# GREAT LAKES COASTAL WETLAND MONITORING PROGRAM

Anuran Survey Standard Operating Procedures

MARCH 30, 2021

# Table of Contents

1. Wetland Sites & Survey Points
    a. Sampling Criteria
        i. It is imperative to ensure that the wetland site is suitable for surveying. This is normally reviewed prior to inclusion in the list of sites to be sampled, but sometimes conditions may have changed due to construction or high/low water levels. Wetlands that are suitable for sampling should meet the following criteria: 1) 4 ha or larger in size; 2) have a direct, obvious surface water connection to a Great Lake or connecting channel at least every year or so; 3) be close enough to that lake or connecting channel to be influenced by it (e.g., seiches); and 4) contain herbaceous or standing-water wetland zones.
        ii. The area within 100 m surrounding survey points should contain at least some herbaceous floating or above water (emergent) wetland vegetation. A more detailed description of acceptable habitat surrounding anuran survey points is being developed.
        **iii.** Wetland sites that have excessive forested or shrub habitat (e.g., >50%) should not be sampled; however, note that many wetlands have trees or shrubs occasionally present within the emergent vegetation or have woody vegetation encroaching on the emergent wetland area. This can also be the case with patches of trees or shrubs on the edge of a wetland or small islands within the wetland. Most of these are perfectly acceptable to sample as long as the forest or shrub are not the dominant habitat. At least some herbaceous floating or emergent wetland vegetation should be present.
        iv. Good judgment is required to determine whether a wetland is suitable, but we want to avoid sampling purely shrub or forested habitat. If there are questions, field personnel should take photographs, carefully document what they see, and contact their PI or field crew coordinator for another opinion. Often judgments can be made from remote sensing imagery.
        v. **If the point location is not near or adjacent to appropriate wetland habitat (e.g., completely forested or shrubby), do not sample the point and note this in the online site database and update the site status accordingly.**
        vi. NOTE: It is important to remember that 'benchmark' sites are exempt from meeting these conditions and should be surveyed regardless of habitat condition.
    b. Establishing Point Count Locations
        i. If point locations have been established at a wetland site in previous years and spatial coordinates were collected via a GPS unit, these locations should be considered the 'Master' point count locations for a given wetland and should be sampled in all subsequent visits and years (e.g., site 1101 has 4 point count locations: AB1101.1, B1101.2, AB1101.3, AB1101.4).
        ii. 'Master' points may need to be moved or skipped during subsequent visits or years for the following reasons:
            - A point becomes 'drowned-out' due to high water (See Appendix A). Or a point becomes too dry due to low water.

- A point is no longer accessible (e.g., not safe to visit, no longer granted access permission from landowners, road closure).

iii. If 'Master' points need to be moved, they should be moved according to these rules:

a. The location of the moved point should meet the sampling criteria (as defined above) while still maintaining minimum required distances between other point locations already established within the wetland (i.e., at least 250 m apart for birds, at least 500 m for anurans).

b. If a point can be moved closer to available emergent vegetation that is within 100 m of the 'Master' point: KEEP the original site name and number (e.g., 'Master' point AB1101.1 remains AB1101.1).

c. If the point must be moved >100 m from the 'Master' point and emergent vegetation is present and accessible between 100-250 m from the 'Master' point: RENAME the point by adding an 'M' after the point ID to indicate the point has been moved (e.g., AB1101.1M).

d. If the closest emergent vegetation is present and accessible >250 m from the 'Master' point then: CREATE an entirely new point number (e.g., AB1101.5).

e. If no submerged, floating, or emergent vegetation exists due to being 'drowned-out' <u>you can still conduct the survey</u> at the 'Master' point location but need to specify it was drowned-out on the data sheet and in the data entry portal. If you decide not to sample the point, write down on the data sheet that the point was not sampled and why and that conditions could not be met to establish a new point in its place.

iv. NOTE: Maintaining the 'Master' point is the priority. If you cannot move a point, even if suitable habitat is available to sample because it would violate minimum distance between previously established points, it should be excluded from being sampled in a given visit or year.

v. When returning to a wetland in subsequent years, the observer should always try to return to the 'Master' point if accessible and meets sampling criteria.

vi. If unsure where to conduct a survey at a given wetland or point count location, contact your field crew leader or PI to determine where the sampling location should be placed and how it should be named prior to conducting the first survey.

vii. If a wetland is being sampled for the first time, establish points according to point selection protocol. Save the point to your GPS unit as a waypoint, using the appropriate naming scheme (see 1c).

- All points, including the latitude and longitude, must be marked on the field maps, and notes on how to locate or access the point must be recorded.

c. Naming Survey Points

i. A wetland site generally contains 1 to 6 anuran survey points, depending on wetland size and accessibility, but it is acceptable to sample additional points if desired or there is a special need.

ii. Points are separated by a minimum of 500 m.

iii. Points shall be identified and recorded using the following naming scheme:

**[taxa-group] [wl-number]. [point-number]**
e.g. AB0536.1 or B9424.2 or AB0643.3

1. **taxa-group:** the letter B for bird-only point count locations or a combination 'AB' if the point applies to both taxonomic groups. Keep multiples in alphabetical order (i.e., AB).
2. **wl-number:** the wetland number is the four-digit number identifying the site (use zeros in front to make up four digits; e.g., site 792 should be 0792).
3. **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 anurans:
   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 taxa-group identifier changes.*

2. Recording Habitat Data
   a. Habitat data will be collected during bird surveys during daylight hours, not during anuran surveys.
3. Field Training and Certification Requirements

Personnel hired to conduct anuran surveys will have demonstrated their proficiency in aural identification of anuran species and will be familiar with all survey and safety protocols prior to conducting any field work.

a. Field Training
   i. Anuran field training will be provided by regional team leaders.
   ii. Training involves instructing crews on how to conduct standardized field surveys, basic travel procedures, and appropriate field safety measures.
   iii. Individuals are trained to proficiently complete field data sheets.
   iv. Rules for site verification, safety issues, GPS and compass use, and record keeping are also included in field training to ensure guidelines in the QAPP are being followed.
   v. Prior to field training sessions, candidate observers will be provided with audio files or web links to frog and toad vocalizations to familiarize them with species prior to taking the online test.
   vi. Upon completion of field training, in addition to passing the required test to demonstrate proficiency in species identification, observers should also be able to demonstrate proficiency in safely navigating to the correct survey location, properly recording the survey location using a handheld GPS unit, and properly filling out a field data sheet.

b. Certification Requirements
   i. All individuals involved in conducting anuran surveys must pass an online test verifying they can identify anuran species (frogs and toads) that may be breeding in the Great Lakes basin (See Appendix B) by vocalizations. This testing system was developed at the University of Wisconsin Green Bay by Dr. Howe to be an objective, secure online training and testing platform modified to target anuran and bird species breeding in the Great Lakes basin.
   ii. Rules that apply to the online test are as follows:
      1. A field observer must be certified *before conducting any surveys.*
      2. A field observer is allowed to retake a test a maximum of 3 times with a minimum of 1 day between subsequent tests.
      3. All field observers must pass the anuran certification test (audio only) before they collect data.
      4. If a field observer has passed the certification process, they are not required to take the test again, even if surveying in subsequent years.
   iii. Certification Instructions: How to take CWMP anuran certification tests
      1. Go to the following website: http://www.birdercertification.org/GreatLakesCoastal/
      2. Register (if you have not previously done so) by clicking 'Registration/Login' and filling in the necessary information.
      3. If required, sign in at the website again.
      4. You will be asked to enter a 'test entry code' which you should obtain from your PI or field crew coordinator.
      5. You should now be logged in. Next select to take the frog audio test to become a certified anuran observer.
      6. Note: The frog visual test is no longer required for certification.
   iv. To become a certified anuran observer, you must correctly identify 15 of 16 species on the audio test.
   v. If you have questions about the certification process, please contact Erin Giese (giesee@uwgb.edu).

4. Survey Timing
   a. The calling survey for anurans will be conducted three times (3 samples) per point. Surveys should occur within a reasonably short period of time after the minimum nighttime temperature has been reached.
      i. 1st Survey: nighttime temperatures have reached 5°C / 41°F
      ii. 2nd Survey: nighttime temperatures have reached 10°C / 50°F
      iii. 3rd Survey: nighttime temperatures have reached 17°C / 63°F

**Note:** For the first round of sampling, the appropriate nighttime temperature threshold should be reached for several days prior to surveying AND needs to ensure that early breeding anurans have begun calling before conducting the survey so that it adequately detects early breeding

species (e.g., wood frogs). Use common sense. In northern regions, after the nighttime temperatures have been reached, it is possible to complete the survey if nighttime temperatures are lower than the threshold IF anurans are calling. Additionally, in the case of the 2nd and 3rd surveys, not all sites (especially in northern regions) will reach the corresponding temperature thresholds for each survey period. In these situations, it is acceptable to conduct surveys 2 & 3 before temperature thresholds have been reached, once the minimum number of days between surveys has been reached. **However, these surveys should be conducted as late in the season as is logistically feasible to ensure that warmer season anurans are adequately surveyed.**

b. Be sure to get accurate sunset times for your location. Weather Underground (www.weatherunderground.com), www.sunrisesunset.com, and other online sites are good sources to check. Many GPS units have a sunrise/sunset app, and there are also free apps available for smart phones where you can obtain the information for your exact location.
   i. Surveys begin ½ hour after sunset.
   ii. Surveys end 4 ½ hours after sunset.
   iii. Example: if sunset is 9:40 pm, surveys can begin at 10:10 pm and continue to 2:10 am. This results in 4 hours of possible surveying time.

c. Surveys will occur no closer than 15 days apart.

5. Survey Weather
   a. Surveys should occur on evenings with little or no wind and in accordance with minimum nighttime temperatures.
   b. Mist or light rain conditions are acceptable for conducting surveys as long as it does not affect an observer's ability to hear.
   c. Do not survey when weather conditions affect the anuran calling. The question underlying this decision is: Are there noticeably fewer anurans calling as a result of the weather? If so, you should discontinue the survey and return during acceptable conditions.
   d. In addition to the weather data, be sure to provide comments on the data sheet if a survey is conducted during questionable weather.

6. Conducting the Survey
   a. At each station, your arrival may cause a decrease in the number of anurans calling. Wait quietly for 1-2 minutes before beginning the survey. Headlamps should be pointed at the data sheet instead of into the wetland or the red light setting should be on prior to and during the survey to avoid influencing the calling behavior of anurans.
   b. While waiting to begin the survey, fill out the following information:
      i. **Point ID:** Each point has an associated ID.
      ii. **Sample:** 1, 2, or 3. Each point will be visited 3 times.
      iii. **Date:** Format of MM/DD/YYYY (05/04/2011).
      iv. **Observer:** Observer first initial and last name (J. Doe).
      v. **Weather:** Circle 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, however it is acceptable to survey during conditions with a steady code of 3 and gusts of 4 (given sites are located in coastal wetlands).

viii. **Air Temperature:**
   1. Take at chest height.
   2. Record in °Celsius.

ix. **Noise:** Assign and record appropriate background noise code (see chart below). All noise codes are acceptable to survey in, as long as the noise source is unrelated to weather.

x. **Bearing:** Take the directional bearing while facing forward (toward the wetland). If you are surrounded by wetland, a bearing direction should be chosen and maintained for each subsequent anuran survey for comparability, even if surveyor is surrounded by wetland.

xi. **Waypoint:** For each anuran 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 of survey. Waypoints must be named using the naming scheme below. ***It is imperative that the waypoint recorded on the data form match the waypoint name recorded on the GPS receiver for future data processing***:
   1. Round 1 Anurans: AB1101.1.R1
   2. Round 2 Anurans: AB1101.1.R2
   3. Round 3 Anurans: AB1101.1.R3

c. Full-circle survey points will be used, with distance intervals at 0-50 m, 50-100 m, and >100 m from the observer, as well as a line delineating the 180° semicircle areas in front of and behind the observer.

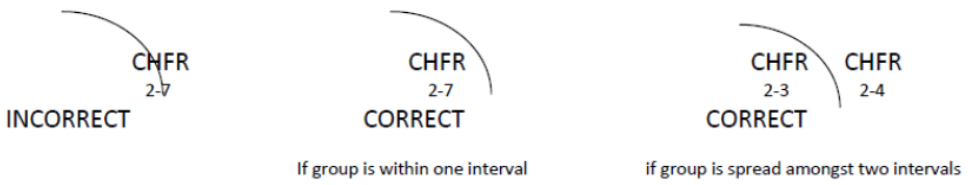
| BEAUFORT WIND SCALE | |
|---|---|
| 0 | Calm; smoke rises vertically |
| 1 | Light air movement; smoke drifts; leaves barely move |
| 2 | Slight breeze; wind felt on face; small twigs move |
| 3 | Gentle breeze; leaves & small twigs in constant motion |
| 4 | Moderate breeze; small branches moving, 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. Just prior to starting the survey:
   i. Fill in the start time.
      1. Record in 24-hour format (8:43 am is 0843; 2:56 pm is 1456).
      2. Circle CDT (Central Daylight Time) or EDT (Eastern Daylight Time) accordingly.

e. Conduct the survey for 3 minutes.
   i. Start a stopwatch or set a timer (e.g., cell phone, GPS unit).
   ii. Use the appropriate 4-letter alpha codes for species observations. Individuals, small groups, and choruses are mapped spatially within the appropriate distance interval(s) on the field data sheet.
   iii. 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.
   iv. For full choruses in multiple distance intervals, record in each distance interval as appropriate.

   Examples:




   v. For each species detected (e.g., CHFR), record the calling code (1, 2, or 3) underneath the species code and then the number of individuals, separated by a hyphen, in all appropriate distance intervals (0-50 m, 50-100 m, >100 m).
   vi. In some cases, there may be more than one calling code (1 & 2) for a species identified within the same distance interval; these should be recorded separately on the field sheet and entered separately.
   vii. For full choruses (calling code = 3) it is impossible to estimate the number of individuals, so only record the calling code.

| Examples: | CHFR | SPPE | NLFR |
|---|---|---|---|
| | 2-7 | 3 | 1-1 |

| Calling Code | Description |
|---|---|
| 1 | Calls not simultaneous; individuals can be accurately counted |
| 2 | Some calls simultaneous; individuals can be reliably estimated |
| 3 | Full chorus, calls continuous & overlapping; not reliably estimated |

f. Water temperature:
   i. 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.

7. Data Management
    a. Crews will check over data sheets after each survey, checking that all fields have been filled in and written clearly 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 preparation 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.
    f. Waypoints can be uploaded 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 >. NOTE: This site can only be accessed if you are logged into the CWMP site as a user.
    g. When uploading waypoints, provide a descriptive name for the file in the format of "Bird-Anuran_Points_YourTeamName_TODAY'S DATE". For example, "Bird-Anuran points_Howe_20180612" would be used for waypoints uploaded by the Howe team on June 12, 2018 using the YYYYMMDD format (YYYY = 4-digit year, MM = 2-digit month, and DD = 2-digit day).
    h. 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 online upload tool to convert version 1.0 to version 1.1 – e.g., http://www.gpsvisualizer.com/convert_input.

8. Safety, Materials & Equipment
    a. Safety
        i. For reasons of safety at night, each anuran survey team should consist of two people; one certified observer and another 'ride-along' person, who does not need to be a certified observer.
        ii. This survey is a single observer protocol – the ride-along is not to influence the survey in any way.
        iii. If both people are qualified observers, it is acceptable to take turns conducting the surveys (i.e., the same observer does not need to conduct the survey at all points).
        iv. For reasons of driving safety and data quality, observers conducting anuran surveys will not then conduct a bird survey the following morning. It is acceptable to conduct anuran and evening bird surveys on the same day.

b. Materials & Equipment
    i. Each team will be equipped with the following:
        1. Data Sheets
        2. Standard Operating Procedures
        3. Reference Sheet Codes
        4. Clipboard
        5. Waterproof, permanent pens/markers (Rite-in-the-Rain pen, ultra-fine tip Sharpie marker)
        6. Stopwatch/timer
        7. Compass
        8. Thermometer, in metal or plastic case
        9. Atlas (road map book)
        10. Wetland site/point maps
        11. GPS unit with waypoints loaded
        12. Headlamp
        13. Pepper spray (optional) [DO NOT attempt to cross the international border with this item]
        14. Extra batteries
        15. First aid kit
        16. Spare equipment & materials

9. Data Entry

Below is a list of all of the information that will be required to enter data into the CWMP data entry portal. To access the data entry system, you must first log in to the online data entry system. If you are a new user, you can complete and submit a request form, which includes creating a user name and password for future use.

- **Site List:** drop down list of all possible wetland site numbers.
- **Point ID:** drop down list of all possible point count numbers (1 to 10) *includes any moved points as well (e.g., 1M, 2M).
- **Entry:** First or Second (to allow for double entry for QC measures). Only first entry appears in data download after passing QC.
- **Drowned-out wetland:** Check box to indicate whether or not a wetland is considered 'drowned-out'. Will be dropdown list (Yes, No, No Visual). See 1b and Appendix A for details.
- **Notes for drowned-out wetland case:** If wetland is considered to be drowned-out, you need to specify how this was determined. See Appendix A. for a description of notes required.
- **Waypoint:** Waypoint label specified on GPS. Should follow naming scheme described in SOP (e.g., B1234.2; NA if missing).
- **Latitude:** latitude that was recorded on field sheet.
- **Longitude:** longitude that was recorded on field sheet.

- **Sample:** drop down list (1 to 3).
- **Date:** enter MM/DD/YYYY.
- **Start Time:** HH:MM, 24-hour format (e.g., 23:43 or 11:45).
- **Time Zone:** drop down menu for Central or Eastern.
- **Crew Code:** team that surveyed the wetland. Drop down menu (BSC, CMU, NRRI, SUNY-B, UWGB).
- **Observer:** F. Lastname (e.g., J. Doe) with a space between the period and last name.
- **Weather:** drop down list (Dry, Damp/Haze/Fog, Drizzle, Rain).
- **Cloud %:** drop down list in 10% increments (0-100).
- **Wind:** drop down list (Beaufort Scale: 0-4).
- **Air Temp:** (in degrees Celsius).
- **Water Temp:** (in degrees Celsius). If unable to safely collect water temperature, write 'NA'
- **Noise:** drop down list (0-4).
- **Bearing:** compass bearing faced during point count survey (0-360).
- **Comments:** any comments related to the survey.
- **QA Completed:** a checkbox that verifies when QA has been completed on the basis of matching duplicate entries (this field is read only and will automatically become checked when double entries match). The person completing the second round of data entry should confirm this box has been checked, and if not, look for errors between entries, or notify PI if unable to determine reason QA box is not checked.
- **Observations**:
  - **Taxa:** drop-down list of (4-letter species code).
  - **Distance:** drop-down list (0-50 m, 50-100 m, >100 m).
  - **In Front?:** indicates whether observation occurred in front of observer (i.e., direction facing wetland) or behind observer (i.e., check box for "within front 180° semicircle").
  - **Amphibian Call Code:** drop down list (calling codes 1, 2, or 3); See SOP 5e. for details about calling codes.
  - **Individuals:** total number of individuals of given species detected (this will be blank with a calling code of 3).

10. Anuran Monitoring Field Data Sheet

ANURAN MONITORING
Field Data Sheet
2021

| | | | |
|---|---|---|---|
| Point ID: | | | |
| Sample: | | | |
| Date: / 2021 | | | |
| Start Time: CDT EDT | | | |
| Observer: | | | |

| | | | |
|---|---|---|---|
| Weather: Dry Damp/Haze/Fog Drizzle Rain | | | |
| % Cloud Cover: | | Wind: | |
| Air Temp °C | | Water Temp: °C | |
| Noise: | | | |

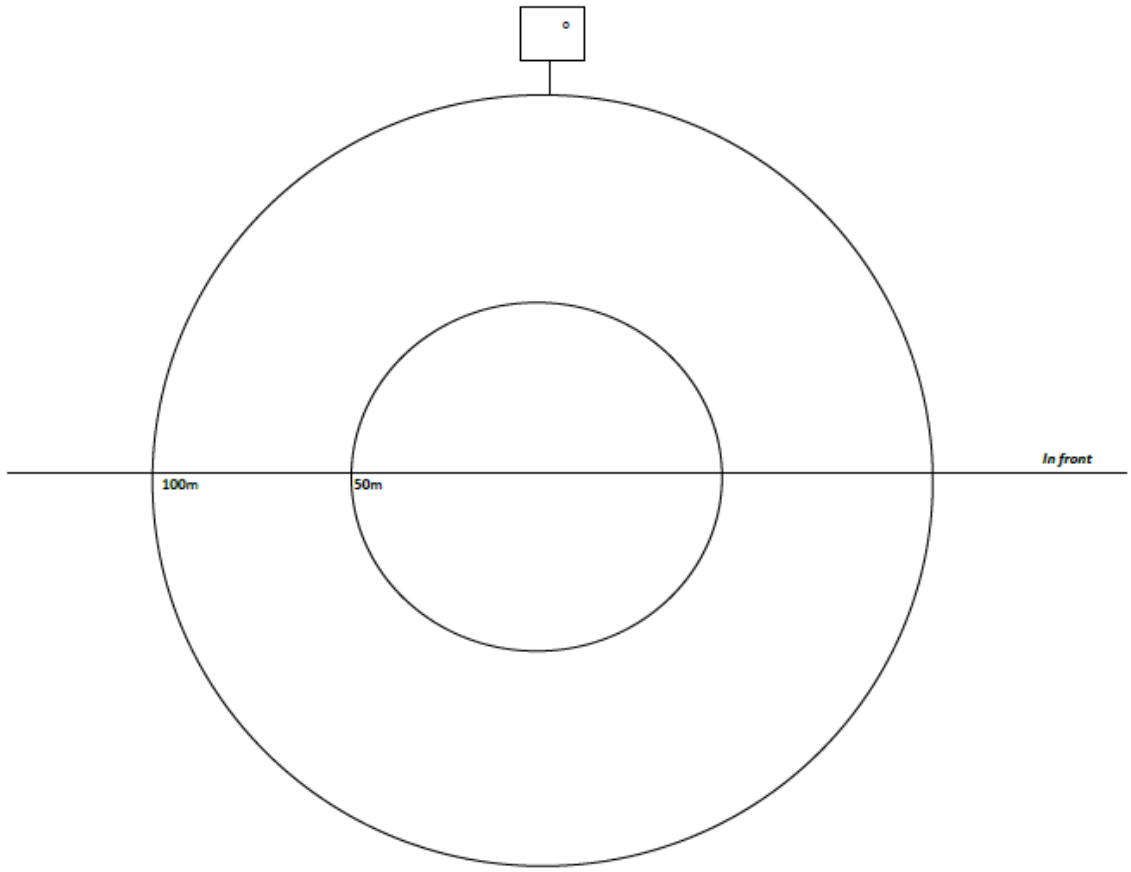
Waypt:
Lat:
Lon:
(in decimal degrees)
Rec #:

Observations:
CHFR
x-y

x = calling code (1,2, or 3)
y = number of individuals (1, or # >1; if small group of the same species are at the same location); leave blank for calling code 3

Examples: AMTO 1-2 CHFR 2-6 SPPE 3

| Calling Code | Description |
|---|---|
| 1 | Calls not simultaneous; individuals can be accurately counted |
| 2 | Some calls simultaneous; individuals can be reliably estimated |
| 3 | Full chorus, calls continuous & overlapping; not reliably estimated |




1st data entry (signature): _____

2nd data entry (signature): _____

Comments:

## Appendix A. 'Drowned-Out' Wetland Description for Bird & Anuran Sampling

**Importance of Designating "Drowned-Out" Wetlands**

Great Lakes water levels can fluctuate by a few centimeters across days or weeks or by over 1 meter across years due to precipitation, seiche, storms, and other climatic factors. During the 10-year sampling period (2011-2020), crews for the Great Lakes Coastal Wetland Monitoring Program (CWMP) have sampled during both record low and record high lake levels. Bird and anuran field teams have been conducting point counts at the same locations across years and thus points that were previously sampled in adequate vegetation during low lake levels (~2011-2015) may have become "drowned-out" or flooded with high water 5+ years later (~2016+). Because some analyses conducted using CWMP data may need to exclude data collected in "drowned-out" wetlands (e.g., indicator analyses) while others need to include those data (e.g., lake level community effects), it is important that each wetland point and site get flagged accordingly (i.e., as being "drowned-out" or not) for a sampling year.

**"Drowned-Out" Point Count Locations (within 100 m of the survey point)**

- Within 100 m of the survey point, a point is considered "drowned-out" when there is no emergent or floating vegetation at all and it is completely flooded by water. See example pictures below.

**"Drowned-Out" Wetland Sites/Complexes**

- A wetland site or complex is considered "drowned-out" when it is completely flooded by water, contains no emergent or floating vegetation, and if all point count locations within that site are "drowned-out."

**What to Do When Points/Sites Are "Drowned-Out"**

- See section 1b of SOP for instructions regarding moving and naming points that are drowned-out.
- For each point count location, enter the following information into the online CWMP data entry portal as to whether or not a point is considered "drowned-out" ("Yes," "No," or "No Visual") and provide supporting rationale/documentation (e.g., photos, point description). For example, in the notes section, you could state 'no suitable habitat available due to high water. Conducted survey at drowned-out point and created a new point in suitable habitat (>250 m from this point)'
- If all point count locations within a wetland site/complex are considered "drowned-out," record the status for that site as "Visit Reject" in the online site selection system. If you can sample emergent vegetation at just one point within a site, then record the status as "Sampled" in the online site selection system.

**Tips If View Is Obstructed or There Is Limited Information**

- Look at habitat forms, photographs, and notes taken at points.
- Ask multiple crew members; check if other taxa teams surveyed it or not.
- Scan to see if marsh-obligate birds or marsh-users were detected there.

## Appendix B. List of Anuran Species in the Great Lakes Basin

List of frog and toad species breeding in the Great Lakes basin and their associated 4-letter taxa code. Depending on your location, you will encounter some of the following species. See Birds Canada's Marsh Monitoring Program handbook for additional useful information about species distributions and phenology.

| Common Name | Taxa Code | Scientific Name |
|---|---|---|
| American Toad | AMTO | *Bufo americanus* |
| Fowler's Toad | FOTO | *Bufo woodhousei fowleri* |
| Gray Treefrog | GRTR | *Hyla versicolor* |
| Cope's Gray Treefrog | CGTR | *Hyla chrysoscelis* |
| Spring Peeper | SPPE | *Pseudacris crucifer* |
| Chorus Frog | CHFR | *P. triseriata & P. maculata* |
| Blanchard's Cricket Frog | BCFR | *Acris crepitans blanchardi* |
| Wood Frog | WOFR | *Rana sylvatica* |
| Northern Leopard Frog | NLFR | *Rana pipiens* |
| Pickerel Frog | PIFR | *Rana palustris* |
| Green Frog | GRFR | *Rana clamitans melanota* |
| Mink Frog | MIFR | *Rana septentrionalis* |
| Bullfrog | BULL | *Rana catesbeiana* |