
GREAT LAKES COASTAL WETLAND MONITORING PROGRAM

Wetland Bird Survey Standard Operating Procedures

MAY 4, 2021

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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 bird 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 shrubby habitat is 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 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' you can still conduct the survey 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 in the online site selection system.
- c. Naming Survey Points
 - i. A wetland site generally contains 1 to 8 bird 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 250 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

- **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).
- **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).
- **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:

<p><i>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.</i></p>

 - 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)

2. Recording Habitat Data

- a. Habitat data will be collected at each point count location once during daylight hours in conjunction with a bird survey.
- b. See – [‘Bird and Anuran Habitat Protocol’](#) located on the CWMP website for details.

3. Field Training and Certification Requirements

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

a. Field Training

- i. Bird field training will be provided by regional team leaders.
- ii. Training involves instructing crews on how to conduct standardized field surveys, on basic travel procedures, and on appropriate field safety measures.
- iii. Individuals are trained to proficiently complete field sheets.
- iv. Individuals are trained in distance estimation using a rangefinder and fixed targets. This training increases accuracy and consistency among field crew in estimating distance of a bird observation from the observer.
- v. 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.
- vi. Prior to field training sessions, candidate observers will be provided with audio files or web links to bird vocalizations to familiarize them with species prior to taking the online test.
- vii. 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 bird surveys must pass an [online test](#) verifying they can identify wetland bird species that may be breeding in the Great Lakes basin by both visual identification and vocalizations. This testing system was developed at the University of Wisconsin-Green Bay by Dr. Robert 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. All field observers must pass the bird certification tests (audio and visual) before they collect data.
 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. If a field observer has passed the certification process, they are not required to take the tests again, even if surveying in subsequent years.
- iii. Certification Instructions: How to take CWMP bird 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 can obtain from your PI or field crew coordinator.
 5. You should now be logged in. Next select to take the bird audio and bird visual tests to become a certified bird observer.
- iv. To become a certified bird observer, you must correctly identify 18 of 20 species on the visual test (90% of 20 bird images [100% for focal species]) and 17 of 18 species on the audio test (95% of 18 species vocalizations [100% for focal species]).
- v. Images will include difficult views and various plumages, and the test will concentrate on species likely to be seen rather than heard. Vocalizations will include background noise to simulate conditions representative of surveys in the field on roadsides.
- vi. If you have questions about the certification process, please contact Erin Giese (giesee@uwgb.edu).

4. Survey Timing

- a. The bird survey will be conducted twice (2 samples) at each point count location.
- b. 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, to avoid surveying migrant birds that do not yet have established breeding territories.
- c. At each wetland site, one survey will be a morning survey and the other will be either a morning survey or an evening survey.
 - d. 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. **Morning surveys:** surveys begin ½ hour before sunrise and end 4 hours after sunrise. For example, if sunrise is 04:45, the survey period is 04:15 to 08:45.
 - ii. **Evening surveys:** surveys begin 4 hours before sunset and end ½ hour after sunset. For example, if sunset is 21:00, the surveying period is 17:00 to 21:30.
 - e. Surveys will occur no closer than 15 days apart.
5. 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 kph) and when there is little or no precipitation. It is acceptable to survey during winds of 3 with gusts of 4, given these are coastal, and therefore often windy areas.
 - 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 and limit visibility and the observer's ability to hear.
 - 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 and return during acceptable conditions.
 - e. 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. Before beginning the survey, fill out the following information on the data sheet:
 - **Point ID:** Each point has an associated ID (e.g., AB1101.1).
 - **Sample:** 1 or 2. Each point will be visited 2 times.
 - **Date:** Format of MM/DD/YYYY (05/04/2011).
 - **Observer:** Observer first initial and last name (J. Doe).
 - **Weather:** Circle the appropriate description: Dry, Damp/Haze/Fog, Drizzle or Rain.
 - **% Cloud Cover:** Estimate the percentage of cloud cover in 10% increments.
 - **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).
 - **Air Temperature:**
 1. Take at chest height.
 2. Record in °Celsius.
 - 1. **Noise:** Assign and record the 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.
 - **Bearing:** Take the directional bearing while facing forward (toward the wetland). If surveyor is surrounded by wetland, a bearing direction should be chosen and maintained for each subsequent bird survey for comparability.
 - **Waypoint:** For each 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 of survey. 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. First Bird Survey: AB1101.1.B1 (B1 = first bird survey)
 2. Second Bird Survey: AB1101.1.B2 (B2 = second bird survey)
- b. 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)

- c. Just prior to starting the survey:
 - 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.

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- 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.
 - Each survey 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 CWMP QAPP as modified in 2019.
 - Broadcast
 - a. See 8c for broadcast equipment recommendations. Equipment must be capable of broadcasting at an 80dB level with minimal distortion and/or noise.
 - b. 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.
 - 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.
 - 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.
 - c. Hold the speaker(s) above the level of vegetation (or as high as possible) and broadcast in the direction of the bearing you recorded.
 - Broadcast order: the following compilation will be provided in one audio file (mp3 format or on a CD).
 - 30 seconds LEAST BITTERN (LEBI)
 - 30 seconds silence
 - 30 seconds SORA (SORA)
 - 30 seconds silence
 - 30 seconds VIRGINIA RAIL (VIRA)
 - 30 seconds silence
 - 30 seconds COMMON GALLINULE (COGA)
 - 30 seconds silence
 - 30 seconds PIED-BILLED GREBE (PBGR)
 - 30 seconds silence
 - d. Record the bird observation data
 - i. 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). The inability to

identify every individual bird is expected. What is not acceptable, however, is not recording individuals you are unable to identify.

- ii. Record the 4-letter alpha code for the species of the individual at the corresponding spatial location on the data sheet. The 4-letter alpha codes can be found [here](#). 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° semicircle or the “back” semicircle.

Example:



INCORRECT

CORRECT

- iii. 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, 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.

- 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)

Examples:

NAWA	<u>NAWA</u>	(NAWA)	—NAWA [?]	(NAWA)—++(NAWA)	DOWOD
observed	calling	singing	flyover	2 males simultaneous singing	woodpecker drumming

- iv. 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 minutes⁰ 1-2 minutes¹ 2-3 minutes² ... 9 -10 minutes⁹

Examples:

NAWA ²	YEWA ⁸	SWSP ³	AMRO ⁹
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)

- v. For focal species only, record ALL time periods the bird is detected in, using commas to separate the numbers in the superscript.

Focal species are listed below and on each data sheet.

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

Examples:

PBGR ^{2,5,9}	VIRA ^{4,5}	AMBI ^{1,7,8,9}
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

- vi. 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:



- viii. 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 in first minute of the survey would be recorded as:
- (27) DCCO⁰—→
- ix. Document all aerial foragers both inside and outside the 100 m 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 and location are not required.
- 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.
 - A bird that is aerial foraging is using the airspace above the survey area 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. It may include a variety of species, such as swallows, terns, swifts, gulls, raptors, etc.

Example:

Aerial Foragers		
<i>taxa</i>	<i>tally</i>	<i>total</i>
TRES	III	3
CLSW	22, 9, 11	42
COTE	1	1

- e. 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, ensuring all fields have been filled in, filled in properly, and are legible.
- 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 for upload errors throughout the season, 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 (e.g., using a program such as Garmin's BaseCamp), and uploading a .gpx file to the CWMP – GPS File Upload site <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_Howe_20180612" would be used for waypoints uploaded by the Howe 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 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

- Because bird surveys are 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.
- This survey is a single observer protocol. Any person that may accompany the observer is not to influence the survey in any way.
- 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).
- 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:
 - Data sheets
 - Standard Operating Procedures
 - Clipboard
 - Waterproof, permanent pens/markers (Rite in the Rain pen, ultra-fine tip Sharpie marker)
 - Stopwatch/timer
 - Compass
 - Thermometer, in metal or plastic case

- Mp3 player – recommended: Sansa Clip (2GB is sufficient) or portable CD player
- Speaker – recommended: iMainGo 2 Handheld Speaker Case (available on Amazon)
- Decibel meter – recommended: Pyle PSPL01 Mini Digital Sound Level Meter (available on Amazon)
- Atlas (road map book)
- Wetland site/point maps
- GPS unit, with waypoints loaded
- Headlamp
- Pepper spray (optional) [DO NOT attempt to cross the international border with this item]
- Extra batteries
- First aid kit
- Spare equipment & materials

9. Data Entry

Below is a list of all of the information that will be required to be entered in 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 username 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 or 2).
- **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).

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- **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).
 - **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).
 - **Aerial Foragers:** See SOP (6e xix.) for description of what constitutes aerial foraging behavior.
 - If yes, need to enter those sample records.
 - **Taxa:** the [4-letter species code](#).
 - **Total:** total number of individuals tallied on data sheet.
 - If no aerial foragers detected, go on to entering sample records from the spatial mapping area.
 - **Observations:** See SOP (6d iii.) for description of observation types aside from aerial foragers listed above.
 - **Taxa:** drop down list of ([4-letter species code](#)).
 - **Distance:** drop down list (0-50 m, 50-100 m, >100 m).
 - **Time:** Enter at least one minute between 0 and 9 for every species; describes minute interval bird was first detected, unless focal species in which all minute intervals should be recorded (See SOP 6d v.)
 - **In Front?:** indicates whether observation occurred in front of observer (i.e., direction surveyor faced wetland) or behind observer; put a check in the checkbox (“in front”) if species was detected in front of the observer.
 - **Behavior:** drop down list (singing, calling, flyover, observed, simultaneous, drumming); See SOP 6e. for details about behavior codes.
 - **# of Individuals:** total number of individuals of given species observed.

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/sites 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 for it.
- 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
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