

# **Great Lakes Coastal Wetland Monitoring Program**

## **Standard Operating Procedure**

### **Bird Survey**

**Synopsis: A standardized method for collecting bird data according to Great Lakes Coastal Wetland Monitoring Program protocols**

Last updated April 5, 2019

## Wetland Bird Survey Standard Operating Procedures

1. Samples: The bird survey will be conducted twice at each point (2 samples).
  - a. Surveys will be conducted during the period of 20 May through 10 July (the breeding period). Surveys in the southern portions of the Great Lakes can start at the earliest date, while the northernmost portions of the Great Lakes (northernmost third of Lake Superior) can be delayed until the first week of June if necessary.
  - b. At each site, one sample will be a morning survey and the other will be an evening survey. See 3a and 3b for sampling times.
  - c. Samples will occur no closer than 15 days apart.
2. Survey weather
  - a. Surveys should only be conducted when the wind strength is less than 4 on the Beaufort wind scale (i.e. wind <15 mph or <20 km/h) and when there is little or no precipitation.
  - b. If the precipitation is heavier than a drizzle, you should discontinue the survey. Moderate to heavy rainfall will decrease bird vocalization and other activity levels.
  - c. The decision to discontinue a survey due to wind is complicated by the fact that winds often gust at coastal wetlands, making survey conditions periodically unacceptable and calm soon after. The decision to conduct or cancel a survey under these conditions is made at the discretion of the field crew leader.
  - d. Do not survey when weather conditions affect the birds' singing. The question underlying this decision is: Are there noticeably fewer birds singing as a result of the weather? If so, you should discontinue the survey.
  - e. In addition to the weather data, be sure to provide comments on the data sheet if a survey is conducted during questionable weather.
3. Sample periods
  - a. Be sure to get accurate sunrise & sunset times for your location. Weather Underground ([www.weatherunderground.com](http://www.weatherunderground.com)), [www.sunrisesunset.com](http://www.sunrisesunset.com) and other online sites are good places to look. There are also free apps available for smart phones where you can obtain the information for your location.
  - b. Morning surveys: sampling begins ½ hour before sunrise and ends 4 hours after sunrise. For example, if sunrise is 04:45, the sampling period is 04:15 to 08:45.
  - c. Evening surveys: sampling begins 4 hours before sunset and ends ½ hour after sunset. For example, if sunset is 21:00, the sampling period is 17:00 to 21:30.
4. Wetland sites & sample points
  - a. A wetland site can contain from 1 to 8 bird sample points.
  - b. Sample points
    - i. Points are separated by a minimum of 250 meters.
    - ii. Points shall be identified and recorded using the following namingscheme:
      1. [taxa-group] [wl-number]. [point-number]  
e.g. AB0536.1 or B9424.2 or AB0643.3
      2. **taxa-group**: one of the letters A or B for Anurans or Birds, respectively, or a combination like 'AB' if the point applies to both taxonomic groups. Keep multiples in alphabetical order, e.g., AB.

3. **wl-number:** the wetland number, the four-digit number identifying the site (use zeros in front to make up four digits).
4. **point-number:** when there are multiple points at a particular wetland site, use a period and then digits after the wl-number to distinguish them. For example, four points at a wetland should be labeled as follows. Note that two of them are also points for amphibians:
  - a. AB5089.1 (surveyed birds/anurans)
  - b. B5089.2 (surveyed for birds only)
  - c. AB5089.3 (surveyed birds/anurans)
  - d. B5089.4 (surveyed for birds only)

*Note that point names should be incremented as 1, 2, 3, etc. but that there is only ONE point 1, ONE point 2, ONE point 3, etc. even if the taxagroup identifier changes.*
- iii. If the point location is already loaded onto the GPS unit:
  1. If the point in the GPS unit was collected in the field: this is the final point location. Proceed to the provided point location.
  2. If the lab generated the point from GIS data: this pre-identified point location may need to be altered slightly in the field due to access considerations and to effectively view the survey area. Save coordinates for any modified point location into your GPS unit.
- iv. If the point location needs to be determined, locate the point according to point selection protocol. Be sure to save it into your GPS unit as a waypoint, using the appropriate naming scheme (see above).
- v. All points, including the latitude and longitude, must be marked on the field maps, and notes such as how to locate the point or access notes must be recorded.
- c. Full-circle sample points will be used, with distance intervals at 0-50 meters, 50-100 meters and 100+ meters from the observer, as well as a line delineating the 180° semicircle areas in front of and behind the observer.
5. Recording of habitat data. **Note that this was dropped as an activity in 2017 and was replaced by a more efficient process used by the Great Lakes Marsh Monitoring Program.**
6. Conducting the survey
  - a. Before beginning the survey, fill out the following:
    - i. Point ID: Each point has an associated ID.
    - ii. Sample: 1 or 2. Each point will be visited 2 times.
    - iii. Date: Format of MM/DD/YYYY (05/04/2011).
    - iv. Observer: Observer first initial and last name (D.Waters).
    - v. Weather: Circle the appropriate description: dry, damp/haze/fog, drizzle or rain.
    - vi. % Cloud Cover: Estimate the percentage of cloud cover in 10% increments.
    - vii. Wind
      1. Beaufort wind scale codes (see chart below).
      2. Only codes 0-3 are acceptable conditions for conducting the survey.
    - viii. Air Temperature
      1. Take at chest height in the shade.
      2. Record in °Celsius. See the conversion chart on the Reference Sheet if needed.
    - ix. Noise: Assign and record the appropriate background noise code (see chart below).

- x. Bearing: Take the directional bearing while facing forward (toward the wetland, if you are not surrounded by wetland). Face the same direction for each subsequent bird survey for comparability.
- xi. Waypoint: For every bird survey, a waypoint must be marked with a GPS unit and recorded on the field data form (including geospatial coordinates) in order to verify the correct location, date, and time. Waypoints must be named using the naming scheme below. *(It is imperative that the waypoint recorded on the data form matches the waypoint name recorded on the GPS receiver.):*
  - 1. Bird Morning: AB1101.1.BM (B=bird, M=morning)
  - 2. Bird Evening: AB1101.1.BE (Bird=bird, E=evening)

**BEAUFORT WIND SCALE**

0	Calm; smoke rises vertically
1	Light air movement; smoke drifts; leaves barely move
2	Slight breeze; wind felt on face; small twigs move
3	Gentle breeze; leaves & small twigs in constant motion
4	Moderate breeze; small branches moving, raises dust & loose paper
5	Large branches & small trees sway

**NOISE CODES**

0	No appreciable effect (owl calling)
1	Slightly affecting sampling (distant traffic, dog barking, car passing)
2	Moderately affecting sampling (distant traffic, 2-5 cars passing)
3	Seriously affecting sampling (continuous traffic nearby, 6-10 cars passing)
4	Profoundly affecting sampling (continuous traffic passing, construction noise)

- d. Conduct the survey.
  - i. Fill in the Start Time.
    - 1. Record in 24-hour format (8:43am is 0843; 2:56pm is 1456).
    - 2. Circle CDT (Central Daylight Time) or EDT (Eastern Daylight Time) accordingly.
  - ii. Start stopwatch or set timer. Alternatively, if using the full 10 minute-duration call broadcast CD/sound file, press play on the broadcast unit and turn the volume down until the actual broadcast calls play.
  - iii. Each sample is broken down into 2 time periods:
    - 1. 0-5 minutes: passive listening (0:00 to 5:00)
    - 2. 5-10 minutes: broadcast and passive listening (5:00 to 10:00). Note that the point count duration was changed in 2019 from 15-min to a 10-min count. See full justification in the GLCWM QAPP as modified in 2019.
  - iv. Broadcast
    - 1. See 5b for broadcast equipment recommendations. Equipment must be capable of broadcasting at an 80dB level with minimal distortion and/or noise.
    - 2. Use the decibel meter before beginning the first survey each day to determine the speakers are projecting at 80db at 1m distance from the speaker. Adjust volume as necessary. Check the box at the top of the data sheet when completed.
      - i. If you are using the full 10-minute sound file and will turn the volume down during the non-broadcast portion of the clip, make note of the volume level the sound system must be at to achieve 80dB broadcast and return it to that position before the broadcast begins.

- ii. If you are using the 5-minute broadcast-only sound file, be sure to turn it on at 5:00 and allow it to play through all five broadcasts.
- 3. Hold the speaker(s) above the level of vegetation (or as high as possible) and broadcast in the direction of the bearing you recorded.
- 4. Broadcast order: the following compilation will be provided in one audio file (mp3 format or on a CD).
  - i. 30 seconds LEAST BITTERN (LEBI)
  - ii. 30 seconds silence
  - iii. 30 seconds SORA (SORA)
  - iv. 30 seconds silence
  - v. 30 seconds VIRGINIA RAIL (VIRA)
  - vi. 30 seconds silence
  - vii. 30 seconds COMMON MOORHEN (COMO)
  - viii. 30 seconds silence
  - ix. 30 seconds PIED-BILLED GREBE (PBGR)
  - x. 30 seconds silence
- e. Record the bird observations data
  - xii. Each individual bird observed must be recorded, whether you were able to identify it or not. Individuals which cannot be positively identified should be recorded as unidentified (i.e. unidentified sparrow, unidentified woodpecker...see Reference Sheet for alpha codes). The inability to identify every individual bird is expected. What is not acceptable, however, is not recording individuals you are unable to identify—this can greatly affect survey results.
  - xiii. Record the 4-letter alpha code for the species of the individual at the corresponding spatial location on the data sheet. The alpha codes can be found on the Reference Sheet. NOTE: It is important to record observations within the lines (DO NOT WRITE ON ANY LINE) so it is clear in which distance interval the observation belongs, or whether it is in the “front” 180° semi-circle or the “back” semi-circle.

Example:

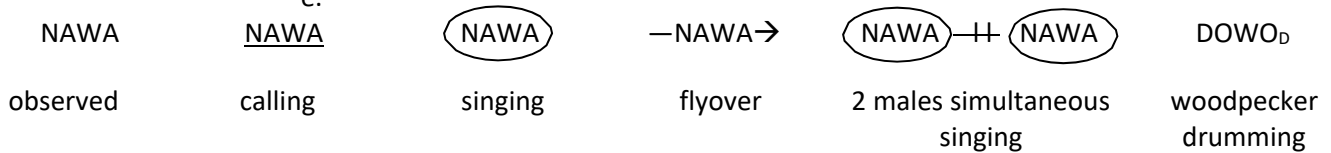
INCORRECT

CORRECT

- xiv. Record the behavior of the individual. Notation is listed below and on each data sheet. For instance, if it was singing, circle the alpha code; if it was calling, underline it. “Observed” means you saw the bird and it wasn’t doing anything else such as calling, singing, calling or drumming. NOTE: record the “highest” level of observation. For instance, if a bird is first observed calling and later sings, record that observation as singing.

1. The order of observations is as follows (highest to lowest):

- a. 2 males simultaneous singing
- b. Singing/woodpecker drumming
- c. Calling
- d. Observed (sight only)
- e.



xv. Record the minute in which each bird was first detected by using a superscript after the alpha code. The notation is listed below and on each data sheet.

Time Codes (superscript):      0-1 minutes<sup>0</sup>      1-2 minutes<sup>1</sup>      2-3 minutes<sup>2</sup>      ... 9-10 minutes<sup>9</sup>

Examples:

NAWA <sup>2</sup>	YWAR <sup>8</sup>	SWSP <sup>3</sup>	AMRO <sup>9</sup>
Nashville Warbler first detected in minute 2 (from 2:00 to 2:59)	Yellow Warbler first detected in minute 8 (from 8:00 to 8:59)	Swamp Sparrow first detected in minute 3 (from 3:00 to 3:59)	American Robin first detected in minute 9 (from 9:00 to 9:59)

- 1. For focal species only, record ALL time periods the bird is detected in, using commas to separate the numbers in the superscript.
- 2. Focal species are listed below and on each data sheet.

Focal Species	
AMBI	American Bittern
AMCO	American Coot
KIRA	King Rail
COMO	Common Moorhen
BLRA	Black Rail
LEBI	Least Bittern
PBGR	Pied-billed Grebe
SORA	Sora
VIRA	Virginia Rail
YERA	Yellow Rail

Examples:

PBGR <sup>2,5,9</sup>	VIRA <sup>4,5</sup>	AMBI <sup>1,7,8,9</sup>
Pied-billed Grebe observed during minutes 2, 5, & 9	Virginia Rail observed during minutes 4 & 5	American Bittern observed during minutes 1, 7, 8 & 9

xvi. Record the breeding evidence code by using a subscript after the alpha code. The most common breeding evidence codes can be found on the data sheet; more can be found, along with descriptions, on the Reference Sheet. Record the “highest” level of breeding evidence. For instance, if a bird is first observed doing a distraction display and later you see it occupying a nest, record it as occupied nest. This is a definite breeding observation, whereas a distraction display is a probable breeding observation.

Examples:

TRES <sub>ON</sub>	MOWA <sub>NB</sub>	RWBL <sub>FY</sub>
Observed an occupied nest cavity of a Tree Swallow (adult seen entering/exiting)	Observed a Mourning Warbler building a nest	Observed a Red-winged Blackbird carrying food for young

xvii. If the bird moves to a different location, record the movement with an arrow from the original location to the new location and record a dot (.) at the new location. NOTE: This is for your own reference ONLY. When entering the data, only the location where the bird was originally detected will be entered.

Example:



xviii. If a bird is detected at multiple points (i.e. at points 4567a, 4567b & 4567c), record it on the data sheet for each of the points. Record the observation on the data sheet at the point where the bird is closest to the observer and make a note, “This bird was also detected at points # and #, closest HERE.” For all others, record the observation and make a note, “This bird was detected at points # & #, closest at #.”

Examples:

AMBI<sup>5,6,8</sup>

This bird was also detected at points 4567a & 4567b, closest HERE.

AMBI<sup>12,13</sup>

This bird was also detected at points 4567a & 4567c, closest at 4567c.

xix. Birds in a single species flock should be recorded with the number of individuals in parentheses in front of the species code. For example, a flock of 27 Double-crested Cormorants flying over would be recorded as:

(27) DCCO→

xx. Document all aerial foragers both inside and outside the 100-meter boundary of the station. Record the species code in the Aerial Foragers box, use the tally box to keep track of them and at the end of the survey period provide a total for each species for the entire 10-minute sampling period. Time codes, location, or breeding evidence codes are not required.

1. This box is for aerial foragers that ARE ONLY aerial foraging; if an aerial forager species lands or is using the landscape for nesting, etc, it should be recorded as such on the spatial mapping portion and not recorded as aerial foraging.
2. A bird that is aerial foraging is using the airspace above the territory for foraging, catching insects in the air, using the airspace for fishing (terns), etc. It is different from a flyover in that a bird flying over the territory is traveling, not foraging.

Example:

Aerial Foragers		
<i>species</i>	<i>tally</i>	<i>total</i>
TRES	III	3
CLSW	22, 9, 11	42

x. Water Temp

1. After the survey, and if standing water is present and accessible, take a water temperature measurement 1 m from the margin at 2 cm depth, where safe to do so. Record in °Celsius. See the Reference Sheet for a conversion chart from °F to °C.

7. Data Management

- a. Crews will check over data sheets after each survey, checking that all fields have been filled in, filled in properly and for readability.
- b. Data sheets must be kept in a secure location, preferably with the crew at all times (in the car when surveying; in the motel at night).



- c. Crews are encouraged to enter data into the online database as often as possible; on a daily basis is preferred.
  - d. Recommended prep for entering data:
    - i. Using a red ultra-fine sharpie marker, number each species code/observation in sequential order on the data sheet. This method allows you to easily follow along the numbering system during actual entry into the database and helps to eliminate mistakes.
  - e. Waypoints should be uploaded into the database on a weekly basis during the field season, even if this means that some points get uploaded many times into the system. This way the database managers can check throughout the season for upload errors and these can be corrected as they arise. Waypoints should also be uploaded a final time at the end of the season to ensure that all points created during the season are in the database. This can be done by connecting your GPS unit to the computer, downloading the .gpx file of waypoints from the device, and uploading a .gpx file to the CWMP – GPS File Upload site <[https://www.greatlakeswetlands.org/DataEntry/gps\\_upload.vbhtml#>](https://www.greatlakeswetlands.org/DataEntry/gps_upload.vbhtml#>). Provide a descriptive name for the file in the format of “Bird-Anuran points YOUR TEAM NAME\_TODAY’S DATE”. For example, “Bird-Anuran points\_Niemi\_20180612” would be used for waypoints uploaded by the Niemi team on June 12, 2018.
  - f. Note that Version 1.1 of the GPX file conversion must be used. The upload tool will not accept GPX Version 1.0 and will tell you so. There is an on-line upload tool to convert version 1.0 to version 1.1 – e.g., [http://www.gpsvisualizer.com/convert\\_input](http://www.gpsvisualizer.com/convert_input).
8. Safety, Materials & Equipment
- a. Because bird surveys are being conducted during daylight hours, observers may survey alone but are required to check in with their field crew leader on a daily basis. Field crew leaders will work out a feasible daily check-in system with their crew to ensure safety in the field.
  - b. This survey is a single observer protocol. Any person that may accompany the observer is not to influence the survey in any way.
  - c. Each team will be equipped with the following:
    - i. Data sheets
    - ii. Standard Operating Procedures
    - iii. Reference Sheet
    - iv. Clipboard
    - v. Waterproof, permanent pens/markers (Rite in the Rain pen, ultra-fine tip Sharpie marker)
    - vi. Stopwatch/timer
    - ix. Compass
    - x. Thermometer, in metal or plastic case
    - xi. Mp3 player – recommended: Sansa Clip (2GB is sufficient) or portable CD player
    - xii. Speaker – recommended: iMainGo 2 Handheld Speaker Case (available on Amazon)
    - xiii. Decibel meter – recommended: Pyle PSPL01 Mini Digital Sound Level Meter (available on Amazon)
    - xiv. Atlas (road map book)
    - vii. Site/point map(s)
    - viii. GPS unit, with points loaded
    - ix. Headlamp
    - x. Pepper spray (DO NOT attempt to cross the international border with this item)
    - xi. Extra batteries
    - xii. Each crew will carry spare equipment and materials

**BIRD MONITORING**  
Field Data Sheet  
2019

broadcast volume at 80dB, checked today

Point ID:
Sample:
Date: / 2019
Start Time: CDT EDT
Observer:

Weather: Dry Damp/Haze/Fog Drizzle Rain	Waypt:
% Cloud Cover:	Wind:
Air Temp: °C	Water Temp: °C
Noise:	Lat: Lon: <small>(in decimal degrees)</small>
	Rec #:

Behavior: NAWA singing    NAWA calling    -NAWA→ flyover    NAWA observed    NAWA ++ NAWA 2 males simultaneous singing    DOWO<sub>D</sub> woodpecker drumming

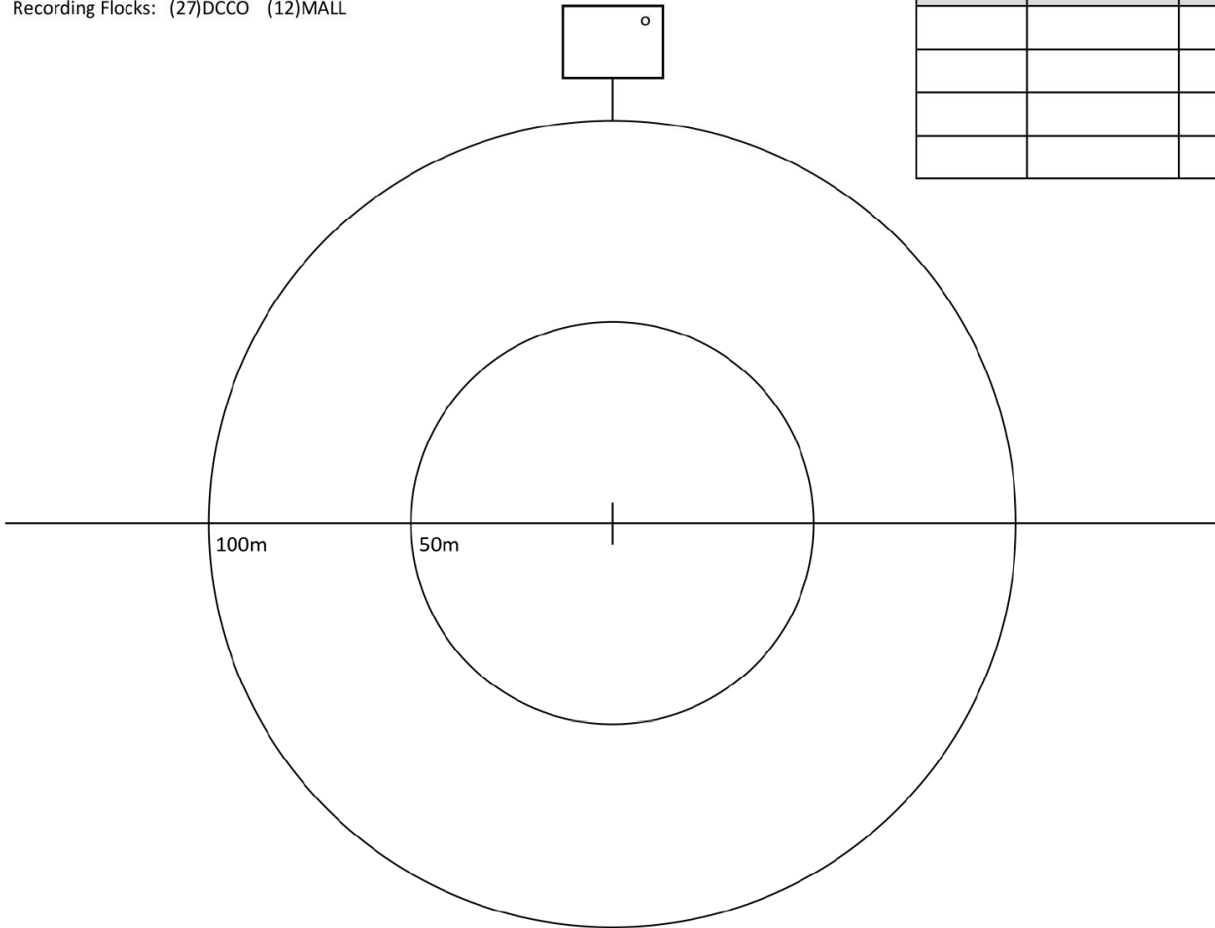
Focal Species record ALL time periods				
AMBI	KIRA	PBGR	COMO	VIRA
AMCO	LEBI	SORA	BLRA	YERA

Time Codes (superscript): 0-1 minutes<sup>0</sup> 1-2 minutes<sup>1</sup> 2-3 minutes<sup>2</sup> ... 9-10 minutes<sup>9</sup>

Breeding Evidence Codes (subscript): NAWA<sub>ON</sub> occupied nest    NAWA<sub>CN</sub> carrying nest material    NAWA<sub>NB</sub> nest building    NAWA<sub>DD</sub> distraction display    NAWA<sub>FY</sub> feeding young

Recording Flocks: (27)DCCO (12)MALL

Aerial Foragers (inside & outside 100m)		
species	tally	total



1st data entry (signature): \_\_\_\_\_

Comments:

2nd data entry (signature): \_\_\_\_\_

Notes for data entry system:

1. Site List: drop down list of all possible wetland site numbers
2. Point ID
3. Entry: First or Second data enterer
4. Waypoint – **record the latitude and longitude on the field sheet.**
5. Sample: drop down list (1-3)
6. Date: enter MM/DD/YYYY
7. Start time: 4 digits, no need for a “:”; drop down menu for CDT or EDT
8. Crew Code: crew's team; e.g., NRRI, CMU
9. Observer (First initial & full last name with no spaces)
10. Weather: drop down list (see protocol or data sheet)
11. Cloud %: 10% increments
12. Air Temp (Celsius)
13. Noise: drop down list (0-4)
14. Wind: drop down list, Beaufort Scale (0-4)
15. Water Temp (Celsius)
16. Bearing (0-360)
17. Comments
18. QA Complete: when QA has been verified on the basis of matching duplicate entries (this field is read only)
19. Aerial Foragers? (yes/no)
  - a. If yes, need to enter those sample records
    - iv. Species (4-letter code; code list on reference sheet)
    - v. Total (number of individuals)
  - b. If no, go on to entering sample records from the spatial mapping area
20. Sample records (for each observation in the spatial mapping area):
  - a. Number of individuals: (single-species flocks only)
  - b. Species code: drop down list (4-letter code, code list on reference sheet)
  - c. Behavior code: drop down list (list in protocol)
  - d. Breeding evidence code: drop down list (list on reference sheet)
  - e. Time code(s): at least one code, could be up to 10 codes (0-9)
  - f. Distance interval: drop down list (0-50, 50-100, 100+)
  - g. Location compared to observer (check box for “within front 180° semicircle”)