

Marshbird Survey

INSTRUCTION MANUAL

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The Ontario Breeding Bird Atlas is a partnership project of:



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Marshbird Survey: Quick Guide

- Skill Level: Must be able to identify all local birds by sight and song/call. Being able to identify common wetland plants is helpful, but not required.
- Timing: 24 May–10 July south of Temagami; 1 June–10 July north of Temagami but excluding the Hudson Bay Lowlands; 1 June–17 July in the Hudson Bay Lowlands. Morning or evening (i.e., 30 minutes before sunrise until 5 hours after sunrise, or 4 hours before sunset until 30 minutes after sunset).
- Duration: Requires 0.5–4 hours to complete 1 survey per square (i.e., to survey 1– 8 survey stations at 10 minutes each, plus travel in between). A 2nd survey is highly encouraged, but not required, adding another 0.5–4 hours to complete.
- Survey area: All regions.
- Atlas Square: Randomly pre-selected priority squares are the focus, although we also encourage marshbird surveys in any square. Contact the <u>Regional</u> <u>Coordinator</u> to avoid duplication of effort.
- Stations: Survey stations are within, or at the edge of, marshbird habitat patches (i.e., marshes, open bogs, or open fens). Stations are located closest to the 8 lowest designated roadside Atlas point count stations.
- Weather: Survey when there is good visibility, it is calm, and there is no precipitation. Wind should be less than 19 km/h (Beaufort wind scale: 0–3) and the temperature should be above 0° Celsius.
- Equipment: A device capable of playing digital audio files in MP3 format (e.g., smartphone or MP3 player) and capable of amplifying sound (e.g., external speaker) are required.

Contents

Introduction	. 1
Marshbird Survey guidelines	. 2
Preparing for your survey	. 2
Training	. 2
Equipment	. 2
Survey area	. 2
Which squares to cover?	. 3
Planning your survey	. 3
Survey timing	. 3
Time of day	. 4
Weather conditions	. 5
Time required	. 5
Completing your survey	. 5
Identifying marshbird habitat patches	. 5
Identifying Marshbird Survey station locations	13
Documenting Marshbird Survey station locations	13
Call broadcast	14
How to do marshbird surveys	14
How to do marshbird habitat assessments	15
Safety	15
Concluding remarks	16
Recording and entering Marshbird Survey data	16
Completing the Marshbird Survey data form	16
Completing the Marshbird Survey habitat assessment data form	20
Entering Marshbird Survey data into NatureCounts	23

Introduction

Thank you for your interest in the Ontario Breeding Bird Atlas-3 Marshbird Survey. Your contribution will aid in the understanding of marshbird populations in Ontario.

The Ontario Breeding Bird Atlas-3 Marshbird Survey (or "Marshbird Survey") is an excellent opportunity for experienced birders. Participants must have good hearing and must be able to identify all local bird species by sight and song/call. It is especially important that participants are able to identify bitterns, grebes, rails, gallinules, coots, and other marshbirds by sight and sound because they are the primary focus of the survey. It is helpful if participants can identify common wetland plants, such as cattail, sweetgale, Common Reed (Phragmites), leatherleaf, and willow, but this is not required.

The Marshbird Survey is closely aligned with the Great Lakes Marsh Monitoring Program delivered by Birds Canada (GLMMP). GLMMP surveyors have done a remarkable job of tracking changes in the distribution and abundance of marshbirds throughout southern Ontario annually since 1995 (see the latest results <u>here</u>). The GLMMP will continue to operate during Ontario Atlas-3, and data collected by the GLMMP will be combined, where appropriate, with data collected by the atlas's Marshbird Survey. We anticipate minimal overlap between locations surveyed for the GLMMP and the Marshbird Survey. In cases where survey locations for the two programs are very close or overlap, please collect and submit data for each program separately following the appropriate field protocol. Please note that the protocols are similar but different in ways appropriate for the objectives of each program.

Coverage by the GLMMP in central and northern Ontario has been sparse over the years compared to coverage in southern Ontario, where volunteer citizen scientists are more numerous. Therefore, the main goal of the Marshbird Survey is to collect robust, detailed information on marshbirds throughout the entire province. In doing so, it will fill important knowledge gaps for marshbirds, especially in central and northern Ontario where coverage has been sparse.

Marshbirds are challenging to monitor because they are elusive and difficult to detect. They often remain quiet and well-concealed within thick wetland vegetation during the day. As a result, special techniques are required to detect them, such as placing survey stations within marshbird habitat, which is often missed by roadside point counts, and by using marshbird call broadcasts during surveys to elicit responses. Both the GLMMP and the Atlas's Marshbird Survey employ these special techniques.

Due to their territorial behaviour, marshbirds often vocalize or approach in response to broadcasts of their songs/calls, which dramatically increase the chances of detecting them. The use of broadcasts will enhance our knowledge of the distribution and population size of these elusive species, but it will not harm or harass the birds in any serious way. The survey protocol uses 30 seconds of songs/calls of each species on a maximum of 2 occasions separated by at least 10 days at each survey location. Using broadcasts in this limited manner is enough to obtain meaningful detections, but will not cause any significant negative effects.

The information made possible by the Marshbird Survey is expected to produce science products not otherwise possible, such as more-detailed and accurate relative abundance maps and more robust total population size estimates for the entire province. The data will also allow calculation of the only population trend information for the entire province, if the Marshbird Survey is repeated in a similar manner in future atlases. Information from the survey will be immediately useful for a variety of conservation initiatives, including species-at-risk status

assessments by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and the Committee on the Status of Species at Risk in Ontario (COSSARO). The data will also be important for strategic planning by the Ontario Eastern Habitat Joint Venture (OEHJV), among others. *Thank you for contributing to the survey!*

Marshbird Survey guidelines

Preparing for your survey

Training

Participants must be able to identify all local bird species by sight and song/call, and in particular, must be able to identify bitterns, grebes, rails, gallinules, coots, and other marshbirds by sight and sound. It is helpful if participants can identify common wetland plants, such as cattail, sweetgale, Common Reed (*Phragmites*), leatherleaf, and willow, but this is not required.

Before you survey, we recommend you familiarize, or re-familiarize, yourself with all of the local birds in the region that you will be surveying in. Bird sounds are available on <u>Dendroica</u> and <u>Xeno-canto</u>, and phone apps such as <u>Merlin</u>. We highly recommend that you review the GLMMP marshbird audio training files (<u>here</u>), which have detailed, annotated descriptions of the vocalizations of over 30 marshbird species, including tips and tricks for discerning vocalizations of difficult pairs of species, such as American Coot versus Common Gallinule (formerly Common Moorhen, which it is referred to as in the GLMMP marshbird audio training files), Virginia Rail versus King Rail, and others.

Equipment

Make sure you have all the required equipment before heading out. Note that a real-time data entry app for the Marshbird Survey is under consideration, but it will not be ready for the 2021 season.

- This manual, either in hard copy or on your phone.
- A map of the 10-km square you are to survey showing the designated roadside Atlas point count stations—either a hard copy, or on your phone form the <u>Atlas Square Resources page</u> or on the NatureCounts app.
- The Marshbird Survey data form
- Flashlight or head lamp, if you plan to survey near dark
- Clipboard
- Compass
- GPS unit
- Portable MP3 player, boom box, or smartphone and amplified speaker. Note that amplified speakers have their own power source. Contact your Atlas <u>Regional Coordinator</u> to see about borrowing an amplified speaker for the Marshbird Survey.
- The MP3 file "Breeding-Bird-Atlas-3-Marshbird-Survey-10min-Broadcast.mp3" (here)
- Road map
- Spare batteries and/or charging cord
- Pen or pencil and a spare

Survey area

The Marshbird Survey occurs throughout the province because marshbirds occur in every region.

Which squares to cover?

Priority Marshbird Survey squares (*n* = 387 squares) have been randomly pre-selected to ensure a representative sample of squares is surveyed throughout the province. Priority squares were selected at a density of 1-in-25 north of Temagami and 1-in-9 south of Temagami to match anticipated surveyor capacity. Previous analyses show that abundance of some marshbirds differs in Great Lakes coastal wetlands compared to inland wetlands, as well as inside and outside coastal wetlands associated with Great Lakes International Joint Commission Areas of Concern (AOC). Marshbird abundance is also anticipated to differ among Bird Conservation Regions (BCR). Therefore, the number of priority squares matches the size of each BCR, as well as the actual estimated aerial extent of coastal-AOC, coastal-non-AOC, and other wetlands within each BCR. Note that "coastal" squares must contain coastal wetlands as indicated by the geospatial information we used to select priority squares. Therefore, some squares designated as "other" straddle a Great Lakes shoreline, where coastal wetlands are absent (or, at least, where they were absent in the geospatial information we used). A map showing the priority squares is given in Fig. 1, plus the priority squares can be viewed on the <u>Atlas Coverage Map</u>.

Participants should complete the Marshbird Survey in priority squares (Fig. 1), as data from these squares will best contribute to meeting the survey's main goal. However, if you are keen and a priority square that requires marshbird surveys is not available to you, we strongly encourage you to complete the survey in any unassigned square, as data from all squares will be useful for a variety of purposes.

Please check with the <u>Regional Coordinator</u> before completing the Marshbird Survey in a square, so duplication of effort can be avoided. Or ask the <u>Regional Coordinator</u> if there are squares that need to be surveyed for marshbirds. You can also check the <u>Atlas Coverage Map</u> to see squares where the Marshbird Survey has been completed.

Planning your survey

Survey timing

You should complete your survey(s) between 24 May-10 July south of Temagami (Regions 1-35 and 45–47); between 1 June–10 July north of Temagami but excluding the Hudson Bay Lowlands (Regions 34 and 36–42 and 44); and between 1 June–17 July in the Hudson Bay Lowlands (Region 43). You should complete at least 1 survey at each Marshbird Survey station. Although we highly encourage you to do a 2nd survey separated by at least 10 days from the 1st survey, but in the same year, and within the acceptable dates (i.e., 24 May-10 July south of Temagami; 1 June–10 July north of Temagami but excluding the Hudson Bay Lowlands; 1 June-17 July in the Hudson Bay Lowlands). You may complete surveys at stations in the same square for the 1st survey or for the 2nd survey on different dates, as long as all survey criteria are met. For example, you might complete your 1st survey at station 1 and 2 on 1 June, and then complete your 1st survey at station 3 and 4 on 3 June, but return and complete your 2nd survey at all 4 of the stations on 25 June. It is also possible to complete surveys at different stations in different years. For example, you might complete 2 surveys at station 1 and 2 in 2021, and then complete 2 surveys at station 3 and 4 in 2024. Once a square receives 1 survey at 1-8 Marshbird Survey stations, or better yet, 2 surveys in the same year at 1–8 stations, the square is considered complete, and does not require any further surveys.



Figure 1. Marshbird Survey priority squares (*n* = 387 squares). Squares were randomly preselected to match anticipated surveyor capacity for completing the surveys (i.e., 1-in-25 squares north of Temagami, 1-in-9 squares south of Temagami), as well as the actual estimated aerial extent of Great Lakes coastal wetlands located within and outside Great Lakes International Joint Commission Areas of Concern (AOC) in each Bird Conservation Region. These squares can be viewed on the <u>Atlas Coverage Map</u>. Note that some Marshbird Survey priority squares shown with black dots will be surveyed by Birds Canada staff as part of a pilot project, and do not need to be surveyed with the Marshbird Survey protocol during Atlas-3.

Doing 2 marshbird surveys, as opposed to 1, dramatically increases the odds that you will detect all of the elusive marshbird species present at your survey stations. Plus, information from survey stations that receive 2 surveys can be used to statistically adjust counts from stations that receive only 1 survey, to get the best estimates of true abundance. We realize that you may be able to complete only 1 marshbird survey at each station due to a variety of reasons, but if possible, please try your best to complete 2 marshbird surveys in the same year at each station.

Time of day

You can do your surveys in the morning or in the evening. Morning surveys are 30 minutes before sunrise until 5 hours after sunrise, whereas evening surveys are 4 hours before sunset until 30 minutes after sunset. Be sure to check in advance when local sunrise and sunset is on the date where you will be surveying. There are numerous sources online where you can look

up local sunrise and sunset. You can mix and match morning and evening surveys as you please for the 1st and 2nd survey. In other words, the 2 surveys at any particular survey station can be in the morning, can be in the evening, or can be any mix of morning and evening.

Weather conditions

Strong wind and precipitation significantly reduce marshbird activity, and in turn, greatly reduce your chances of detecting them during surveys. Therefore, you should do surveys only when wind is less than 20 kilometres per hour, which is 3 or less on the Beaufort wind scale. For reference, Beaufort 3 is described as a gentle breeze and is enough to constantly move twigs, extend a light flag, and cause large wavelets with crests that begin to break. By contrast, Beaufort 4, which is too strong for marshbird surveys, is described as a moderate breeze and is enough to move small branches, raise dust and loose paper, and cause small waves. Surveys should not be done when there is precipitation. Temperature does not greatly influence marshbird detections, although you should do your surveys only when the temperature is above 0° Celsius. If you start a survey and the weather worsens and becomes unsuitable, then please stop and finish it on another occasion, if possible.

Time required

It takes approximately 0.5–4 hours to survey 1–8 Marshbird Survey stations in a square, depending on the time required to locate, access, and travel between stations. In squares with many Marshbird Survey stations located far from roads, it might take you longer than 4 hours to complete all of your surveys. We highly encourage you to complete a 2nd survey at each station separated by at least 10 days from the 1st survey, but in the same year, and within the dates listed above. If you do a 2nd survey, it will require an additional 0.5–4 hours on top of the hours listed above.

Completing your survey

Marshbird Survey stations have not been pre-selected. You must identify and record the coordinates (UTM or lat/long) of Marshbird Survey stations yourself using a GPS unit (or alternatively your phone), according to the guidance below. We were unable to pre-select Marshbird Survey stations because current geospatial information describing marshbird habitat is not accurate enough at a fine enough scale. Instead, you will randomly determine the location of Marshbird Survey stations using a combination of information from square maps, online aerial imagery, and field observations.

You will randomly identify Marshbird Survey stations within a square in 2 steps: 1) identify marshbird habitat patches; and 2) identify Marshbird Survey stations within, or at the edge of, marshbird habitat patches.

Identifying marshbird habitat patches

A <u>marshbird habitat patch</u> is a low-lying, wet area that is partially or entirely vegetated with emergent (above water), floating, or submersed (below water) plants, and is periodically or regularly inundated up to a depth of 2 metres with standing or slowly-moving water. Nearly all of the marshbirds that are the primary focus of the survey prefer varying amounts of emergent non-woody vegetation and/or relatively open-grown low woody shrubs for breeding activities. Therefore, at least some of the vegetation in a marshbird habitat patch will consist of 1 type, or a variety, of emergent non-woody plants, such as cattails, reeds, burreed, pickerelweed, arrowhead, grasses, and sedges and/or 1 type, or a variety, of relatively short and open-grown woody shrubs (i.e., relatively short and open-grown = while standing you can see over them or just about over them), such as willow, sweetgale, leatherleaf, and laurels. Where open water occurs, a variety of submersed and floating plants will often flourish, such as water milfoil and lily pads. In other words, a marshbird habitat patch can be a marsh, open-grown bog, open-grown fen, open-grown shrub wetland, or a mix of these wetland types. A marshbird habitat patch is not a shallow, un-vegetated lake, nor is it a swamp with dense, relatively tall trees that form a mostly closed canopy overhead. A marshbird habitat; for example, 40% of a wetland that is a shallow pond with lily pads bordered by a band of cattails is a marshbird habitat patch, whereas the remaining 60% that consists of tall, mature, closed-canopy red maple swamp, is not marshbird habitat.

The <u>preferred minimum size (area) of a marshbird habitat patch</u> is 1 hectare of more-or-less contiguous marshbird habitat. For reference, 1 hectare is equal to 2.5 acres, 100 x 100 metres, 110 x 110 yards, or about the size of a typical local community sports field. If you can imagine a young baseball player on your local town's team easily throwing a ball over the patch's longest fetch, then it's probably too small to be worth surveying. Some of the marshbird species we are most interested in surveying very occasionally breed in patches of habitat smaller than 1 hectare (e.g., Sora and Virginia Rail), but the majority do not, so a minimum of 1 hectare appears to be a preferred size cut-off. A 1-hectare minimum cut-off is also consistent with the marshbird habitat definition used by the GLMMP (see Introduction above for how the atlas's Marshbird Survey aligns with the GLMMP).

There are up to 40 randomly-selected, designated, roadside survey stations within each square, which you will use to locate marshbird habitat patches. The designated roadside stations are marked on the map of each 10-km square, and the UTM coordinates of each are shown on the right side of the map. Maps of each 10-km square are available on the <u>Atlas Square Resources</u> page and on the NatureCounts app. Coordinates for the designated roadside stations can also be downloaded in various formats (CSV, GPX, KML/KMZ) on the <u>Atlas Square Resources page</u>.

To <u>identify marshbird habitat patches</u>, start with designated roadside survey station number 1. Select the closest, accessible marshbird habitat patch that meets the criteria above and is at least about 1 hectare or greater in size. In squares with few wetlands, the closest available marshbird habitat patch may be up to several kilometres from the designated roadside location. You will have to use a combination of information from the atlas square map, online aerial satellite imagery (available, for example, on Google Earth, Google Maps, <u>Atlas Square</u> <u>Resources page</u>, NatureCounts app, or elsewhere), and field observations to locate and confirm that marshbird habitat patches meet the criteria described above. Do this again for designated roadside survey stations 2–8, until you identify 1–8 marshbird habitat patches.

In some cases, the same marshbird habitat patch will be the closest to 2 or more designated roadside survey stations. If the patch is large enough, place more than 1 Marshbird Survey station at the edge of, or within, the patch, such that all Marshbird Survey stations are greater than 400 metres apart. If you are unable to identify multiple, accessible stations at the edge of, or within, the patch that meet the 400-metre minimum distance requirement, then proceed to the second-closest marshbird habitat patch, and so on, until a patch is identified. There are more details on how and where to place Marshbird Survey stations within marshbird habitat patches in the section "Identifying Marshbird Survey station locations" below. See Fig. 2a-d for various examples of how to select marshbird habitat patches, and place Marshbird Survey stations, in relation to each of the first 8 designated roadside survey stations.

Some of the Marshbird Survey priority squares in the north beyond roads have no designated roadside survey stations. In lieu of designated stations to use as starting points, randomly select

8 of the 100 square-kilometer blocks located within each square, and use the centre point of each of the blocks as starting points (Fig. 2e). You can generate 8 random numbers between 1 and 100 using a random number generator; there are various random number generators available online, or enter the following formula in an empty cell in a Microsoft Excel spreadsheet: "=randbetween(1,100)". Please proceed with the centre points of these 8 randomly-chosen square-kilometer-sized blocks as if they were designated roadside survey stations. See Fig. 2e for an example of how to select marshbird habitat patches, and place Marshbird Survey stations, in a square with no designated roadside survey stations.



17TNH42

Figure 2a. An example of how to select marshbird habitat patches, and place Marshbird Survey stations, in relation to each of the first 8 designated roadside survey stations in a square with relatively few, widely scattered wetlands in southern Ontario. In this square, there were only 5 accessible marshbird habitat patches.

17TNJ46



Figure 2b. An example of how to select marshbird habitat patches, and place Marshbird Survey stations, in relation to each of the first 8 designated roadside survey stations in a square with 1 large wetland complex in southern Ontario.

17TPL52



Figure 2c. An example of how to select marshbird habitat patches, and place Marshbird Survey stations, in relation to each of the first 8 designated roadside survey stations in a square with moderate road coverage in central Ontario.

17TPL96



Figure 2d. An example of how to select marshbird habitat patches, and place Marshbird Survey stations, in relation to each of the first 8 designated roadside survey stations in a square with very sparse road coverage in central Ontario.



17TPL85

Figure 2e. An example of how to select marshbird habitat patches, and place Marshbird Survey stations, in a square with no designated roadside survey stations in central Ontario.

In many squares there will be fewer than 8 accessible marshbird habitat patches that meet the criteria; in southern Ontario south of the shield, where wetland loss has been high, 3–5 marshbird habitat patches per square will be the norm. Some marshbird habitat patches will be located next to, or very near to, a public road, trail, or other type of access, whereas others will require traveling overland away from a road or trail to gain access, which will often require landowner permission. We highly encourage you to try your best to acquire landowner permission to access marshbird habitat patches that are not publicly accessible, although we realize this may not be possible for a variety of reasons. We will understand if you do not attempt to, or are unable to, gain access for any reason. See <u>Appendix C</u> for further details on accessing private land.

Please complete the Marshbird Suvey at as many survey stations as you can in a square up to a maximum of 8 stations per square. We note that if you are able to gain access to only 1 station or very few stations, or if you can complete only 1 station or very few stations, out of the maximum of 8 stations potentially available in a square, then please still submit your Marshbird Survey data because it will be extremely useful and very important for analysis.

Be aware that some squares, especially in highly developed regions (e.g., the Greater Toronto Area) and in predominantly agricultural regions (e.g., Essex County), may have no marshbird habitat patches at all, or may have a few, but they are inaccessible due to landowner access. In these squares you will be unable to complete the survey. If such a square is a pre-selected Marshbird Survey priority square, then we encourage you to randomly choose an alternative from among the 8 adjacent potentially alternative squares (Fig. 3); for example, by putting 8 numbered scrap pieces of paper in a hat and blindly drawing 1 piece. Please proceed in your randomly-chosen alternative priority square by following all of the guidance provided here. If the alternative square does not work, then please choose a second alternative square from amongs the remaining 7 alternative squares, and so on, if required. In the unlikely event that none of the 8 alternative squares works out, then please proceed to another priority Marshbird Survey square, if possible.



Figure 3. Eight adjacent potentially alternative squares (grey squares) to be considered for surveys in cases where the survey cannot be completed in randomly, pre-selected Marshbird Survey priority squares (yellow square).

Identifying Marshbird Survey station locations

At each marshbird habitat patch, find a good, accessible vantage point at the edge of, or within, the patch that is approximately closest to the designated roadside survey station that was used to identify the patch. This point is a "Marshbird Survey station" and is the location from which you will conduct the survey. The Marshbird Survey station should provide a reasonably unobstructed view of at least part of the marshbird habitat patch. The Marshbird Survey station can be at the edge of a road margin immediately next to a marshbird habitat patch, if safety allows, which works well on secondary and back roads with little traffic. However, if traffic is an issue, and landowner access allows, we encourage you to place the Marshbird Survey station far enough away from the roadside to reduce noise from passing cars (e.g., more than 200 metres), which will increase your chances of hearing marshbirds. The Marshbird Survey station can also be located within the patch, and may require a canoe or boat to access. If the marshbird habitat patch is larger than about 300 metres across at the widest point, then we highly encourage you, if possible, and if safety allows, to place the Marshbird Survey station at least 100 metres or more out in the "interior" of the marshbird habitat patch. This is advantageous because several marshbird species are more abundant towards the centre of large habitat patches, so it is best if large patches (i.e., larger than about 300 metres across at the widest point) have survey stations well out in the interior, or close to the centre, of the patch. Marshbird survey stations must be greater than 400 metres from any other Marshbird Survey station, which reduces the chances of double-counting the calls of far-carrying species, such as American Bittern and Pied-billed Grebe. In some instances, as noted above under "Identifying marshbird habitat patches," more than 1 Marshbird Survey station may be placed within the same marshbird habitat patch, as long as all of the stations are more than 400 metres apart. See Fig. 2 for various examples of how to place Marshbird Survey stations within selected marshbird habitat patches in relation to each of the first 8 designated roadside survey stations, plus an example involving a square with no designed roadside survey stations.

Please try your best to meet all of the following criteria when identifying Marshbird Survey stations, so that other atlasers (perhaps yourself!) can more easily revisit the stations in the future:

- physically accessible at the time of year of the survey
- legally accessible (no trespassing)
- near a safe parking spot
- in a quiet location with little traffic
- not directly in front of a house
- points should be at the very edge of, or within, the marshbird habitat patch
- more than 400 metres from any other Marshbird Survey station

Documenting Marshbird Survey station locations

You will assign a <u>unique identifier</u> to each Marshbird Survey station. It will consist of the 7-digit atlas square number followed by the 1-digit designated roadside station number that was used to identify the Marshbird Survey station, e.g., 17TNH41-4, which will be referred to as the station or site name.

You will document the precise (e.g., ± 1 metre) location of each Marshbird Survey station by using a GPS unit (or alternatively your phone) in the field to record latitude and longitude (e.g., lat: 42.61573, long: -80.45872; note the negative sign preceding the longitude). Alternatively, you may record UTM or grid coordinates, consisting of 3 components: UTM grid zone, easting, and northing (e.g., UTM grid zone: 17T, easting: 544386, northing: 4718218); but be aware that you will need to convert to latitude and longitude later, in order to enter them into the computer

(i.e., <u>the data entry site only accepts lat/long</u>). The conversion can be done using the <u>atlas</u> <u>conversion tool</u>. It is extremely important that you record lat/long (or UTM) coordinates for each Marshbird Survey station, so that you can relocate the station during your 2nd survey (if you are able to do a 2nd survey), and so that others can relocate the station during future atlases. You will record the lat/long (or UTM) coordinates for each Marshbird Survey station on the Marshbird Survey data form during the 1st survey, and you will enter them into the computer later, along with your other data, through the NatureCounts website (see "Entering Marshbird Survey data into NatureCounts" below for details); coordinates do not need to be recorded again during the 2nd survey, provided you already recorded them during the 1st survey, as indicated on the Marshbird Survey data form.

Please also record the direction you faced during the 1st survey at each Marshbird Survey station. You will face this same direction during your 2nd survey. The direction will be a compass bearing between 1 and 360°. Record the bearing on the MarshBird Survey data form and enter it into the database later online. Recording the direction you faced during surveys is important because it will allow us to combine data during analysis from the Atlas's Marshbird Survey, which records birds in all directions from the observer (i.e., within a full-circle sample plot), with data from the GLMMP, which records birds only in front of the observer (i.e., within a forward-facing semicircular sample plot).

Call broadcast

Use the Ontario Atlas-3 Marshbird Survey playback MP3 file to perform your surveys (<u>here</u>). During each survey, place the portable player in an elevated position (e.g., 1 metre above the substrate, if possible), push the play button, and, if needed, move a short distance away from the speaker so you can better hear marshbirds and other species during the playback.

The entire recording is 10 minutes long. It begins with a double beep and 5 minutes of passive listening with no broadcast, followed by a second 5-minute period consisting of 30 seconds of calls and 30 seconds of silence for each of 5 marshbird species or groups of species: Least Bittern, Sora, Virginia Rail, American Coot mixed with Common Gallinule, and Pied-billed Grebe, in that order. A single beep sounds at the end of the first 3 minutes. The broadcast ends with a double beep, at the end of 10 minutes. There is no need for a stop watch, or for you to keep track of time through some other means during a survey, because the broadcast will "keep track" of the time for you. Please note that a different call broadcast with species appropriate for use in the Hudson Bay Lowlands is under consideration and might be introduced for use in that region at a future time.

Test the volume of your playback equipment before doing marshbird surveys. Play the broadcast at the highest possible volume without causing distortion. Play the broadcast outside under survey conditions, perhaps on a straight, reasonably flat, quiet road with little traffic, when there is little wind and no precipitation, and listen at increasing distances until you can no longer hear the broadcast. To be loud enough for the Marshbird Survey, the marshbird broadcast should be audible from your speaker from at least 100 metres away, or be at least 80-90 decibels at 1 metre from the source. Contact a <u>Regional Coordinator</u> to see about borrowing playback equipment for use during marshbird surveys.

How to do marshbird surveys

Marshbird surveys are point counts, which consist of quietly standing, or sitting in a boat, at each Marshbird Survey station and counting all birds seen or heard during a 10-minute period. These counts are extremely valuable because they tell us a great deal about the birds that are detected, as well as the birds that are not detected. Please only record birds that are detected

during the 10-minute survey. Do not record anything detected just before or just after the survey, even if it's missed only by a few seconds. Surveys are certain to miss some species, and their absence is an indicator that those species may be relatively uncommon in the area. Any species detected before or after 10-minute surveys can be recorded on a regular Atlas Checklist.

Wait about a minute after arrival at a Marshbird Survey station for the birds to settle down to your presence. During this time, fill out the required information at the top of the data form, such as date, weather, and UTM or lat/long coordinates. If you prefer, you might also complete the habitat assessment at this time (more details given below). When ready to begin, record your start time and start the portable player with the call broadcast described in the previous section, which will keep track of the time for you until the end of the survey. During the survey remain in place, but turn around so as not to miss any birds which may be flying or calling behind you.

You will record on a map 5 pieces of information for each individual of each species that you see or hear during each survey: 1) species, 2) time interval of <u>first</u> detection (of 3 possible time intervals), 3) direction of <u>first</u> detection (in front of you or behind you), 4) distance of <u>first</u> detection (of 3 possible distance categories or bands), and 5) breeding evidence, if applicable. Recording these details will allow us to make robust estimates of total population sizes by applying statistical adjustments to account for the fact that some individuals will be present during surveys, but will go undetected for various reasons. Recording the details will also allow data from the Atlas's Marshbird Survey to be combined with data from various other programs, such as the GLMMP and the Breeding Bird Survey. See "Map" in the section "Completing the Marshbird Survey data form" below for more details.

How to do marshbird habitat assessments

At the time of your 1st marshbird survey, you will perform a simple marshbird habitat assessment. At each Marshbird Survey station, you will record 4 pieces of marshbird habitat information: 1) wetland type; 2) presence of certain influential factors, such as water control structures; 3) percent aerial coverage of major vegetation and land cover types, and 4) percent aerial coverage of emergent non-woody plants. The marshbird habitat assessment is to be completed only once during your 1st survey; it does not have to be done again during the 2nd survey. Although if you forget to do it during your 1st survey, then please complete it during your 2nd survey. See "Completing the Marshbird Survey habitat assessment data form" below for more details.

If you do not feel comfortable completing the marsh bird habitat assessment for any reason, then please consider recruiting a friend who might feel comfortable completing it for you instead. As a last option, please submit photos of as much of the marshbird habitat surrounding each of your Marshbird Survey stations as possible by email to atlas@birdsontario.org. Please include in the body of your email for each photo or set of photos: 1) atlas square number, 2) station number, 3) date, and 4) either UTM or latitude/longitude coordinates. Staff will use your photos, aerial imagery, and other sources of information to complete the habitat assessment for you.

Safety

Please have fun, but make sure you are safe. Carry a cell-phone and have a friend accompany you, if desired. A friend can help with the portable player, maps, GPS, navigation, and data forms, which can be challenging for 1 person. Having a friend join you is especially recommended if you need to travel far from your vehicle to access survey stations, particularly over rough terrain, through forested country, on the water, or in other isolated situations. It's a good idea to let someone know where you plan to be travelling, and when you expect to return.

Please be careful when standing in road margins: wearing highly visible clothing or a safety vest is recommended. Ensure your car is pulled completely off the road, but be careful to avoid getting stuck in soft shoulders or sliding into the ditch. If you are accessing survey stations that require using a canoe or boat, then please be especially careful and follow all applicable boating laws and over-water safety guidance. If you are accessing survey stations away from your vehicle near dark, please ensure that you carry a well-charged flashlight or headlamp for safe navigation. See <u>Appendix A</u> for more details.

Concluding remarks

Once you have surveyed 1–8 Marshbird Survey stations at least once (but hopefully twice!) and entered your marshbird and habitat data into the online database (see below for details), you have completed the Marshbird Survey for the square. As a result of your effort, our knowledge of marshbirds in the province will grow immensely. *Congratulations, and thank you*!

If you would like to do more, please select another Marshbird Survey priority square to survey. Please check with the <u>Regional Coordinator</u> to avoid duplicating effort.

Recording and entering Marshbird Survey data

In the future, you may be able to record and enter Marshbird Survey data through an app while in the field. In the meantime, please print off and record your observations on a hard-copy data form in the field, and then enter your data online by visiting the NatureCounts website (see "Entering Marshbird Survey data into NatureCounts" below for details). Alternatively, you may record the required information in a notebook, using a hard-copy data form as a guide to ensure you record each of the required pieces of data. Please ensure that all of the information on your forms or in your notebook is legible, so you can read it later.

Completing the Marshbird Survey data form

See an example of a completed bird data form in Fig. 4. Below are further details for each item on the form.

Atlas square #: record the 7-digit number, e.g., 17TNH41.

Station #: record the 1-digit Marshbird Survey station number, i.e., 1, 2, 3, 4, 5, 6, 7, or 8. This is the 1-digit designed roadside point count station number that was used to identify the Marshbird Survey station.

Observer name: record your full first and last name, e.g., Doug Tozer.

Day: record the day of the month as a number, e.g., 1, 15, or 31.

Month: record as MAY, JUN, or JUL.

Year: record as 2021, 2022, 2023, 2024, or 2025.

Survey: fill in the appropriate bubble to indicate if it is the 1st or the 2nd survey.

Start time: record when your 10-minute marshbird survey begins in 24-hour format, e.g., record 5:52 am as 05:52, and 8:02 pm as 20:02.

Temperature (Temp.): record air temperature in degrees Celsius.

Wind: record Beaufort wind scale number as 0, 1, 2, or 3. Note that Beaufort 4 or higher means the wind is too strong to survey.

	Wind speed				
No.	km/hr	mi/hr	Description	Effects on water	Effects on land
0	< 1	< 0.6	Calm	Water surface like a mirror, but not necessarily flat	Smoke rises vertically
1	1–5	0.7–3.1	Light air	Ripples with the appearance of scales are formed, but without foam crests	Direction of wind shown by smoke drift, but not wind vanes
2	6–11	3.2-6.8	Light breeze	Small wavelets, still short but more pronounced. Crests do not break. When visibility good, horizon line always very clear	Wind felt on face. Leaves rustle. Ordinary vane moved by wind
3	12–19	6.9–11.8	Gentle breeze	Large wavelets. Crests begin to break. Foam of glassy appearance. Perhaps scattered whitecaps	Leaves and small twigs in constant motion. Wind extends light flag
4	20–28	11.9–17.4	Moderate breeze	Small waves, becoming longer. Fairly frequent whitecaps	Raises dust and loose paper. Small branches are moved

Characteristics of Beaufort wind scale numbers (No.) 0–4.

Noise: record noise index as None or slight, Moderate, High, or Excessive.

Characteristics of noise index.

Index	Description
None or slight	Relatively quiet, little interference
Moderate	Some interference with broadcast and/or listening
High	Substantial interference with broadcast and/or listening
Excessive	Extreme interference with broadcast and/or listening

GPS coordinates recorded previously: fill in the bubble to indicate if you recorded GPS coordinates previously or not. If not, please be sure to record them.

UTM grid zone: record the 3-digit designation, e.g., 15U, 17T, 18T. Leave blank if recording lat/long. Recall that you will need to convert UTM or grid coordinates to latitude and longitude later, in order to enter them into the computer (i.e., <u>the data entry site only accepts lat/long</u>). The conversion can be done using the <u>atlas conversion tool</u>.

Latitude (or *Easting*): record the 2-digit number to 5 decimal places for latitude, e.g., 42.61573. Alternatively, record the 6-digit number for easting, e.g., 544386, and convert to latitude later, in order to enter it into the computer.

Longitude (or Northing): record the 2-digit negative number to 5 decimal places for longitude, e.g., -80.45872. Alternatively, record the 7-digit number for northing, e.g., 4718218, and convert to longitude later, in order to enter it into the computer.

Direction: record the compass bearing faced during each survey as $1-360^{\circ}$. Note that North = 360° , East = 90° , South = 180° , and West = 270° .

Map: You will record your bird observations during each survey on the map. You will record 5 pieces of information for each individual or group of individuals of each species that you see or hear during each survey: 1) species, 2) time interval of <u>first</u> detection (of 3 possible time intervals), 3) direction of <u>first</u> detection (in front of you or behind you), 4) distance of <u>first</u> detection (of 3 possible distance categories or bands), and 5) breeding evidence, if applicable.

Most birds that you will observe will be "Possible" breeders, i.e., observed within breeding habitat. You should record the highest level of breeding evidence for any species that is not a "Possible" breeder. That is, you should record breeding evidence for all species that are an "X" (non-breeder) or a Probable or Confirmed breeder. We will assume all other observations are Possible breeders and those breeding evidence codes will be added automatically following data entry, so you don't have to keep track of Possible breeding evidence on your data form or enter those data into the computer.

Therefore, record each individual or group of individuals on the map in the correct direction (i.e., in front of you or behind you) and in the correct distance band (i.e., less than 50 metres, between 50 metres and 100 metres, or greater than 100 metres) with a 4-letter species code followed by a superscripted 1, 2, or 3 indicating which time interval it was first detected in: 1 = the first 3 minutes or minute 1–3, 2 = the next 2 minutes or minute 4–5, and 3 = the last 5 minutes or minute 6–10. Note that a single beep sounds on the broadcast at the end of the first 3 minutes, and you will know when the last 5 minutes begins because that is when the playback for the 1st species (Least Bittern) begins. If a species code refers to more than one individual, then record the number of individuals in front of the species code.

For example, if you first detect a Red-winged Blackbird in the first minute or minute 1, you would record RWBL¹; a Swamp Sparrow first detected in minute 2 would be SWSP¹; a Marsh Wren first detected in minute 4 would be MAWR²; and a two Common Yellowthroats first detected in minute 6 would be 2 COYE³. You will also include an appropriate breeding evidence code, if applicable, after the superscript for the time interval, e.g., COYE³ CF for a male Common Yellowthroat seen carrying food for young.

Please note the following. Each individual or group of individuals is only recorded once, as per the circumstances (i.e., direction, distance band, time band) of its <u>first</u> detection; subsequent detections are not recorded. Please try your best to keep track of new versus subsequent detections. Often, this will require making a best guess. If an individual bird is heard from more than one Marshbird Survey station, then record it at both locations.

See Fig. 4 for an example of a completed bird data form, and please see "Entering Marshbird Survey data into NatureCounts" below for how you would enter these data online. Please enter your data within 2 weeks of completing your survey, or, at the latest, <u>by 31 August each year</u>. If you have any questions, please email <u>atlas@birdsontario.org</u>.



Figure 4. An example of a completed Marshbird Survey data form.

Completing the Marshbird Survey habitat assessment data form

See an example of a completed habitat assessment form in Fig. 5. Below are further details for each item on the form.

Atlas square #: record the 7-digit number, e.g., 17TNH41.

Station #: record the 1-digit Marshbird Survey station number, i.e., 1, 2, 3, 4, 5, 6, 7, or 8. This is the 1-digit designated roadside station number that was used to identify the Marshbird Survey station.

Observer name: record your full first and last name, e.g., Doug Tozer.

Day: record the day of the month as a number, e.g., 1, 15, or 31.

Month: record as MAY, JUN, or JUL.

Year: record as 2021, 2022, 2023, 2024, or 2025.

A. Choose 1 that applies best within 100 m: Choose the wetland type that best describes the marshbird habitat within 100 metres of the Marshbird Survey station. Below are descriptions of each of the 4 potential choices:

- <u>Marsh/shallow open water:</u> typically high in nutrients and very productive with lots of nonwoody plant growth. Characterized by robust emergent plants like cattails, reeds, burreed, pickerelweed, arrowhead, grasses, and sedges, and with floating and submerged plants where shallow open water occurs, such as water milfoil and lily pads.
- <u>Bog/Fen:</u> typically nutrient-poor and filled or covered with partially decomposed plants (peat). Surface layer composed of mosses, especially *Sphagnum*, which often forms raised hummocks separated by small, shallow pools. Sedges often occur in abundance. There is frequently a characteristic layer of low, open-grown, woody shrubs, such as sweetgale, leatherleaf, and laurels. Small, scattered Tamarack, Black Spruce, and Eastern White Cedar often occur.
- <u>Shrub wetland (e.g., alder, willow):</u> technically a thicket swamp characterized by thick growths of low, open-grown shrubs, such as willows, red-osier dogwood, buttonbush, and speckled alder. Often located between a mature, closed-canopy, treed swamp and a marsh.
- <u>Other</u>: select this choice if you feel the marshbird habitat within 100 metres is not described well by any of the 3 choices above. Be sure to describe the marshbird habitat in your station the best you can, noting especially the dominant species of plants that are present.

B. Choose all that apply within 100 m: Indicate using Xs, checkmarks, or other marks if any of the influential factors in the list apply to the marshbird habitat within 100 metres of the Marshbird Survey station. Below is a list of the 4 potential choices:

- Beaver pond or meadow
- Influenced by dam, dike, or other water control by humans
- Park, land trust, wildlife area, or other protected area
- Saltwater (Hudson Bay Lowlands only)

C. Estimate the aerial coverage within 100 m (as a percentage) of: Imagine yourself floating above the surface of the wetland, and then estimate the aerial coverage (as a percentage) of each of the major vegetation and land cover types within 100 metres of the Marshbird Survey station. Please ensure that your estimates add to 100 percent. You may make a sketch of the major vegetation and land cover types on the map first if it helps you, although you are not required to do so. See Fig. 5 for an example. Below is a list of the 6 potential vegetation and land cover types:

- Open water (with or without floating plants)
- Emergent (above water) non-woody plants
- Open-grown woody shrubs
- Trees
- Mud, sand, rock
- Other (e.g., developed, agriculture)

D. For the <u>emergent non-woody plant component</u> only, estimate the aerial coverage (as a **percentage**) of: As above, imagine yourself floating above the surface of the wetland, and then estimate the aerial coverage (as a percentage) of each of the emergent non-woody plant species or groups of species <u>only within the area or coverage occupied by all of the emergent</u> <u>non-woody plants</u> within 100 metres. For example, if 25% of the area within100-metres is covered with emergent plants, and half of that is composed of cattails and the other half is composed of grasses and sedges, then put 50% cattail and 50% grasses and sedges. Please ensure that your estimates add to 100 percent. See Fig. 5 for an example. Below is a list of the 5 potential emergent vegetation types:

- Cattail (Typha)
- Common Reed (Phragmites)
- Grasses and sedges
- Rushes/Bullrushes (e.g., Juncus, Scirpus)
- Other. Please describe.

See Fig. 5 for an example of a completed habitat assessment data form, and please see "Entering Marshbird Survey data into NatureCounts" for how you would enter these data online. Please enter your data within 2 weeks of completing your survey, or, at the latest, <u>by 31 August each year</u>. If you have any questions, please email <u>atlas@birdsontario.org</u>.

Thank you very much for doing the Marshbird Survey. We hope you enjoy it!



Figure 5. An example of a completed Marshbird Survey habitat assessment data form. Inset shows a satellite image of the Marshbird Survey station from Google Earth, earth.google.com/ web, to aid interpretation.

Entering Marshbird Survey data into NatureCounts

Please watch the video at the following link for detailed instructions on how to enter your Marshbird Survey data online:

Atlas-3 Marshbird Survey Data Entry Video: https://www.youtube.com/watch?v=XuW2tkOKm3s

If the direct link to the video immediately above doesn't work, then you can find the Atlas-3 Marshbird Survey Data Entry Video on the Atlas-3 Marshbird Survey page at the following link: <u>https://www.birdsontario.org/marshbird-surveys/</u>

Please note that Marshbird Survey stations are referred to as "sites" on the NatureCounts website, and that during data entry you will name or refer to each station (site) by its unique identifier, e.g., 17TNH41-4. In other words, when you are asked during data entry to assign a "site name" it will consist of the 7-digit atlas square number, followed immediately by a dash, followed immediately by the 1-digit designated roadside station number that was used to identify and locate the station (site), e.g., 17TPL52-1. Please be especially careful to enter this unique identifier into the site name box exactly correctly with all 9 digits (including the dash).

During data entry, you will first be asked to "...select a site where you made your observations" from a dropdown list or by zooming in on a map to select the marker for your station (site). However, please proceed by entering the lat/long coordinates directly from your data form. Please do not indicate the location of a station (site) by clicking on the map to populate the lat/long coordinate boxes. Even though this option exists, we do not want you to use it for entering the location of Marshbird Survey stations (sites); instead, we want you to type in the lat/long coordinates from your data form, which were taken from your GPS or phone.

To enter Marshbird Survey data online, go to <u>birdsontario.org</u> and click on Tools & Resources, then Data Entry, and then Special Surveys. Login to NatureCounts and follow the instructions given in the instructional video at the link given above.