least seasonally. | 0 |  |
| 123 |  |  | 1-25\% of the AA, or $<1 \%$ but $>0.01$ ha never contains surface water. | 0 |  |
| 124 |  |  | 25-50\% of the AA never contains surface water. | 0 |  |
| 125 |  |  | 50-75\% of the AA never contains surface water. | 1 |  |
| 126 |  |  | 75-99\% of the AA never contains surface water, OR $>99 \%$ and there is at least one persistently ponded water body larger than 1 ha in the AA | 0 |  |
| 127 |  |  | 99-100\% AND there is no persistently ponded water body larger than 1 ha within the AA Enter "1" andSKIP to F42 (Channel Connection). | 0 |  |
| 128 | F25 | \% of AA with <br> Persistent Surface Water | Identify the parts of the $A A$ that still contain surface water (flowing or ponded, open or hidden beneath vegetation) even during the driest times of a normal year, i.e., when the AA's surface water is at its lowest annual level. At that time, the percentage of the AA that still contains surface water is: |  | If you are unable to determine the condition at the driest time of year, ask the land owner or neighbors about it if possible. Indicators of persistence may include fish, some dragonflies, beaver, and muskrat. [AM, CS, FA, FR, INV, NR, POL, PR, SBM, WBF, WBN] |
| 129 |  |  | None. The AA dries up completely (no water in channels either) or never has surface water during most years. SKIP to F27. | 0 |  |
| 130 |  |  | 1-20\% of the AA | 1 |  |
| 131 |  |  | 20-50\% of the AA | 0 |  |
| 132 |  |  | 50-95\% of the AA | 0 |  |
| 133 |  |  | >95\% of the AA True for many fringe wetlands. | 0 |  |
| 134 | F26 | \% of Summertime Water that is Shaded | At mid-day during the warmest time of year, the area of surface waterwithin the AA that is shaded by vegetation and other features that are within the $A A$ at that time is: |  | [FA, WC] |
| 135 |  |  | -5\% of the water is shaded, or no surface water is present then. | 0 |  |
| 136 |  |  | $5-25 \%$ of the water is shaded. | 0 |  |
| 137 |  |  | 25-50\% of the water is shaded. | 0 |  |
| 138 |  |  | 50-75\% of the water is shaded. | 1 |  |
| 139 |  |  | >75\% of the water is shaded. | 0 |  |
| 140 | F27 | \% of AA that is Fooded Only Seasonally | The percentage of the AA's area that is between the annual high water and the annual low water (surface water) is: |  | Flood marks (algal mats, adventitious roots, debris lines, ice scour, etc.) are often evident when not fully inundated. Aso, such areas often have a larger proportion of upland and annual (vs. perennial) plant species. In riverine systems, the extent of this zone can be estimated by multiplying by 2 the bankful height and visualising where that would intercept the land along the river. [CS, FA, IN, NR, OE, PH, SR, WBF, WBN, WS] |
| 141 |  |  | None, or $<0.01$ hectare and <1\% of the AA. SKIP to F29. | 0 |  |
| 142 |  |  | 1-20\% of the AA , or $<1 \%$ but $>0.01$ ha | 1 |  |
| 143 |  |  | 20-50\% of the AA | 0 |  |


|  | A | B | C | D | E |
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| 144 |  |  | 50-95\% of the AA | 0 |  |
| 145 |  |  | >95\% of the AA | 0 |  |
| 146 <br> 147 <br> 148 <br> 149 <br> 150 <br> 151 | F28 | Annual Water Auctuation Range | The annual fluctuation in surface water level within most of the parts of the AA that contain surface water at least temporarily is: |  | Look for flood marks (see above). Because the annual range of water levels is difficult to estimate without multiple visits, consider asking the land owner or neighbors about it. [AM, CS, INV, NR, OE, PH, PR, SR, WBN, WS] |
|  |  |  | $<10$ cm change (stable or nearly so). | 0 |  |
|  |  |  | $10 \mathrm{~cm}-50 \mathrm{~cm}$ change. | 1 |  |
|  |  |  | 0.5-1 m change. | 0 |  |
|  |  |  | 1-2 m change. | 0 |  |
|  |  |  | >2 m change. | 0 |  |
|  | Is the AA plus adjacent ponded water smaller than 0.01 hectare (about $10 \mathrm{~m} \times 10 \mathrm{~m}$, or $1 \mathrm{~m} \times 100 \mathrm{~m}$ )? If so, enter " 1 " in column D andSKIP TO F42 (Connection). |  |  | 0 |  |
| 153 | F29 | Predominant Depth Class | During most of the time when surface water is present during the growing season, its depth, averaged over the entire inundated part of the AA , is: |  | If a boat is unavailable, estimate this by considering wetland size and local topography. Or if timing and safety allow, depths may be measured by drilling through winter ice. This question is asking about the spatial median depth that occurs during most of that time, even if inundation is only seasonal or temporary. If inundation in most but not all of the wetland is brief, the answer will be based on the deptr of the most persistently inundated part of the wetland. Include surface water in channels and ditches as well as ponded areas. [CS, FA, FR, INV, OE, PH, PR, Sens, SFS, SR, WBF, WBN, WC] |
| 154 |  |  | $<10 \mathrm{~cm} \mathrm{deep} \mathrm{(but}>0$ ). | 0 |  |
| 155 |  |  | 10-50 cm deep. | 1 |  |
| 156 |  |  | 0.5-1 mdeep. | 0 |  |
| 157 |  |  | 1-2 mdeep. | 0 |  |
| 158 |  |  | >2 deep. True for many fringe wetlands. | 0 |  |
| 159 | F30 | $\begin{array}{\|l} \hline \text { Depth Classes - } \\ \text { Evenness of } \\ \text { Proportions } \end{array}$ | When present, surface water in most of the AA usually consists of (select one): |  | Estimate these proportions by considering the gradient and microtopography of the site. [FR, INV, WBF, WBN] |
| 160 |  |  | One depth class that comprises >90\% of the AA's inundated area (use the classes in the question above). | 1 |  |
| 161 |  |  | One depth class that comprises 50-90\% of the AA's inundated area | 0 |  |
| 162 |  |  | Neither of above. There are 3 or more depth classes and none occupy $>50 \%$ a | 0 |  |
| 163 | F31 | \% of Water That Is Ponded (not Fowing) | During most times when surface water is present, the percentage that is (1)ponded (stagnant, or flows so slowly that fine sediment is not held in suspension) AND (2) is likely to be deeper than 0.5 min some places, is: |  | Nearly all wetlands with surface water have some ponded water. [AM, CS, IN $, ~ N R, O E, P R$, Sens, SR, WBF, WBN, WC, WS] |
| 164 |  |  | -5\% of the water, or it occupies $<100$ sq.m cumulatively. Nearly all the surface water is flowing. SKIP to F34. | 0 |  |
| 165 |  |  | 5-30\% of the water. | 0 |  |
| 166 |  |  | 30-70\% of the water. | 1 |  |
| 167 |  |  | 70-95\% of the water. | 0 |  |
| 168 |  |  | >95\% of the water. | 0 |  |
|  | F32 | Ponded Open Water Mnimum Size | During most of the growing season, the largest patch of open water that is ponded and is in or bordering the $A A$ is $>0.01$ hectare (about 10 mby 10 m ) and mostly deeper than 0.5 m If true enter " 1 " and continue, If false, enter " 0 " andSKIP to F41 (Floating Algae \& Duckweed). | 0 | Open water is not obscured by vegetation in aerial ('duck's eye") view. It includes vegetation floating on the water surface or entirely submersed beneath it. |
| 169 |  |  |  |  |  |
| 170 | F33 | \% of Ponded Water that is Open | In ducks-eye aerial view, the percentage of the ponded water that isopen (lacking emergent vegetation during most of the growing season, and unhidden by a forest or shrub canopy) is: |  | [AM, CS, FA, FR, INN, NR, OE, PR, SR, WBF, WBN, WC] |
| 171 |  |  | None, or $<1 \%$ of the AA and largest pool occupies $<0.01$ hectares. Enter "1" and SKIP to F41 (Hoating Algae \& Duckweed). | 0 |  |
| 172 |  |  | 1-4\% of the ponded water. Enter "1" and SKIP to F41 (Floating Agae \& Duckweed). | 0 |  |
| 173 |  |  | 5-30\% of the ponded water. | 0 |  |
| 174 |  |  | 30-70\% of the ponded water. | 0 |  |
| 175 |  |  | 70-99\% of the ponded water. | 0 |  |
| 176 |  |  | 100\% of the ponded water. | 0 |  |
| 177 | F34 | Wdth of Vegetated Zone within Wetland | At the time during the growing season when the AA's water level is lowest, the average width of vegetated areain the AA that separates adjoining uplands from open water within the $A A$ is: |  | "Vegetated area" does not include underwater or floating-leaved plants, i.e., aquatic bed. Mdth may include wooded riparian areas if they have wetland soil or plant indicators. [AM, CS, $\mathrm{NR}, \mathrm{OE}, \mathrm{PH}, \mathrm{PR}$, SBM, Sens, SR, WBN] |
| 178 |  |  | <1m | 0 |  |
| 179 |  |  | 1-9m | 0 |  |
| 180 |  |  | 10-29m | 0 |  |
| 181 |  |  | 30-49m | 0 |  |
| 182 |  |  | 50-100m. | 0 |  |
| 183 |  |  | $>100 \mathrm{~m}$, or open water is absent at that time. | 0 |  |
| 184 | F35 | Fat Shoreline Extent | During most of the part of the growing season when water is present, the percentage of the AA'swater edge length that is nearly flat (a slope less than about $5 \%$ measured within 5 mlandward of the water) is: |  | If several isolated pools are present in early summer, estimate the percent of their collective shorelines that has such a gentle slope. [SR, WBN] |
| 185 |  |  | $<1 \%$ of the water edge. | 0 |  |
| 186 |  |  | 1-25\% of the water edge. | 0 |  |
| 187 |  |  | 25-50\% of the water edge. | 0 |  |



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| 209 |  |  | Temporary (surface water flows out for <14 days, not necessarily consecutive). | 0 |  |
| 210 |  |  | None -- but maps show a stream network downslope from the AA and within a distance that is less than the AA's length.SKIP to F47 (pH Measurement). | 0 |  |
| 211 |  |  | No surface water flows out of the wetland except possibly during extreme events (<once per 10 years). Or, water flows only into a wetland, ditch, or lake that lacks an outlet. SKIP to F47 (pH Measurement). | 0 |  |
| 212 | F43 | Outflow Confinement | During major runoff events, in the places where surface water exits the $A$ A or connected waters nearby, the water: |  | "Major runoff events" would include biennial high water caused by storms and/or rapid snowmelt. [CS, NR, OE, PR, Sens, SR, STR, WS] |
| 213 |  |  | Mostly passes through a pipe, culvert, narrowly breached dike, berm, beaver dam, or other partial obstruction (other than natural topography) that does not appear to drain the wetland artificially during most of the growing season. | 0 |  |
| 214 |  |  | Leaves through natura exits (channels or diffuse outflow), not mainly through artificial or temporary features. | 0 |  |
| 215 |  |  | Is exported more quickly than usual due to ditches or pipes within the AA or connected to its outlet, or within 10 m of the AA's edge, which drain the wetland artificially, or water is pumped out of the AA | 1 |  |
| 216 | F44 | Tributary Channel | At least once annually, surface water from a tributary channel that is $>100 \mathrm{mlong}$ moves into the $A A O$, surface water from a larger permanent water body adjacent to the AA spills into the AA. If it enters only via a pipe, that pipe must be fed by a mapped stream or lake further upslope. If no, SKIP to F47 (pH Measurement). | 1 | If inlet tributaries cannot be searched for due to inaccessibility of part of the AA, follow suggestions in F42 above. [NRv, PH, PRv, SRv] |
| 217 | F45 | Input Water Temperature | Based on lack of shade, water source characteristics, or actual temperature measurements, the inflow is likely to be warmer than surface water in the $A A$ during part of most years. Enter $1=y e s, 0=n o$. | 0 | [WO]] |
| 218 | F46 | Throughflow Resistance | During its travel through the AA at the time of peak annual flow, water arriving in channels: [select only the ONE encountered bymost of the incoming water]. |  | [FA, PR, INN, NR, OE, PR, SR, WS] |
|  |  |  | Does not bump into many plant stems as it travels through the AA. Nearly all the water continues to travel in unvegetated (often incised) channels that have minimal contact with wetland vegetation, or through a zone of open water such as an instream pond or lake. | 1 |  |
| 220 |  |  | Bumps into herbaceous vegetation but mostly remains in farily straight channels. | 0 |  |
|  |  |  | Bumps into herbaceous vegetation and mostly spreads throughout, or is in widely meandering, multi-branched, or braided channels. | 0 |  |
| 222 |  |  | Bumps into tree trunks and/or shrub stems but mostly remains in fairly straight channels. | 0 |  |
| 223 |  |  | Bumps into tree trunks andlor shrub stems and follows a fairly indirect path from entrance to exit (meandering, multi-branched, or braided). | 0 |  |
| 224 | F47 | pH Measurement | The pH in most of the AA's surface water: |  | Preferably, measure this in larger areas of ponded surface water within the AA, or in streams that have passed through (not along) most of the AA. Unless surface water is completely absent, do not dig holes or make depressions in peat in order to provide water for this measurement. Avoid measuring near roads or in puddles formed only by recent rain. [AM, FA, FR, NR, WBF, PH, PR, Sens, WBF, WBN] |
| 225 |  |  | Was measured, and is: [enter the reading in the colurn to the right.] |  |  |
| 226 |  |  | Was not measured but surface water is present and is darkly tea-coloured. Or if no surface water, then mosses and plants that indicate peatland (e.g., Labrador tea) are prevalent. Enter "1". | 0 |  |
| 227 |  |  | Neither of above. Enter "1". | 1 |  |
|  | F48 | $\begin{aligned} & \text { TDS and/or } \\ & \text { Conductivity } \end{aligned}$ | The TDS (total dissolved solids) or conductivity off the AA's surface water is: (select the first true row with information): |  | See above for measurement guidance. [FR, INV, NRR, PH, PRV, Sens] |
| 229 |  |  | TDS is: [Enter the reading in ppmor mg/L in the column to the right, if measured, or answer next row.] |  |  |
| 230 |  |  | Conductivity is [Enter the reading in $\mu \mathrm{S} / \mathrm{cm}$ in the colum to the right.] |  |  |
| 231 |  |  | Was not measured, but plants that indicate saline conditions cover much of the vegetated A A Enter "1". | 0 |  |
| 232 |  |  | Neither of above | 1 |  |
| 233 | F49 | Beaver Probability | Use of the AA by beaver during the past 5 years is (select most applicable ONE): |  | [FA, FR, PH, SBM, Sens, WBF, WBN] |
|  |  |  | Evident from direct observation or presence of gnawed limbs, dams, tracks, dens, lodges, or extensive stands of water-killed trees (snags). | 0 |  |
| 235 |  |  | Likely based on known occurrence in the region and proximity to suitable habitat, which may include: (a) a persistent freshwater wetland, pond, or lake, or a perennial low or mid-gradient ( $<10 \%$ ) channel, and (b) a corridor or multiple stands of hardwood trees and shrubs in vegetated areas near surface water. | 0 |  |
|  |  |  | Unlikely because site characteristics above are deficient, and/or this is a settled area or other area where beaver are routinely removed. | 1 |  |
| 237 | F50 | Groundwater Strength of Evidence | Select first applicable choice: |  | Adhere to these criteria strictly -- do not use personal judgment based on fen conditions, pH , or other evidence. Consult topographic maps to detect breaks in slope described here. Rust deposits associated with groundwater seeps may be most noticeable as orange discoloration in ice formations along streams during early winter. [AM, CS, FA, FR, INN, NR, OE, PH, PRv, SFS, WC, WS] |
|  |  |  | Springs are known to be present within the $A A$, or if groundwater levels have been monitored, that has demonstrated that groundwater primarily discharges to the wetland for longer periods during the year than periods when the wetland recharges the groundwater. | 0 |  |
| 239 |  |  | Most of the $A A$ has a slope of $>5 \%$, or is very close to the base of a natural slope longer than 100 and much steeper than the slope of the AA, AND the pH of surface water, if known, is $>5.5$. | 0 |  |
| 240 |  |  | Neither of above is true, although some groundwater may discharge to or flow through the AA O O groundwater influx is unknown. | 1 |  |


|  | A | B | C | D | E |
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| 241 | F51 | Internal Gradient | The gradient along most of the flow path within the $A$ A is: |  | This is not the same as the shoreline slope. It is the elevational difference between the AA's inlet and outlet, divided by the flow-distance between them and corverted to percent. If available, use a clinometer to measure this. Free clinometer apps can be downloaded to smartphones. If the wetland is large (longer than $\sim 1 \mathrm{~km}$ ), this may be estimated using Google Earth to determine the minimum and maximum elevation within the $A A$, then dividing by length and multiplying by 100. [CS, NR, OE, PR, SR, WBF, WBN, WS] |
| 242 |  |  | 2\% or the AA has no surface water outlet (not even seasonally). | 0 |  |
| 243 |  |  | 2-5\% | 1 |  |
| 244 |  |  | 6-10\% | 0 |  |
| 245 |  |  | >10\% | 0 |  |
| Note for the next three questions: If the AA lacks an upland edge, evaluate based on the AA's entire perimeter, and moving outward into whatever areas 246 are adjacent. In many situations, these questions are best answered by measuring from aerial images. |  |  |  |  |  |
| 247 | F5 | Vegetated Buffer as \% of Perimeter | Wthin a zone extending 30 m laterally from the AA's edge with upland and/or other wetlands, the percentage that containsperennial vegetation cover (except lamns, row crops, heavily grazed land, conifer plantations) is: |  | [AM, FA, FR, INN, NRV, PH, POL, PRV, SBM, Sens, SRv, STR, WBN] |
| 248 |  |  | -5\% | 0 |  |
| 249 |  |  | 5 to 30\% | 1 |  |
| 250 |  |  | 30 to 60\% | 0 |  |
| 251 |  |  | 60 to 90\% | 0 |  |
| 252 |  |  | >90\%, or all the area within 30 m of the AA edge is other wetlands. SKIP to P55. | 0 |  |
| 253 | F53 | Type of Cover in Buffer | Wthin 30 m upslope of where the wetland transitions to upland, the upland land cover that is NOT perennial vegetation is mostly (mark ONE): |  | [AM, FA, INN, NRV, PH, POL, SBM, STR, WBN] |
| 254 |  |  | Impervious surface, e.g., paved road, parking lot, building, exposed rock. | 0 |  |
| 255 |  |  | Bare or nearly bare penious surface or managed vegetation, e.g., lamn, row crops, unpaved road, dike, landslide. | 1 |  |
| 256 | F54 | Buffer Slope | The steepest and/or most disturbed part of the upland area that is within 30 m of the wetland and occupies $>10 \%$ of that upland area has a percent slope of: |  | [NRV, PRV, Sens, SRV] |
| 257 |  |  | <1\% (flat -- almost no noticeable slope) or all the area within 30 mof the $A$ A edge is other wetlands. | 0 |  |
| 258 |  |  | 2-5\% | 1 |  |
| 259 |  |  | 5-30\% | 0 |  |
| 260 |  |  | -30\% | 0 |  |
| 261 | F55 | Cliffs or Steep Banks | In the AA or within 100 m , there are elevated terrestrial features such as cliffs, talus slopes, stream banks, or excavated pits (but not riprap) that extend at least 2 m nearly vertically, are urvegetated, and potentially contain crevices or other substrate suitable for nesting or den areas. Enter 1 (yes) or 0 (no). | 0 | Do not include upturned trees as potential den sites. [POL, SBM] |
| 262 | F56 | New or Expanded Wetland | Human actions within or adjacent to the AA have persistently expanded a naturally occurring wetland or created a wetland where there previously was none (e.g., by excavation, impoundment): |  | Determine this using historical aerial photography, old maps, soil maps, or permit files as available [CS, NR, OE, PH, Sens] |
| 263 |  |  | No. | 0 |  |
| 264 |  |  | Yes, and created or expanded 20-100 years ago. | 0 |  |
| 265 |  |  | Yes, and created or expanded $3-20$ years ago. | 0 |  |
| 266 |  |  | Yes, and created or expanded within last 3 years. | 0 |  |
| 267 |  |  | Yes, but time of origin or expansion unknown. | 0 |  |
| 268 |  |  | Unknown if new or expanded within 20 years or not. | 1 |  |
| 269 | F57 | Burn History | More than $1 \%$ of the AA's previously vegetated area: |  | Look for charred soil or stumps (in multiple widely-spaced locations) or ask landowner. [CS, PH, STR] |
| 270 |  |  | Burned within past 5 years. | 0 |  |
| 271 |  |  | Burned 6-10 years ago. | 0 |  |
| 272 |  |  | Burned 11-30 years ago. | 0 |  |
| 273 |  |  | Burned $>30$ years ago, or no evidence of a burn and no data. | 1 |  |
| 274 | F58 | Visibility | The maximum percentage of the wetland that is visible from the best vantage point on public roads, public parking lots, public buildings, or public maintained trails that intersect, adjoin, or are within 100 m of the $A A$ (select one) is: |  | [PU, STR, WBFV] |
| 275 |  |  | 25\% | 0 |  |
| 276 |  |  | 25-50\% | 0 |  |
| 277 |  |  | -50\% | 1 |  |
| 278 | F59 | Non-consumptive Uses - Actual or Potential | Assuming access permission was granted, select AL statements that are true of the AA as it currently exists: |  | [PU, STR] |
| 279 |  |  | For an average person, walking is physically possible in (not just near) $>5 \%$ of the $A A$ during most of the growing season, e.g., free of deep water and dense shrub thickets. | 1 |  |
| 280 |  |  | Maintained roads, parking areas, or foot-trails are within 10 m of the $A A$, or the $A A$ can be accessed part of the year by boats arriving via contiguous waters. | 0 |  |
| 281 |  |  | Within or near the AA, there is an interpretive center, trails with interpretive signs or brochures, andor regular guided interpretive tours. | 0 |  |


|  | A | B | C | D |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 282 | F60 | Unvisited Core Area | The percentage of the AA almost never visited by humans during an average growing season probably comprises: [ Note: Only include the part actually walked or driven (not simply viewed from) with a vehicle or boat. Do not include visitors on trails outside of the AA unless more than half the wetland is visible from the trails and they are within 30 mof the wetland edge. In that case include only the area occupied by the trail.] |  | [AM, FAv, PRv, PH, PU, SBM, STR, WBF, WBN] |
| 283 |  |  | -5\% and no inhabited building is within $100 \mathrm{mof} \mathrm{the} A$ A | 0 |  |
| 284 |  |  | -5\% and inhabited building is within 100 mof the $A$ A | 0 |  |
| 285 |  |  | $5-50 \%$ and no inhabited building is within 100 m of the $A$ A | 0 |  |
| 286 |  |  | $5-50 \%$ and inhabited building is within 100 m of the $A$ A | 0 |  |
| 287 |  |  | 50-95\%, with or without inhabited building nearby. | 0 |  |
| 288 |  |  | >95\% of the AA with or without inhabited building nearby. | 1 |  |
| 289 | F61 | Frequently Visited Area | The part of the AA visited by humans almost daily for several weeks during an average growing season probably comprises: [See note above.] |  | [AM, PH, PU, SBM, STR, WBF, WBN] |
| 290 |  |  | -5\% If F60 was answered ">95\%' (mostly never visited), SKIP to F64. | 1 |  |
| 291 |  |  | 5-50\% | 0 |  |
| 292 |  |  | 50-95\% | 0 |  |
| 293 |  |  | >95\% of the AA | 0 |  |
| 294 | F62 | BMP - Soils | Boardwalks, paved trails, fences or other infrastructure and/or well-enforced regulations appear to effectively prevent visitors from walking on soil within nearly all of the AA when the soil is unfrozen. Enter " 1 " if true. | 0 | [PH, PU] |
| 295 | F63 | BMP - Wildlife Protection | Fences, observation blinds, platforms, paved trails, exclusion periods, and/or well-enforced prohibitions on motorised boats, off-leash pets, and off road vehicles appear to effectively exclude or divert visitors and their pets from the $A A$ at critical times in order to minimize disturbance of wildlife (except during hunting seasons). Enter "1" if true. | 0 | [AM, PU, WBF, WBN] |
| 296 | F64 | Consumptive Uses (Provisioning Services) | Recent evidence was found within the AA of the following potentially-sustainable consumptive uses. Select ALL that apply. |  | [FAv, Rev, WBFV] |
| 297 |  |  | Low-impact commercial timber harvest (e.g., selective thinning). | 0 |  |
| 298 |  |  | Commercial or tracitional-use havesting of native plants, their fruits, or mushrooms. | 0 |  |
| 299 |  |  | Waterfowl hunting. | 0 |  |
| 300 |  |  | Fshing. | 0 |  |
| 301 |  |  | Trapping of furbearers. | 0 |  |
| 302 |  |  | None of the above. | 1 |  |
| 303 | F65 | Domestic Wells | The closest wells or water bodies that currently provide drinking water are: |  | [NRN] |
| 304 |  |  | Muthin 0-100 m of the AA | 0 |  |
| 305 |  |  | $100-500 \mathrm{~m}$ away. | 0 |  |
| 306 |  |  | -500 m away, or no information. | 1 |  |
| 307 | F66 | Calcareous Fen | The AA is, or is part of, a calcareous fen. See the Plants_Calcar worksheet in the accompanying Supplnfo file for list of plant indicators (calciphiles). Enter 1 If more than two Strong or more than five Moderate calciphile species are present; otherwise enter 0 , but if not able to identify those and no information, change to blank. | 0 | [ $\mathrm{PH}, \mathrm{PR}]$ |



| S3 | Accelerated Inputs of Nutrients |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | In the last column, place a check mark next to any item - occurring in either the wetland or its CA - that is likely to have accelerated the inputs of nutrients to the wetland. [NRV, PRV, STR] |  |  |  |  |
|  | Stormwater or wastewater effluent (including failing septic systems), landfills. |  |  |  |  |
|  | Fertilizers applied to lamns, ag lands, or other areas in the CA |  |  |  |  |
|  | Livestock, dogs. |  |  |  |  |
|  | Artificial drainage of upslope lands. |  |  |  |  |
|  | If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly more nutrients, then leave the "O's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present. |  |  |  |  |
|  |  | Severe (3 points) | Medium (2 points) | Mild (1 point) |  |
|  | Type of loading: | High density of unmaintained septic, some types of industrial sources. | Moderate density septic, cropland, secondary wastewater treatment plant. | Livestock, pets, low density residential. | 0 |
|  | Frequency \& duration of input: | Frequent and year-round. | Frequent but mostly seasonal. | Infrequent \& during high runoff events mainly. | 0 |
|  | AA proximity to main sources (actual or potential): | 0-15m | 15-100 m or in groundwater. | In more distant part of contributing area. | 0 |
|  | - Sume |  |  |  | 0 |
|  |  |  |  | Stressor subscore= | 0.00 |


| S4 | Excessive Sediment Loading from Contributing Area |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | In the last column, place a check mark next to any item present in the CA that is likely to have elevated the load of waterborne or windlorne sediment reaching the wetland fromits CA [FA, FR, IN, PH, SRV, STR] |  |  |  |  |
|  | Erosion from plowed fields, fill, timber harvest, dirt roads, vegetation clearing, fires. |  |  |  | 1 |
|  | Erosion from construction, in-channel machinery in the CA |  |  |  |  |
|  | Erosion from off-road vehicles in the CA |  |  |  |  |
|  | Erosion from livestock or foot traffic in the CA |  |  |  |  |
|  | Stormwater or wastewater effluent. |  |  |  |  |
|  | Sediment from road sanding, gravel mining, other mining, oil/ gas extraction. |  |  |  |  |
|  | Accelerated channel downcutting or headcutting of tributaries due to altered land use. |  |  |  |  |
|  | Other human-related disturbances within the CA |  |  |  |  |
|  | If any items were checked above, then for each row of the table below, assign points ( 3,2 , or 1 as shown in header) in the last column. However, if you believe the checked items did not cumulatively add significantly more sediment or suspended solids to the AA, then leave the "O's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present. |  |  |  |  |
|  |  | Severe (3 points) | Medium (2 points) | Mild (1 point) |  |
|  | Erosion in CA: | Extensive evidence, high intensity.* | Potentially (based on high-intensity ${ }^{\star}$ land use) or scattered evidence. | Potentially (based on low-intensity ${ }^{\star}$ land use) with little or no direct evidence. | 2 |
|  | Recentness of significant soil disturbance in the CA: | Current \& ongoing. | 1-12 months ago. | $>1$ y ago. | 2 |
|  | Duration of sediment inputs to the wetland: | Frequent and year-round. | Frequent but mostly seasonal. | Infrequent \& during high runoff events mainly. | 2 |
|  | AA proximity to actual or potential sources: | 0-15m. | 15-100 m. | In more distant part of contributing area. | 2 |
|  | * high-intensity= extensive off-road vehicle use, plowing, grading, excavation, erosion with or without veg removal; low-intensity= veg removal only with little or no apparent erosion or disturbance of soil or sediment. |  |  | Sum= | 8 |
|  |  |  |  | Stressor subscore= | 0.67 |
| S5 | Soil or Sediment Alteration Within the Assessment Area |  |  |  |  |
|  |  (whichever is less). [CS, IMV, NR, PH, SR, STR] |  |  |  |  |
|  | Compaction from machinery, off-road vehicles, livestock, or mountain bikes, especially during wetter periods. |  |  |  |  |
|  | Leveling or other grading not to the natural contour. |  |  |  |  |
|  | Tillage, plowing (but excluding disking for enhancement of native plants). |  |  |  | 1 |
|  | Fill or riprap, excluding small amounts of upland soils containing organic amendments (compost, etc.) or small amounts of topsoil imported from another wetland. |  |  |  |  |
|  | Excavation. |  |  |  |  |
|  | Ditch cleaning or dredging in or adjacent to the wetland. |  |  |  |  |
|  | Boat traffic in or adjacent to the wetland and sufficient to cause shore erosion or stir bottom sediments. |  |  |  |  |
|  | Artificial water level or flow manipulations sufficient to cause erosion or stir bottom sediments. |  |  |  |  |
|  | If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not measurably alter the soil structure andl/or topography, then leave the "O's" for the scores in the following rous. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present. |  |  |  |  |
|  |  | Severe (3 points) | Medium (2 points) | Mild (1 point) |  |
|  | Spatial extent of altered soil: | >95\% of wetland or >95\% of its upland edge (if any). | 5-95\% of wetland or 5-95\% of its upland edge (if any). | $<5 \%$ of wetland and $<5 \%$ of its upland edge (if any). | 2 |
|  | Recentness of significant soil alteration in wetland: | Current \& ongoing. | 1-12 months ago. | $>1$ yr ago. | 3 |
|  | Duration: | Long-lasting, minimal veg recovery. | Long-lasting but mostly revegetated. | Shor-term, revegetated, not intense. | 3 |
|  | Timing of soil alteration: | Frequent and year-round. | Frequent but mostly seasonal. | Mainly during one-time or scattered events. | 2 |
|  | Sum= |  |  |  | 10 |


| Scores will appear below after data are entered in worksheets OF, F, and S. See Manual for definitions and descriptions of how scores were computed. |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Wetland Functions or Other Attributes: | Function Score (Normalised) | Function Rating | Benefits Score (Normalised) | Benefits Rating | Function Score (raw) | Benefits Score (raw) |
| Water Storage \& Delay (WS) | 0.61 | Lower | 9.19 | Higher | 2.40 | 4.08 |
| Stream Flow Support (SFS) | 2.69 | Moderate | 1.92 | Moderate | 2.17 | 1.28 |
| Water Cooling (WC) | 5.04 | Moderate | 4.09 | Moderate | 3.36 | 2.22 |
| Sediment Retention \& Stabilisation (SR) | 0.53 | Lower | 10.00 | Higher | 2.61 | 5.47 |
| Phosphorus Retention (PR) | 0.00 | Lower | 10.00 | Higher | 3.23 | 7.99 |
| Nitrate Removal \& Retention (NR) | 1.17 | Lower | 10.00 | Higher | 3.62 | 10.00 |
| Carbon Sequestration (CS) | 0.00 | Lower |  |  | 4.86 |  |
| Organic Nutrient Export (OE) | 6.50 | Moderate |  |  | 4.25 |  |
| Anadromous Fish Habitat (FA) | 0.00 | Lower | 0.00 | Lower | 0.00 | 0.00 |
| Resident Fish Habitat (FR) | 0.00 | Lower | 0.00 | Lower | 0.00 | 0.00 |
| Aquatic Invertebrate Habitat (INV) | 0.70 | Lower | 4.20 | Moderate | 3.78 | 3.50 |
| Amphibian \& Turtle Habitat (AM) | 5.55 | Moderate | 3.99 | Moderate | 6.03 | 5.05 |
| Waterbird Feeding Habitat (WBF) | 5.87 | Moderate | 5.00 | Moderate | 4.47 | 5.00 |
| Waterbird Nesting Habitat (WBN) | 4.38 | Moderate | 3.33 | Moderate | 3.17 | 3.33 |
| Songbird, Raptor, \& Mammal Habitat (SBM) | 8.45 | Higher | 3.33 | Moderate | 7.35 | 3.33 |
| Pollinator Habitat (POL) | 7.16 | Moderate | 3.33 | Moderate | 5.94 | 3.33 |
| Native Plant Habitat (PH) | 4.19 | Moderate | 5.54 | Moderate | 5.57 | 5.54 |
| Public Use \& Recognition (PU) |  |  | 2.73 | Moderate |  | 2.17 |
| Wetland Sensitivity (Sens) |  |  | 7.92 | Higher |  | 4.43 |
| Wetland Ecological Condition (EC) |  |  | 2.46 | Lower |  | 6.39 |
| Wetland Stressors (STR) (higher score means more stress) |  |  | 10.00 | Higher |  | 5.62 |
| Summary Ratings for Grouped Functions: |  |  |  |  |  |  |
| HYDROLOGIC Group (WS) | 0.61 | Lower | 9.19 | Higher | 2.40 | 4.08 |
| WATER QUALITY SUPPORT Group (max+avg/2 of SR, PR, NR, CS) | 0.80 | Lower | 10.00 | Higher | 4.22 | 8.91 |
| AQUATIC SUPPORT Group (max+avg/2 of SFS, INV, OE, WC) | 5.12 | Moderate | 3.80 | Lower | 3.82 | 2.92 |
| AQUATIC HABITAT Group (max+avg/2 of FA, FR, AM, WBF, WBN) | 4.51 | Moderate | 3.73 | Moderate | 4.38 | 3.86 |
| TRANSITION HABITAT Group (max+avg/2 of SBM, PH, POL) | 7.53 | Higher | 4.81 | Lower | 6.82 | 4.81 |
| WETLAND CONDITION (EC) |  |  | 2.46 | Lower |  | 6.39 |
| WETLAND RISK (average of Sensitivity \& Stressors) |  |  | 8.96 | Higher |  | 5.02 |
|  | NOTE: A score of 0 does not mean the function or benefit is absent from the wetland. It means only that this wetland has a capacity that is equal or less than the lowest-scoring one, for that function or benefit, from among all the NS calibration wetlands that were assessed previously. |  |  |  |  |  |


| Cover Page: Basic Description of Assessment | WESP-AC version 2 |
| :---: | :---: |
| Site Name: | 101 Cambridge Wetland 10 |
| Investigator Name: | BL, CP |
| Date of Field Assessment: | 29 Sept 2021 |
| Nearest Town: | Coldbrook, Nova Scotia |
| Latitude (decimal degrees): | $368934.00 \mathrm{~m} \mathrm{E}$, |
| Longitude (decimal degrees): | 4990991.00 m N , UTM 20T |
| Is a map based on a formal on-site wetland delineation available? | Yes |
| Approximate size of the Assessment Area (AA, in hectares): | ~7.20 |
| AA as percent of entire wetland (approx.). Attach sketch map if AA is smaller than the entire contiguous wetland. | 100 |
| What percent (approx.) of the wetland were you able to visit? | 100 |
| What percent (approx.) of the AA were you able to visit? | 100 |
| Were you able to ask the site owner/manager about any of the questions? | No |
| Indicate here if you intentionally surveyed for rare plants, calciphile plants, or rare animals: | Yes |
| Have you attended a WESP-AC training session? If so, indicate approximate month \& year. | Yes |
| How many wetlands have you assessed previously using WESP-AC? (approx.) | >100 |
| Comments about the site or this WESP-AC assessment (attach extra page if desired): |  |


|  | A | B | C | D | E |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | Date: | 29 Sept 2021 | Site Identifier: 101 Cambridge ML-10 | Investig | tor: BL, CP |
| 2 | Form OF (Office). Non-tidal Wetland Data Form. WESP-AC version 2 for Nova Scotia wetlands only. DIRECTIONS: Conduct an assessment only after reading the accompanying <br>  require using these online map viewers: <br> Google Earth Pro: https://www.google.com/earth/download/gep/agree.html <br> Provincial Landscape Viewer: https://nsgi.novascotia.ca/plv/ <br>  <br>  <br>  <br>  Sensitivity, STR= Stressors. |  |  |  |  |
| 3 | \# | Indicators | Condition Choices | Data | Definitions/Explanations |
| 4 | OF1 | Province | Mark the province in which the A A is located by changing the 0 in the colum next to it to a "1". Mark only one. |  | This determines to which province's calibration wetlands the raw score of any wetland is normalised. In the function and benefits models, it also triggers the automatic exclusion of indicators for which no spatial data exists in a particular province. |
| 5 |  |  | New Brunswick | 0 |  |
| 6 |  |  | Nova Scotia | 1 |  |
| 7 |  |  | Prince Edward Island | 0 |  |
| 8 |  |  | Newfoundland-Labrador | 0 |  |
| 9 | OF2 | $\begin{aligned} & \text { Ponded Area Wthin } 1 \\ & \mathrm{~km} \end{aligned}$ | The area of surface water ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: |  | "Adjacent" means not separated from the AA by a wide expanse ( $>50 \mathrm{~m}$ ) of upland (including roads >50 m wide). Include ponded areas likely to be hidden by wetland vegetation. If surface water extends beyond 1 km , include only the part within 1 km . Do not include tidal areas. Measure the area from aerial imagery using Google Earth Pro (click on Ruler icon in toolbar, then Polygon in popup menu). [PH, SBM, WBN] |
| 10 |  |  | 80.01 hectare (about $10 \mathrm{~m} \times 10 \mathrm{~m}$ ). | 0 |  |
| 11 |  |  | 0.01-0.1 hectare. | 1 |  |
| 12 |  |  | 0.1-1 hectare. | 0 |  |
| 13 |  |  | 1 to 10 hectares. | 0 |  |
| 14 |  |  | 10 to 100 hectares. | 0 |  |
| 15 |  |  | $>100$ hectares. | 0 |  |
| 16 | OF3 | Ponded Water \& Wetland Wthin 1 km | The area of wetlands and surface water ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) withir 1 km is: |  | See definition of adjacent in OF2. If the AA's wetland vegetation extends beyond 1 km , include only the part within 1 km "Ponded" means not flowing in rivers or streams. [Sens, WBF] |
| 17 |  |  | 40.01 hectare (about $10 \mathrm{~m} \mathrm{\times 10} \mathrm{~m}$ ). | 0 |  |
| 18 |  |  | 0.01-0.1 hectare. | 0 |  |
| 19 |  |  | 0.1-1 hectare. | 0 |  |
| 20 |  |  | 1 to 10 hectares. | 0 |  |
| 21 |  |  | 10 to 100 hectares. | 1 |  |
| 22 |  |  | $>100$ hectares. | 0 |  |
| 23 | OF4 | Size of Largest Nearby Vegetated Tract or Corridor | The largest vegetated patch or corridor that includes the AA's vegetation plus alladjacent upland vegetation that is not lamn, row crops, heavily grazed lands, conifer plantation is: |  | See definition of adjacent in OF2. Use Google Earth Pro's polygon ruler (as described above). <br> Exclude conifer plantations only if it is obvious that trees were planted in rows. [AM, PH, SBM, Sens] |
| 24 |  |  | $<0.01$ hectare (about $10 \mathrm{~m} \mathrm{\times 10} \mathrm{~m}$ ). | 0 |  |
| 25 |  |  | 0.01-0.1 hectare. | 0 |  |
| 26 |  |  | 0.1-1 hectare. | 0 |  |
| 27 |  |  | 1 to 10 hectares. | 0 |  |
| 28 |  |  | 10 to 100 hectares. | 0 |  |
| 29 |  |  | 100 to 1000 hectares. | 0 |  |
| 30 |  |  | >1000 hectares. [This is nearly always the answer in relatively undeveloped landscapes.] | 1 |  |


|  | A | B | C | D | E |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 31 | OFS | Distance to Large Vegetated Tract | The minimum distance from the edge of the AA to the edge of the closestvegetated land (but excluding row crops, lamn, conifer plantation) larger than 375 hectares (about 2 km on a side), is: |  | To measure distance, use Google Earth Pro (Ruler > Line tool). The 375 -ha criterion is from the Fundy Model Forest Project. [AM, PH, POL, SBM, Sens] |
| 32 |  |  | $<50 \mathrm{~m}$, and not separated from the 375 -ha vegetated area by any width ofpaved roads, stretches of open water, row crops, bare ground, lawn, or impervious surface. Or the $A A$ itself contains $>375$ ha of vegetation. [This is often the answer in relatively undeveloped landscapes.] | 1 |  |
|  |  |  | 40 m , but completely separated from the 375-ha vegetated area by those features, and AA does not contain $>375$ ha of vegetation. | 0 |  |
| 34 |  |  | 50-500 m, and not separated. | 0 |  |
| 35 |  |  | 50-500 m, but separated by those features. | 0 |  |
| 36 |  |  | $0.5-5 \mathrm{~km}$, and not separated. | 0 |  |
| 37 |  |  | $0.5-5 \mathrm{~km}$, but separated by those features. | 0 |  |
| 38 |  |  | None of the above (the closest patches or corridors which are that large are $>5 \mathrm{~km}$ away). | 0 |  |
| 39 | OF6 | Herbaceous Uniqueness | The AA's vegetation cover is $>10 \%$ herbaceous* but uplands within 5 km have $<10 \%$ herbaceous cover. If so, enter " 3 " and continue to OF7. If not, consider: <br> The AA's vegetation cover is $>10 \%$ herbaceous* but uplands within 1 km have $<10 \%$ herbaceous cover. If so enter " 2 " and continue to Of7. If not, consider: <br> The AA's vegetation cover is $>10 \%$ herbaceous* but uplands within 100 m of the wetland edge have $<10 \%$ herbaceous cover. If so, enter "1". <br> [* NOTE: Exclude lamns, row crops, heavily grazed lands, forest, shrublands. Include moss as well as grasslike plants in this use of "herbaceous vegetation'] | 1 | For this question only, consider moss to be herbaceous vegetation. Determine the score by vieving aerial imagery in Google Earth after successively drawing or estimating the boundaries of the buffers of $5 \mathrm{~km}, 1 \mathrm{~km}$, and 100 m radius focused on the center of the AA. Circles of specified radius can be dramn in Google Earth Pro by clicking on the Ruler icon, then Circle in the pop-up menu. [AMN, PHN, POLv, SBMN, WBFv, WBNv] |
| 40 | OF1 | Woody Uniqueness | The AA's vegetation cover is $>10 \%$ woody* but uplands within $5 \mathrm{kmhave}<10 \%$ woody cover. If so, enter " 3 " and continue to OF8. If not, consider: <br> The AA's vegetation is $>10 \%$ woody ${ }^{\star}$ but uplands within 1 km have $<10 \%$ woody cover. If so enter " 2 " and continue to OF8. If not, consider: <br> The AA's vegetation is $>10 \%$ woody ${ }^{\star}$ but uplands within 100 m of the wetland edge have $<10 \%$ woody cover. If so, enter " 1 " <br> [* NOTE: woody cover = trees \& shrubs taller than 1 m ] | 0 | See above. Do not consider conifer plantations to be forest if it is obvious that trees were planted in rows. [AMN, PHV, POLv, SBMN] |
| 41 | OF8 | Local Vegetated Cover Percentage | Draw a 5 -km radius circle measured from the center of the AA. Ignoring all permanent water in the circle, the percent of the remaining are that is wooded or unmanaged herbaceous vegetation (NOT lawn, row crops, bare or heavily grazed land, clearcuts, or conifer plantations) is: |  | In Google Earth, draw the 5 km buffer and then estimate land cover percentages, or do GIS analysis of an appropriate land cover layer. [AM, PH, POL, SBM, Sens] |
| 42 |  |  | -5\% of the land. | 0 |  |
| 43 |  |  | 5 to 20\% of the land. | 0 |  |
| 44 |  |  | 20 to 60\% of the land. | 1 |  |
| 45 |  |  | 60 to $90 \%$ of the land. | 0 |  |
| 46 |  |  | >90\% of the land. SKIP to OF10. | 0 |  |
| 47 | OF9 | Type of Land Cover | Wthin the 5 -km radius circle, and ignoring all permanent water, the land area that is bare or non-perennial cover is mostly: |  | [AM, SBM] |
| 48 |  |  | Impervious surface, e.g., paved road, parking lot, building, exposed rock. | 0 |  |
| 49 |  |  | Bare pervious surface, e.g., lawn, recent (< 5 yrs ago) clearcut, dirt or gravel road, cropland, landslide, conifer plantation. | 1 |  |
| 50 | OF10 | Distance by Road to Nearest Population | Measured along the maintained road nearest the A , the distance to the nearestpopulation center is: |  | "Population center" means a settled area with more than about 5 regularly- inhabited structures per square kilometer In Google Earth Pro, click on the Ruler icon, then Path, and draw and measure the |
| 51 |  | Nearest Center | $<100 \mathrm{~m}$. | 0 |  |
| 52 |  |  | 100-500m. | 1 |  |
| 53 |  |  | $0.5-1 \mathrm{~km}$ | 0 |  |
| 54 |  |  | $1-5 \mathrm{~km}$ | 0 |  |
| 55 |  |  | -5km | 0 |  |
| 56 | OF11 | Distance to Nearest Maintained Road | From the center of the AA, the distance to the nearest maintained public road (dirt or paved) is: |  | Determine this by viewing aerial imagery in Google Earth Pro and measuring with the Ruler>Line |
| 57 |  |  | $<10 \mathrm{~m}$ | 0 |  |
| 58 |  |  | 10-25m. | 0 |  |
| 59 |  |  | 25-50m. | 0 |  |
| 60 |  |  | 50-100 m. | 0 |  |
| 61 |  |  | 100-500m. | 1 |  |
| 62 |  |  | >500 m. | 0 |  |


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| 63 | OF12 | Wildifife Access | Draw a circle of radius of 5 km from the center of the $A A$ If marmals and amphibians can move from the center of the $A A$ to $A L L$ other separate wetlands and ponds located within the circle without being forced to cross pavement (any width), lawns, bare ground, and/or marine waters, mark $1=$ yes can move to all, $0=$ no. Change toblank if there are no other wetlands within 5 km . | 0 | Draw the 5 km circle in Google Earth Pro using the Circle tool and search for roads and wetlands within it, being alert for roads hidden under forest canopy. [AM, SBM, STR] |
| 64 | OF13 | Distance to Ponded Water | The distance from the AA center to the closest (but separate) ponded water body visible in Google Earth imagery is: |  | In Google Earth Pro, zoom in dosely to examine the surrounding landscape for ponds, lakes, and wetlands that appear to be permanently flooded. [AM, PH, SBM, Sens, WBF, WBN] |
| 65 |  |  | -50 m, and not separated by any width of paved roads, stretches of open water, row crops, lamn, bare ground, or impervious surface. | 0 |  |
| 66 |  |  | 50 m , but completely separated by those features. | 0 |  |
| 67 |  |  | $50-500 \mathrm{~m}$, and not separated. | 0 |  |
| 68 |  |  | $50-500 \mathrm{~m}$, but separated by those features. | 0 |  |
| 69 |  |  | $0.5-1 \mathrm{~km}$, and not separated. | 0 |  |
| 70 |  |  | $0.5-1 \mathrm{~km}$, but separated by those features. | 1 |  |
| 71 |  |  | None of the above (the closest patches or corridors that large are >1 km away). | 0 |  |
| 72 | OF14 | Distance to Large Ponded Water | The distance from the AA center to the closest (but separate)non-tidal body of water that is ponded during most of the year and islarger than 8 hectares during most of a normal year is: |  | Determine this by viewing aerial imagery in Google Earth. [Sens, WBF, WBN] |
| 73 |  |  | $<100 \mathrm{~m}$ | 0 |  |
| 74 |  |  | $100 \mathrm{~m}-1 \mathrm{~km}$ | 0 |  |
| 75 |  |  | 1-2km. | 0 |  |
| 76 |  |  | 2-5 km | 0 |  |
| 77 |  |  | $5-10 \mathrm{~km}$ | 1 |  |
| 78 |  |  | $>10 \mathrm{~km}$ | 0 |  |
| 79 | OF15 | Tidal Proximity | The distance from the AA edge to the closesttidal water body (regardless of its salinity) is: |  | In Google Earth, measure the distance to the ocean (including Bay of Fundy) or tidal river, whichever is closer. If you need to see howfar upriver a river is tidal, see the KNZ file provided with this calculator for NS (NS Headtide). Points shown in those files are only an approximation, so local information if available may be preferable. [FA, WBF] |
| 80 |  |  | $\angle 100 \mathrm{~m}$ | 0 |  |
| 81 |  |  | $100 \mathrm{~m}-1 \mathrm{~km}$ | 0 |  |
| 82 |  |  | $1-5 \mathrm{~km}$ | 0 |  |
| 83 |  |  | $5-10 \mathrm{~km}$ | 0 |  |
| 84 |  |  | $10-40 \mathrm{~km}$ | 1 |  |
| 85 |  |  | $>40 \mathrm{~km}$ | 0 |  |


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| 86 | OF16 | Upland Edge Contact | Select one: |  | [NR, SBM, Sens] |
|  |  |  | The AA has no upland edge (or upland is <1\% of perimeter). The AA is entirely surrounded by (\& contiguous with) other wetlands or water | 0 |  |
|  |  |  | 1-25\% of the AA's perimeter abuts upland (including filled areas). The rest adjoins other wetlands or water that is mostly wider than the Af | 0 |  |
| 89 |  |  | $25-50 \%$ of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA | 0 |  |
| 90 |  |  | $50-75 \%$ of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA. | 0 |  |
| 91 |  |  | More than $75 \%$ of the AA's perimeter abuts upland. Any remainder adjoins other wetlands or water that is mostly wider than the AA. This will be true for most assessments done with WESP-AC. | 1 |  |
| 92 | OF17 | Food Damage fromNon tidal Waters | Wthin 5 km downstream or downslope of the AA (select first true choice): |  | Contact local authories to determine if such maps exist. Where available, LiDAR imagery can provide finer elevational resolution useful for flood modeling. [WSV] |
| 93 |  |  | Maps show Flood Zone or Flood Risk areas and there appears to be infrastructure vulnerable to river flooding not caused by tidal storm surges. | 0 |  |
| 94 |  |  | Maps show Food Zone or Flood Risk areas, but infrastructure is absent or is not vulnerable to floods from a non-tidal river. In some cases levees, upriver dams, or other measures may partly limit damage or risk from smaller events. | 0 |  |
| 95 |  |  | Maps do not show Food Zone or Food Risk areas (or no such mapping has been done locally) and there appears to be infrastructure vulnerable to river flooding unrelated to tidal storm surges. | 1 |  |
| 96 |  |  | Maps do not show Flood Zone or Food Risk areas (or no such mapping has been done locally) and there isno infrastructure vulnerable to river flooding unrelated to tidal storm surges. | o |  |
| 97 | OF18 | Relative Đevation in Watershed | In Google Earth, enable the Terrain layer (lower left menu) and open the NS_Watersheds Secondary KNZ file that accompanies this calculator. Then determine the AA's approximate elevation (bottom right, NOT the "eye alt"). Then move cursor around to determine the watershed's maximum and minimum elevation. Divide the AA's elevation by the (max-min). | 0.01 | [FA, NR, Sens, SFSv, WCV, WSv] |
| 98 | OF19 | Water Quality Sensitive Watershed or Area | The AA is in a Protected Water Supply area (Designated Water Supply Area, Natural Watershed Municipal Surface Water Supply Area, or Municipal Water Supply Area) according to the provided KMZ overlay ('NS Protected Water Supply Areas'). Enter $1=$ yes, $0=$ no. | 0 | If an ACCDC report is available for this AA, it also may contain such information. [NRV] |


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| 99 |  | Degraded Water Upstream | Sampling indicates a problem with concentrations of metals, hydrocarbons, nutrients, or other substances (excluding bacteria, acidic water, high temperatures) being present at levels harmful to aquatic life or humans, and: |  | May use existing data, or sample those waters as part of this wetland assessment. "Harmful" should be evaluated with regard to current federal or provincial water quality standards. [AM, FA, FR, NRV, PRV, SRV, STR, WBF, WBN] |
| 100 |  |  | The condition is present within the AA | 0 |  |
| 101 |  |  | The condition is present in waters within 1 km that flowinto the AA, but has not been documented in the AA itself. | 0 |  |
| 102 |  |  | Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters. | 0 |  |
| 103 |  |  | Data are insufficient (no or inadequate sampling within 1 km , or condition exists only at $>1 \mathrm{~km}$ upstream). This is the situation for nearly all wetlands in this region. | 1 |  |
| 104 | OF21 | Degraded | The problem described above is downslope fromthe AA, and: |  | May use existing data, or monitor waters as part of this wetland assessment. [NRV, PRv, SRV] |
| 105 |  | Donnstream | The condition is present within 1 km downslope and connected to the AA by a channel. | 0 |  |
| 106 |  |  | The condition is present within 5 km downslope and connected to the AA by a channel, or within 1 km but not connected to the AA by a channel. | 0 |  |
| 107 |  |  | Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters. | 0 |  |
| 108 |  |  | Data are insufficient (no or inadequate sampling within 1 km , or condition exists only at $>1 \mathrm{~km}$ upstream). This is the situation for nearly all wetlands in this region. | 1 |  |
| 109 | OF22 | Wetland as a \% of Its Contributing Area (Catchment) | From a topographic map and field observations, estimate the approximate boundaries of the catchment (CA) of the entire wetland of which the AA may be only a part. Then adjust those boundaries if necessary based on your field observations of the surrounding terrain, and/or by using procedures described in the Manual. Divide the area of the wetland (not just the $A A$ ) by the approximate area of its catchment excluding the area of the wetland itself. When doing the calculation, if ponded water is adjacent to the wetland, include that in the wetland area. The result is: |  | Topographic maps may be viewed online at the National Atlas of Canada (Toporama): http://atlas.gc.ca/toporama/en/index.htmI [NR, PR, Sens, SR, WS] |
| 110 |  |  | <0.01, or catchment size unknown due to stormwater pipes that collect water from an indeterminate area. | 0 |  |
| 111 |  |  | 0.01 to 0.1. | 1 |  |
| 112 |  |  | 0.1 to 1. | 0 |  |
| 113 |  |  |  | 0 |  |
| 114 | OF23 | Unvegetated Surface in the Contributing Area | The proportion of the AA's contributing area (measured to no more than 1000 m upslope) that is comprised of buildings, roads, parking lots other pavement, exposed bedrock, landslides, and other mostly-bare surface is about : |  | [FA, INV, NRV, PRV, SRv, STR, WCV, WSV] |
| 115 |  |  | <10\% | 0 |  |
| 116 |  |  | 10 to $25 \%$ | 0 |  |
| 117 |  |  | >25\% | 1 |  |
| 118 | OF24 | Transport From Upslope | A relatively large proportion of the precipitation that falls farther upslope in the CA reaches this wetland quickly as runoff (surface water), as indicated by the following: <br> (a) input channel is present, <br> (b) input channels have been straightened, <br> (c) upslope wetlands have been ditched extensively, <br> (d) land cover is mostly non-forest, <br> (e) CA slopes are steep, and/or <br> (f) most CA soils are shallow (bedrock near surface) and/or have high runoff coefficients. <br> This statement is: |  | [NRV, PRV, SRv, WSU] |
| 119 |  |  | Mostly true. | 0 |  |
| 120 |  |  | Somenhat true. | 0 |  |
| 121 |  |  | Mostly untrue. | 1 |  |
| 122 | OF25 | Aspect | The overland flow direction of most surface water (in streams, rivers, or runoff) that enters the AA is: |  | [AM, NR, SFS, WC, WS] |
| 123 |  |  | Northward (N, NE). north-facing contributing area | 0 |  |
| 124 |  |  | Southward (S, SW). south-facing contributing area. | 0 |  |
| 125 |  |  | Other (E, SE, W, M M), or no detectable uphill slope or input channel (flat). | 1 |  |
| 126 <br> 127 | OF26 | Internal Aow Distance (Path Length) | The horizontal flow distance from the wetland's inlet to outlet is: <br> 10 m | 0 | Identify inlets and outlets, if any, from topographic maps (use elevations to determine which are inlets and which are outlets) and augment by field inspection. With the Provincial Landscape Viewer, select Nova.Scotia Tonnas the Baseman Also enable the laver ForestnsW/AM Predicted Flow Then |





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| 19 |  |  | deciduous trees taller than 3 m | 2 |  |
| 20 |  |  | coniferous or ericaceous shrubs or trees 1-3 mtall not directly below the canopy of trees. | 2 |  |
| 21 |  |  | deciduous shrubs or trees 1-3 mtall not directly below the canopy of trees. | 3 |  |
| 22 |  |  | Coniferous or ericaceous shrubs <1 mtall not directly below the canopy of taller vegetation. | 2 |  |
| 23 |  |  | deciduous shrubs or trees $<1 \mathrm{mtall}$ (e.g., deciduous seedlings) not directly below the canopy of taller vegetation. | 3 |  |
| 24 | Note: If none of top 4 rous in F3 was marked 2 or greater, SKIP to F9 (N fixers). |  |  |  |  |
| 25 | F4 | Dominance of Most Abundant Shrub Species | Determine which two woody plant species comprise the greatest portion of the low ( $\langle<\mathrm{m}$ ) woody cover. Then choose one: |  | [PH, POL, SBM, Sens] |
| 26 |  |  | those species together comprise $>50 \%$ of such cover. | 1 |  |
| 27 |  |  | those species together do not comprise $>50 \%$ of such cover. | 0 |  |
| 28 | Fs | Woody Diameter Classes | Mark $A \amalg$ the types that comprise $>5 \%$ of the woody canopy cover in the $A A$ or $>5 \%$ of the wooded areas (if any) along its upland edge (perimeter). The edge should include only the trees whose canopies extend into the AA |  | Estimate the diameters at chest height. If small-diameter trees are overtopped (shaded) by larger ones, visualise a "subcanopy" at the average height of the smaller-dbh trees, to serve as a basis for the minimum $5 \%$ canopy requirement in this question. The trees and shrubs need not be wetland species. [AM, CS, POL, SBM, Sens, WBN] |
| 29 |  |  | coniferous, $1-9 \mathrm{~cm}$ diameter and $>1 \mathrm{~m}$ tall. | 1 |  |
| 30 |  |  | broad-leaved deciduous $1-9 \mathrm{~cm}$ diameter and $>1 \mathrm{mtall}$. | 1 |  |
| 31 |  |  | coniferous, $10-19 \mathrm{~cm}$ diameter. | 1 |  |
| 32 |  |  | broad-leaved deciduous $10-19 \mathrm{~cm}$ diameter. | 1 |  |
| 33 |  |  | coniferous, $20-40 \mathrm{~cm}$ diameter. | 1 |  |
| 34 |  |  | broad-leaved deciduous $20-40 \mathrm{~cm}$ diameter. | 0 |  |
| 35 |  |  | coniferous, 740 cm diameter. | 1 |  |
| 36 |  |  | broad-leaved deciduous $>40 \mathrm{~cm}$ diameter. | 0 |  |
| 37 | F6 | Height Class Interspersion | Follow the key below and mark the ONE row that best describes MOST of the AA: |  | [AM, INW, NR, PH, SBM, Sens] |
|  |  |  | A. Neither the vegetation taller than 1 m nor the vegetation shorter than that comprise $>70 \%$ of the vegetated part of the $A A$. They each comprise $30-70 \%$ Choose between A 1 and A 2 and mark the choice with 1 in the adjoining column. Othervise go to B below. |  |  |
| 38 |  |  |  |  |  |
| 39 |  |  | A1 The two height classes are mostly scattered and intermixed throughout the AA | 0 |  |
| 40 |  |  | A2 Not A1. The two height classes are mostly in separate zones or bands, or in proportionately large clumps. | 0 |  |
| 41 |  |  | B. Ether the vegetation shorter than 1 m comprises $>70 \%$ of the vegetated part of the $A A$, or the vegetation taller than that does. One size class might even be totally absent. Choose between B1 and B2 and mark the choice with a 1 in the adjoining column: |  |  |
| 42 |  |  | B1 The less prevalent height class is mostly scattered and intermixed within the prevalent one. | 0 |  |
| 43 |  |  | B2. Not B1. The less prevalent height class is mostly located apart from the prevalent one, in separate zones or clumps, or is completely absent. | 1 |  |
| 44 | F | Large Snags (Dead Standing Trees) | The number of large snags (diameter $\mathbf{2 0} \mathbf{~ c m}$ ) in the AA plus adjacent upland area within 10 m of the wetland edge is: |  | Snags are dead standing trees that often (not always) lack bark and foliage. Include only ones that are at least 2 m tall. [POL, SBM, WBN] |
| 45 |  |  | None, of fewer than $8 /$ hectare which exceed this diameter. | 1 |  |
| 46 |  |  |  | 0 |  |
| 47 |  |  | Several ( $>8$ hectare) but above not true. | 0 |  |
| 48 | F8 | Domned Wood | The number of downed wood pieces longer than $\mathbf{2 m}$ and with diameter $>10 \mathrm{~cm}$, and not persistently submerged, is: |  | Exclude temporay "bum piles." [AM, IN, POL, SBM] |
| 49 |  |  | Few or none that meet these criteria. | 1 |  |
| 50 |  |  | Several ( $>5$ if $A$ A is $>5$ hectares, less for smaller $A$ As) meet these criteria | 0 |  |
| 51 | F9 | NFixers | The percentage of the AA's vegetated cover that contains nitrogen-fixing plants (e.g., alder, sweetgale, clover, lupine, alfalfa, other legumes) is: |  | Do not include $N$-fixing algae or lichens. [FA, $\mathrm{PR}, \mathrm{IN}, \mathrm{NR}, \mathrm{N}, \mathrm{OE}, \mathrm{PH}, \mathrm{SBM}$, Sens] |
| 52 |  |  | <1\% or none. | 0 |  |
| 53 |  |  | 1-25\% of the vegetated cover, in the AA or along its water edge (whichever has more). | 1 |  |
| 54 |  |  | 25-50\% of the vegetated cover, in the AA or along its water edge (whichever has more). | 0 |  |
| 55 |  |  | $50-75 \%$ of the vegetated cover, in the AA or along its water edge (whichever has more). | 0 |  |
| 56 |  |  | $>75 \%$ of the vegetated cover, in the AA or along its water edge (whichever has more). | 0 |  |
| 57 | F10 | Sphagnum Moss Extent | The cover of Sphagnum moss (or any moss that forms a dense cushion many centimeters thick), including the moss obscured by taller sedges and other plants rooted in it, is: |  | Exclude moss growing on trees and rocks. [CS, PH] |
| 58 |  |  | -5\% of the vegetated part of the AA | 1 |  |
| 59 |  |  | $5-25 \%$ of the vegetated part of the $A$ A | 0 |  |
| 60 |  |  | $25-50 \%$ of the vegetated part of the AA | 0 |  |
| 61 |  |  | $50-95 \%$ of the vegetated part of the AA | 0 |  |
| 62 |  |  | >95\% of the vegetated part of the AA | 0 |  |



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| 103 |  |  | 50-95\% of the vegetated area | 1 |  |
| 104 |  |  | -25\% of the vegetated area | 0 |  |
| 105 | F19 | Dominance of Most Abundant Herbaceous | Determine which two herbaceous species comprise the greatest portion of the herbaceous cover (excluding mosses and floating-leaved aquatic plants). Then choose one of the following: |  | For this question, induce ferms as well as graminoids and forbs. [EC, IN, PH, POL, Sens $]$ |


|  | A | B | C | D | E |
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| 106 |  | Species | those species together comprise $>50 \%$ of the areal cover of herbaceous plants at any time during the year. | 1 |  |
| 107 |  |  | those species together do not comprise $>50 \%$ of the areal cover of herbaceous plants at any time during the year. | 0 |  |
| 108 | F20 | Invasive Plant Cover | How extensive is the cover of invasive plant species in the AA? For species, see Plants invasive worksheet in the accompanying Supplinfo file. |  | [EC, PH, POL, Sens] |
| 109 |  |  | invasive species appear to be absent in the $A$, or are present only in trace amount (a few individuals). | 1 |  |
| 110 |  |  | invasive species are present in more than trace amounts, but comprise $<5 \%$ of herbaceous cover (or woody cover, if the invasives are moody). | 0 |  |
| 111 |  |  | invasive species comprise 5-20\% of the herb cover (or woody cover, if the invasives are woody). | 0 |  |
| 112 |  |  | invasive species comprise 20-50\% of the herb cover (or woody cover, if the invasives are woody). | 0 |  |
| 113 |  |  | invasive species comprise $>50 \%$ of the herb cover (or woody cover, if the irvasives are woody). | 0 |  |
| 114 | F21 | Invasive Cover Along Upland Edge | Along the wetland-upland boundary, the percent of the upland edge (within 3 mupslope from the wetland) that is occupied by invasive plant species is: |  | If a plant cannot be identified to species (e.g., winter conditions) but its genus contains an exotic species, assume the unidentified plant to also be exotic. If vegetation is so senesced that exotic species cannot be identified, answer "none". [PH, STR] |
| 115 |  |  | none of the upland edge (invasives apparently absent), or AA has no upland edge. | 1 |  |
| 116 |  |  | some (but $\stackrel{5 \%}{ } \%$ ) of the upland edge. | 0 |  |
| 117 |  |  | 5-50\% of the upland edge. | 0 |  |
| 118 |  |  | most ( $>50 \%$ ) of the upland edge. | 0 |  |
| 119 | F22 | Fringe Wetland | During most of the year, open water within or adjacent to the vegetated part of the wetland is much wider than the maximum width of the vegetated zone within the wetland. Enter "1" if true, "0" if false. | 0 | [MBF, WBN, WCV] |
| 120 | F23 | Lacustrine Wetland | The vegetated part of the AA is within or adjacent to a body of non-tidal standing open water whose size exceeds8 hectares during most of a normal year. | 0 | [ $\mathrm{F}, \mathrm{PR}, \mathrm{PU}, \mathrm{WBF}, \mathrm{WBN}$ ] |
| 121 | F24 | \% of AA Without Surface Water | The percentage of the AA that never contains surface water during an average year (that is, except perhaps for a few hours after snowmelt on rainstorms), but which is still a wetland, is: |  | 1 hectare is 10,000 sq. mor about 2.5 acres. It could have dimensions of $100 \mathrm{mby} 100 \mathrm{~m}, 1000 \mathrm{mby}$ 10 m , or similar. [AM, FA, $\operatorname{FR}, \mathrm{IN}, \mathrm{NR}, \mathrm{PH}, \mathrm{PR}, \mathrm{SBM}$, Sens, SRv, WBF, WBN, WC] |
| 122 |  |  | <1\%. In other words, all or nearly all of the AA is covered by water permanently or at least seasonally. | 0 |  |
| 123 |  |  | 1-25\% of the AA, or $<1 \%$ but $>0.01$ ha never contains surface water. | 1 |  |
| 124 |  |  | 25-50\% of the AA never contains surface water. | 0 |  |
| 125 |  |  | 50-75\% of the AA never contains surface water. | 0 |  |
| 126 |  |  | $75-99 \%$ of the AA never contains surface water, OR $>99 \%$ and there is at least one persistently ponded water body larger than 1 ha in the AA | 0 |  |
| 127 |  |  | 99-100\% AND there is no persistently ponded water body larger than 1 ha within the AA Enter "1" andSKIP to F42 (Channel Connection). | 0 |  |
| 128 | F25 | \% of AA with Persistent Surface Water | Identify the parts of the AA that still contain surface water (flowing or ponded, open or hidden beneath vegetation) even during the driest times of a normal year, i.e., when the AA's surface water is at its lowest annual level. At that time, the percentage of the AA that still contains surface water is: |  | If you are unable to determine the condition at the driest time of year, ask the land owner or neighbors about it if possible. Indicators of persistence may include fish, some dragonflies, beaver, and muskrat. [AM, CS, FA, FR, INV, NR, POL, PR, SBM, WBF, WBN] |
| 129 |  |  | None. The AA dries up completely (no water in channels either) or never has surface water during most years. SKIP to F27. | 0 |  |
| 130 |  |  | 1-20\% of the AA. | 0 |  |
| 131 |  |  | 20-50\% of the AA | 1 |  |
| 132 |  |  | 50-95\% of the AA | 0 |  |
| 133 |  |  | >95\% of the AA True for many fringe wetlands. | 0 |  |
| 134 | F26 | \% of Summertime Water that is Shaded | At mid-day during the warmest time of year, the area of surface waterwithin the $A A$ that is shaded by vegetation and other features that are within the $A A$ at that time is: |  | [FA, WC] |
| 135 |  |  | -5\% of the water is shaded, or no surface water is present then. | 0 |  |
| 136 |  |  | $5-25 \%$ of the water is shaded. | 1 |  |
| 137 |  |  | 25-50\% of the water is shaded. | 0 |  |
| 138 |  |  | 50-75\% of the water is shaded. | 0 |  |
| 139 |  |  | >75\% of the water is shaded. | 0 |  |
| 140 | F27 | \% of AA that is Fooded Only Seasonally | The percentage of the $A$ A's area that is between the annual high water and the annual low water (surface water) is: |  | Food marks (algal mats, adventitious roots, debris lines, ice scour, etc.) are often evident when not fully inundated. Aso, such areas often have a larger proportion of upland and annual (vs. perennial) plant species. In riverine systems, the extent of this zone can be estimated by multiplying by 2 the bankful height and visualising where that would intercept the land along the river. [CS, FA, INV, NR, OE, PH, SR, WBF, WBN, WS] |
| 141 |  |  | None, or <0.01 hectare and <1\% of the AA SKIP to F29. | 0 |  |
| 142 |  |  | 1-20\% of the AA, or <1\% but >0.01 ha. | 0 |  |
| 143 |  |  | 20-50\% of the AA | 1 |  |


|  | A | B | C | D | E |
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| 144 |  |  | 50-95\% of the AA | 0 |  |
| 145 |  |  | >95\% of the AA | 0 |  |
| 146 | F28 | Annual Water Auctuation Range | The annual fluctuation in surface water level within most of the parts of the $A$ A that contain surface water at least temporarily is: |  | Look for flood marks (see above). Because the annual range of water levels is difficult to estimate without multiple visits, consider asking the land owner or neighbors about it. [AM, CS, INV, NR, OE, PH, PR, SR, WBN, WS] |
| 147 |  |  | $<10$ cm change (stable or nearly so). | 0 |  |
| 148 |  |  | $10 \mathrm{~cm}-50 \mathrm{~cm}$ change. | 0 |  |
| 149 |  |  | 0.5-1 m change. | 0 |  |
| 150 |  |  | 1-2 m change. | 0 |  |
| 151 |  |  | >2m change. | 1 |  |
| 152 | Is the AA plus adjacent ponded water smaller than 0.01 hectare (about $10 \mathrm{~m} \times 10 \mathrm{~m}$, or $1 \mathrm{~m} \times 100 \mathrm{~m}$ )? If so, enter " 1 " in column D andSKIP TO F42 (Connection). |  |  | 0 |  |
| 153 | F29 | Predominant Depth Class | During most of the time when surface water is present during the growing season, its depth, averaged over the entire inundated part of the $A A$, is: |  | If a boat is unavailable, estimate this by considering wetland size and local topography. Or if timing and safety allow, depths may be measured by drilling through winter ice. This question is asking about the spatial median depth that occurs during most of that time, even if inundation is only seasonal or temporary. If inundation in most but not all of the wetland is brief, the answer will be based on the depth of the most persistently inundated part of the wetland. Include surface water in channels and ditches as well as ponded areas. [CS, FA, FR, INV, OE, PH, PR, Sens, SFS, SR, WBF, WBN, WC] |
| 154 |  |  | $<10 \mathrm{~cm} \mathrm{deep} \mathrm{(but}>0$ ). | 0 |  |
| 155 |  |  | 10-50 cm deep. | 0 |  |
| 156 |  |  | 0.5-1 mdeep. | 0 |  |
| 157 |  |  | 1-2 mdeep. | 1 |  |
| 158 |  |  | >2 m deep. True for many fringe wetlands. | 0 |  |
| 159 | F30 | $\begin{array}{\|l} \hline \text { Depth Classes - } \\ \text { Evenness of } \\ \text { Proportions } \end{array}$ | When present, surface water in most of the AA usually consists of (select one): |  | Estimate these proportions by considering the gradient and microtopography of the site. [FR, IN WBF, WBN |
| 160 |  |  | One depth class that comprises >90\% of the AA 's inundated area (use the classes in the question above). | 0 |  |
| 161 |  |  | One depth class that comprises 50-90\% of the AA's inundated area | 1 |  |
| 162 |  |  | Neither of above. There are 3 or more depth classes and none occupy $>50 \%$ | 0 |  |
| 163 | F31 | $\%$ of Water That Is Ponded (not Flowing) | During most times when surface water is present, the percentage that is (1)ponded (stagnant, or flows so slowly that fine sediment is not held in suspension) AND (2) is likely to be deeper than 0.5 min some places, is: |  | Nearly all wetlands with surface water have some ponded water. [AM, CS, IN , NR, OE, PR, Sens, SR, WBF, WBN, WC, WS] |
| 164 |  |  | -5\% of the water, or it occupies $<100$ sq.m cumulatively. Nearly all the surface water is flowing. SKIP to F34. | 0 |  |
| 165 |  |  | 5-30\% of the water. | 1 |  |
| 166 |  |  | 30-70\% of the water. | 0 |  |
| 167 |  |  | 70-95\% of the water. | 0 |  |
| 168 |  |  | >95\% of the water. | 0 |  |
|  | F32 | Ponded Open Water Minimum Size | During most of the growing season, the largest patch of open water that is ponded and is in or bordering the $A A$ is $>0.01$ hectare (about 10 mby 10 m ) and mostly deeper than 0.5 m If true enter " 1 " and continue, If false, enter " 0 " andSKIP to F41 (Floating Algae \& Duckweed). | 0 | Open water is not obscured by vegetation in aerial ('duck's eye') view. It includes vegetation floating on the water surface or entirely submersed beneath it. |
| 169 |  |  |  |  |  |
| 170 | F33 | \% of Ponded Water that is Open | In ducks-eye aerial view, the percentage of the ponded water that isopen (lacking emergent vegetation during most of the growing season, and unhidden by a forest or shrub canopy) is: |  | [AM, CS, FA, FR, INV, NR, OE, PR, SR, WBF, WBN, WC] |
| 171 |  |  | None, or $<1 \%$ of the $A$ A and largest pool occupies $<0.01$ hectares. Enter "1" and SKIP to F41 (Foating Agae \& Duckweed). | 0 |  |
| 172 |  |  | 1-4\% of the ponded water. Enter "1" and SKIP to F41 (Floating Agae \& Duckweed). | 0 |  |
| 173 |  |  | 5-30\% of the ponded water. | 0 |  |
| 174 |  |  | 30-70\% of the ponded water. | 0 |  |
| 175 |  |  | 70-99\% of the ponded water. | 1 |  |
| 176 |  |  | 100\% of the ponded water. | 0 |  |
| 177 | F34 | Wdth of Vegetated Zone within Wetland | At the time during the growing season when the AA's water level is lowest, the average width of vegetated areain the AA that separates adjoining uplands from open water within the $A A$ is: |  | "Vegetated area" does not include underwater or floating-leaved plants, i.e., aquatic bed. Wdth may include wooded riparian areas if they have wetland soil or plant indicators. [AM, CS, NR, OE, PH, PR, SBM, Sens, SR, WBN] |
| 178 |  |  | <1m. | 0 |  |
| 179 |  |  | 1-9m | 0 |  |
| 180 |  |  | 10-29m | 0 |  |
| 181 |  |  | 30-49m | 1 |  |
| 182 |  |  | 50-100m. | 0 |  |
| 183 |  |  | $>100 \mathrm{~m}$, or open water is absent at that time. | 0 |  |
| 184 | F35 | Fat Shoreline Extent | During most of the part of the growing season when water is present, the percentage of the AA'swater edge length that is nearly flat (a slope less than about $5 \%$ measured within 5 mlandward of the water) is: |  | If several isolated pools are present in early summer, estimate the percent of their collective shorelines that has such a gentle slope. [SR, WBN] |
| 185 |  |  | $<1 \%$ of the water edge. | 0 |  |
| 186 |  |  | 1-25\% of the water edge. | 0 |  |
| 187 |  |  | 25-50\% of the water edge. | 0 |  |



|  | A | B | C | D | E |
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| 209 |  |  | Temporary (surface water flows out for $<14$ days, not necessarily consecutive). |  |  |
| 210 |  |  | None -- but maps show a stream network downslope from the AA and within a distance that is less than the AA's length. SKIP to F47 (pH Measurement). | 0 |  |
| 211 |  |  | No surface water flows out of the wetland except possibly during extreme events (<once per 10 years). Or, water flows only into a wetland, ditch, or lake that lacks an outlet. SKIP to F47 (pH Measurement). | 0 |  |
| 212 | F43 | Outflow Confinement | During major runoff events, in the places where surface water exits the AA or connected waters nearby, the water: |  | "Major runoff events" would include biennial high water caused by storms and/or rapid snowmelt. [CS, NR, OE, PR, Sens, SR, STR, WS] |
| 213 |  |  | Mostly passes through a pipe, culvert, narrowly breached dike, berm, beaver dam, or other partial obstruction (other than natural topography) that does not appear to drain the wetland artificially during most of the growing season. | 0 |  |
| 214 |  |  | Leaves through natural exits (channels or diffuse outflow), not mainly through artificia or temporary features. | 1 |  |
| 215 |  |  | Is exported more quickly than usual due to ditches or pipes within the AA or connected to its outlet, or within 10 m of the AA's edge, which drain the wetland artificially, or water is pumped out of the AA | 0 |  |
| 216 | F44 | Tributary Channel | At least once annually, surface water from a tributary channel that is $>100 \mathrm{mlong}$ moves into the $A A \quad O$, surface water from a larger permanent water body adjacent to the AA spills into the AA If it enters only via a pipe, that pipe must be fed by a mapped stream or lake further upslope. If no, SKIP to F47 (pH Measurement). | 1 | If inlet tributaries cannot be searched for due to inaccessibility of part of the AA, follow suggestions in F42 above. [NRv, PH, PRv, SRv] |
|  | F45 | Input Water Temperature | Based on lack of shade, water source characteristics, or actual temperature measurements, the inflow is likely to be warmer than surface water in the $A A$ during part of most years. Enter $1=$ yes, $0=$ no. | 0 | [WCu] |
| 218 | F46 | Throughflow Resistance | During its travel through the AA at the time of peak annual flow, water arriving in channels: [select only the ONE encountered bymost of the incoming water]. |  | [FA, FR, INV, NR, OE, PR, SR, WS] |
|  |  |  | Does not bump into many plant stems as it travels through the AA. Nearly all the water continues to travel in unvegetated (often incised) channels that have minimal contact with wetland vegetation, or through a zone of open water such as an instream pond or lake. | 1 |  |
| 220 |  |  | Bumps into herbaceous vegetation but mostly remains in fairly straight channels. | 0 |  |
|  |  |  | Bumps into herbaceous vegetation and mostly spreads throughout, or is in widely meandering, multi-branched, or braided channels. | 0 |  |
| 222 |  |  | Bumps into tree trunks and/or shrub stems but mostly remains in fairly straight channels. | 0 |  |
| 223 |  |  | Bumps into tree trunks and/or shrub stems and follows a fairly indirect path from entrance to exit (meandering, multi-branched, or braided). | 0 |  |
| 224 | F47 | pH Measurement | The pH in most of the AA's surface water: |  | Preferably, measure this in larger areas of ponded surface water within the AA, or in streams that have passed through (not along) most of the AA. Unless surface water is completely absent, do not dig holes or make depressions in peat in order to provide water for this measurement. Avoid measuring near roads or in puddles formed only by recent rain. [AM, FA, FR, NR, WBF, PH, PR, Sens, WBF, WBN] |
| 225 |  |  | Was measured, and is: [enter the reading in the colum to the right.] |  |  |
| 226 |  |  | Was not measured but surface water is present and is darkly tea-coloured. Or if no surface water, then mosses and plants that indicate peatland (e.g., Labrador tea) are prevalent. Enter "1". | 0 |  |
| 227 |  |  | Neither of above. Enter "1". | 1 |  |
|  | F48 | $\begin{aligned} & \text { TDS and/or } \\ & \text { Conductivity } \end{aligned}$ | The TDS (total dissolved solids) or conductivity off the AA's surface water is: (select the first true row with information): |  | See above for measurement guidance. [PR, INV, NRN, PH, PRV, Sens] |
| 229 |  |  | TDS is: [Enter the reading in ppmor mg/L in the colum to the right, if measured, or answer next row.] |  |  |
| 230 |  |  | Conductivity is [Enter the reading in $\mu \mathrm{S} / \mathrm{cm}$ in the colum to the right.] |  |  |
| 231 |  |  | Was not measured, but plants that indicate saline conditions cover much of the vegetated AA Enter "1". | 0 |  |
| 232 |  |  | Neither of above | 1 |  |
| 233 | F49 | Beaver Probability | Use of the AA by beaver during the past 5 years is (select most applicable ONE): |  | [FA, RR, PH, SBM, Sens, WBF, WBN] |
|  |  |  | Evident from direct observation or presence of gnawed limbs, dams, tracks, dens, lodges, or extensive stands of water-killed trees (snags). | 0 |  |
| 235 |  |  | Likely based on known occurrence in the region and proximity to suitable habitat, which may include: (a) a persistent freshwater wetland, pond, or lake, or a perennial low or mid-gradient ( $<10 \%$ ) channel, and (b) a corridor or multiple stands of hardwood trees and shrubs in vegetated areas near surface water. | 0 |  |
| 236 |  |  | Unlikely because site characteristics above are deficient, and/or this is a settled area or other area where beaver are routinely removed. | 1 |  |
| 237 | F50 | Groundwater Strength of Evidence | Select first applicable choice: |  | Adhere to these criteria strictly -- do not use personal judgment based on fen conditions, pH , or other evidence. Consult topographic maps to detect breaks in slope described here. Rust deposits associated with groundwater seeps may be most noticeable as orange discoloration in ice formations along streams during early winter. [AM, CS, FA, FR, INN, NR, OE, PH, PRv, SFS, WC, WS] |
| 238 |  |  | Springs are known to be present within the AA, or if groundwater levels have been monitored, that has demonstrated that groundwater primarily discharges to the wetland for longer periods during the year than periods when the wetland recharges the groundwater. | 0 |  |
| 239 |  |  | Most of the AA has a slope of $>5 \%$, or is very close to the base of a natural slope longer than 100 and much steeper than the slope of the $A A, A N D$ the pH of surface water, if known, is $>5.5$. | 0 |  |
| 240 |  |  | Neither of above is true, although some groundwater may discharge to or flow through the AA. Or groundwater influx is unknown. | 1 |  |


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| 24 | F51 | Internal Gradient | The gradient along most of the flow path within the A A is: |  | This is not the same as the shoreline slope. It is the elevational difference between the AA's inlet and outlet, divided by the flow-distance between them and corverted to percent. If available, use a clinometer to measure this. Free clinometer apps can be downloaded to smartphones. If the wetland is large (longer than $\sim 1 \mathrm{~km}$ ), this may be estimated using Google Earth to determine the minimum and maximum elevation within the $A A$, then dividing by length and multiplying by 100 . [CS, $N R, O E, P R$, SR, WBF, WBN, WS] |
| 242 |  |  | 2\% or the AA has no surface water outlet (not even seasonally). | 1 |  |
| 243 |  |  | 2-5\% | 0 |  |
| 244 |  |  | 6-10\% | 0 |  |
| 245 |  |  | >10\% | 0 |  |
| Note for the next three questions: If the AA lacks an upland edge, evaluate based on the AA's entire perimeter, and moving outward into whatever areas 246 are adjacent. In many situations, these questions are best answered by measuring from aerial images. |  |  |  |  |  |
| 247 | F52 | Vegetated Buffer as \% of Perimeter | Wthin a zone extending 30 m laterally from the AA's edge with upland and/or other wetlands, the percentage that containsperennial vegetation cover (except lamns, row crops, heavily grazed land, conifer plantations) is: |  | [AM, FA, FR, INV, NRV, PH, POL, PRV, SBM, Sens, SRv, STR, WBN] |
|  |  |  | -5\% | 0 |  |
| 249 |  |  | 5 to 30\% | 0 |  |
| 250 |  |  | 30 to 60\% | 0 |  |
| 251 |  |  | 60 to 90\% | 1 |  |
| 252 |  |  | >90\%, or all the area within 30 m of the AA edge is other wetlands. SKIP to P55. | 0 |  |
| 253 | F53 | Type of Cover in Buffer | Wthin 30 m upslope of where the wetland transitions to upland, the upland land cover that is NOT perennial vegetation is mostly (mark ONE): |  | [AM, FA, INN, NRV, PH, POL, SBM, STR, WBN] |
| 254 |  |  | Impervious surface, e.g., paved road, parking lot, building, exposed rock. | 0 |  |
| 255 |  |  | Bare or nearly bare pervious surface or managed vegetation, e.g., lamn, row crops, unpaved road, dike, landslide. | 1 |  |
| 256 | F54 | Buffer Slope | The steepest and/or most disturbed part of the upland area that is within 30 m of the wetland and occupies $>10 \%$ of that upland area has a percent slope of: |  | [NRN, PRN, Sens, SRV] |
| 257 |  |  | <1\% (flat -- almost no noticeable slope) or all the area within 30 mof the AA edge is other wetlands. | 0 |  |
| 258 |  |  | 2-5\% | 0 |  |
| 259 |  |  | 5-30\% | 1 |  |
| 260 |  |  | >30\% | 0 |  |
| 261 | F55 | Cliffs or Steep Banks | In the AA or within 100 m , there are elevated terrestrial features such as cliffs, talus slopes, stream banks, or excavated pits (but not riprap) that extend at least 2 m nearly vertically, are urvegetated, and potentially contain crevices or other substrate suitable for nesting or den areas. Enter 1 (yes) or 0 (no). | 0 | Do not include upturned trees as potential den sites. [POL, SBM] |
| 262 | F56 | New or Expanded Wetland | Human actions within or adjacent to the AA have persistently expanded a naturally occurring wetland or created a wetland where there previously was none (e.g., by excavation, impoundment): |  | Determine this using historical aerial photography, old maps, soil maps, or permit files as available [CS, NR, OE, PH, Sens] |
| 263 |  |  | No. | 1 |  |
| 264 |  |  | Yes, and created or expanded $20-100$ years ago. | 0 |  |
| 265 |  |  | Yes, and created or expanded 3 -20 years ago. | 0 |  |
| 266 |  |  | Yes, and created or expanded within last 3 years. | 0 |  |
| 267 |  |  | Yes, but time of origin or expansion unknown. | 0 |  |
| 268 |  |  | Unknown if new or expanded within 20 years or not. | 0 |  |
| 269 | F57 | Burn History | More than $1 \%$ of the AA's previously vegetated area: |  | Look for charred soil or stumps (in multiple widely-spaced locations) or ask landowner. [CS, PH, STR] |
| 270 |  |  | Burned within past 5 years. | 0 |  |
| 271 |  |  | Burned 6-10 years ago. | 0 |  |
| 272 |  |  | Burned 11-30 years ago. | 0 |  |
| 273 |  |  | Burned $>30$ years ago, or no evidence of a burn and no data. | 1 |  |
| 274 | F58 | Visibility | The maximum percentage of the wetland that is visible from the best vantage point on public roads, public parking lots, public buildings, or public maintained trails that intersect, adjoin, or are within 100 m of the $A \mathrm{~A}$ (select one) is: |  | [PU, STR, WBFV] |
| 275 |  |  | 25\% | 0 |  |
| 276 |  |  | 25-50\% | 1 |  |
| 277 |  |  | -50\% | 0 |  |
| 278 | F59 | Non-consumptive Uses - Actual or Potential | Assuming access permission was granted, select $A \amalg$ statements that are true of the $A A$ as it currently exists: |  | [PU, STR] |
| 279 |  |  | For an average person, walking is physically possible in (not just near) $>5 \%$ of the AA during most of the growing season, e.g., free of deep water and dense shrub thickets. | 0 |  |
| 280 |  |  | Maintained roads, parking areas, or foot-trails are within 10 m of the $A A$, or the $A A$ can be accessed part of the year by boats arriving via contiguous waters. | 0 |  |
| 281 |  |  | Wuthin or near the AA, there is an interpretive center, trails with interpretive signs or brochures, andor regular guided interpretive tours. | 0 |  |


|  | A | B | C | D |  |
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| 282 | F60 | Unvisited Core Area | The percentage of the AA almost never visited by humans during an average growing season probably comprises: [ Note: Only include the part actually walked or driven (not simply viewed from) with a vehicle or boat. Do not include visitors on trails outside of the AA unless more than half the wetland is visible from the trails and they are within 30 mof the wetland edge. In that case include only the area occupied by the trail.] |  | [AM, FAv, PRv, PH, PU, SBM, STR, WBF, WBN] |
| 283 |  |  | -5\% and no inhabited building is within $100 \mathrm{mof} \mathrm{the} A$ A | 0 |  |
| 284 |  |  | -5\% and inhabited building is within 100 mof the $A$ A | 0 |  |
| 285 |  |  | $5-50 \%$ and no inhabited building is within 100 m of the $A$ A | 0 |  |
| 286 |  |  | $5-50 \%$ and inhabited building is within 100 m of the $A$ A | 0 |  |
| 287 |  |  | 50-95\%, with or without inhabited building nearby. | 0 |  |
| 288 |  |  | >95\% of the AA with or without inhabited building nearby. | 1 |  |
| 289 | F61 | Frequently Visited Area | The part of the AA visited by humans almost daily for several weeks during an average growing season probably comprises: [See note above.] |  | [AM, PH, PU, SBM, STR, WBF, WBN] |
| 290 |  |  | -5\% If F60 was answered ">95\%' (mostly never visited), SKIP to F64. | 1 |  |
| 291 |  |  | 5-50\% | 0 |  |
| 292 |  |  | 50-95\% | 0 |  |
| 293 |  |  | >95\% of the AA | 0 |  |
| 294 | F62 | BMP - Soils | Boardwalks, paved trails, fences or other infrastructure and/or well-enforced regulations appear to effectively prevent visitors from walking on soil within nearly all of the AA when the soil is unfrozen. Enter " 1 " if true. | 0 | [PH, PU] |
| 295 | F63 | BMP - Wildlife Protection | Fences, observation blinds, platforms, paved trails, exclusion periods, and/or well-enforced prohibitions on motorised boats, off-leash pets, and off road vehicles appear to effectively exclude or divert visitors and their pets from the $A A$ at critical times in order to minimize disturbance of wildlife (except during hunting seasons). Enter "1" if true. | 0 | [AM, PU, WBF, WBN] |
| 296 | F64 | Consumptive Uses (Provisioning Services) | Recent evidence was found within the AA of the following potentially-sustainable consumptive uses. Select ALL that apply. |  | [FAv, Rev, WBFV] |
| 297 |  |  | Low-impact commercial timber harvest (e.g., selective thinning). | 0 |  |
| 298 |  |  | Commercial or tracitional-use havesting of native plants, their fruits, or mushrooms. | 0 |  |
| 299 |  |  | Waterfowl hunting. | 0 |  |
| 300 |  |  | Fshing. | 0 |  |
| 301 |  |  | Trapping of furbearers. | 0 |  |
| 302 |  |  | None of the above. | 1 |  |
| 303 | F65 | Domestic Wells | The closest wells or water bodies that currently provide drinking water are: |  | [NRN] |
| 304 |  |  | Muthin 0-100 m of the AA | 0 |  |
| 305 |  |  | $100-500 \mathrm{~m}$ away. | 0 |  |
| 306 |  |  | -500 m away, or no information. | 1 |  |
| 307 | F66 | Calcareous Fen | The AA is, or is part of, a calcareous fen. See the Plants_Calcar worksheet in the accompanying Supplnfo file for list of plant indicators (calciphiles). Enter 1 If more than two Strong or more than five Moderate calciphile species are present; otherwise enter 0 , but if not able to identify those and no information, change to blank. | 0 | [ $\mathrm{PH}, \mathrm{PR}]$ |



| S3 | Accelerated Inputs of Nutrients |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | In the last column, place a check mark next to any item - occurring in either the wetland or its CA - that is likely to have accelerated the inputs of nutrients to the wetland. [NRV, PRV, STR] |  |  |  |  |
|  | Stormwater or wastewater effluent (including failing septic systems), landfills. |  |  |  |  |
|  | Fertilizers applied to lamns, ag lands, or other areas in the CA |  |  |  |  |
|  | Livestock, dogs. |  |  |  |  |
|  | Artificial drainage of upslope lands. |  |  |  |  |
|  | If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly more nutrients, then leave the "O's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present. |  |  |  |  |
|  |  | Severe (3 points) | Medium (2 points) | Mild (1 point) |  |
|  | Type of loading: | High density of unmaintained septic, some types of industrial sources. | Moderate density septic, cropland, secondary wastewater treatment plant. | Livestock, pets, low density residential. | 0 |
|  | Frequency \& duration of input: | Frequent and year-round. | Frequent but mostly seasonal. | Infrequent \& during high runoff events mainly. | 0 |
|  | AA proximity to main sources (actual or potential): | 0-15m | 15-100 m or in groundwater. | In more distant part of contributing area. | 0 |
|  | - Sume |  |  |  | 0 |
|  |  |  |  | Stressor subscore= | 0.00 |


| S4 | Excessive Sediment Loading from Contributing Area |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | In the last column, place a check mark next to any item present in the CA that is likely to have elevated the load of waterborme or windborne sediment reaching the wetland fromits CA [FA, FR, INW, PH, SRV, STR] |  |  |  |  |
|  | Erosion from plowed fields, fill, timber havest, dirt roads, vegetation clearing, fires. |  |  |  | 1 |
|  | Erosion from construction, in-channel machinery in the CA |  |  |  |  |
|  | Erosion from off-road vehicles in the CA |  |  |  |  |
|  | Erosion from livestock or foot traffic in the CA |  |  |  |  |
|  | Stormwater or wastewater effluent. |  |  |  |  |
|  | Sediment from road sanding, gravel mining, other mining, oil/ gas extraction. |  |  |  |  |
|  | Accelerated channel downcutting or headcutting of tributaries due to altered land use. |  |  |  |  |
|  | Other human-related disturbances within the CA |  |  |  |  |
|  | If any items were checked above, then for each row of the table below, assign points ( 3,2, or 1 as shown in header) in the last column. However, if you believe the checked items did not cumulatively add significantly more sediment or suspended solids to the $A A$ then leave the "O's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present. |  |  |  |  |
|  |  | Severe (3 points) | Medium (2 points) | Mild (1 point) |  |
|  | Erosion in CA: | Extensive evidence, high intensity.* | Potentially (based on high-intensity ${ }^{\star}$ land use) or scattered evidence. | Potentially (based on low-intensity ${ }^{\star}$ land use) with little or no direct evidence. | 1 |
|  | Recentness of significant soil disturbance in the CA: | Current \& ongoing. | 1-12 months ago. | $>1$ y ago. | 1 |
|  | Duration of sediment inputs to the wetland: | Frequent and year-round. | Frequent but mostly seasonal. | Infrequent \& during high runoff events mainly. | 1 |
|  | AA proximity to actual or potential sources: | 0-15m. | 15-100 m. | In more distant part of contributing area. | 1 |
|  | * high-intensity= extensive off-road vehicle use, plowing, grading, excavation, erosion with or without veg removal; low-intensity= veg removal only with little or no apparent erosion or disturbance of soil or sediment. |  |  | Sum= | 4 |
|  |  |  |  | Stressor subscore= | 0.33 |
| S5 | Soil or Sediment Alteration Within the Assessment Area |  |  |  |  |
|  |  (whichever is less). [CS, INW, NR, PH, SR, STR] |  |  |  |  |
|  | Compaction from machinery, off-road vehicles, livestock, or mountain bikes, especially during wetter periods. |  |  |  |  |
|  | Leveling or other grading not to the natural contour. |  |  |  |  |
|  | Tillage, plowing (but excluding disking for enhancement of native plants). |  |  |  |  |
|  | Fill or riprap, excluding small amounts of upland soils containing organic amendments (compost, etc.) or small amounts of topsoil imported from another wetland. |  |  |  |  |
|  | Excavation. |  |  |  |  |
|  | Ditch cleaning or dredging in or adjacent to the wetland. |  |  |  |  |
|  | Boat traffic in or adjacent to the wetland and sufficient to cause shore erosion or stir bottom sediments. |  |  |  |  |
|  | Avtificial water level or flow manipulations sufficient to cause erosion or stir bottom sediments. |  |  |  |  |
|  |  effects, contrast the current condition with the condition if the checked items never occurred or were no longer present. |  |  |  |  |
|  |  | Severe (3 points) | Medium (2 points) | Mild (1 point) |  |
|  | Spatial extent of altered soil: | >95\% of wetland or >95\% of its upland edge (if any). | 5-95\% of wetland or 5-95\% of its upland edge (if any). | $<5 \%$ of wetland and $<5 \%$ of its upland edge (if any). | 0 |
|  | Recentness of significant soil alteration in wetland: | Current \& ongoing. | 1-12 months ago. | $>1 \mathrm{yr}$ ago. | 0 |
|  | Duration: | Long-lasting, minimal veg recovery. | Long-lasting but mostly revegetated. | Short-term, revegetated, not intense. | 0 |
|  | Timing of soil alteration: | Frequent and year-round. | Frequent but mostly seasonal. | Mainly during one-time or scattered events. | 0 |
|  | Sum= |  |  |  | 0 |



| Cover Page: Basic Description of Assessment | WESP-AC version 2 |
| :---: | :---: |
| Site Name: | Cambridge Wetland 11 |
| Investigator Name: | BL, CP |
| Date of Field Assessment: | 29 September 2021 |
| Nearest Town: | Waterville, NS |
| Latitude (decimal degrees): | $368998.02 \mathrm{~m} \mathrm{E}$, |
| Longitude (decimal degrees): | $4989608.29 \mathrm{~m} \mathrm{~N} \mathrm{UTM} \mathrm{20T}$ |
| Is a map based on a formal on-site wetland delineation available? | Yes |
| Approximate size of the Assessment Area (AA, in hectares): | $\sim 4 \mathrm{ha}$ |
| AA as percent of entire wetland (approx.). Attach sketch map if AA is smaller than the entire contiguous wetland. | 100 |
| What percent (approx.) of the wetland were you able to visit? | 100 |
| What percent (approx.) of the AA were you able to visit? | 100 |
| Were you able to ask the site owner/manager about any of the questions? | No |
| Indicate here if you intentionally surveyed for rare plants, calciphile plants, or rare animals: | Yes |
| Have you attended a WESP-AC training session? If so, indicate approximate month \& year. | Yes |
| How many wetlands have you assessed previously using WESP-AC? (approx.) | Yes |
| Comments about the site or this WESP-AC assessment (attach extra page if desired): |  |


|  | A | B | C | D | E |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | Date: 29 Sept 2021 |  | Site Identifier: Highway 101 Cambridge Wetland 11 | Investigator: BLCP |  |
| 2 | Form OF (Office). Non-tidal Wetland Data Form. WESP-AC version 2 for Nova Scotia wetlands only. DIRECTIONS: Conduct an assessment only after reading the accompanying <br> Manual and the Explanations column of the data form. In the Data column, change the 0 (false) to a 1 (true) for the best choice, or for multiple choices where allowed and so indicated. Answering many of the questions below will require using these online map viewers: <br> Google Earth Pro: https://www.google.com/earth/download/gep/agree.html <br> Provincial Landscape Viewer: https://nsgi.novascotia.ca/plv/ <br> For most wetlands, completing this office data form will require 1-2 hours. For a list of functions to which each question pertains, see bracketed abbreviations in the Definitions/Explanations column. For detailed descriptions of each WESP-AC model, see Appendix B of the accompanying Manual. Codes for functions and values are: WS= Water Storage, SFS= Stream Flow Support, WC= Water Cooling, SR= Sediment Retention \& Stabilisation, PR= Phosphorus Retention, NR= Nitrate Removal, CS= Carbon Sequestration, OE= Organic Nutrient Export, INV=Invertebrate Habitat, FA= Anadromous Fish Habitat, FR= Resident Fish Habitat, AM=Amphibian \& Reptile Habitat, WBF= Feeding Waterbird Habitat, WBN= Nesting Waterbird Habitat, SBM= Songbird, Raptor, \& Mammal Habitat, POL= Pollinator Habitat, PH= Native Plant Habitat, PU= Public Use \& Recognition, EC= Ecological Condition, Sen= Wetland Sensitivity, STR= Stressors. |  |  |  |  |
| 3 | \# | Indicators | Condition Choices | Data | Definitions/Explanations |
| 4 | OF1 | Province | Mark the province in which the A A is located by changing the 0 in the colum next to it to a "1". Mark only one. |  | This determines to which province's calibration wetlands the raw score of any wetland is normalised. In the function and benefits models, it also triggers the automatic exclusion of indicators for which no spatial data exists in a particular province. |
| 5 |  |  | New Brunswick | 0 |  |
| 6 |  |  | Nova Scotia | 1 |  |
| 7 |  |  | Prince Edward Island | 0 |  |
| 8 |  |  | Newfoundland-Labrador | 0 |  |
| 9 | OF2 | Ponded Area Wthin 1 km | The area of surface water ponded during most of the growing season that is both (1) in or adjacent to the AA and (2) within 1 km is: |  | "Adjacent" means not separated from the AA by a wide expanse ( $>50 \mathrm{~m}$ ) of upland (including roads >50 m wide). Include ponded areas likely to be hidden by wetland vegetation. If surface water extends beyond 1 km , include only the part within 1 km . Do not include tidal areas. Measure the area from aerial imagery using Google Earth Pro (click on Ruler icon in toolbar, then Polygon in popup menu). [PH, SBM, WBN] |
| 10 |  |  | 80.01 hectare (about $10 \mathrm{~m} \times 10 \mathrm{~m}$ ). | 0 |  |
| 11 |  |  | 0.01-0.1 hectare. | 0 |  |
| 12 |  |  | 0.1-1 hectare. | 0 |  |
| 13 |  |  | 1 to 10 hectares. | 1 |  |
| 14 |  |  | 10 to 100 hectares. | 0 |  |
| 15 |  |  | $>100$ hectares. | 0 |  |
| 16 | OF3 | Ponded Water \& Wetland Wthin 1 km | The area of wetlands and surface water ponded during most of the growing season that is both (1) in or adjacent to the $A A$ and (2) within 1 km is: |  | See definition of adjacent in OF2. If the AA's wetland vegetation extends beyond 1 km , include only the part within 1 km "Ponded" means not flowing in rivers or streams. [Sens, WBF] |
| 17 |  |  | $<0.01$ hectare (about $10 \mathrm{~m} \mathrm{\times 10} \mathrm{~m}$ ). | 0 |  |
| 18 |  |  | 0.01-0.1 hectare. | 0 |  |
| 19 |  |  | 0.1-1 hectare. | 0 |  |
| 20 |  |  | 1 to 10 hectares. | 0 |  |
| 21 |  |  | 10 to 100 hectares. | 1 |  |
| 22 |  |  | $>100$ hectares. | 0 |  |
| 23 | OF4 | Size of Largest Nearby <br> Vegetated Tract or Corridor | The largest vegetated patch or corridor that includes the AA's vegetation plus alladjacent upland vegetation that is not lamn, row crops, heavily grazed lands, conifer plantation is: |  | See definition of adjacent in OF2. Use Google Earth Pro's polygon ruler (as described above). <br> Exclude conifer plantations only if it is obvious that trees were planted in rows. [AM, PH, SBM, Sens] |
| 24 |  |  | $<0.01$ hectare (about $10 \mathrm{~m} \times 10 \mathrm{~m}$ ). | 0 |  |
| 25 |  |  | 0.01-0.1 hectare. | 0 |  |
| 26 |  |  | 0.1-1 hectare. | 0 |  |
| 27 |  |  | 1 to 10 hectares. | 0 |  |
| 28 |  |  | 10 to 100 hectares. | 0 |  |
| 29 |  |  | 100 to 1000 hectares. | 0 |  |
| 30 |  |  | >1000 hectares. [This is nearly always the answer in relatively undeveloped landscapes.] | 1 |  |


|  | A | B | C | D | E |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 31 | OFS | Distance to Large Vegetated Tract | The minimum distance from the edge of the AA to the edge of the closestvegetated land (but excluding row crops, lamn, conifer plantation) larger than 375 hectares (about 2 km on a side), is: |  | To measure distance, use Google Earth Pro (Ruler > Line tool). The 375 -ha criterion is from the Fundy Model Forest Project. [AM, PH, POL, SBM, Sens] |
| 32 |  |  | $<50 \mathrm{~m}$, and not separated from the 375 -ha vegetated area by any width ofpaved roads, stretches of open water, row crops, bare ground, lawn, or impervious surface. Or the $A A$ itself contains $>375$ ha of vegetation. [This is often the answer in relatively undeveloped landscapes.] | 1 |  |
|  |  |  | 40 m , but completely separated from the 375-ha vegetated area by those features, and AA does not contain $>375$ ha of vegetation. | 0 |  |
| 34 |  |  | 50-500 m, and not separated. | 0 |  |
| 35 |  |  | 50-500 m, but separated by those features. | 0 |  |
| 36 |  |  | $0.5-5 \mathrm{~km}$, and not separated. | 0 |  |
| 37 |  |  | $0.5-5 \mathrm{~km}$, but separated by those features. | 0 |  |
| 38 |  |  | None of the above (the closest patches or corridors which are that large are $>5 \mathrm{~km}$ away). | 0 |  |
| 39 | OF6 | Herbaceous Uniqueness | The AA's vegetation cover is $>10 \%$ herbaceous* but uplands within 5 km have $<10 \%$ herbaceous cover. If so, enter " 3 " and continue to OF7. If not, consider: <br> The AA's vegetation cover is $>10 \%$ herbaceous* but uplands within 1 km have $<10 \%$ herbaceous cover. If so enter " 2 " and continue to Of7. If not, consider: <br> The AA's vegetation cover is $>10 \%$ herbaceous* but uplands within 100 m of the wetland edge have $<10 \%$ herbaceous cover. If so, enter "1". <br> [* NOTE: Exclude lamns, row crops, heavily grazed lands, forest, shrublands. Include moss as well as grasslike plants in this use of "herbaceous vegetation'] | 1 | For this question only, consider moss to be herbaceous vegetation. Determine the score by vieving aerial imagery in Google Earth after successively drawing or estimating the boundaries of the buffers of $5 \mathrm{~km}, 1 \mathrm{~km}$, and 100 m radius focused on the center of the AA. Circles of specified radius can be dramn in Google Earth Pro by clicking on the Ruler icon, then Circle in the pop-up menu. [AMN, PHN, POLv, SBMN, WBFv, WBNv] |
| 40 | OF1 | Woody Uniqueness | The AA's vegetation cover is $>10 \%$ woody* but uplands within $5 \mathrm{kmhave}<10 \%$ woody cover. If so, enter " 3 " and continue to OF8. If not, consider: <br> The AA's vegetation is $>10 \%$ woody ${ }^{\star}$ but uplands within 1 km have $<10 \%$ woody cover. If so enter " 2 " and continue to OF8. If not, consider: <br> The AA's vegetation is $>10 \%$ woody ${ }^{\star}$ but uplands within 100 m of the wetland edge have $<10 \%$ woody cover. If so, enter " 1 " <br> [* NOTE: woody cover = trees \& shrubs taller than 1 m ] | 0 | See above. Do not consider conifer plantations to be forest if it is obvious that trees were planted in rows. [AMN, PHV, POLv, SBMN] |
| 41 | OF8 | Local Vegetated Cover Percentage | Draw a 5 -km radius circle measured from the center of the AA. Ignoring all permanent water in the circle, the percent of the remaining are that is wooded or unmanaged herbaceous vegetation (NOT lawn, row crops, bare or heavily grazed land, clearcuts, or conifer plantations) is: |  | In Google Earth, draw the 5 km buffer and then estimate land cover percentages, or do GIS analysis of an appropriate land cover layer. [AM, PH, POL, SBM, Sens] |
| 42 |  |  | -5\% of the land. | 0 |  |
| 43 |  |  | 5 to 20\% of the land. | 0 |  |
| 44 |  |  | 20 to 60\% of the land. | 1 |  |
| 45 |  |  | 60 to $90 \%$ of the land. | 0 |  |
| 46 |  |  | >90\% of the land. SKIP to OF10. | 0 |  |
| 47 | OF9 | Type of Land Cover | Wthin the 5 -km radius circle, and ignoring all permanent water, the land area that is bare or non-perennial cover is mostly: |  | [AM, SBM] |
| 48 |  |  | Impervious surface, e.g., paved road, parking lot, building, exposed rock. | 0 |  |
| 49 |  |  | Bare pervious surface, e.g., lawn, recent (< 5 yrs ago) clearcut, dirt or gravel road, cropland, landslide, conifer plantation. | 1 |  |
| 50 | OF10 | Distance by Road to Nearest Population | Measured along the maintained road nearest the A , the distance to the nearestpopulation center is: |  | "Population center" means a settled area with more than about 5 regularly- inhabited structures per square kilometer In Google Earth Pro, click on the Ruler icon, then Path, and draw and measure the |
| 51 |  | Center | $<100 \mathrm{~m}$. | 1 |  |
| 52 |  |  | 100-500m. | 0 |  |
| 53 |  |  | $0.5-1 \mathrm{~km}$ | 0 |  |
| 54 |  |  | $1-5 \mathrm{~km}$ | 0 |  |
| 55 |  |  | -5km | 0 |  |
| 56 | OF11 | Distance to Nearest <br> Maintained Road | From the center of the AA, the distance to the nearest maintained public road (dirt or paved) is: |  | Determine this by viewing aerial imagery in Google Earth Pro and measuring with the Ruler>Line |
| 57 |  |  | $<10 \mathrm{~m}$ | 1 |  |
| 58 |  |  | 10-25m. | 0 |  |
| 59 |  |  | 25-50m. | 0 |  |
| 60 |  |  | 50-100 m. | 0 |  |
| 61 |  |  | 100-500m. | 0 |  |
| 62 |  |  | >500 m. | 0 |  |


|  | A | B | C | D | E |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 63 | OF12 | Wildifife Access | Draw a circle of radius of 5 km from the center of the $A A$ If marmals and amphibians can move from the center of the $A A$ to $A L L$ other separate wetlands and ponds located within the circle without being forced to cross pavement (any width), lawns, bare ground, and/or marine waters, mark $1=$ yes can move to all, $0=$ no. Change toblank if there are no other wetlands within 5 km . | 0 | Draw the 5 km circle in Google Earth Pro using the Circle tool and search for roads and wetlands within it, being alert for roads hidden under forest canopy. [AM, SBM, STR] |
| 64 | OF13 | Distance to Ponded Water | The distance from the AA center to the closest (but separate) ponded water body visible in Google Earth imagery is: |  | In Google Earth Pro, zoom in dosely to examine the surrounding landscape for ponds, lakes, and wetlands that appear to be permanently flooded. [AM, PH, SBM, Sens, WBF, WBN] |
| 65 |  |  | -50 m, and not separated by any width of paved roads, stretches of open water, row crops, lamn, bare ground, or impervious surface. | 0 |  |
| 66 |  |  | 50 m , but completely separated by those features. | 0 |  |
| 67 |  |  | $50-500 \mathrm{~m}$, and not separated. | 0 |  |
| 68 |  |  | $50-500 \mathrm{~m}$, but separated by those features. | 0 |  |
| 69 |  |  | $0.5-1 \mathrm{~km}$, and not separated. | 1 |  |
| 70 |  |  | $0.5-1 \mathrm{~km}$, but separated by those features. | 0 |  |
| 71 |  |  | None of the above (the closest patches or corridors that large are >1 km away). | 0 |  |
| 72 | OF14 | Distance to Large Ponded Water | The distance from the AA center to the closest (but separate)non-tidal body of water that is ponded during most of the year and islarger than 8 hectares during most of a normal year is: |  | Determine this by viewing aerial imagery in Google Earth. [Sens, WBF, WBN] |
| 73 |  |  | $<100 \mathrm{~m}$ | 0 |  |
| 74 |  |  | $100 \mathrm{~m}-1 \mathrm{~km}$ | 0 |  |
| 75 |  |  | 1-2km. | 0 |  |
| 76 |  |  | 2-5 km | 0 |  |
| 77 |  |  | $5-10 \mathrm{~km}$ | 1 |  |
| 78 |  |  | $>10 \mathrm{~km}$ | 0 |  |
| 79 | OF15 | Tidal Proximity | The distance from the AA edge to the closesttidal water body (regardless of its salinity) is: |  | In Google Earth, measure the distance to the ocean (including Bay of Fundy) or tidal river, whichever is closer. If you need to see howfar upriver a river is tidal, see the KNZ file provided with this calculator for NS (NS Headtide). Points shown in those files are only an approximation, so local information if available may be preferable. [FA, WBF] |
| 80 |  |  | $\angle 100 \mathrm{~m}$ | 0 |  |
| 81 |  |  | $100 \mathrm{~m}-1 \mathrm{~km}$ | 0 |  |
| 82 |  |  | $1-5 \mathrm{~km}$ | 0 |  |
| 83 |  |  | $5-10 \mathrm{~km}$ | 0 |  |
| 84 |  |  | $10-40 \mathrm{~km}$ | 1 |  |
| 85 |  |  | $>40 \mathrm{~km}$ | 0 |  |


|  | A | B | C | D | E |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 86 | OF16 | Upland Edge Contact | Select one: |  | [NR, SBM, Sens] |
|  |  |  | The AA has no upland edge (or upland is <1\% of perimeter). The AA is entirely surrounded by (\& contiguous with) other wetlands or water | 0 |  |
|  |  |  | 1-25\% of the AA's perimeter abuts upland (including filled areas). The rest adjoins other wetlands or water that is mostly wider than the Af | 0 |  |
| 89 |  |  | $25-50 \%$ of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA | 0 |  |
| 90 |  |  | $50-75 \%$ of the AA's perimeter abuts upland. The rest adjoins other wetlands or water that is mostly wider than the AA. | 0 |  |
| 91 |  |  | More than $75 \%$ of the AA's perimeter abuts upland. Any remainder adjoins other wetlands or water that is mostly wider than the AA. This will be true for most assessments done with WESP-AC. | 1 |  |
| 92 | OF17 | Food Damage fromNon tidal Waters | Wthin 5 km downstream or downslope of the AA (select first true choice): |  | Contact local authories to determine if such maps exist. Where available, LiDAR imagery can provide finer elevational resolution useful for flood modeling. [WSV] |
| 93 |  |  | Maps show Flood Zone or Flood Risk areas and there appears to be infrastructure vulnerable to river flooding not caused by tidal storm surges. | 0 |  |
| 94 |  |  | Maps show Food Zone or Flood Risk areas, but infrastructure is absent or is not vulnerable to floods from a non-tidal river. In some cases levees, upriver dams, or other measures may partly limit damage or risk from smaller events. | 0 |  |
| 95 |  |  | Maps do not show Food Zone or Food Risk areas (or no such mapping has been done locally) and there appears to be infrastructure vulnerable to river flooding unrelated to tidal storm surges. | o |  |
| 96 |  |  | Maps do not show Flood Zone or Food Risk areas (or no such mapping has been done locally) and there isno infrastructure vulnerable to river flooding unrelated to tidal storm surges. | 1 |  |
| 97 | OF18 | Relative Đevation in Watershed | In Google Earth, enable the Terrain layer (lower left menu) and open the NS_Watersheds Secondary KNZ file that accompanies this calculator. Then determine the AA's approximate elevation (bottom right, NOT the "eye alt"). Then move cursor around to determine the watershed's maximum and minimum elevation. Divide the AA's elevation by the (max-min). | 0.02 | [FA, NR, Sens, SFSv, WCV, WSv] |
| 98 | OF19 | Water Quality Sensitive Watershed or Area | The AA is in a Protected Water Supply area (Designated Water Supply Area, Natural Watershed Municipal Surface Water Supply Area, or Municipal Water Supply Area) according to the provided KMZ overlay ('NS Protected Water Supply Areas'). Enter $1=$ yes, $0=$ no. | 0 | If an ACCDC report is available for this AA, it also may contain such information. [NRV] |


|  | A | B | C | D |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 99 |  | Degraded Water Upstream | Sampling indicates a problem with concentrations of metals, hydrocarbons, nutrients, or other substances (excluding bacteria, acidic water, high temperatures) being present at levels harmful to aquatic life or humans, and: |  | May use existing data, or sample those waters as part of this wetland assessment. "Harmful" should be evaluated with regard to current federal or provincial water quality standards. [AM, FA, FR, NRV, PRV, SRV, STR, WBF, WBN] |
| 100 |  |  | The condition is present within the AA | 0 |  |
| 101 |  |  | The condition is present in waters within 1 km that flowinto the AA, but has not been documented in the AA itself. | 0 |  |
| 102 |  |  | Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters. | 0 |  |
| 103 |  |  | Data are insufficient (no or inadequate sampling within 1 km , or condition exists only at $>1 \mathrm{~km}$ upstream). This is the situation for nearly all wetlands in this region. | 1 |  |
| 104 | OF21 | Degraded | The problem described above is downslope fromthe AA, and: |  | May use existing data, or monitor waters as part of this wetland assessment. [NRV, PRv, SRV] |
| 105 |  | Downstream | The condition is present within 1 km downslope and connected to the AA by a channel. | 0 |  |
| 106 |  |  | The condition is present within 5 km downslope and connected to the AA by a channel, or within 1 km but not connected to the AA by a channel. | 0 |  |
| 107 |  |  | Sampling during both low water periods and times with high runoff (storms, snowmelt) indicates no problems in either the AA or inflowing waters. | 0 |  |
| 108 |  |  | Data are insufficient (no or inadequate sampling within 1 km , or condition exists only at $>1 \mathrm{~km}$ upstream). This is the situation for nearly all wetlands in this region. | 1 |  |
| 109 | OF22 | Wetland as a \% of Its Contributing Area (Catchment) | From a topographic map and field observations, estimate the approximate boundaries of the catchment (CA) of the entire wetland of which the AA may be only a part. Then adjust those boundaries if necessary based on your field observations of the surrounding terrain, and/or by using procedures described in the Manual. Divide the area of the wetland (not just the $A A$ ) by the approximate area of its catchment excluding the area of the wetland itself. When doing the calculation, if ponded water is adjacent to the wetland, include that in the wetland area. The result is: |  | Topographic maps may be viewed online at the National Atlas of Canada (Toporama): http://atlas.gc.ca/toporama/en/index.htmI [NR, PR, Sens, SR, WS] |
| 110 |  |  | <0.01, or catchment size unknown due to stormwater pipes that collect water from an indeterminate area. | 1 |  |
| 111 |  |  | 0.01 to 0.1. | 0 |  |
| 112 |  |  | 0.1 to 1. | 0 |  |
| 113 |  |  |  | 0 |  |
| 114 | OF23 | Unvegetated Surface in the Contributing Area | The proportion of the AA's contributing area (measured to no more than 1000 m upslope) that is comprised of buildings, roads, parking lots other pavement, exposed bedrock, landslides, and other mostly-bare surface is about : |  | [FA, INV, NRV, PRV, SRv, STR, WCV, WSV] |
| 115 |  |  | <10\% | 0 |  |
| 116 |  |  | 10 to $25 \%$ | 1 |  |
| 117 |  |  | >25\% | 0 |  |
| 118 | OF24 | Transport From Upslope | A relatively large proportion of the precipitation that falls farther upslope in the CA reaches this wetland quickly as runoff (surface water), as indicated by the following: <br> (a) input channel is present, <br> (b) input channels have been straightened, <br> (c) upslope wetlands have been ditched extensively, <br> (d) land cover is mostly non-forest, <br> (e) CA slopes are steep, and/or <br> (f) most CA soils are shallow (bedrock near surface) and/or have high runoff coefficients. <br> This statement is: |  | [NRV, PRV, SRv, WSU] |
| 119 |  |  | Mostly true. | 0 |  |
| 120 |  |  | Somenhat true. | 0 |  |
| 121 |  |  | Mostly untrue. | 1 |  |
| 122 | OF25 | Aspect | The overland flow direction of most surface water (in streams, rivers, or runoff) that enters the AA is: |  | [AM, NR, SFS, WC, WS] |
| 123 |  |  | Northward (N, NE). north-facing contributing area | 1 |  |
| 124 |  |  | Southward (S, SW). south-facing contributing area. | 0 |  |
| 125 |  |  | Other (E, SE, W, M M), or no detectable uphill slope or input channel (flat). | 0 |  |
| 126 <br> 127 | OF26 | Internal Aow Distance (Path Length) | The horizontal flow distance from the wetland's inlet to outlet is: <br> 10 m | 0 | Identify inlets and outlets, if any, from topographic maps (use elevations to determine which are inlets and which are outlets) and augment by field inspection. With the Provincial Landscape Viewer, select Nova.Scotia Tonnas the Baseman Also enable the laver ForestnsW/AM Predicted Flow Then |





|  | A | B | C | D | E |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 19 |  |  | deciduous trees taller than 3 m | 4 |  |
| 20 |  |  | coniferous or ericaceous shrubs or trees 1-3 mtall not directly below the canopy of trees. | 2 |  |
| 21 |  |  | deciduous shrubs or trees 1-3 mtall not directly below the canopy of trees. | 2 |  |
| 22 |  |  | Coniferous or ericaceous shrubs $<1 \mathrm{mtall}$ not directly below the canopy of taller vegetation. | 1 |  |
| 23 |  |  | deciduous shrubs or trees $<1 \mathrm{mtall}$ (e.g., deciduous seedlings) not directly below the canopy of taller vegetation. | 1 |  |
| 24 | Note: If none of top 4 rous in F3 was marked 2 or greater, SKIP to F9 (N fixers). |  |  |  |  |
| 25 | F4 | Dominance of Most Abundant Shrub Species | Determine which two woody plant species comprise the greatest portion of the low ( $\langle<\mathrm{m}$ ) woody cover. Then choose one: |  | [PH, POL, SBM, Sens] |
| 26 |  |  | those species together comprise $>50 \%$ of such cover. | 1 |  |
| 27 |  |  | those species together do not comprise $>50 \%$ of such cover. | 0 |  |
| 28 | Fs | Woody Diameter Classes | Mark $A \amalg$ the types that comprise $>5 \%$ of the woody canopy cover in the $A A$ or $>5 \%$ of the wooded areas (if any) along its upland edge (perimeter). The edge should include only the trees whose canopies extend into the AA |  | Estimate the diameters at chest height. If small-diameter trees are overtopped (shaded) by larger ones, visualise a "subcanopy" at the average height of the smaller-dbh trees, to serve as a basis for the minimum $5 \%$ canopy requirement in this question. The trees and shrubs need not be wetland species. [AM, CS, POL, SBM, Sens, WBN] |
| 29 |  |  | coniferous, $1-9 \mathrm{~cm}$ diameter and $>1 \mathrm{mtall}$. | 1 |  |
| 30 |  |  | broad-leaved deciduous $1-9 \mathrm{~cm}$ diameter and $>1 \mathrm{mtall}$. | 1 |  |
| 31 |  |  | coniferous, $10-19 \mathrm{~cm}$ diameter. | 1 |  |
| 32 |  |  | broad-leaved deciduous $10-19 \mathrm{~cm}$ diameter. | 1 |  |
| 33 |  |  | coniferous, $20-40 \mathrm{~cm}$ diameter. | 1 |  |
| 34 |  |  | broad-leaved deciduous $20-40 \mathrm{~cm}$ diameter. | 1 |  |
| 35 |  |  | coniferous, 740 cm diameter. | 0 |  |
| 36 |  |  | broad-leaved deciduous $>40 \mathrm{~cm}$ diameter. | 0 |  |
| 37 | F6 | Height Class Interspersion | Follow the key below and mark the ONE row that best describes MOST of the AA: |  | [AM, INV, NR, PH, SBM, Sens] |
|  |  |  | A. Neither the vegetation taller than 1 m nor the vegetation shorter than that comprise $>70 \%$ of the vegetated part of the $A A$. They each comprise $30-70 \%$ Choose between A 1 and A 2 and mark the choice with a 1 in the adjoining colum. Otherwise go to B below. |  |  |
| 38 |  |  |  |  |  |
| 39 |  |  | A1 The two height classes are mostly scattered and intermixed throughout the AA | 1 |  |
| 40 |  |  | A2 Not A1. The two height classes are mostly in separate zones or bands, or in proportionately large clumps. | 0 |  |
| 41 |  |  | B. Ether the vegetation shorter than 1 m comprises $>70 \%$ of the vegetated part of the $A A$, or the vegetation taller than that does. One size class might even be totally absent. Choose between B1 and B2 and mark the choice with a 1 in the adjoining column: |  |  |
| 42 |  |  | B1 The less prevalent height class is mostly scattered and intermixed within the prevalent one. | 0 |  |
| 43 |  |  | B2. Not B1. The less prevalent height class is mostly located apart from the prevalent one, in separate zones or clumps, or is completely absent. | 0 |  |
| 44 | F | Large Snags (Dead Standing Trees) | The number of large snags (diameter $\mathbf{2 0} \mathbf{~ c m}$ ) in the AA plus adjacent upland area within 10 m of the wetland edge is: |  | Snags are dead standing trees that often (not always) lack bark and foliage. Include only ones that are at least 2 m tall. [POL, SBM, WBN] |
| 45 |  |  | None, of fewer than $8 /$ hectare which exceed this diameter. | 1 |  |
| 46 |  |  | Several ( $>8 / \mathrm{hectare)}$ ) and a pond, lake, or slow-flowing water wider than 10 mis within 1 km | 0 |  |
| 47 |  |  | Several ( $>8$ hectare) but above not true. | 0 |  |
| 48 | F8 | Downed Wood | The number of downed wood pieces longer than 2 m and with diameter $>10 \mathrm{~cm}$, and not persistently submerged, is: |  | Exclude temporay "bum piles." [AM, INV, POL, SBM] |
| 49 |  |  | Few or none that meet these criteria. | 0 |  |
| 50 |  |  | Several ( $>5$ if $A$ A is $>5$ hectares, less for smaller $A$ As) meet these criteria | 1 |  |
| 51 | F9 | NFixers | The percentage of the AA's vegetated cover that contains nitrogen-fixing plants (e.g., alder, sweetgale, clover, lupine, alfalfa, other legumes) is: |  | Do not include N -fixing algae or lichens. [FA, $\mathrm{FR}, \mathrm{IN}, \mathrm{NRV}, \mathrm{OE}, \mathrm{PH}, \mathrm{SBM}$, Sens] |
| 52 |  |  | <1\% or none. | 0 |  |
| 53 |  |  | 1-25\% of the vegetated cover, in the AA or along its water edge (whichever has more). | 1 |  |
| 54 |  |  | $25-50 \%$ of the vegetated cover, in the AA or along its water edge (whichever has more). | 0 |  |
| 55 |  |  | $50-75 \%$ of the vegetated cover, in the AA or along its water edge (whichever has more). | 0 |  |
| 56 |  |  | $>75 \%$ of the vegetated cover, in the AA or along its water edge (whichever has more). | 0 |  |
| 57 | F10 | Sphagnum Moss Extent | The cover of Sphagnum moss (or any moss that forms a dense cushion many centimeters thick), including the moss obscured by taller sedges and other plants rooted in it, is: |  | Exclude moss growing on trees and rocks. [CS, PH] |
| 58 |  |  | -5\% of the vegetated part of the AA | 0 |  |
| 59 |  |  | $5-25 \%$ of the vegetated part of the $A$ A | 1 |  |
| 60 |  |  | $25-50 \%$ of the vegetated part of the AA | 0 |  |
| 61 |  |  | $50-95 \%$ of the vegetated part of the AA | 0 |  |
| 62 |  |  | >95\% of the vegetated part of the AA | 0 |  |



|  | A | B | C | D | E |
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| 103 |  |  | 50-95\% of the vegetated area | 0 |  |
| 104 |  |  | -95\% of the vegetated area | 0 |  |
| 105 | F19 | Dominance of Most Abundant Herbaceous | Determine which two herbaceous species comprise the greatest portion of the herbaceous cover (excluding mosses and floating-leaved aquatic plants). Then choose one of the following: |  | For this question, indude fems as well as graminoids and forbs. [EC, IN, PH, POL, Sens] |


|  | A | B | C | D | E |
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| 106 |  | Species | those species together comprise $>50 \%$ of the areal cover of herbaceous plants at any time during the year. | 0 |  |
| 107 |  |  | those species together do not comprise $>50 \%$ of the areal cover of herbaceous plants at any time during the year. | 1 |  |
| 108 | F20 | Invasive Plant Cover | How extensive is the cover of invasive plant species in the AA? For species, see Plants_irvasive worksheet in the accompanying Supplnfo file. |  | [EC, PH, POL, Sens] |
| 109 |  |  | invasive species appear to be absent in the AA, or are present only in trace amount (a few individuals). | 0 |  |
| 110 |  |  | invasive species are present in more than trace amounts, but comprise $<5 \%$ of herbaceous cover (or woody cover, if the invasives are woody). | 1 |  |
| 111 |  |  | invasive species comprise 5-20\% of the herb cover (or woody cover, if the invasives are woody). | 0 |  |
| 112 |  |  | invasive species comprise $20-50 \%$ of the herb cover (or woody cover, if the invasives are woody). | 0 |  |
| 113 |  |  | invasive species comprise $>50 \%$ of the herb cover (or woody cover, if the invasives are woody). | 0 |  |
| 114 | F21 | Invasive Cover Along Upland Edge | Along the wetland-upland boundary, the percent of the upland edge (within 3 m upslope from the wetland) that is occupied by invasive plant species is: |  | If a plant cannot be identified to species (e.g., winter conditions) but its genus contains an exotic species, assume the unidentified plant to also be exotic. If vegetation is so senesced that exotic species cannot be identified, answer "none". [PH, STR] |
| 115 |  |  | none of the upland edge (irvasives apparently absent), or $A A$ has no upland edge. | 1 |  |
| 116 |  |  | some (but $<5 \%$ ) of the upland edge. | 0 |  |
| 117 |  |  | 5-50\% of the upland edge. | 0 |  |
| 118 |  |  | most ( $>50 \%$ ) of the upland edge. | 0 |  |
| 119 | F22 | Fringe Wetland | During most of the year, open water within or adjacent to the vegetated part of the wetland is much wider than the maximum width of the vegetated zone within the wetland. Enter " 1 " if true, " 0 " if false. | 0 | [WBF, WBN, WCV] |
| 120 | F23 | Lacustrine Wetland | The vegetated part of the AA is within or adjacent to a body of non-tidal standing open water whose size exceeds8 hectares during most of a normal year. | 0 | [ $\mathrm{FR}, \mathrm{PR}, \mathrm{PU}, \mathrm{WBF}, \mathrm{WBN}$ ] |
| 121 | F24 | \% of AA Without Surface Water | The percentage of the AA that never contains surface water during an average year (that is, except perhaps for a few hours after snommelt on rainstorms), but which is still a wetland, is: |  | 1 hectare is 10,000 sq. mor about 2.5 acres. It could have dimensions of $100 \mathrm{mby} 100 \mathrm{~m}, 1000 \mathrm{mby}$ 10 m , or similar. [AM, FA, $\nrightarrow \mathrm{R}, \mathrm{IN}, \mathrm{NR}, \mathrm{PH}, \mathrm{PR}, \mathrm{SBM}$, Sens, SRv, WBF, WBN, WC] |
| 122 |  |  | <1\%. In other words, all or nearly all of the AA is covered by water permanently or at least seasonally. | 0 |  |
| 123 |  |  | $1-25 \%$ of the AA , or $<1 \%$ but $>0.01$ ha never contains surface water. | 0 |  |
| 124 |  |  | 25-50\% of the AA never contains surface water. | 0 |  |
| 125 |  |  | $50-75 \%$ of the AA never contains surface water. | 0 |  |
| 126 |  |  | $75-99 \%$ of the AA never contains surface water, OR $>99 \%$ and there is at least one persistently ponded water body larger than 1 ha in the AA | 1 |  |
| 127 |  |  | 99-100\% AND there is no persistently ponded water body larger than 1 ha within the AA. Enter "1" andSKIP to F42 (Channel Connection). | 0 |  |
| 128 | F25 | \% of AA vith Persistent Surface Water | Identify the parts of the AA that still contain surface water (flowing or ponded, open or hidden beneath vegetation) even during the driest times of a normal year, i.e., when the AA's surface water is at its lowest annual level. At that time, the percentage of the AA that still contains surface water is: |  | If you are unable to determine the condition at the driest time of year, ask the land owner or neighbors about it if possible. Indicators of persistence may include fish, some dragonflies, beaver, and muskrat. [AM, CS, FA, FR, INV, NR, POL, PR, SBM, WBF, WBN] |
| 129 |  |  | None. The AA dries up completely (no water in channels either) or never has surface water during most years. SKAP to F27. | 0 |  |
| 130 |  |  | 1-20\% of the AA | 1 |  |
| 131 |  |  | 20-50\% of the AA | 0 |  |
| 132 |  |  | 50-95\% of the AA | 0 |  |
| 133 |  |  | >95\% of the AA True for many fringe wetlands. | 0 |  |
| 134 | F26 | \% of SurmertimeWater that Is Shaded | At mid-day during the warmest time of year, the area of surface waterwithin the $A A$ that is shaded by vegetation and other features that are within the $A A$ at that time is: |  | [FA, WC] |
| 135 |  |  | -5\% of the water is shaded, or no surface water is present then. | 0 |  |
| 136 |  |  | $5-25 \%$ of the water is shaded. | 0 |  |
| 137 |  |  | 25-50\% of the water is shaded. | 0 |  |
| 138 |  |  | 50-75\% of the water is shaded. | 0 |  |
| 139 |  |  | >75\% of the water is shaded. | 1 |  |
| 140 | F27 | \% of AA that is fooded Only Seasonally | The percentage of the AA's area that is between the annual high water and the annual low water (surface water) is: |  | Food marks (algal mats, adventitious roots, debris lines, ice scour, etc.) are often evident when not fully inundated. Aso, such areas often have a larger proportion of upland and annual (vs. perennial) plant species. In riverine systems, the extent of this zone can be estimated by multiplying by 2 the bankful height and visualising where that would intercept the land along the river. [CS, FA, INV, NR, OE, PH, SR, WBF, WBN, WS] |
| 141 |  |  | None, or <0.01 hectare and <1\% of the AA SKIP to F29. | 0 |  |
| 142 |  |  | 1-20\% of the AA, or $<1 \%$ but $>0.01$ ha | 1 |  |
| 143 |  |  | 20-50\% of the AA | 0 |  |


|  | A | B | C | D | E |
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| 144 |  |  | 50-95\% of the AA | 0 |  |
| 145 |  |  | >95\% of the AA | 0 |  |
| 146 <br> 147 <br> 148 <br> 149 <br> 150 <br> 151 | F28 | Annual Water Fuctuation Range | The annual fluctuation in surface water level within most of the parts of the AA that contain surface water at least temporarily is: |  | Look for flood marks (see above). Because the annual range of water levels is difficult to estimate without multiple visits, consider asking the land owner or neighbors about it. [AM, CS, INV, NR, OE, PH, PR, SR, WBN, WS] |
|  |  |  | $<10$ cm change (stable or nearly so). | 0 |  |
|  |  |  | $10 \mathrm{~cm}-50 \mathrm{~cm}$ change. | 1 |  |
|  |  |  | 0.5-1 m change. | 0 |  |
|  |  |  | 1-2 m change. | 0 |  |
|  |  |  | >2 m change. | 0 |  |
|  | Is the AA plus adjacent ponded water smaller than 0.01 hectare (about $10 \mathrm{~m} \times 10 \mathrm{~m}$, or $1 \mathrm{~m} \times 100 \mathrm{~m}$ )? If so, enter " 1 " in column D andSKIP TO F42 (Connection). |  |  | 0 |  |
| 153 | F29 | Predominant Depth Class | During most of the time when surface water is present during the growing season, its depth, averaged over the entire inundated part of the AA , is: |  | If a boat is unavailable, estimate this by considering wetland size and local topography. Or if timing and safety allow, depths may be measured by drilling through winter ice. This question is asking about the spatial median depth that occurs during most of that time, even if inundation is only seasonal or temporary. If inundation in most but not all of the wetland is brief, the answer will be based on the deptr of the most persistently inundated part of the wetland. Include surface water in channels and ditches as well as ponded areas. [CS, FA, FR, INV, OE, PH, PR, Sens, SFS, SR, WBF, WBN, WC] |
| 154 |  |  | $<10 \mathrm{~cm} \mathrm{deep} \mathrm{(but}>0$ ). | 0 |  |
| 155 |  |  | 10-50 cm deep. | 1 |  |
| 156 |  |  | 0.5-1 mdeep. | 0 |  |
| 157 |  |  | 1-2 mdeep. | 0 |  |
| 158 |  |  | >2 deep. True for many fringe wetlands. | 0 |  |
| 159 | F30 | $\begin{array}{\|l} \hline \text { Depth Classes - } \\ \text { Evenness of } \\ \text { Proportions } \end{array}$ | When present, surface water in most of the AA usually consists of (select one): |  | Estimate these proportions by considering the gradient and microtopography of the site. [FR, INV, WBF, WBN] |
| 160 |  |  | One depth class that comprises >90\% of the $A$ A's inundated area (use the classes in the question above). | 1 |  |
| 161 |  |  | One depth class that comprises 50-90\% of the AA's inundated area | 0 |  |
| 162 |  |  | Neither of above. There are 3 or more depth classes and none occupy $>50 \%$ a | 0 |  |
| 163 | F31 | \% of Water That Is Ponded (not Fowing) | During most times when surface water is present, the percentage that is (1)ponded (stagnant, or flows so slowly that fine sediment is not held in suspension) AND (2) is likely to be deeper than 0.5 min some places, is: |  | Nearly all wetlands with surface water have some ponded water. [AM, CS, IN $, ~ N R, O E, P R$, Sens, SR, WBF, WBN, WC, WS] |
| 164 |  |  | -5\% of the water, or it occupies $<100$ sq.m cumulatively. Nearly all the surface water is flowing. SKIP to F34. | 1 |  |
| 165 |  |  | 5-30\% of the water. | 0 |  |
| 166 |  |  | 30-70\% of the water. | 0 |  |
| 167 |  |  | 70-95\% of the water. | 0 |  |
| 168 |  |  | >95\% of the water. | 0 |  |
|  | F32 | $\begin{array}{\|l\|} \hline \text { Ponded Open Water - } \\ \text { Minimum Size } \end{array}$ | During most of the growing season, the largest patch of open water that is ponded and is in or bordering the $A A$ is $>0.01$ hectare (about 10 mby 10 m ) and mostly deeper than 0.5 m If true enter " 1 " and continue, If false, enter " 0 " andSKIP to F41 (Floating Algae \& Duckweed). | 0 | Open water is not obscured by vegetation in aerial ('duck's eye") view. It includes vegetation floating on the water surface or entirely submersed beneath it. |
| 169 |  |  |  |  |  |
| 170 | F33 | \% of Ponded Water that is Open | In ducks-eye aerial view, the percentage of the ponded water that isopen (lacking emergent vegetation during most of the growing season, and unhidden by a forest or shrub canopy) is: |  | [AM, CS, FA, FR, INV, NR, OE, PR, SR, WBF, WBN, WC] |
| 171 |  |  | None, or $<1 \%$ of the AA and largest pool occupies $<0.01$ hectares. Enter "1" and SKIP to F41 (Hoating Algae \& Duckweed). | 0 |  |
| 172 |  |  | 1-4\% of the ponded water. Enter "1" and SKIP to F41 (Floating Agae \& Duckweed). | 0 |  |
| 173 |  |  | 5-30\% of the ponded water. | 0 |  |
| 174 |  |  | 30-70\% of the ponded water. | 0 |  |
| 175 |  |  | 70-99\% of the ponded water. | 0 |  |
| 176 |  |  | 100\% of the ponded water. | 0 |  |
| 177 | F34 | Wdth of Vegetated Zone within Wetland | At the time during the growing season when the AA's water level is lowest, the average width of vegetated areain the AA that separates adjoining uplands from open water within the $A A$ is: |  | "Vegetated area" does not include underwater or floating-leaved plants, i.e., aquatic bed. Mdth may include wooded riparian areas if they have wetland soil or plant indicators. [AM, CS, $\mathrm{NR}, \mathrm{OE}, \mathrm{PH}, \mathrm{PR}$, SBM, Sens, SR, WBN] |
| 178 |  |  | <1m | 0 |  |
| 179 |  |  | 1-9m | 0 |  |
| 180 |  |  | 10-29m | 1 |  |
| 181 |  |  | 30-49m | 0 |  |
| 182 |  |  | 50-100m. | 0 |  |
| 183 |  |  | $>100 \mathrm{~m}$, or open water is absent at that time. | 0 |  |
| 184 | F35 | Fat Shoreline Extent | During most of the part of the growing season when water is present, the percentage of the AA'swater edge length that is nearly flat (a slope less than about $5 \%$ measured within 5 mlandward of the water) is: |  | If several isolated pools are present in early summer, estimate the percent of their collective shorelines that has such a gentle slope. [SR, WBN] |
| 185 |  |  | $<1 \%$ of the water edge. | 0 |  |
| 186 |  |  | 1-25\% of the water edge. | 0 |  |
| 187 |  |  | 25-50\% of the water edge. | 1 |  |



|  | A | B | C | D | E |
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| 209 |  |  | Temporary (surface water flows out for <14 days, not necessarily consecutive). | 0 |  |
| 210 |  |  | None -- but maps show a stream network downslope from the AA and within a distance that is less than the AA's length.SKIP to F47 (pH Measurement). | 0 |  |
| 211 |  |  | No surface water flows out of the wetland except possibly during extreme events (<once per 10 years). Or, water flows only into a wetland, ditch, or lake that lacks an outlet. SKIP to F47 (pH Measurement). | 0 |  |
| 212 | F43 | Outflow Confinement | During major runoff events, in the places where surface water exits the $A$ A or connected waters nearby, the water: |  | "Major runoff events" would include biennial high water caused by storms and/or rapid snowmelt. [CS, NR, OE, PR, Sens, SR, STR, WS] |
| 213 |  |  | Mostly passes through a pipe, culvert, narrowly breached dike, berm, beaver dam, or other partial obstruction (other than natural topography) that does not appear to drain the wetland artificially during most of the growing season. | 0 |  |
| 214 |  |  | Leaves through natura exits (channels or diffuse outflow), not mainly through artificial or temporary features. | 0 |  |
| 215 |  |  | Is exported more quickly than usual due to ditches or pipes within the AA or connected to its outlet, or within 10 m of the AA's edge, which drain the wetland artificially, or water is pumped out of the AA | 1 |  |
| 216 | F44 | Tributary Channel | At least once annually, surface water from a tributary channel that is $>100 \mathrm{mlong}$ moves into the $A A O$, surface water from a larger permanent water body adjacent to the AA spills into the AA. If it enters only via a pipe, that pipe must be fed by a mapped stream or lake further upslope. If no, SKIP to F47 (pH Measurement). | 1 | If inlet tributaries cannot be searched for due to inaccessibility of part of the AA, follow suggestions in F42 above. [NRv, PH, PRv, SRv] |
| 217 | F45 | Input Water Temperature | Based on lack of shade, water source characteristics, or actual temperature measurements, the inflow is likely to be warmer than surface water in the $A A$ during part of most years. Enter $1=y e s, 0=n o$. | 0 | [W0]] |
| 218 | F46 | Throughflow Resistance | During its travel through the AA at the time of peak annual flow, water arriving in channels: [select only the ONE encountered bymost of the incoming water]. |  | [FA, PR, INN, NR, OE, PR, SR, WS] |
|  |  |  | Does not bump into many plant stems as it travels through the AA. Nearly all the water continues to travel in unvegetated (often incised) channels that have minimal contact with wetland vegetation, or through a zone of open water such as an instream pond or lake. | 1 |  |
| 220 |  |  | Bumps into herbaceous vegetation but mostly remains in farily straight channels. | 0 |  |
|  |  |  | Bumps into herbaceous vegetation and mostly spreads throughout, or is in widely meandering, multi-branched, or braided channels. | 0 |  |
| 222 |  |  | Bumps into tree trunks and/or shrub stems but mostly remains in fairly straight channels. | 0 |  |
| 223 |  |  | Bumps into tree trunks andlor shrub stems and follows a fairly indirect path from entrance to exit (meandering, multi-branched, or braided). | 0 |  |
| 224 | F47 | pH Measurement | The pH in most of the AA's surface water: |  | Preferably, measure this in larger areas of ponded surface water within the AA, or in streams that have passed through (not along) most of the AA. Unless surface water is completely absent, do not dig holes or make depressions in peat in order to provide water for this measurement. Avoid measuring near roads or in puddles formed only by recent rain. [AM, FA, FR, NR, WBF, PH, PR, Sens, WBF, WBN] |
| 225 |  |  | Was measured, and is: [enter the reading in the colurn to the right.] |  |  |
| 226 |  |  | Was not measured but surface water is present and is darkly tea-coloured. Or if no surface water, then mosses and plants that indicate peatland (e.g., Labrador tea) are prevalent. Enter "1". | 0 |  |
| 227 |  |  | Neither of above. Enter "1". | 1 |  |
|  | F48 | $\begin{aligned} & \text { TDS and/or } \\ & \text { Conductivity } \end{aligned}$ | The TDS (total dissolved solids) or conductivity off the AA's surface water is: (select the first true row with information): |  | See above for measurement guidance. [FR, INV, NRR, PH, PRV, Sens] |
| 229 |  |  | TDS is: [Enter the reading in ppmor mg/L in the column to the right, if measured, or answer next row.] |  |  |
| 230 |  |  | Conductivity is [Enter the reading in $\mu \mathrm{S} / \mathrm{cm}$ in the colum to the right.] |  |  |
| 231 |  |  | Was not measured, but plants that indicate saline conditions cover much of the vegetated A A Enter "1". | 0 |  |
| 232 |  |  | Neither of above | 1 |  |
| 233 | F49 | Beaver Probability | Use of the AA by beaver during the past 5 years is (select most applicable ONE): |  | [FA, RR, PH, SBM, Sens, WBF, WBN] |
|  |  |  | Evident from direct observation or presence of gnawed limbs, dams, tracks, dens, lodges, or extensive stands of water-killed trees (snags). | 0 |  |
| 235 |  |  | Likely based on known occurrence in the region and proximity to suitable habitat, which may include: (a) a persistent freshwater wetland, pond, or lake, or a perennial low or mid-gradient ( $<10 \%$ ) channel, and (b) a corridor or multiple stands of hardwood trees and shrubs in vegetated areas near surface water. | 0 |  |
|  |  |  | Unlikely because site characteristics above are deficient, and/or this is a settled area or other area where beaver are routinely removed. | 1 |  |
| 237 | F50 | Groundwater Strength of Evidence | Select first applicable choice: |  | Adhere to these criteria strictly -- do not use personal judgment based on fen conditions, pH , or other evidence. Consult topographic maps to detect breaks in slope described here. Rust deposits associated with groundwater seeps may be most noticeable as orange discoloration in ice formations along streams during early winter. [AM, CS, FA, FR, INN, NR, OE, PH, PRv, SFS, WC, WS] |
|  |  |  | Springs are known to be present within the $A A$, or if groundwater levels have been monitored, that has demonstrated that groundwater primarily discharges to the wetland for longer periods during the year than periods when the wetland recharges the groundwater. | 0 |  |
| 239 |  |  | Most of the $A A$ has a slope of $>5 \%$, or is very close to the base of a natural slope longer than 100 and much steeper than the slope of the AA, AND the pH of surface water, if known, is $>5.5$. | 0 |  |
| 240 |  |  | Neither of above is true, although some groundwater may discharge to or flow through the AA O O groundwater influx is unknown. | 1 |  |


|  | A | B | C | D | E |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 241 | F51 | Internal Gradient | The gracient along most of the flow path within the $A A$ is: |  | This is not the same as the shoreline slope. It is the elevational difference between the AA's inlet and outlet, divided by the flow-distance between them and corverted to percent. If available, use a clinometer to measure this. Free clinometer apps can be downloaded to smartphones. If the wetland is large (longer than $\sim 1 \mathrm{~km}$ ), this may be estimated using Google Earth to determine the minimum and maximum elevation within the $A A$, then dividing by length and multiplying by 100. [CS, NR, OE, PR, SR, WBF, WBN, WS] |
| 242 |  |  | 2\%\% or the AA has no surface water outlet (not even seasonally). | 0 |  |
| 243 |  |  | 2-5\% | 1 |  |
| 244 |  |  | 6-10\% | 0 |  |
| 245 |  |  | >10\% | 0 |  |
| Note for the next three questions: If the AA lacks an upland edge, evaluate based on the AA's entire perimeter, and moving outward into whatever areas 246 are adjacent. In many situations, these questions are best answered by measuring from aerial images. |  |  |  |  |  |
| 247 | F5 | Vegetated Buffer as \% of Perimeter | Wthin a zone extending 30 m laterally from the AA's edge with upland and/or other wetlands, the percentage that containsperennial vegetation cover (except lamns, row crops, heavily grazed land, conifer plantations) is: |  | [AM, FA, FR, INN, NRV, PH, POL, PRV, SBM, Sens, SRv, STR, WBN] |
| 248 |  |  | -5\% | 1 |  |
| 249 |  |  | 5 to 30\% | 0 |  |
| 250 |  |  | 30 to 60\% | 0 |  |
| 251 |  |  | 60 to 90\% | 0 |  |
| 252 |  |  | >90\%, or all the area within 30 m of the AA edge is other wetlands. SKIP to F55. | 0 |  |
| 253 | F53 | Type of Cover in Buffer | Wthin 30 m upslope of where the wetland transitions to upland, the upland land cover that is NOT perennial vegetation is mostly (mark ONE): |  | [AM, FA, INN, NRV, PH, POL, SBM, STR, WBN] |
| 254 |  |  | Impervious surface, e.g., paved road, parking lot, building, exposed rock. | 0 |  |
| 255 |  |  | Bare or nearly bare pervious surface or managed vegetation, e.g., lamn, row crops, unpaved road, dike, landslide. | 1 |  |
| 256 | F54 | Buffer Slope | The steepest and/or most disturbed part of the upland area that is vithin 30 m of the wetland and occupies $>10 \%$ of that upland area has a percent slope of: |  | [NRV, PRV, Sens, SRV] |
| 257 |  |  | <1\% (flat -- almost no noticeable slope) or all the area within 30 mof the $A$ A edge is other wetlands. | 0 |  |
| 258 |  |  | 2-5\% | 1 |  |
| 259 |  |  | 5-30\% | 0 |  |
| 260 |  |  | >30\% | 0 |  |
| 261 | F55 | Cliffs or Steep Banks | In the AA or within 100 m , there are elevated terrestrial features such as cliffs, talus slopes, streambanks, or excavated pits (but not riprap) that extend at least 2 m nearly vertically, are unvegetated, and potentially contain crevices or other substrate suitable for nesting or den areas. Enter 1 (yes) or 0 (no). | 0 | Do not include upturned trees as potential den sites. [POL, SBM] |
| 262 | F56 | New or Expanded Wetland | Human actions within or adjacent to the AA have persistently expanded a naturally occurring wetland or created a wetland where there previously was none (e.g., by excavation, impoundment): |  | Determine this using historical aerial photography, old maps, soil maps, or permit files as available [CS, NR, OE, PH, Sens] |
| 263 |  |  | No. | 0 |  |
| 264 |  |  | Yes, and created or expanded 20-100 years ago. | 0 |  |
| 265 |  |  | Yes, and created or expanded $3-20$ years ago. | 0 |  |
| 266 |  |  | Yes, and created or expanded within last 3 years. | 0 |  |
| 267 |  |  | Yes, but time of origin or expansion unknown. | 0 |  |
| 268 |  |  | Unknown if new or expanded within 20 years or not. | 1 |  |
| 269 | F57 | Burn History | More than $1 \%$ of the AA's previously vegetated area: |  | Look for charred soil or stumps (in multiple widely-spaced locations) or ask landowner. [CS, PH, STR] |
| 270 |  |  | Burned within past 5 years. | 0 |  |
| 271 |  |  | Burned 6-10 years ago. | 0 |  |
| 272 |  |  | Burned 11-30 years ago. | 0 |  |
| 273 |  |  | Burned $>30$ years ago, or no evidence of a burn and no data. | 1 |  |
| 274 | F58 | Visibility | The maximum percentage of the wetland that is visible from the best vantage point on public roads, public parking lots, public buildings, or public maintained trails that intersect, adjoin, or are within 100 m of the $A A$ (select one) is: |  | [PU, STR, WBFV] |
| 275 |  |  | 25\%\% | 1 |  |
| 276 |  |  | 25-50\% | 0 |  |
| 277 |  |  | -50\% | 0 |  |
| 278 | F59 | Non-consumptive Uses - Actual or Potential | Assuming access permission was granted, select AL statements that are true of the AA as it currently exists: |  | [PU, STR] |
| 279 |  |  | For an average person, walking is physically possible in (not just near) $>5 \%$ of the $A A$ during most of the growing season, e.g., free of deep water and dense shrub thickets. | 1 |  |
| 280 |  |  | Maintained roads, parking areas, or foot-trails are within 10 m of the $A A$, or the $A A$ can be accessed part of the year by boats arriving via contiguous waters. | 0 |  |
| 281 |  |  | Wthin or near the AA , there is an interpretive center, trails with interpretive signs or brochures, and/or regular guided interpretive tours. | 0 |  |


|  | A | B | C | D |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 282 | F60 | Unvisited Core Area | The percentage of the AA almost never visited by humans during an average growing season probably comprises: [ Note: Only include the part actually walked or driven (not simply viewed from) with a vehicle or boat. Do not include visitors on trails outside of the AA unless more than half the wetland is visible from the trails and they are within 30 mof the wetland edge. In that case include only the area occupied by the trail.] |  | [AM, FAv, PRv, PH, PU, SBM, STR, WBF, WBN] |
| 283 |  |  | -5\% and no inhabited building is within $100 \mathrm{mof} \mathrm{the} A$ A | 0 |  |
| 284 |  |  | -5\% and inhabited building is within 100 mof the $A$ A | 0 |  |
| 285 |  |  | $5-50 \%$ and no inhabited building is within 100 m of the $A$ A | 0 |  |
| 286 |  |  | $5-50 \%$ and inhabited building is within 100 m of the $A$ A | 0 |  |
| 287 |  |  | 50-95\%, with or without inhabited building nearby. | 0 |  |
| 288 |  |  | >95\% of the AA with or without inhabited building nearby. | 1 |  |
| 289 | F61 | Frequently Visited Area | The part of the AA visited by humans almost daily for several weeks during an average growing season probably comprises: [See note above.] |  | [AM, PH, PU, SBM, STR, WBF, WBN] |
| 290 |  |  | -5\% If F60 was answered ">95\%' (mostly never visited), SKIP to F64. | 1 |  |
| 291 |  |  | 5-50\% | 0 |  |
| 292 |  |  | 50-95\% | 0 |  |
| 293 |  |  | >95\% of the AA | 0 |  |
| 294 | F62 | BMP - Soils | Boardwalks, paved trails, fences or other infrastructure and/or well-enforced regulations appear to effectively prevent visitors from walking on soil within nearly all of the AA when the soil is unfrozen. Enter " 1 " if true. | 0 | [PH, PU] |
| 295 | F63 | BMP - Wildlife Protection | Fences, observation blinds, platforms, paved trails, exclusion periods, and/or well-enforced prohibitions on motorised boats, off-leash pets, and off road vehicles appear to effectively exclude or divert visitors and their pets from the $A A$ at critical times in order to minimize disturbance of wildlife (except during hunting seasons). Enter "1" if true. | 0 | [AM, PU, WBF, WBN] |
| 296 | F64 | Consumptive Uses (Provisioning Services) | Recent evidence was found within the AA of the following potentially-sustainable consumptive uses. Select ALL that apply. |  | [FAv, Rev, WBFV] |
| 297 |  |  | Low-impact commercial timber harvest (e.g., selective thinning). | 0 |  |
| 298 |  |  | Commercial or tracitional-use havesting of native plants, their fruits, or mushrooms. | 0 |  |
| 299 |  |  | Waterfowl hunting. | 0 |  |
| 300 |  |  | Fshing. | 0 |  |
| 301 |  |  | Trapping of furbearers. | 0 |  |
| 302 |  |  | None of the above. | 1 |  |
| 303 | F65 | Domestic Wells | The closest wells or water bodies that currently provide drinking water are: |  | [NRN] |
| 304 |  |  | Muthin 0-100 m of the AA | 0 |  |
| 305 |  |  | $100-500 \mathrm{~m}$ away. | 0 |  |
| 306 |  |  | -500 m away, or no information. | 1 |  |
| 307 | F66 | Calcareous Fen | The AA is, or is part of, a calcareous fen. See the Plants_Calcar worksheet in the accompanying Supplnfo file for list of plant indicators (calciphiles). Enter 1 If more than two Strong or more than five Moderate calciphile species are present; otherwise enter 0 , but if not able to identify those and no information, change to blank. | 0 | [ $\mathrm{PH}, \mathrm{PR}]$ |



| s3 | Accelerated Inputs of Nutrients |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | In the last column, place a check mark next to any item -- occurring in either the wetland or its CA - that is likely to have accelerated the inputs of nutrients to the wetland. [NRV, PRR, STR] |  |  |  |  |
|  | Stormwater or wastewater effluent (including failing septic systems), landfills. |  |  |  |  |
|  | Fertilizers applied to lamns, ag lands, or other areas in the CA |  |  |  | 1 |
|  | Livestock, dogs. |  |  |  |  |
|  | Artificial drainage of upslope lands. |  |  |  |  |
|  | If any items were checked above, then for each row of the table below, assign points. However, if you believe the checked items did not cumulatively expose the AA to significantly more nutrients, then leave the "O's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present. |  |  |  |  |
|  |  | Severe (3 points) | Medium (2 points) | Mild (1 point) |  |
|  | Type of loading: | High density of unmaintained septic, some types of industrial sources. | Moderate density septic, cropland, secondary wastewater treatment plant. | Livestock, pets, low density residential. | 1 |
|  | Frequency \& duration of input: | Frequent and year-round. | Frequent but mostly seasonal. | Infrequent \& during high runoff events mainly. | 1 |
|  | AA proximity to main sources (actual or potential): | 0-15m | $15-100 \mathrm{~m}$ or in groundwater. | In more distant part of contributing area. | 1 |
|  | Sum= |  |  |  | 3 |
|  | Stressor subscore= |  |  |  | 0.33 |


| S4 | Excessive Sediment Loading from Contributing Area |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | In the last column, place a check mark next to any item present in the CA that is likely to have elevated the load of waterborme or windborne sediment reaching the wetland fromits CA [FA PR, INW, PH, SRv, STR] |  |  |  |  |
|  | Erosion from plowed fields, fill, timber havest, dirt roads, vegetation clearing, fires. |  |  |  | 1 |
|  | Erosion from construction, in-channel machinery in the CA |  |  |  |  |
|  | Erosion from off-road vehicles in the CA |  |  |  |  |
|  | Erosion from livestock or foot traffic in the CA |  |  |  |  |
|  | Stormwater or wastewater effluent. |  |  |  |  |
|  | Sediment from road sanding, gravel mining, other mining, oil/ gas extraction. |  |  |  |  |
|  | Accelerated channel downcutting or headcutting of tributaries due to altered land use. |  |  |  |  |
|  | Other human-related disturbances within the CA |  |  |  |  |
|  |  then leave the "O's" for the scores in the following rows. To estimate effects, contrast the current condition with the condition if the checked items never occurred or were no longer present. |  |  |  |  |
|  |  | Severe (3 points) | Medium (2 points) | Mild (1 point) |  |
|  | Erosion in CA: | Extensive evidence, high intensity.* | Potentially (based on high-intensity ${ }^{\star}$ land use) or scattered evidence. | Potentially (based on low-intensity ${ }^{\star}$ land use) with little or no direct evidence. | 1 |
|  | Recentness of significant soil disturbance in the CA: | Current \& ongoing. | 1-12 months ago. | $>1$ y ago. | 1 |
|  | Duration of sediment inputs to the wetland: | Frequent and year-round. | Frequent but mostly seasonal. | Infrequent \& during high runoff events mainly. | 1 |
|  | AA proximity to actual or potential sources: | 0-15m. | 15-100 m. | In more distant part of contributing area. | 1 |
|  | * high-intensity= extensive off-road vehicle use, plowing, grading, excavation, erosion with or without veg removal; low-intensity= veg removal only with little or no apparent erosion or disturbance of soil or sediment. |  |  | Sum= | 4 |
|  |  |  |  | Stressor subscore= | 0.33 |
| S5 | Soil or Sediment Alteration Within the Assessment Area |  |  |  |  |
|  |  (whichever is less). [CS, IM $, ~ N R, ~ P H, ~ S R, ~ S T R] ~] ~$ |  |  |  |  |
|  | Compaction from machinery, off-road vehicles, livestock, or mountain bikes, especially during wetter periods. |  |  |  |  |
|  | Leveling or other grading not to the natural contour. |  |  |  |  |
|  | Tillage, plowing (but excluding disking for enhancement of native plants). |  |  |  |  |
|  | Fill or riprap, excluding small amounts of upland soils containing organic amendments (compost, etc.) or small amounts of topsoil imported from another wetland. |  |  |  |  |
|  | Excavation. |  |  |  |  |
|  | Ditch cleaning or dredging in or adjacent to the wetland. |  |  |  |  |
|  | Boat trafic in or adjacent to the wetland and sufficient to cause shore erosion or stir bottom sediments. |  |  |  |  |
|  | Artificial water level or flow manipulations sufficient to cause erosion or stir bottom sediments. |  |  |  |  |
|  |  effects, contrast the current condition with the condition if the checked items never occurred or were no longer present. |  |  |  |  |
|  |  | Severe (3 points) | Medium (2 points) | Mild (1 point) |  |
|  | Spatial extent of altered soil: | >95\% of wetland or >95\% of its upland edge (if any). | 5-95\% of wetland or 5-95\% of its upland edge (if any). | $<5 \%$ of wetland and $<5 \%$ of its upland edge (if any). | 0 |
|  | Recentness of significant soil alteration in wetland: | Current \& ongoing. | 1-12 months ago. | $>1 \mathrm{yr}$ ago. | 0 |
|  | Duration: | Long-lasting, minimal veg recovery. | Long-lasting but mostly revegetated. | Short-term, revegetated, not intense. | 0 |
|  | Timing of soil alteration: | Frequent and year-round. | Frequent but mostly seasonal. | Mainly during one-time or scattered events. | 0 |
|  | Sum= |  |  |  | 0 |


| Scores will appear below after data are entered in worksheets OF, F, and S. See Manual for definitions and descriptions of how scores were computed. |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Wetland Functions or Other Attributes: | Function Score (Normalised) | Function Rating | Benefits Score (Normalised) | Benefits Rating | Function Score (raw) | Benefits Score (raw) |
| Water Storage \& Delay (WS) | 0.31 | Lower | 4.34 | Moderate | 2.18 | 1.93 |
| Stream Flow Support (SFS) | 4.07 | Moderate | 3.25 | Moderate | 3.28 | 2.16 |
| Water Cooling (WC) | 8.90 | Higher | 4.87 | Moderate | 5.93 | 2.64 |
| Sediment Retention \& Stabilisation (SR) | 1.80 | Lower | 10.00 | Higher | 3.60 | 4.95 |
| Phosphorus Retention (PR) | 0.00 | Lower | 9.46 | Higher | 3.73 | 7.36 |
| Nitrate Removal \& Retention (NR) | 1.58 | Lower | 10.00 | Higher | 3.92 | 10.00 |
| Carbon Sequestration (CS) | 1.15 | Lower |  |  | 5.74 |  |
| Organic Nutrient Export (OE) | 8.13 | Higher |  |  | 5.31 |  |
| Anadromous Fish Habitat (FA) | 5.25 | Higher | 7.81 | Higher | 3.44 | 4.96 |
| Resident Fish Habitat (FR) | 5.02 | Moderate | 7.94 | Higher | 2.73 | 4.96 |
| Aquatic Invertebrate Habitat (INV) | 6.63 | Higher | 6.23 | Higher | 6.20 | 4.60 |
| Amphibian \& Turtle Habitat (AM) | 4.15 | Moderate | 4.92 | Moderate | 5.30 | 5.81 |
| Waterbird Feeding Habitat (WBF) | 6.28 | Moderate | 5.00 | Moderate | 4.78 | 5.00 |
| Waterbird Nesting Habitat (WBN) | 5.08 | Moderate | 5.00 | Higher | 3.69 | 5.00 |
| Songbird, Raptor, \& Mammal Habitat (SBM) | 8.80 | Higher | 5.00 | Moderate | 7.66 | 5.00 |
| Pollinator Habitat (POL) | 7.40 | Moderate | 3.33 | Moderate | 6.13 | 3.33 |
| Native Plant Habitat (PH) | 4.75 | Moderate | 5.71 | Moderate | 5.80 | 5.71 |
| Public Use \& Recognition (PU) |  |  | 2.98 | Moderate |  | 2.34 |
| Wetland Sensitivity (Sens) |  |  | 7.02 | Moderate |  | 4.17 |
| Wetland Ecological Condition (EC) |  |  | 5.65 | Moderate |  | 7.92 |
| Wetland Stressors (STR) (higher score means more stress) |  |  | 10.00 | Higher |  | 5.96 |
| Summary Ratings for Grouped Functions: |  |  |  |  |  |  |
| HYDROLOGIC Group (WS) | 0.31 | Lower | 4.34 | Moderate | 2.18 | 1.93 |
| WATER QUALITY SUPPORT Group (max+avg/2 of SR, PR, NR, CS) | 1.47 | Lower | 9.91 | Higher | 4.99 | 8.72 |
| AQUATIC SUPPORT Group (max+avg/2 of SFS, INV, OE, WC) | 7.92 | Higher | 5.50 | Moderate | 5.69 | 3.87 |
| AQUATIC HABITAT Group (max+avg/2 of FA, FR, AM, WBF, WBN) | 5.72 | Moderate | 7.04 | Higher | 4.64 | 5.48 |
| TRANSITION HABITAT Group (max+avg/2 of SBM, PH, POL) | 7.89 | Higher | 5.19 | Lower | 7.10 | 5.19 |
| WETLAND CONDITION (EC) |  |  | 5.65 | Moderate |  | 7.92 |
| WETLAND RISK (average of Sensitivity \& Stressors) |  |  | 8.51 | Higher |  | 5.07 |

[^0] means only that this wetland has a capacity that is equal or less than the lowest-scoring one, for that function or benefit, from among all the NS calibration wetlands that were assessed previously.


[^0]:    NOTE: A score of 0 does not mean the function or benefit is absent from the wetland. It

