

# **Great Lakes Coastal Wetland Monitoring Program**

## **Standard Operating Procedure**

### **Anuran Survey**

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

Last updated April 25, 2019

## Anuran Calling Survey Standard Operating Procedures

1. Samples: The calling survey for anurans will be conducted 3 times (3 samples) per point on evenings with little or no wind and according to minimum nighttime temperatures. Surveys should occur within a reasonably short period of time after the minimum nighttime temperature has been reached. Samples are to be conducted no fewer than 15 days apart. Mist or light rain conditions are acceptable for conducting surveys so long as it doesn't affect an observer's ability to hear.
  - a. 1<sup>st</sup> Sample: nighttime temperatures have reached 5°C / 41°F.
  - b. 2<sup>nd</sup> Sample: nighttime temperatures have reached 10°C / 50°F.
  - c. 3<sup>rd</sup> Sample: nighttime temperatures have reached 17°C / 63°F.

Note that for the first round of sampling, the appropriate nighttime temperature should be reached for several days AND insure that early anurans have begun calling so a reasonable sample can be obtained. Common sense should prevail. For instance, in the northern regions, after the nighttime temperatures have been reached, it may be possible to complete the count when nighttime temperatures are lower than the indicated temperatures AND if anurans are calling. Additionally, in the case of the 2<sup>nd</sup> and 3<sup>rd</sup> sample, not all sites (especially those located in the northern parts of the Great Lakes basin) will reach the 10°C / 50°F and 17°C / 63°F nighttime temperature thresholds, respectively, during the survey period. For these sites it may be acceptable to conduct the 2<sup>nd</sup> or 3<sup>rd</sup> sample before the temperature threshold has been reached. **However, these samples should be conducted as late in the season as is logistically feasible to ensure that warmer season anurans are adequately surveyed.**

2. Sampling period
  - a. Check local weather information for the official sunset time.
  - b. Sampling begins ½ hour after sunset.
  - c. Sampling ends 4 ½ hours after sunset.
  - d. Example: if sunset is 9:40 pm, surveys will begin at 10:10 pm and continue to 2:10 am. This results in 4 hours of sampling time.
3. Wetland sites & sample points
  - a. It is imperative to ensure that the wetland site is suitable for sampling. 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. Wetland sites that have excessive forested or shrub habitat should not be sampled; however, note that many wetlands have trees or shrubs present or they are encroaching on the emergent wetland area. This can also be the case with patches of trees or shrubs on the edge or small islands within the wetland. Most of these are perfectly acceptable to sample as long as the forest or shrub are not too excessive. Emergent vegetation should be the dominant habitat present. Good judgement is required to determine whether a wetland is suitable, but we clearly want to avoid sampling purely shrub or forested habitat. If there are questions, field personnel should contact their PI or coordinator for a second or third opinion. Often judgments can be made from remote sensing imagery. **If the point location is not near or adjacent to appropriate wetland habitat (e.g., completely forest), do not sample the point and note this in the electronic site record in the site status log.**
  - b. It is recommended that a wetland site contain from 1 to 6 sample points depending on wetland size and accessibility, but it is acceptable to sample at additional points if desired or there is a special need. These extra points should be clearly identified as not part of the original design and comment on the reasons for their inclusion.
  - c. Sample points
    - i. Points are separated by a minimum of 500 m.
    - 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; e.g., site 792 should be 0792).
  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 only two of them are points for anurans:
    - AB5089.1 (surveyed birds/anurans)
    - B5089.2 (surveyed for birds only)
    - AB5089.3 (surveyed birds/anurans)
    - B5089.4 (surveyed for birds only)
- 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.
- d. Full-circle sample points will be used, with distance intervals 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.
4. 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:
      - i. Waypoint: For every anuran survey, a waypoint must be marked with a GPS unit and recorded on the field data form (including geospatial coordinates – latitude and longitude) 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.)*
        - a. Round 1 Anurans: AB1101.1.R1
        - b. Round 2 Anurans: AB1101.1.R2
        - c. Round 3 Anurans: AB1101.1.R3

- ii. Sample: Each point will be visited 3 times for repeat calling surveys.
- iii. Date
  - 1. Format of MM/DD/YY (05/04/11).
  - 2. Be sure to advance the date for surveys conducted after midnight.
- 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.
  - 2. Record in °Celsius. See the conversion chart if needed.
- ix. Noise: Assign & record the appropriate noise code (see chart below).
- x. Bearing: Take the bearing while facing forward (toward the wetland).

**BEAUFORT WIND SCALE**

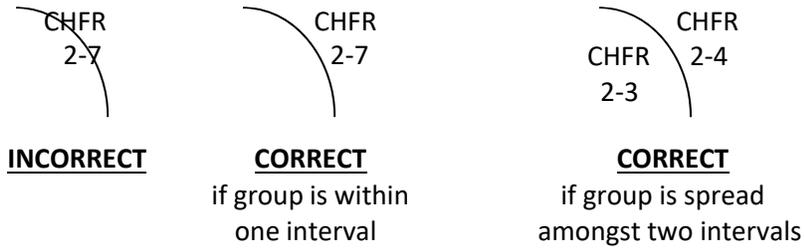
0	Calm; smoke rises vertically
1	Light air movement; smoke drifts; leaves barely move
2	Slight breeze; wind felt on face; small twigs move
3	Gentle breeze; leaves & small twigs in constant motion
4	Moderate breeze; small branches moving, raises dust & loose paper
5	Large branches & small trees sway

**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)

- c. Conduct the survey for 3 minutes.
  - 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.
  - ii. Start stopwatch or set timer.
  - iii. Using the appropriate species codes, individuals, small groups and choruses are mapped spatially within the appropriate distance interval(s) on the 360° map. 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. For full choruses in multiple distance intervals, record in each distance interval as appropriate.

Examples:



- iv. For each species code recorded (e.g., CHFR), record the calling code underneath the species code (1, 2 or 3), then a hyphen, and then the number of individuals (for codes 1 & 2 only) in all appropriate distance intervals (<50 m, 50-100 m, >100 m).
1. In some cases, there may be more than one calling code (1 & 2 only) of a species identified within the same 0-50, 50-100, or >100 m band, these should be recorded separately on the field sheet and entered separately.
  2. For full choruses (code 3), it is impossible to estimate the number of individuals, so do not record anything except the calling code.
  3. Examples:
 

CHFR	SPPE	NLFR
2-7	3	1-1

- v. Water Temp
1. After the survey, take water temperature 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.

**ANURAN SPECIES CODES**

AMTO	American Toad
BCFR	Northern (Blanchard’s) Cricket Frog
BULL	Bullfrog
CHFR	Chorus Frog (Western/Boreal)
CGTR	Cope’s Gray Treefrog
FOTO	Fowler’s Toad
GRTR	Gray Treefrog
GRFR	Green Frog
MIFR	Mink Frog
NLFR	Northern Leopard Frog
PIFR	Pickerel Frog
SPPE	Spring Peeper
WOFR	Wood Frog

**CALLING CODES**

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

## 5. 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).
- g. Notes for data entry system:
  - i. Point ID
  - ii. Sample drop down list (1-3)
  - iii. Date: can enter MM/DD/YYYY
  - iv. Start time: 4 digits with “:” separating hour and minutes; drop down menu for CDT or EDT
  - v. Observer (First initial, period & full last name with no spaces)
  - vi. Weather: drop down list (see protocol or data sheet)
  - vii. % Cloud Cover: 10% increments
  - viii. Air Temp (Celsius)
  - ix. Noise: drop down list (0-4)
  - x. Wind: drop down list, Beaufort Scale (0-5)
  - xi. Water Temp (Celsius)
  - xii. Bearing (0-360)
  - xiii. Sample records (for each observation):
    1. Species code: drop down list (4-letter code, code list in protocol)
    2. Calling code: drop down list (1-3)
    3. # of individuals (calling codes 1 & 2 only; calling code 3 will not have a number)
    4. Distance interval: drop down list (0-50, 50-100, 100+)
    5. Location compared to observer (check box for “within front 180° semicircle”)

## 6. Safety, Materials & Equipment

- a. For reasons of safety at night, each anuran survey team should consist of two people, consisting of one observer and another “ride-along” person (does not need to be a qualified observer).
  - i. This survey is a single observer protocol—the ride-along is not to influence the survey in any way.
  - ii. If both people are qualified observers, it is fine to take turns; the same observer does not need to conduct the survey at all points.
- b. For reasons of driving safety and data quality, observers conducting anuran surveys at night will not then conduct bird surveys the following morning. When anuran surveys need to be conducted during the bird breeding season, the evening bird surveys are to be conducted during that time.
- c. NOTE: This will necessitate a team of two splitting up to perform the evening birdsurveys, then meeting back up again to then perform the evening anuran surveys. Each team will be equipped with the following:
  - i. Data sheets
  - ii. Clipboard
  - iii. Waterproof, permanent pens/markers (Rite in the Rain pen, ultra-fine tip Sharpie marker)
  - iv. Stopwatch/timer
  - v. Compass
  - vi. Thermometer, in metal or plastic case
  - vii. Standard Operating Procedures
  - viii. Codes Reference Sheet
  - ix. Atlas (road map book)
  - x. Site/point map(s)
  - xi. GPS unit, with points loaded
  - xii. Headlamp
  - xiii. Pepper spray
  - xiv. Extra batteries
  - xv. Each crew will carry spare equipment & materials

