

COMMUNITY SUCCESSION AFTER CRANBERRY BOG ABANDONMENT WITHIN THE NEW JERSEY PINE BARRENS

PROJECT OBJECTIVES: The goal of this project is to evaluate the community diversity of active and inactive cranberry bogs within the New Jersey Pine Barrens over time, by observing and collecting an inventory of species. This work will produce a complete inventory of plants, vertebrates and invertebrates of all bogs assessed as well as species diversity for the bog itself. Bog inventories of each respective bog location will be provided to all responsible parties. The results of the work will provide an insight to the impacts of cranberry bog farming as an agricultural practice. This experiment will show the community succession of a cranberry bog over time as a result of harvesting, abandonment, and other natural occurrences.

EXPERIMENTAL DESIGN:

STUDY SITE:

- Identify sites where cranberries are farmed
- Categorize the status of the bog being sampled based on the level of activity and flooded state.

ACTIVITY:

- Active: Currently being harvested for cranberry production
- Partially Active: Currently bog is maintained but not for cranberry production
- Inactive: Not currently being harvested for cranberry production (if known, number of years in abandonment will be recorded)

FLOOD STATUS:

- Flooded: bog is filled with water
- Partially flooded: swamp like environment
- Unflooded: bog is dry

SAMPLING: VEGETATION IDENTIFICATION

- 10 x 10 meter plot will be placed along the edge of a bog and selected based on site location
- Full inventory of vegetation within the plot will be recorded using nondestructive methods
- Five 1 m² quadrats will be randomly placed throughout the plot area which are used to measure species diversity (Figure 1.)
- Within each quadrat the number of plant species will be recorded as well as the relative abundance based on cover of ground cover and canopy (greater than 1 meter) done separately (Figure 2.)
- Shannon-Weiner Diversity Index will be calculated.
- Plant species will be categorized into functional groups (shrubs, vines, grasses, herbs, and legumes) and functional diversity will be calculated
- Diameter at Breast Height (DBH) will be taken for trees greater than 1 meter in height

- Root Collar Diameter (RCD) will be taken for woody species under 1 meter in height
- One soil core of 10 cm will be taken from each 1 m² quadrat within the sampling plot for seed bank analysis
- A small clipping of unidentified species will be taken back to the lab for identification
- Summary of data to be collected: Species name, species number, functional group, species diversity

SAMPLING: AQUATIC VERTEBRATE SPECIES IDENTIFICATION

- Within the 10 x10 meter sampling plot vertebrates will be identified through observation
- Dependent on the status of the bog, electrofishing will assist locating and identifying aquatic vertebrates and diversity will be collected (no fish will be harmed or killed)
- Findings will be recorded and added to species inventory

SAMPLING: INVERTEBRATE SPECIES IDENTIFICATION

DRY FIELDS:

- Various traps will be set throughout the 10x10 meter plot.
- Sampling bushes/tree branches: bushes/tree shaking with a catching bin underneath to collect invertebrates (Figure 3)
- Areas of dense foliage: pitfall traps will be utilized by taking a plastic cup, digging a hole, burying it, and waiting for invertebrates to fall in. Some pitfall traps may be left overnight and covered (Figure 4)
- Grassy areas: sweepnets will be used along with a net to collect flying invertebrates (Figure 5)
- Pooters/Aspirators will be used to collect small and/or flying invertebrates (Figure 6)
- Invertebrates will be collected with the use of flat-headed tweezers, forceps, collection jars, soft bristled paint brushes
- 80% ethanol will be used to preserve invertebrates for identification in the lab post-capture
- Findings will be recorded and added to species inventory

WET FIELDS:

- Using a dip net technique to sample sediment, each sample will be placed in a large sieve over a bucket.
- Water will be used to rinse the sample through the sieve and a variety of different sized meshes to separate invertebrates from the sediment sample.
- Within the sediment sample, macroinvertebrates will be sorted, identified, and recorded to keep track of the variety and abundance of macroinvertebrates found within each sample
- Species will be brought back to lab for identification with microscopes
- Species diversity will be calculated using Shannon Weiner Index
- Findings will be recorded and added to species inventory

Community succession will be determined and compared against bogs of different statuses.

Data will be examined across time.

FIGURES:

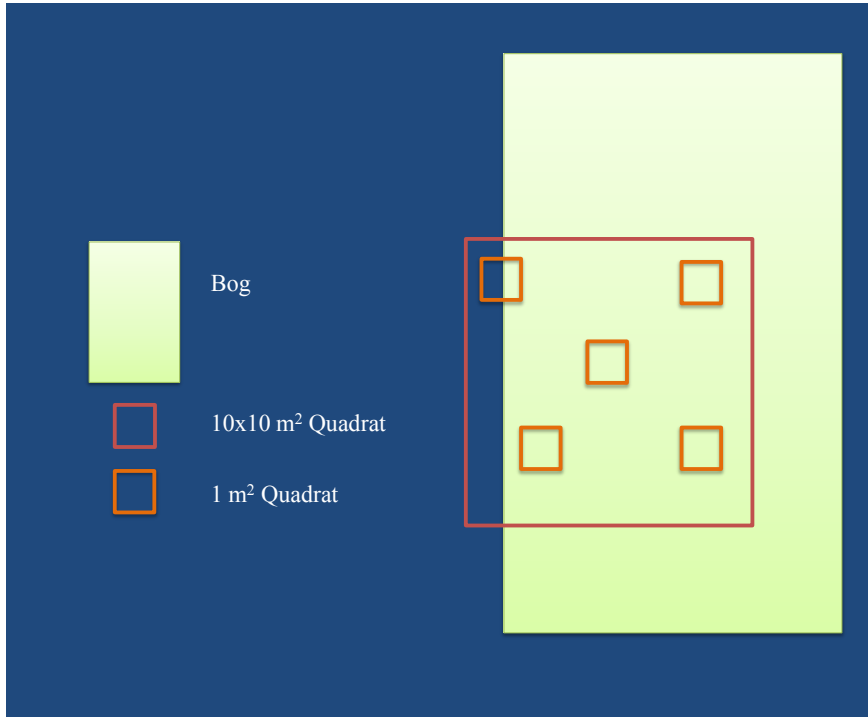


Figure 1. Example of sampling area within site location

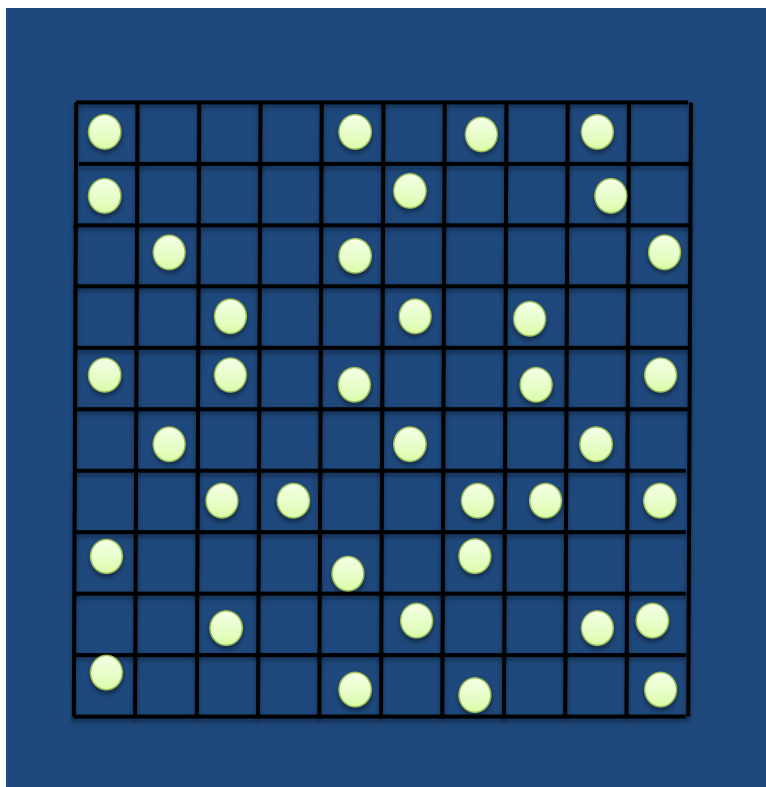


Figure 2. Example of 1 m² quadrat in use (green circles are representative of identified plant species)



Figure 3. Example of a tree being shaken with a catching bin underneath for invertebrate sampling

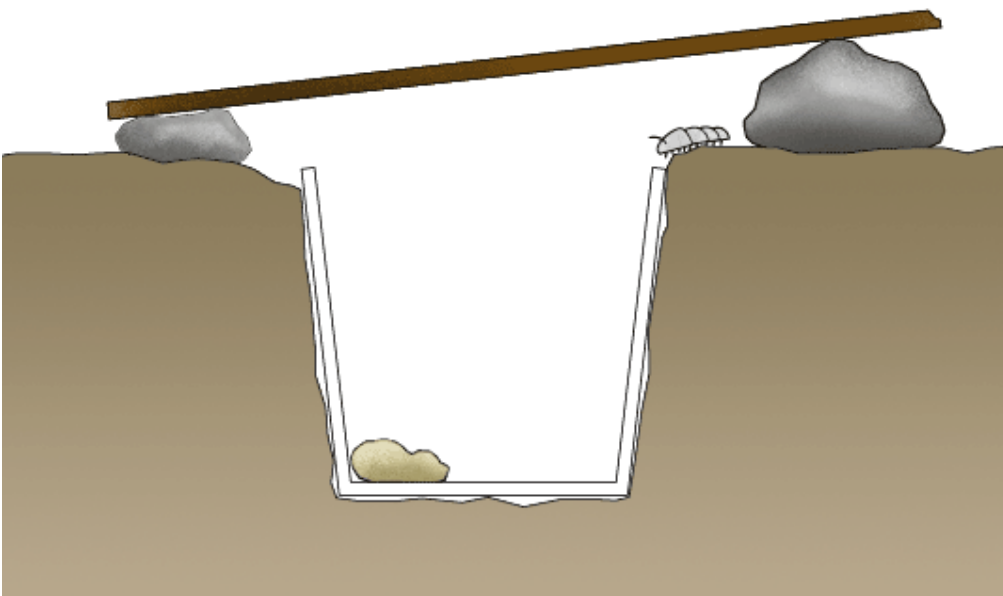


Figure 4. Example of a pitfall trap



Figure 5. Collection of invertebrates with use of a sweepnet

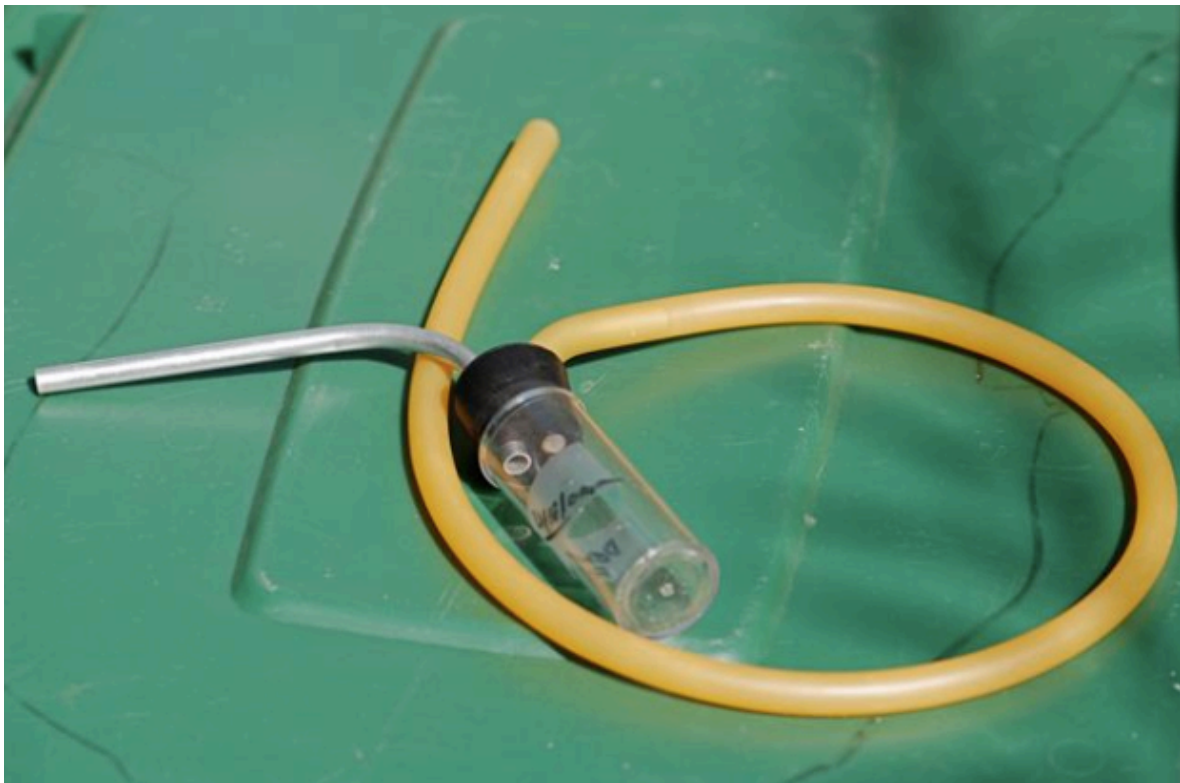


Figure 6. A pooter/aspirator