Indiana Marsh Bird Project

Survey Manual

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

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Safety Guidelines

Above all else, <u>we value your safety in the field</u>. Please read the following safety guidelines and remember that <u>your safety comes first</u> 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, ***<u>for absolutely any reason</u>*****,** 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.boatus.org/indiana/)
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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Important Phone Numbers	
Brad Bumgardner, Survey Coordinator	219-928-6905 (cell)
Libby Keyes, Survey Coordinator	708-567-5510 (cell)
Stephanie Beilke, Audubon Great Lakes Project Manager	920-366-5825 (cell) 312-453-0230 ext. 2009 (office)
Willow Slough	219-285-2704 (general number)
Kankakee Sands	219-285-2184 (general number)
Indiana Dunes National Lakeshore	800-727-5847 (law enforcement) 219 395-8585 ext.1772 (receptionist)
Indiana Dunes State Park	219-926-1952 (general number)

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Introduction

Through a partnership including the Indiana Department of Natural Resources, Audubon Great Lakes, Indiana Audubon Society, and Northwest Indiana Restoration Monitoring Inventory, and in cooperation with various landowners, the Indiana Marsh Bird Monitoring Program was established to monitor eight species of special concern in the state of Indiana.

Through this project we aim to increase our understanding of eight secretive marsh bird species at eight priority wetland sites across Indiana. We will also be collecting habitat data at wetland sites to determine species' habitat needs and preferences. Results of this study will be used to develop a better understanding of where marsh bird species occur across Indiana and inform management decisions.

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 eight focal species and twelve secondary species (see below).

Coordinators

Field technicians and volunteer surveyors will all be assigned a local coordinator who will be the main contact for questions, site assignments, and data submission:

Site Name	Coordinator	Email	Phone
Indiana Dunes	Brad Bumgardner	bbumgardner@indianaaudubon.org	219-928-6905
Kankakee Sands			
Willow Slough			
Grand Calumet	Libby Keyes	libby.inthefield@gmail.com	708-567-5510
Little Calumet			
Wolf Lake			
Goose Pond	Brandon Schweder	BSchweder@dnr.IN.gov	859-967-9698
Muscatatuck NWR			
Patoka NWR			
Tern Bar Slough			

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Survey Point Verification

All point locations will be verified in the field prior to the first survey of the year. Point verification may be completed by the volunteer surveyor if he or she is available to travel to the site or by the local coordinator. Each point will be assessed to make sure it is accessible from a public road, is in emergent marsh habitat, and poses no safety concerns. Points may be located on the edge or interior of a marsh. Points may be re-located up to 100 meters in order to best meet these criteria. If a point is moved, the new GPS point location will need to be recorded into a GPS, conveyed to the local coordinator, and checked to make sure that they are not within 400 m of any other points. If a point is removed entirely, then a substitute point will be selected from a pre-generated list (in coordination with the project coordinator).

We highly recommend that all surveyors locate their points once before their first survey, even if the points have been field-verified (unless the survey area is too far from home). Collection of vegetation information may be done on that same visit. Surveyors may visit the points in the order that is most efficient. All subsequent surveys should be conducted in the same order.

Focal Species

Six primary bird species are specifically targeted with the playback of their calls (see table below). Two primary species will also be recorded when detected during the surveys, but will not be specifically targeted with playback. In addition, ten secondary species will be recorded when detected during the surveys using a modified format on the forms.

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

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

Record all focal 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 spring.

Region	Survey 1	Survey 2	Survey 3
Northern IN	1 May – 14 May	15 May – 31 May	1 Jun – 14 Jun
Southern IN	15 Apr – 30 Apr	1 May – 14 May	15 May – 31 May

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.

If a volunteer is unavailable for one or more of the surveys, he or she should contact his/her local coordinator 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 coordinator 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 prefer 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. If you are not able to conduct your survey in the morning, it is acceptable to run the survey in the evening. Evening surveys begin 2-3 hours before sunset and must be completed by dark (start time is determined by the duration of your particular route). You can look up daily sunrise and sunset 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. 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 period followed by six 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, King Rail, Common Gallinule, then Pied-billed Grebe. It is also very important that you use the provided eleven-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). Your coordinator 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 Primary species, 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 primary 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-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**, write each individual of each species on a line on the datasheet. Mark the FIRST (and only the first) minute in which you detected that individual. 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. 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.

In some cases, you may find so many marshbirds calling that it is extremely difficult to record and track each individual bird on its own line. If you have a great number of a secondary species, you may note it instead as a group. For example, you may see 13 American Coots at one survey point. In these situations, simply write down an estimate of the total number of individuals detected (in this case, the number 13) for the entire 11 minutes under the column labeled "group size." If you detect no birds during the survey, write "no species detected."

For Secondary Species, observers will record the individual bird only in the first time interval during which the bird was detected. Surveyors will estimate the distance to the bird using distance categories (<50 meters, 50-100 m, >100 m). If there are too many to handle, record a species with the total number of individuals under "group size." Make sure you record points with no birds detected as "no species detected."

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.

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
Black Rail	BLRA	Swamp Sparrow	SWSP
		Yellow-crowned Night-Heron	YCNH
		Yellow-headed Blackbird	YHBL

Detected 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.

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.**

Group size: For visually detected birds that are in a group, and within the same distance category (see Distance code, below), estimate the number of individuals in the group.

Distance: *For primary species,* estimate the distance to the bird when it was FIRST detected, using the appropriate distance estimate in intervals of 10 meters. *For secondary species*, place each bird into one of three distance bins: <50 meters, >50 meters, >100 m and record the number of individuals detected per distance bin.

Call types: *For all 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.

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

Black Rail: **ch** = *churt* or **tch** (alarm call), **gr** = *grr* (alarm call, territorial defense), **kk***: kic-kic-*

kerr (mate attraction, territorial signal)

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)

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

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

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)

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*

Direction: Record the approximate compass bearing (0-360°) to indicate what direction you heard the individual bird.

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 individuals or groups of 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.

Optional map label: *See Territory Maps section.*

Water Gauges

To measure seasonal fluctuations in water levels, each site will have water gauges, marked with 0.02 ft increments, installed between survey points, close enough to shore that they may be read, but submerged enough they will not dry out in the summer. Sites will have 1 gauge per water management unit (units determined by the local land manager) so each surveyor may not be required to gather this data.

If your route passes by a gauge, mark down, at each visit, which tick-mark (to the nearest 0.02 ft) the water level has risen to.

If you note a water gauge has been knocked over or otherwise cannot be read or located, notify your local coordinator.

Potential Issues

Being properly prepared and planning for unforeseen circumstances will go a long way in in making your surveys as easy as possible. Nonetheless issues may pop up that are out of your control

My point is inaccessible: if your point is flooded you may move the point up to 100m in any direction, mark down the new coordinates, and continue your survey from this point. Notify your local coordinated as soon as possible of this change. If your point cannot be accessed due to overgrown vegetation or flooded trails, call your coordinator as soon as possible so trails can be cleared for your next visit, or a new point can be created.

Something came up and I won't be around for a survey: Contact your local coordinator as soon as you know you won't be available so a replacement can fill in. **It is very important you tell us as soon as possible.**

I think I saw a target species but I'm not sure: If you cannot confirm your ID, do not mark it in your data sheet, you may leave a note in the comments about your sighting.

Optional: Territory Maps

When you encounter more than one individual of the same species on the same survey, you may differentiate them by a letter code that you can record on a map of your site. This is only to help you differentiate between individuals, especially when you may encounter the same individual at more than one point.

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. Keep this data hidden until all surveys have been completed for the year.

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

Quick Daily Checklist

- Equipment checklist
  - Personal equipment
    - Phone
    - Phone charger
    - Binoculars
    - Snacks and 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
      - Copy of any permits, if applicable
      - Pen/pencil
  - 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 distance category for focal species detections
  - After surveys are completed, double-check that data sheets are completely filled out, look for cells with missing data
  - Record your time in the field and sign off on your timesheet
- **When you return from the field:**
  - After double-checking your data, scan or take a picture with your phone of **ALL completed datasheets**, including any territory maps, summary sheets and time sheets, and email the scanned documents to your coordinator