

Calumet Marsh Bird Monitoring

Survey Manual

Welcome to the Calumet Marsh Bird Monitoring Survey. Thank you for your participation; your dedication to this project enables us to document habitat use and populations of marsh-dwelling birds in the Calumet region. Direct any questions about the Calumet Marsh Bird Survey to Stephanie Beilke, Audubon Great Lakes Conservation Science Associate (sbeilke@audubon.org; 312-453-0230, ext. 2009)

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Safety Guidelines

Above all else, we value your safety in the field. Please read the following safety guidelines and remember that your safety comes first over the collection of scientific data.

1. If you are able to, we recommend bringing a partner or field assistant with you into the field. The buddy system ensures that someone can assist you (though they cannot assist with detecting or pointing out birds) and can call for help if needed.
2. If you are surveying alone, make sure someone knows where you will be and when you expect to be back, in case you need any assistance.
3. If, ***for absolutely any reason***, you do not feel safe in the field, leave the situation immediately and call for help if necessary.
4. Drive carefully. Lock your vehicle and don't leave valuable items behind in your vehicle.
5. Always bring plenty of water with you into the field.
6. Use recommended parking areas according to map documents and communications with your coordinator.
7. Have a phone with you at all times. We also recommend bringing a portable charger with you into the field in case your phone runs out of battery.
8. Surveys begin before sunrise, so you should be prepared to navigate in the dark with a flashlight and/or headlamp.
9. Be prepared to encounter wet and uneven terrain in the field. If you have difficulty reaching your assigned points, you may conduct your survey as near to the point as you can get. If this occurs, record the latitude and longitude of the point where you surveyed and contact your coordinator after the survey to let them know where you moved the point.
10. If you will be using a motorized boat, we highly recommend completing an Online Boating Safety Course (<https://www.boat-ed.com/illinois/>)
11. If you will be using a kayak or canoe, we highly recommend completing the free online Paddle Sports Safety Course (<https://www.boaterexam.com/paddling/>).
12. Remember to check yourself and clothing for ticks after surveys.

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In case of emergency, call 911. For non-emergencies, contact your survey coordinator.

Important Phone Numbers	
Stephanie Beilke, Audubon Great Lakes Project Manager	920-366-5825 (cell) 312-453-0230 ext. 2009 (office)
Libby Keyes, Survey Coordinator	708-567-5510 (cell)
Naureen Rana, Chicago Park District, please notify 24 hours in advance when visiting Chicago Park District properties	312-742-4291 Naureen.rana@chicagoparkdistrict.com
Forest Preserves of Cook County Law Enforcement (non-emergency)	708-771-1001

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Introduction

As part of the Calumet wetland working group, a partnership of land managers, scientists and conservationists working to restore the valuable wetlands of Calumet, Audubon Great Lakes is leading secretive marsh bird monitoring at approximately 30 sites from Southeast Chicago to the Indiana Dunes.

The aim of this study is to document marsh bird breeding response to changes in habitat condition and management, as well as provide long-term trends on regional breeding populations of 17 species of concern. Data are also critical in stimulating restoration and improved management, feeding back into recovery goals set by the coalition.

Methods

A team of field technicians and volunteer surveyors will use a call-playback method (based on Conway 2011) designed to maximize the detection of secretive marsh birds. Using a series of silent periods and periods during which the calls of each species are broadcast across the wetland, surveyors will record the species they detect. The survey will focus on five focal species and 12 secondary species (see below).

Site Summary

During your first trip into the field, use a site summary datasheet to collect data for each point along your survey route. It is important to record the compass bearing (the direction you are facing towards the center of the wetland) to play the broadcast recording, so that repeat surveys follow the same configuration. Latitude and longitude coordinates should be recorded, especially in case you need to move the point.

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Primary and Secondary Focal Species

Five primary bird species are specifically targeted with the playback of their calls (see table below). In addition, three primary and eight secondary species will be recorded when detected during the surveys using a modified format on the forms.

Primary Species	Secondary Species
Common Gallinule	American Coot
Least Bittern	Black-crowned Night-Heron
Pied-billed Grebe	Black Tern
Sora	Blue-winged Teal
Virginia Rail	Little Blue Heron
	Marsh Wren
Non-playback primary:	Snowy Egret
American Bittern	Swamp Sparrow
King Rail	Yellow-crowned Night-Heron
	Yellow-headed Blackbird

Control-click on the Species Name for a link to a Species Account

Record only primary and secondary target species on your datasheets. Do not spend time counting other species not listed as targets.

Time of Year

Peak marsh bird calling activity occurs during the courtship and egg-laying periods in May and June.

Survey 1	Survey 2	Survey 3
1 May – 14 May	15 May – 31 May	1 Jun – 15 Jun

The goal is three surveys conducted annually at each survey site. This will help confirm presence/absence of most species with 90% certainty and provide data on calling activity throughout the season. Each of the three replicate surveys should be conducted during a survey period as described in the table above. In addition to each survey falling in the proper period, each survey needs to be at least 10 days apart. Follow these guidelines as closely as possible but if you must digress slightly, doing so is better than not conducting a survey at all. Please note that due to the need for good weather conditions (low wind, no precipitation), you will likely need to plan for several survey slots during each period in case bad weather knocks out one or more of your planned dates.

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If a volunteer is unavailable for one or more of the surveys, he or she should contact the Audubon Great Lakes staff as soon as possible to request assistance. For instance, if travel or other obligations preclude a volunteer from performing surveys during the May 15 – 31 period, s/he would alert the Audubon staff preferably prior to May 15. This will enable us to send another surveyor out to complete the survey. If a volunteer encounters a lot of bad weather and runs out of available time slots within a particular survey period, also please let us know in case someone else can come out to complete the survey.

Time of Day

We require all surveys to be run in the morning. Morning surveys begin 30 minutes before sunrise (at first light) and should be completed by no later than 3 hours after sunrise. You can look up daily sunrise times online or in most weather apps (or use reference sheet provided). Don't forget your headlamp or flashlight for navigating to and from points in low light.

Suitable Weather Conditions

Surveys should only be conducted when there is no sustained rain or heavy fog, and when the wind speed is < 12 mph (20 km/hr). This wind speed corresponds to leaves and twigs in constant motion, or a Beaufort scale wind of 3 or less (leaves and small twigs in constant motion, light flag extended; NOT raising loose dust or paper). Marsh birds are less likely to call in inclement weather. Participants should postpone surveys if they believe winds are affecting probability of marsh birds calling and/or being detected. If wind speed increases to above 20 km/hr during the survey or sustained rain begins while the survey is underway, participants should stop the survey and repeat the entire survey route another day (i.e. don't just go back and repeat the remaining points on the route). This will require that you be flexible with your survey schedule and watch the weather forecasts closely.

Survey Protocol

All surveys should be conducted by a single observer. If more than one individual is present, only the primary observer may collect data. The second person may record weather, habitat, and bird data but should not assist in the detection of birds. A team of surveyors may take turns among points or survey occasions as to whom is the primary surveyor. All surveys are unlimited-radius point counts, i.e. record all target birds detected at a survey point regardless of their distance from that point.

Surveys at each point consist of two parts, beginning with an initial 5-minute passive listening

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period followed by five 1-minute segments. Each 1-minute segment contains 30 seconds of vocalizations broadcast for one target species, followed by 30 seconds of silence (response time). The calls will be pre-recorded and provided to each surveyor in an mp3 file. The species calls must always be played in the same order for standardization and to minimize inhibition of less-dominant species. The call order will be Least Bittern, Sora, Virginia Rail, Common Gallinule, then Pied-billed Grebe. It is also very important that you use the provided ten-minute sequence and not play different audio files. This standardization is necessary to ensure that the study results are compatible with other efforts regionally.

Pre-recorded calls are broadcast using smartphones or mp3 players connected to portable speaker(s). Audubon Great Lakes will provide speakers and other equipment as needed. There are particular volume guidelines for the speakers (80-90 dB at one meter from the speaker). At the training sessions we will test each set of speakers to determine the appropriate volume setting to use. You can use a decibel reader from ~1m away from the speaker to measure the volume level.

The broadcast player should be placed upright on the ground or suspended slightly above ground in the vegetation. These speakers are waterproof, but if the area is inundated, place the speaker on an object as close to the ground as possible. Point the speaker toward the center of the wetland and do not change/rotate the speaker's position during the call-broadcast survey. Speakers should be pointed in the same direction for all replicate surveys. Observers should stand 2 m to one side of the speaker, as standing too close can reduce your ability to hear responses.

Species Detections

For target species, both on the primary list and the secondary list, each individual bird detected during the survey period will be entered on a separate line on the field data form. This requires surveyors to determine if a bird that is detected several times during the survey is a new individual or one already detected. A conservative approach is best in identifying additional individuals.

Each individual of the both primary and secondary target species will be entered on its own line on the datasheet (i.e. one individual bird per row). Surveyors will need to determine if a bird detected several times is a new individual or one already detected.

For the **Primary Species**, observers will record *during which intervals* each individual is detected, going across the datasheet (i.e. during the initial 5-minute period, or any of the 30-

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second call periods or any of the 30-second silent periods). Observers do not need to record the number of times a bird responded during each segment. Simply record if the individual was detected during each time segment. Recording all the segments during which an individual bird is detected is extremely important so that we can determine whether call-broadcast is effective at eliciting additional responses for each of the primary species.

Moreover, recording whether each individual responds during each time period allows us to estimate detection probability using capture-recapture models. Estimates of detection probability are essential for regional/national monitoring efforts so that we can determine how well the survey data index true population trends.

Observers will also estimate the distance from the survey point to each individual bird. This is to be the distance when the bird was first detected (birds will approach the call- broadcast but we need the distance at first detection). Recording distance to each individual will allow us to use distance sampling to estimate density for each species in each survey area. Estimating the distance to some individual birds will involve some uncertainty, so observers are encouraged to practice their estimating skills using objects of known distance. You will also be provided with detailed aerial photograph printouts of the survey point locations that have known radii for reference.

For Primary Species, observers will record a detection for each time interval during which each individual is detected (i.e., in the first 5-minutes, the first 30-second playback, etc.). Surveyors also estimate distance from the survey point to the individual for the first detection only.

For the **Secondary Species**, record each species detected on a line on the datasheet. Mark the FIRST (and only the first) minute in which you detected individual(s) of secondary species. Then, rather than estimate an exact distance for each individual (as you will for primary species) you should place each bird into one of three distance bins, i.e. <50 meters, 50-100 m, >100 m, based on when you first detected the bird and you will record the number of individuals for each distance bin. This will simplify the distance estimation but maintain adequate value of the data. Unlike with primary species, you do NOT need to mark every minute in which you detect the secondary species (just the first minute of detection!). This may seem complex at first but you'll find with practice that it's rather straightforward.

If you detect no birds during the survey, write "no species detected."

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Filling Out the Datasheet

Date: Indicate the date of the survey. Use separate datasheets for different dates.

Survey Period: Indicate if this is the first, second, or third survey of the year for this site.

Observer(s): Provide the name of the individual(s) conducting the survey, with the one detecting the birds first, following by those who are assisting.

Site: Write the name associated with your survey site. These should be provided with your maps and/or other survey materials.

Start Commute Time: Provide the time that you began working on the survey on this occasion. This includes the time driving to the area.

End Time: Provide the approximate time that you finished working on the survey, including the drive home. This will be used to track volunteer effort and contributions.

Mileage: Record the mileage that you drove for this survey, including the commute and the driving among points. This will be used in the calculation of volunteer contributions.

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Record the following data only **ONCE** per point:

- **Point:** List the survey point number.
- **Start time:** Write the start time for the survey point using military time (24 hr) notation.
- **Temperature:** Estimate in Fahrenheit the ambient temperature at the beginning of the survey and again at the final survey point. You may take this directly or you may use this from the weather application on your phone.
- **Sky:** Using the following codes, characterize the sky: 0 = clear/ few clouds; 1= partly cloudy/variable; 2 = cloudy; 4 = fog or smoke; 5 = drizzle; 6 = snow; 7 = snow/sleet.
- **Wind speed:** Categorize wind speed based on the Beaufort scale: 0=smoke rises vertically; 1=wind direction shown by smoke drift; 2=wind felt on face; leaves rustle; 3=leaves & small twigs in constant motion and light flag extended; 4=raises dust and loose paper -- small branches are moved; 5=small trees with leaves sway -- crested wavelets on inland waters
- **Noise:** Indicate the overall average level of background noise using the following codes: 0 = no noise; 1 = faint noise; 2 = moderate noise; 3 = loud noise (noise obscures birds > 50m away); 4 = intense noise (noise obscures birds > 25m away). Please note that if you experience a short-term high level of noise (e.g., airplane or train), you can pause the survey, resume when it has passed, and you don't have to record that higher level of noise.

Species: Write down the species code (indicated below) for each species detected. Each bird on this species list will be recorded individually on its own row on the datasheet. If no birds are detected at an entire survey point bout, then record "no species" and put a line through the empty columns.

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Primary Species		Secondary Species	
Common Gallinule	COGA	American Coot	AMCO
Least Bittern	LEBI	Black-crowned Night-Heron	BCNH
Pied-billed Grebe	PBGR	Black Tern	BLTE
Sora	SORA	Blue-winged Teal	BWTE
Virginia Rail	VIRA	Little Blue Heron	LBHE
American Bittern	AMBI	Marsh Wren	MAWR
King Rail	KIRA	Snowy Egret	SNEG
		Swamp Sparrow	SWSP
		Yellow-crowned Night-Heron	YCNH
		Yellow-headed Blackbird	YHBL

Responded during: For each individual, record the time periods during which you detected it. Put a “H” in each minute column during which that individual was detected by ear; put an “S” in each column during which the individual was detected visually (including flyovers). If the individual is both heard and seen, put a “HS” in that column. For example, if a Virginia Rail calls during the second minute of the survey and then you see and hear it again in response to its species’ call-broadcast, then a “H” would be recorded in column “1-2” and a “HS” in column “VIRA 8-9”. If a second individual of the same species is also detected, start a new row for this new individual and use the same recording method.

Call types: For primary species, record the call type(s) detected to the best of your abilities. This can help us learn more about breeding chronology, observer bias, detection probability, and more. See the descriptions below and on the bottom of the survey sheet.

Least Bittern: **coo** = *coo-coo* (male advertisement/territorial), **kak** = *kak-kak-kak* (when feeding young), **ert** or **ank** (given when flushed)

Sora: **wh** = *whinny* (territorial defense and mate contact), **pw** = *per-weep* or *koo-EE* (advertisement), **kp** = *keep* (contact call)

Virginia Rail: **g** = grunt (pair contact, territorial call), **t** = *tick-it* or *gik-gik-gidik* (male advertisement call), **ki** = *kicker* or *chi-chi-chi-treer* (female advertisement call), **s** = squawk or *kiu* (sharp call, contact among individuals); **kk** = *kikik*

King Rail: **cl** = clatter, **kb** = *kek-burr*, **kek**, **kh** = *kek-hurrah*;

Common Gallinule: **wo** = “wipe out”, **kp** = *keep* (contact call, similar to Sora), **gu** = “giddy-up”

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Pied-billed Grebe: **ow** = *owhoop, ge-ge-gadum-gadum-gwaaow* (primary territorial call), **hy** = *hyena, ek-ek-ek-hn-hn* (rapid staccato greeting call, chatter, rattle)

American Bittern: **pl** = *pump-er-lunk* (mate attraction, territorial signal), **cp** = *chu-peep* (copulation), **kok** (given when flushed)

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Direction: *For primary species*, record the approximate compass bearing (0-360°) or cardinal direction (NW, N, NE, E, SE, S, SW) to indicate what direction you heard the individual bird.

Distance: *For primary species*, estimate the distance to the bird when it was FIRST detected, to the nearest meter. If the bird is any distance more than 200 meters from the survey point, simply write “>200” in this column. *For secondary species*, place each bird into one of three distance bins: <50 meters, 50-100 m, >100 m and record the number of individuals detected per distance bin.

Outside Survey Period: Mark H/HS/S if the detection was only between surveys or before/after the survey. As a counterexample, you would not mark anything in this box if you heard the bird during the survey and then again immediately after the survey since the bird is already accounted for.

In Target Area: Mark yes, “Y,” if it is in your designated wetland that you are monitoring, no, “N,” if it is in a neighboring wetland/non-focal area or flying over without stopping.

Detected at Previous Point: Indicate “Y” if the individual was observed during a previous point count. This excludes birds seen/heard “outside survey period.” If a bird was observed outside the survey period first, and then later detected at another point, then the “outside” observation should be changed to “Y” for “detected at a previous point” and make clarifying comments in the Comments bin.

Comments: Provide comments as desired.

Note: The number of lines filled out on the datasheet will differ among survey points and will correspond to the total number of individual target marsh birds detected at each point. If no marsh birds are detected at a survey point, record the point number, starting time, weather information and background noise and then write “No species” in the comment column.

Focal sp. map label: *See Territory Maps section.*

Territory Maps

The Conway protocol doesn’t call for individual territory mapping, as its primary focus is to develop density estimates in areas far too large to get individual counts. In the Calumet, however, our monitoring sites are small enough that we can actually map out individual territories and get a minimum count of territories/pairs for each site. This will provide highly precise information regarding the success/failure of future management actions in increasing occupancy of the focal species.

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Territory maps should be filled out after you are finished surveying. Record territories for any primary focal species as well as American Bittern and King Rail. Label each individual with a letter (A-S) and then circle the individual territories on the map you observed using the Sharpie marker provided. Use the table on the right to indicate which species the letter corresponds to and if you believe that individual was detected during your survey. You may also indicate the letter from the territory map on your survey datasheet to correspond with your original observation. If necessary, return to the territorial boundary areas to determine whether 1 or 2 birds are present, and where the dividing line to the territories are, best you can determine them.

A head count for secondary species per site should be filled out at the bottom of the territory map datasheet. If you want to record all the species that you observe during your visit, you can keep notes on your own and input these data into <http://www.ebird.org>.

Equipment Provided to Observers

1. Datasheets
2. Survey point locations (Lat-Longs)
3. Map file (kml) for survey points
4. Map of survey points
5. Audio file for mp3 player, smartphone, or other mobile device
6. Playback speaker
7. Survey placard for car identification
8. Clipboard
9. Compass

Personal Equipment to Bring into the Field

1. Binoculars
2. Bug spray and/or head net
3. Flashlight/headlamp – for getting into or out of survey area in the dark
4. Pencils (if using pen, make sure it is waterproof)
5. Watch/clock/smartphone – to record start times
6. Thermometer – to record the temperature at the start/end of your survey (or use smart phone weather app)
7. Waterproof footwear – depending on the weather and survey point location, knee-high rubber boots or hip waders may be needed
8. Rain pants and/or rain gear – for dew-laden mornings or when rain threatens
9. Snacks and water

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10. Rangefinder, if you have one, for aiding in distance estimation
11. Sun protection (hat, sunscreen)

Additional Safety Considerations

1. Drive carefully
2. Use recommended parking areas according to map documents
3. If anyone you encounter wants more information about the project, has concerns about what you are doing or where you are working, please provide them with the permit information (when applicable) or direct them to contact Stephanie.

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Quick Daily Checklist

- Equipment checklist
 - Personal equipment
 - Phone
 - Phone charger
 - Binoculars
 - Food/water
 - Waterproof footwear
 - Data recording equipment/paper materials
 - Clipboard (all the following should be in your clipboard):
 - Datasheets and territory maps
 - Site maps
 - Site summary sheets
 - Permits (if applicable)
 - Pen/pencil, sharpie pen
 - Electronic/other equipment
 - Audio mp3 (stored on phone or mp3 player)
 - GPS Coordinates (stored on phone or GPS unit)
 - GPS unit (if applicable)
 - Decibel reader (if applicable)
 - Stereo and cord for connecting to mp3 player/phone (make sure unit is charged)
 - Compass
- Datasheet checklist
 - Record daily mileage and start and end times of your trip
 - Record weather and noise data once per point (using phone if applicable to get temperature data)
 - Record every minute and approximate distance for primary focal species detections
 - Record first minute and “distance bin” for secondary focal species detections
 - After all points completed, fill out Territory map to the best of your ability
 - After surveys are completed, double-check that data sheets are completely filled out, look for cells with missing data
- After double-checking your data, scan all completed datasheets (including territory maps and summary sheets) and submit to your survey coordinator.