

Annual Report North Carolina CRFL Projects

Project No: 2143-08

**Project Title: North Carolina Division of Marine Fisheries
Five-Year Project for Recurring Obligated Funds
Fisheries Independent Assessment Program (Job 4)**

Grant Duration: Start Date: 1 July 2007 End Date: 30 June 2012
Period Covered by This Report: Start Date: 1 July 2007 End Date: 30 June 2008

Project Costs:
Proposed CRFL: \$344,217 Grantee: Total: \$344,217
This Period CRFL: \$205,553 Grantee: Total: \$205,553

Study/Job Title: **North Carolina Division of Marine Fisheries
Five-Year Project for Recurring Obligated Funds
Job 4: Fisheries Independent Assessment Program (FIA)**

Study/Job Objectives:

Objectives:

The Fisheries Reform Act of 1997 established a process for preparing coastal FMPs in North Carolina. The goal of these plans is to ensure the long-term viability of the state's economically important species or fisheries. The purpose of this study is to augment the NCDMF ability to collect and analyze essential data used to produce the FMPs for recreationally important species and to help determine overfishing status, levels of spawning stock biomass, mortality, recruitment and sustainable harvest levels which form the basis for all management actions recommended in FMPs. Specific objectives are:

1. To calculate annual indices of abundance in major North Carolina rivers and Atlantic Ocean for the following target species: American shad (*Alosa sapidissima*), striped bass (*Morone saxatilis*), bluefish (*Pomatomus saltatrix*), spotted seatrout (*Cynoscion nebulosus*), weakfish (*Cynoscion regalis*), spot (*Leiostomus xanthurus*), Atlantic croaker (*Micropogonias undulatus*), southern kingfish (*Menticirrhus americanus*) red drum (*Sciaenops ocellatus*), Spanish mackerel (*Scomberomorus maculatus*), and southern flounder (*Paralichthys lethostigma*). Catch per unit effort (CPUE) data from fishery independent surveys that standardizes effort will provide an unbiased relative index of abundance to track stock status. Target species may vary by river system.
2. To supplement samples for age, growth, and reproduction studies in order to determine age structure, sex ratios, and relative cohort size for the target species.
3. To evaluate catch rates and species distribution for identifying and resolving management problems in five North Carolina river systems and the Atlantic Ocean.
4. To characterize habitat use in those five river systems.

The goal is to maintain long-term fisheries independent surveys that will provide data on CPUE, catch composition, abundance, size, age, maturity and mortality in the Neuse, Pamlico, Pungo, New and Cape Fear rivers and Atlantic Ocean for important recreational fish. Maintaining the integrity of and adding to existing times series will provide for improved stock assessments and, through more effective FMPs, the long-term viability of the recreational finfish fisheries.

Activity This Period (by River System):

General:

With the initiation of CRFL funds, ongoing FIA sampling in the Neuse, Pamlico and Pungo rivers was able to continue with no break in coverage, beginning in October 2007. Similar sampling in the two other rivers (New and Cape Fear) and the Atlantic Ocean had not occurred prior to CRFL funding and thus, study personnel and equipment had to be procured and constructed, as well as field testing a comparable sampling design suited to the southern area of the state. Thus, actual field sampling in the southern area did not begin until May 2008.

While the CRFL funds are awarded on a fiscal year basis, the target species catch rates (and most assessments) are computed on an annual or calendar year basis. For this reason this initial progress report will document the sampling completed but the computation of annual catch rates, species composition, and other statistics for 2007 (Pamlico area only) and 2008 (all systems) will be included in the September 2009 CRFL Progress Report. Hence, each subsequent progress report will also cover the previous calendar year.

The study employed a stratified-random sampling design based on area and water depth for each system. The SAS procedure PLAN was used to randomly select sampling grids within each area (SAS Institute 1985). Sampling gear consists of an array of nets consisting of 30-yard segments of 2 ½ (ocean only), 3, 3½, 4, 4½, 5, 5½, 6, and 6½ (non-ocean only) inch stretched mesh webbing (240 yards of gill net per sample). Catches from this array of gill nets, combined together, comprise a single sample. Gear was typically deployed within an hour of sunset and fished the following morning to keep all soak times at a standard 12 hours.

Physical and environmental conditions, including surface and bottom water temperature (°C), salinity (ppt), dissolved oxygen (mg/L), bottom composition, as well as, a qualitative assessment of sediment size, were recorded upon retrieval of the nets on each sampling trip. All attached submerged aquatic vegetation (SAV) in the immediate sample area was identified to species and density of coverage was estimated visually when possible. Additional habitat data recorded included distance from shore, presence or absence of sea grass or shell, and substrate type. All species groups were enumerated and an aggregate weight (nearest 0.01 kilogram (kg)) was obtained for most species. Individuals were measured to the nearest millimeter for either fork or total length according to the morphology of the species. Selected species were retained and taken to the lab where age structures (otoliths and/or scales) were removed and sex and maturity stage of gonads are determined. Live Atlantic sturgeon (*Acipenser oxyrinchus*), striped bass, and red drum captured in good condition were tagged and released in support of other Division studies.

Neuse, Pamlico, and Pungo rivers:

For the Neuse, Pamlico, and Pungo rivers, 32 samples were completed (8 areas x twice a month x 2 samples-shallow and deep) each month. With the winter hiatus in sampling (15

December- 15 February), a total of 224 samples were obtained. From October 1, 2007 through June 30th, 2008, 675 specimens were processed and sent to the age and growth laboratory in Morehead City for analysis. Also, 99 red drum and 33 striped bass were tagged throughout these rivers. In 2007, data collected from these rivers were incorporated in preliminary assessments for spotted seatrout, southern flounder, and blue crab. Survey data was also supplied to a number of academic researchers (Duke,NCSU).

New and Cape Fear rivers:

For the southern district (New and Cape Fear rivers) 12 samples were completed (New River 2 areas x twice a month x 2 samples-shallow and deep and Cape Fear - 1 area x twice a month x 2 shallow samples) each month. Sixteen samples were collected from New River with eight from the upper and eight from the lower. Eight samples were collected from the Cape Fear River.

Atlantic Ocean:

The Atlantic Ocean consists of 6 samples to be completed each quarter (3 areas twice per quarter). Only three samples were obtained during the funding period. Reasons for deviations from the sampling schedule are listed below.

Deviations:

Neuse, Pamlico, and Pungo rivers:

None

New and Cape Fear rivers:

The sampling regime has been changed due to interactions with sea turtles. In order to minimize turtle interactions the future sampling for the southern area will be divided into two sampling designs with different net soak times. Gillnet samples during the fall and winter (October to March) will be set overnight (~12 hours). Samples from the spring and summer (April to September) will be set for four hours beginning two hours before sunset. This change in the effort parameter will hinder CPUE analysis for data collected prior to August 2008.

Atlantic Ocean:

Only three samples were taken during the initial sampling period. Time constraints (sampling did not begin until May) and weather conditions did not allow the completion of all anticipated samples. Similar to the southern district river sampling design, the ocean sampling had to be changed due to interactions with sea turtles. The future sampling for the ocean in the southern area will be divided into two sampling designs with different net soak times. Gillnet samples during the fall and winter (October to March) will be set overnight (~12 hours). Samples from the spring and summer (April to September) will be set for three hours beginning one hour after sunrise. This change in the effort parameter will hinder CPUE analysis for data collected prior to August 2008.

Planned Activities:

Neuse, Pamlico, and Pungo rivers:

Completion of 32 samples each month, equipment maintenance, data recording and quality control measures, review, and analysis of 2007 & 2008 data to be reported in September 2009 CRFL Progress Report.

New and Cape Fear rivers:

Completion of 12 samples each month, equipment maintenance, data recording and quality control measures, review, and analysis of 2007 & 2008 data to be reported in September 2009 CRFL Progress Report.

Atlantic Ocean:

Completion of 6 samples quarterly, equipment maintenance, data recording and quality control measures, review, and analysis of 2007 & 2008 data to be reported in September 2009 CRFL Progress Report.