

Jug Bay Wetlands Sanctuary, Glendening Vernal Pool Survey Plan

OBJECTIVES:

The research objective is long-term monitoring of population of vernal pool obligate and facilitative species along with physical properties of the vernal pool. Specifically, the number of egg masses from wood frogs and spotted salamanders will be counted and larvae caught by dip netting. By using a consistent protocol, estimates of the total vernal pool population can be computed and comparisons can be made between results from different years. Physical characteristics of the vernal pool will also be collected for analysis of long term changes and as covariates with the population.

METHODOLOGY OVERVIEW

Summary

Two observers will follow randomly selected transects across the vernal pool. They will count egg masses and follow a dip netting protocol to sample for larvae, tadpoles, and macro-invertebrates (particularly fairy shrimp). Pitfall traps and calling indexes for amphibian adults will also be used. Water quality and pool dimensions will be recorded as well.

Animals

The double observer method will be used along randomly selected transects across the vernal pool. This procedure allows for better statistical accuracy. The observers will count egg masses within 1 meter of one side of the transect. The water depth will be measured periodically to allow analysis of egg mass density as a function of water depth and to approximate the volume of water associated with the count. A particular dip net technique will occur using D nets so the volume of water sampled can be computed.

Water Quality

Water quality will be sampled at multiple locations. When the water level is high, there is an additional extent of pool to the north east of the main area. This shallower, northeastern area will be sampled when present. Parameters to be recorded include: water temperature, dissolved oxygen (YSI Meter), air temperature, pH, salinity, nutrients and Secchi depth measured with the turbidity tube.

Other Physical Characteristics

Vernal pool physical extents will be measured. In addition to the data collected during the transects the following data will be collected:

- The depth of the water at grid pole 530S will be measured both from the bottom (on the rock which was flush with the soil surface to avoid uncertainty due to the muddy bottom) and from the top of the grid pole to the water surface (for comparison to prior year data).
- GPS “track” data will be collected while walking around the pool. This will allow a calculation of surface area.

Soil Temperature

Soil temperature in an area beyond the maximum extent of the pool will be recorded since this is the non-breeding habitat for the spotted salamanders. Data loggers will be used to collect this data. Weather station data supplement the climatic information.

Observation Conditions

Weather can have a significant impact on the ease of seeing submerged objects. Data to be recorded includes the approximate wind speed (could ripple the surface reducing visibility) and cloud cover (impacts the amount of reflections on the water surface and sub-surface light penetration).

SURVEY PROCEDURES

Egg Count /Animal Census

Teams of two people will perform the double observer technique. This technique is more scientifically reliable than only one person counting. In this technique, the first person points out egg masses and counts them. The other person writes down the count provided by the first person. The key to the technique is the second person watches the counting and writes down the number of egg masses the first person misses or counts twice. To maintain validity, the recorder does NOT say anything if he/she detects an error.

1. At the start of the transect, record the pool edge relative to the marked points. Write down the starting time to the nearest minute.
2. Walk along the south side of the rope marking the transect. Try to avoid stepping over the rope into the count area. Count the egg masses within 1 meter of the transect rope. The distance is important. Egg masses on the borderline of 1 meter from the rope are counted if they are mostly within 1 meter and NOT counted if mostly outside the 1 meter line. Similarly, egg masses under the rope are included or excluded based on position.
3. At each marked point on the rope (1 meter intervals)
 - a. Observer 1 calls out the number of egg masses since the last point
 - b. Observer 2 records that number, and records misses or double counts as the difference.
4. At every stake (5 meter intervals) take depth measurements
 - a. Observer 1 calls out the depth at each stake (every 5 meters)
 - b. Observer 2 writes down the depth in the 'Dip Net Sample' table
5. At every stake (5 meters interval) take a dip net sample
 - a. Observer 1 sweeps D-net forward and away from transect line for 1 meter across substrate
 - b. The larvae and invertebrates are identified. (Unidentifiable creatures are put in a plastic bag and tied to the stake for later identification. NOTE THIS on the data sheet).
 - c. Observer 2 records counts in the appropriate box in the 'Dip Net Sample' table
6. Observer 1 and 2 exchange roles half way (flip datasheet)¹
 - a. Note time of change (using same watch/time source as the starting time).
7. At the end of the transect, record the position of the pool water boundary relative to the marked points. Record the time to the nearest minute using the same watch/time source as the starting time.

Water Quality

One person will generally follow the JBWS water sampling protocols. Take samples from main pool near GMP 530-S and from the Northeast pool if existing. Data is recorded on the Survey data sheet.

Pitfall Traps

Two person team check 6 traps.

1. At each bucket
 - a. Identify all amphibians present, recording species and abundance
 - b. Release amphibians at least 5 meters from the edge of the fence and place next to a log or other cover
 - c. Remove any invertebrates, leaves, or other debris from buckets
 - d. Bail out any excess water (greater than 1 inch)
 - e. Close lid tightly
2. Check drift fence
 - a. Repair any gaps between buckets and fence using leaf litter
 - b. Check for holes and sagging along fence Report unfixable problems to staff

¹ Data sheets are computer generated based on actual water level with half the wet transect on each side of the page.