

CHAPTER 4.

ACTIVITY TRAP ASSESSMENT PROTOCOL FOR AQUATIC MACROINVERTEBRATES IN GREAT LAKE COASTAL WETLANDS

¹Roger Thoma, ²Michael Gray, and ³Joseph A. Exl

¹Ohio Environment Protection Agency
2110 E. Aurora Road, Twinsburg, OH 44087

²Ohio Environment Protection Agency
4675 Homer Ohio Lane, Groveport, OH 43215

³U.S. Fish and Wildlife Service, 620 South Walker Street,
Bloomington, Indiana 47403

I. Purpose

To describe activity trap assessment protocol for the collection of invertebrates in Great Lake coastal wetlands for the purpose of developing biological criteria. This method is adapted from Ohio EPA (1997) and from Wilcox et al. (1999).

II. Scope/ Limitations

This procedure applies to all sites that Great Lakes Coastal Wetland invertebrates are collected to develop biological criteria and assess water quality in the Great Lakes.

III. General Sampling Procedures

The methods described are to be applied to all invertebrate collections in the Great Lakes Coastal Wetland project. Data generated from this methodology will be used to determine final collection methodology (D-frame and/or activity trap) throughout the remainder of the Coastal Wetlands project.

IV. Requirements

- A. Qualification of crew leaders: The crew leader must be a professional aquatic biologist with a minimum of a Bachelor of Science degree in biology with an aquatic entomology, invertebrate zoology, fisheries, or closely related field. Additionally, they must have at least six months experience working under a macroinvertebrate biologist in the areas of invertebrate sampling methodology and taxonomy.

- B. Qualification of field technicians/ interns: A field technician/ intern must have at least one year of college education and had coursework in environmental and/ or biological science.
- C. General qualifications: All personnel conducting this procedure must have excellent map reading skills and a demonstrated proficiency in the use of a GPS receiver and an orienteering compass. Sites may be located far from the nearest road access point. It maybe necessary to hike in over long distances with field equipment. High physical condition is mandatory.

V. Responsibilities

- A. Field crew leader: Ensures that data generated using this procedure meet the standards and objectives of the study. Carries out the procedures in the action steps.
- B. Technical personnel: Carries out he procedures outlined in the action steps, including maintenance and stocking of equipment, data collection and recording.

VI. Quality Assurance and Quality Control

Compliance with this procedure will be maintained through annual internal reviews by state and federal partners. Technical personnel will conduct periodic self-checks by comparing their results with other trained personnel. Calibration and maintenance of equipment will be conducted according to the guidelines specified in the manufacture's manuals.

In addition to adhering to the specific requirements of the sampling protocol and any supplementary site specific procedures, the QA/QC requirements are as follows:

- A. Control of deviations: Deviations from the procedure shall be sufficiently documented to allow repetition on the activity as actually preformed.
- B. QC samples: Ten percent of all sites sampled on any given year are resampled as a means of determining sampling error.
- C. Verification: The state and federal partners will conduct periodic reviews of field personnel to ensure that technical personnel are following the procedures outlined by this SOP.

VII. Training

- A. All personnel will receive training annually from a trainer designated by the program manager. Major revisions in this procedure will require that all personnel be trained in the revised procedure by an authorized trainer.
- B. Training activities will include instruction in the field as well as a field test to ensure that personnel can implement this procedure.

VIII. Action steps

- A. Equipment list: Ensure that all of the following items are present before implementing this procedure:
 - 1. Field forceps
 - 2. White sorting pan
 - 3. Funnel traps (window screen mesh size), 10 per site
 - 4. Sample containers (4oz. wide-mouth glass jars, 1 liter wide-mouth plastic bottles)
 - 5. Plastic squeeze bottle with 70% ethanol
 - 6. Preservatives (10% formalin, 70% ethanol, 95% ethanol)
 - 7. Hip chain
- B. Data collection method: The use of funnel traps as a method of collection has been used extensively for amphibians (particularly adult *Ambystoma* spp.) and more recently as a protocol for macroinvertebrate collections in wetlands. A number of different kinds of funnel traps have been described ranging from modified two liter pop bottles to custom-made designs of PVC or clear acrylic plastics.

For this project, funnel traps will be constructed of aluminum window screen cylinders with fiberglass window screen funnels at each end. The funnel traps are similar in design to minnow traps. The cylinder is made of aluminum window screen 18" long and 8" in diameter. The funnels that empty into the cylinder are made of fiberglass window screen. The base of the funnel is 8" in diameter and attached to each end of the cylinder so that the funnel directs inward. The funnel has an opening 1.75" in diameter which serves as the means of entry into the trap. Laboratory analysis of the funnel trap macroinvertebrate samples will follow the standardized Ohio EPA procedures (Ohio EPA 1989).

Ten funnel traps will be installed in each wetland. Prior to installing the first funnel trap, the perimeter of the area where standing water is present in the wetland will be measured using a hip chain. The total perimeter length will be divided by 10 and the ten funnel traps will be installed uniformly around the perimeter of the wetland at 10% of the total perimeter distance.

The funnel traps are installed on the bottom at a location deep enough to submerge the trap. The traps are left in the wetland for twenty-four hours in order to ensure unbiased sampling for animals with diurnal and nocturnal activity patterns. The traps are

designed to collect any amphibians or macroinvertebrates that swim or crawl into the funnel openings.

Upon retrieval, the traps are emptied by everting the funnel and shaking the contents into a white sorting pan. Organisms that can be readily identified in the field are counted and recorded in the field logbook and released. The remaining organisms are transferred to a 1 liter plastic bottle and preserved with 70% ethanol. The contents of each trap are kept in separate bottles for individual analysis in the laboratory. If large numbers of amphibians are kept for identification in the lab, the samples are transferred to formalin for long term storage. Salamanders will be identified using keys in Pflingsten and Downs (1989). Frogs and tadpoles will be identified using keys in Walker (1946). Macroinvertebrates will be identified using procedures outlined in Ohio EPA (1989). The number of each taxa collected will be expressed as a function of the time the trap was deployed.

IX. Required Records

- A. Specimen identification laboratory bench sheets need to include the REMAP site number, wetland name, and date.
- B. Notes on the number of traps retrieved and the presence of organisms needs to be recorded. Problems encountered with traps including presence of tadpoles or fish specimens need to be noted.

X. References

Ohio EPA .1989. Biological Criteria for the Protection of Aquatic Life. Volume III. Standardized Biological Field Sampling and Laboratory Methods for Assessing Fish and Macroinvertebrate Communities. Ohio EPA, Division of Water Quality Planning and Assessment, Ecological Assessment Section, Columbus, Ohio.

Pflingsten, R.A. and F.L. Downs (eds.). 1989. Salamanders of Ohio. Ohio Biological Survey Bulletin 7 (2).

Wilcox, D.A., J.E. Meeker, P.L. Hudson, B.J. Armitage, M.G. Black, and D.G. Uzarski. 1999. Development of evaluation criteria to assess and protect the biological integrity of Great Lakes wetlands. U.S. Geological Survey, Biological Resources Division, unpublished report.