

Protected Fish Survey Protocols

Project Development and
Environmental Analysis Branch



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Purpose

The purpose of this procedure is to outline the methodology for conducting surveys for protected fish species.

Responsibility

The biologist conducting the survey should become familiar with the methodologies associated with surveying for protected fish species. Consultants will be provided a copy of these protocols and will be monitored for adherence by the biologist in charge of the contract.

Scheduling and Time Constraints

Although there is no set survey windows for protected fish species, there are some basic guidelines. Fall is the ideal time to survey for Spotfin chub. Spring is the ideal time to survey for the Cape Fear shiner. Obviously, winter months are the least desirable for conducting surveys. Requests for Protected Fish Surveys should be made 1 year in advance of the desired due date.

Procedures

Currently, the two federally listed threatened or endangered freshwater species that NCDOT surveys for are the Cape Fear shiner and the spotfin chub. The Waccamaw silverside has not been previously surveyed for because its range is restricted to Lake Waccamaw. All survey efforts, including collection methods, should be coordinated with the NC Wildlife Resources Central Aquatic Nongame Coordinator (919-528-9886).

Procedure 1: General Survey Steps

Step 1. There are three basic surveying methods that can be used. They are:

- Seining – Most often used in pools and deeper run areas.
- Passive Seining – Typically used in high velocity areas such as riffles or fast runs.

- Backpack Electrofishing - Employed in areas of slow to moderate stream flow. Habitat such as woody debris (snags and logs), rocks, and root mats and undercut banks along stream edges are also generally sampled using backpack electrofishing units.

The methods are described in more detail under [Methods](#). Be prepared to use all three methods during the survey since you will not know the various habitats that exist until you get to the site.

Step 2. Determine the coverage area for the surveys. The area covered during surveys may vary depending upon the purpose of the survey and the size of the stream. All habitat types and flow regimes found in a stream should be sampled. In general, the stream should be evaluated 100 meters upstream and 400 meters downstream of any crossing. However, there may be conditions that dictate different distances to survey. Examples are:

- Areas are found within the stream reach that are not suitable habitat for any species of fish. In this case, the entire linear distance would not be actively sampled.
- Changes in habitat or flow regime occur within a reasonable distance beyond the normal survey limits that provide suitable habitat. In this case, the stream reach would be sampled beyond the general survey limits.

Step 3. At a minimum, all freshwater fish surveys should be performed under the onsite supervision of a biologist with a General Scientific Collection Permit issued by the North Carolina Wildlife Resources Commission (NCWRC). Surveys for federally listed threatened and endangered fish species should be conducted under the onsite supervision of a biologist with a state Endangered Species Collection permit for the target species (issued by NCWRC) and possibly a federal Endangered Species Collection Permit issued by U.S. Fish and Wildlife Service.

Step 4. A minimum of five (5) sampling passes should be made for each of the habitat types and flow regimes. If any new fish species are collected during the last pass, two (2) additional passes should be made for that habitat type or flow regime.

Step 5. Fish collected from all techniques are temporarily held in five (5) gallon buckets until they can be identified and recorded. Voucher specimens for any questionable identification should be preserved in 10 % formalin solution and returned to the lab for positive identification.

Step 6. All field data and species present are recorded in the Aquatics Survey Notebook and then entered in the [WRC Aquatics Collection Report](#) spreadsheet at the appropriate time. To use the spreadsheet:

- Click on the link above.
- On the dialog box, click "Enable Macros"
- On the next dialog box click "OK"
- A blank entry form will open. Use this form to enter the field data. If you wish to see the spreadsheet itself, click on the "View Sheet" button in the lower right.
- When you have finished entering in the data, click on the "View Sheet" button.
- Save the completed spreadsheet
- Print the spreadsheet or exit out

The completed spreadsheet is submitted to NCWRC.

Step 7. The final product of the survey is a list of fish species collected at a site and the number of those species sited.

Methods

Procedure 1: Seining and Passive Seining

- Step 1.** Seining is generally described as actively pulling a seine through the water. This technique is most often used in pool or deeper run areas.
- Step 2.** A seine tool is netting with two end poles for support.
- Step 3.** Passive seining is typically used in areas of high water velocity such as riffles or fast runs. For this method, the seine is stationary and is held in place by two (2) biologists.
- Step 4.** Drive the fish into the seine by kicking/disturbing the substrate and water column from upstream to downstream to the seine, or using the backpack electrofishing unit(s) to shock from upstream to downstream to the seine.
- Step 5.** When the electrofishing units are used, at least one biologist with a dip net should accompany the biologists with the electrofishing units to collect any fish that do not drift into the seine.

Method 2: Backpack Electrofishing

- Step 1.** This collection technique is employed in areas of slow to moderate stream flow. Habitat such as woody debris (snags and logs), rocks, and root mats and undercut banks along stream edges are generally sampled using backpack electrofishing units.
- Step 2.** Traditional backpack electrofishing consists of a biologist operating the electrofishing unit to stun the fish accompanied by another biologist using a dip net to collect the stunned fish.
- Step 3.** Multiple electrofisher/dip net teams should be used on streams with an average width of greater than four (4) meters to maximize sampling efficiency.

Background

Fish community assessments may be requested whenever there is a need for information to support a NCDOT project. Most general fish community surveys (what species are found at a site) are typically associated with mitigation related projects and may be conducted throughout the state. Surveys to specifically address threatened and endangered species issues are typically required when projects are located in counties potentially inhabited by those species. Check the most recently published USFWS list of threatened and endangered species to determine which counties require surveys.

Policy, Regulatory, and Legal Requirements

- Endangered Species Act

Warnings and Precautions

None

Resources and Tools

- The Freshwater Fishes of North Carolina
- Peterson Field Guide – Freshwater Fishes
- Freshwater Fishes of the Carolinas, Virginia, Maryland & Delaware
- Freshwater Fishes of Virginia
- The Fishes of Tennessee

Contacts

- For suggestions to change this procedure contact: Karen Capps (919) 715-7299
- For questions about performing this procedure contact: Jared Gray (919) 715-1422 ; Neil Medlin (919) 715-1447

User Access

Restricted NCDOT, FHWA, MPO, RPO, Consultants, etc.