



Maritimes Marsh Monitoring Program

Survey Protocols (2022 Edition)



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Background

Wetlands are among the most productive ecosystems in Canada and play valuable roles on the landscape. Wetlands, and marshes in particular, filter water out of sediment and contaminants, cycle water-borne nutrients, recharge groundwater flows, mitigate flooding and erosion, and provide essential habitat for a diverse array of wildlife. Historically, wetlands were regarded as wastelands. Consequently, countless wetlands have been lost, fragmented, or otherwise degraded due to human influences. Despite an increasing awareness of the value of these ecosystems, wetlands continue to be lost and damaged throughout Canada. This destruction has given rise to concerns about the viability of populations of many bird species that depend on wetlands for one or more portions of their life cycle. The goal of the Maritimes Marsh Monitoring Program is to serve as a long-term monitoring and assessment program for of waterfowl, migratory gamebirds, other wetland-associated species, and their habitats in the Maritimes.

Over the long-term, our collective goal is to assess and monitor the status of wetland-associated species and the habitats upon which they depend, in order to help establish wetland conservation and management priorities for the Maritimes.

Long-term objectives are:

- 1) Monitor trends in wetland-dependent species population size, occupancy, distribution and abundance across the Maritimes.
- 2) Gain a better knowledge of wetland species-habitat associations and habitat features that influence occupancy, abundance and distribution.
- 3) Evaluate effectiveness of current management activities for wetland-associated species, including wetland restoration and protection schemes.
- 4) Identify additional high priority wetlands for conservation.
- 5) Actively engage the public in wetland conservation and research.

Avian Surveys

Parameters

- Each marsh bird routes are surveyed **two times** per year **between June 1st and June 30th**. These dates result in the best program data, however, the survey end date *can be extended to July 15th* if necessary.
- Successive surveys of the same route must be conducted at least 14 days apart.
- Surveys should begin ~30 minutes before sunrise and end no later than 10:00 a.m.
- Do not initiate surveys if there is drizzle or wind exceeding 20 km/h (Beaufort 4 and above).
- Avian surveys may have only one observer.
- All surveys are completed using a broadcast speaker and the MMMP mp3 file, which plays for the duration of the survey.
- Primary species (unlimited radius): Pied-billed Grebe, Virginia Rail, Sora, Common Gallinule, American Coot, Yellow Rail, Willet, Black Tern, American Bittern, Least Bittern, Marsh Wren, Nelson's Sparrow.
- Secondary species: all others within a 100-m radius.

Procedure:

Site Information

Upon arriving at a survey station (“point”), record the site and weather information (described below). After this is done, start the MMMP sound file, broadcast on a speaker.

- Cloud cover: estimated as covering 10ths of the sky. For example if there are no clouds present a 0 is recorded, if it is fully overcast a 10 is recorded.
- Temperature: Record the air temperature at each point. Be sure to keep it out of direct sunlight. If you don’t have a thermometer, leave this space blank and it will be filled in with data from the closest weather station.
- Precipitation: recorded on a scale from 0 to 3 (Table 1). Point counts should not be initiated when the precipitation code is 2 or 3 but if conditions change during the survey, codes allow us to track those changes.
- Wind Speed: estimated using the Beaufort Scale (Table 2). Surveys should not be initiated when the wind speed is 4 or above but if conditions change during the survey, wind speed codes allow us to track those changes.
- Wind Direction: approximated on the 16 point compass (e.g. N, NNW, NW, etc.) and is referenced in terms of the originating direction (not the direction it is travelling).
- Background Noise: recorded on a scale of 0-4 (Table 3). It provides an indication of the ambient noise at a site that may interfere with detecting birds. You may add a note as to the source of the noise (e.g. traffic, barking dogs, etc.). When deciding on your survey days, keep potential noise in mind; for example, if a route is near a busy road, attempt to survey on a weekend.

Table 1. Precipitation codes. Shading indicates unacceptable weather conditions to initiate bird surveys.

Value	Description
0	None
1	Damp/Moist/Fog
2	Drizzle
3	Rain

Table 2. Beaufort wind codes. Shading indicates unacceptable weather conditions to initiate bird surveys.

Beaufort Number	Description	Wind Speed (km/h)	Effects
0	Calm	<1	Air calm, smoke rises vertically
1	Light Air	1-5	Light air movement, smoke drifts
2	Light Breeze	6-11	Wind felt on face, leaves rustle
3	Gentle Breeze	12-19	Leaves and small twigs in continual motion, wind extends light flags
4	Moderate Breeze	20-29	Wind raises dust, loose paper, moves small branches
5	Fresh Breeze	30-39	Small trees begin to sway, white crested wavelets form on inland waters
6	Strong Breeze	40-49	Large branches in motion, telephone wires “whistle”

Table 3. Background noise codes.

Noise Code	Description	Examples
0	No appreciable effect	owl calling
1	Slightly affecting sample	distant traffic, dog barking, car passing
2	Moderately affecting sampling	distant traffic, 2-5 cars passing
3	Seriously affecting sampling	continuous traffic nearby, 6-10 cars, equipment operating nearby
4	Profoundly affecting sampling	continuous traffic passing, construction noise

Recording bird observations: Primary Species

Primary Species are surveyed with an unlimited radius. All Primary Species must be documented using a separate row for each *individual* of each species detected during the 15-minute survey. Thus, each time a new individual is detected, a new row is added to the data sheet. During the first ten minutes of the survey, observers are required to record each Primary Species every minute they are seen or heard. During the final 5 minutes of the survey, Primary Species detections are only recorded once for the five-minute period. If Primary Species are detected while arriving at or departing from the survey point, these individuals are also included on the datasheet in the appropriately labeled columns. Please note that only 5 of the 12 Primary Species vocalizations are included during the call-broadcast, but all 12 species must be recorded using the protocol outlined above.

Species included in the call-broadcast:

1. Least Bittern
2. Nelson's Sparrow
3. Virginia Rail
4. Sora
5. Pied-billed Grebe

Note that there are two qualifications to the above instructions:

1. Black Terns often gather in large groups, and tracking individuals can be overwhelming or even impossible. For this species only, one row can be used for all individuals detected on the survey, noting the *total number seen each minute*. Estimates of flock size are accepted.
2. American Coot and Common Gallinule vocalizations are very similar and often difficult to distinguish, therefore observers should use the code GOOT when American Coots or Common Gallinules are detected by sound ONLY. When either species is seen, use the appropriate code (AMCO or COGA).

Observers need to estimate the *distance* of Primary Species from the focal point (i.e., where they are conducting the point count). Observers do not record exact distances, but rather if an individual occurred within 50m of the observer, between 50-100m, or greater than 100m. Always choose the closest distance class; for example, if a PBGR is initially detected over 100m away in minute 2, then moves between 50-100m in minute 3, then again greater than 100m away in minute 7, the distance class chosen is 50-100m.

Critically, to ensure one individual isn't counted multiple times, indicate whether or not the individual Primary Species in each row were heard at a *previous point* that you already surveyed that morning. For example, the first point count will be "No" for all Primary Species, as you haven't completed any other surveys that day to have heard them. If on that first survey you hear a very distant PBGR >100m to the south, and you then travel south to your next point to find a PBGR, you will circle "Yes" to indicate that this is likely the same individual you heard on your first point count.

Recording bird observations: Secondary Species

Any detected bird that isn't a Primary Species is a Secondary Species. Technicians are required to identify and record all additional species detected during the point count; volunteers have the option to only record Primary Species. Contrary to Primary Species, only individuals that fall within a 100-m radius are counted. They are also only counted in three 5-minute blocks (separated by the two 5-minute listening

periods and the 5-minute call-broadcast period). Each *species* gets its own row with individuals tallied in the adjacent columns for each time block. Only record the maximum number of individuals for each 5-minute block.

For example, if in a 5-minute period 3 Tree Swallows forage over the marsh, fly out of sight, and then 2 fly in and continue foraging, the Tree Swallow total is “3”.

Aerial Foragers (AF) and Outside Fly-throughs (OF)

Fly-throughs are individuals that are simply moving through the site without using the habitat in any way (e.g., often gulls, but can be any species including wetland birds). Secondary species that fly over should be given their own line on the datasheet (even if that species has already been noted on the point count) and indicated that they are fly-throughs in the appropriate column. Aerial foragers are individuals that are actively foraging within the site, but remain in flight. This includes aerial insectivores like swifts and swallows. Check off the appropriate column if an individual was foraging in the air.

Red-winged Blackbirds

For Red-winged Blackbirds, record males only. As one male forms pair bonds with several different females, experience has shown there are often too many females to follow their movements.

Ducks

Ducks are included as Secondary Species, but when possible we ask that observers identify and count the number of drakes (males), hens (females) and young observed for each species, within each 5-minute interval. When entering the data into the table use only one row for each species and include the counts of all drakes, hens, and chicks.

For example, if 5 male MALL, 3 female MALL and 5 chicks are seen in a 5-minute interval, write 5D/3H/5Y (D=drake, H=hens, Y=young). At some wetlands, counting ducks with this level of detail will keep observers very busy. In these situations, count the ducks in just one of the 5-minute intervals.

Habitat Surveys

Parameters

- The survey site is a 100-m radius around the point.
- Surveys are completed once per year, at a time when leaves are present, plants can be readily identified, and water levels have not begun to fall due to summer climate; this can be most easily completed during the second bird survey visit or by making a third trip to the site.
- If conducting habitat surveys during the second bird survey visit, **the avian observer cannot complete the habitat survey while also conducting a bird survey.** Preferably, wait until all bird surveys are completed before beginning habitat surveys.
- With two or more observers present, habitat surveys can be completed while the avian observer is conducting a bird survey.
- Multiple observers may complete the habitat survey.
- The most important parts of the survey to complete are Sections A to D; species identification is preferred but not prioritized.

Procedure:

Site Information

The top portion of the datasheet identifies the date, site details, and observer information. Unlike bird surveys, multiple observers are allowed to complete the habitat survey.

A. Wetland Type

This section gives an overall picture of the type of wetland where each point count station occurs. Chose the most appropriate habitat(s) within 100m and indicate with an x in the adjacent box.

- **Marsh (deep/shallow):** Permanently flooded standing fresh water ≤ 2 m deep at mid-summer, emergent vegetation such as cattails and reeds present, often floating vegetation such as pond lilies and eelgrass. **OR** marshes that maintain water throughout the growing period but may become dry in mid-summer, dominated by emergent vegetation such as cattails. Often impounded wetlands.
- **Bog/Fen:** Saturated wetlands typically covered by peat. Can be covered by sphagnum moss, grasses, sedges and ericaceous shrubs like leatherleaf. Bogs are typically higher upland than fens and are fed by groundwater. Fens are natural depressions that receive water from upland sources.
- **Alder/Shrub Wetland:** Wetlands dominated by a variety of shrubs or alder thickets, often adjacent to wetlands with emergent vegetation.
- **Coastal Wetland/Saltmarsh:** Coastal Wetlands include all wetlands in coastal watersheds that drain directly into coastal waters. They often, but not always, contain salt or brackish water. Saltmarshes are grassy coastal wetlands flooded tidally twice a day.

B. Wetland Modifier

Identify any modifications to the wetland that may be affecting the point count area (100-m radius), or that alter the flow of water in the wetland. Choose as many categories that apply.

- **Impoundment:** Water flow impeded and purposefully enclosed in a reservoir, often by dykes or berms.
- **Dykes/Berms:** Raised barriers adjacent to a body of water, often walkable.
- **Channel/River:** Narrow bodies of water connecting two larger waterbodies. Can be quickly moving or still. This also includes artificial channels such as water-filled ditches.
- **Roadside/Trail/Boardwalk:** Purposeful routes for walking or driving, including if they're poorly maintained (e.g., old dirt road).
- **Industrial:** Factories, refineries, fisheries, etc. Includes aquaculture.

- **Agriculture:** Fields for crops (including hayfields) or livestock, barnyards, etc.
- **Urban/Residential:** Houses, lawns, stores, etc.
- **Natural/Protected Area:** Area covered by national, provincial, or municipal protections with the intent to conserve nature.
- **Sewage Lagoon:** Water body into which sewage flows to be filtered and broken down. These areas are usually highly productive (and clean and odourless).
- **Pollution:** Any noticeable negative impact to the wetland such as gasoline rainbows on the water surface

C. Water Regime

Identify the amount of standing water in the area.

- **Permanent:** Almost never dries up; water is usually quite deep (knee to chest deep).
- **Semi-permanent:** Can dry up in some years of low precipitation (or if water level is periodically drawn down); water is usually fairly shallow (not much more than knee deep).
- **Seasonal:** Usually flooded in spring and early summer, but tends to dry up in late summer or in dry years. Even when flooded, the water is shallow (not much more than calf deep).
- **Tidal:** Surface water may only be present during high tide, and the water level fluctuates with tidal influences (e.g., saltmarshes, dunes).

D. Major Habitats within the Station Radius

Percentages of major habitats occurring within 100m of the point count station should be estimated and recorded in this section, even if the habitat is not a part of the wetland (e.g., nearby farm fields, highway).

The sum of all habitats in this section should be 100%. In order to not go over 100%, imagine a bird's-eye view of the site so that tall, broad vegetation is included, and not the habitat below it. E.g., if a group of trees encompassing 15% of the site has grass growing below the canopies, only the tree cover is counted in that area. If possible, it can be helpful to use a smartphone to look up satellite imagery to determine the category breakdown.

- **Large patches of open water/floating plants:** Open water is defined as any patch of water that is at least 1x3m (4x8ft), almost or entirely free of emergent herbaceous vegetation like cattails. If you can float a small canoe on it, chances are it's open water. It may consist partially or completely of submerged or surface floating aquatic vegetation (e.g., Pondweeds (*Potamogeton* spp.), Duckweeds (*Lemna* spp.)).

- **EMERGENT herbaceous vegetation:** Non-woody plants that are rooted in shallow water but have their main vegetative structure above the water (e.g., Cattails (*Typha* spp.), Common Reed (*Phragmites australis*), Bulrushes (*Scirpus* spp.)).
- **NON-EMERGENT herbaceous vegetation:** Non-woody plants that are rooted on dry land (e.g., Goldenrod (*Solidago* spp.), grasses in areas that don't flood). These are often plants found growing on dykes or in nearby fields or roadsides.
- **Shrubs:** Shrubs are defined as woody plants, often multi-stemmed, 1-3m tall (e.g., Dogwoods (*Cornus* spp.), Serviceberries (*Amelanchier* spp.), Willows (*Salix* spp.)). This category also includes tree species saplings under 3m tall.
- **Trees:** Trees are defined as woody plants taller than 3m (e.g., Maples (*Acer* spp.), Spruces (*Picea* spp.)).
- **Exposed Substrate:** Any area devoid of surface vegetation and water coverage (e.g., sand dunes, rock outcroppings, exposed marsh sediment, roads). If surveying a site with tidal influence, include a comment indicating your estimate of how much substrate is exposed due to the current tide (e.g., what percentage of exposed substrate would be underwater at high tide?).

Sections E, F: Emergent and Non-Emergent Herbaceous Vegetation

As with Section D, the sum of % cover within sections E-J will always equal 100%.

For the species breakdowns of dominant emergent herbaceous vegetation (section E), and non-emergent vegetation (section F), estimate the percent cover of each plant. These values should sum to 100% unless the box at the bottom of the section indicating zero presence is checked. Do not include species that encompass <5% of the category, unless these scant species together add up to 5% or greater coverage. In this case, make a new species category called "<5%" on the line provided (section E only). Add as many lines as needed to include species not included on the datasheet. For section, you are not required to list species other than non-emergent grasses/sedges.

Circle Map

This space is for sketching the main habitat characteristics to aid observers in coverage estimates. It is not necessary to complete but is helpful for mentally consolidating the habitat characteristics into their categories.



Thank you for participating in the Maritimes Marsh Monitoring Survey!

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Many thanks to our Partners and Funders

