Reef Fish Survey

DATA ACKNOWLEDGMENT AND DATA CAVEATS

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I. ACKNOWLEDGMENT

The following survey design, protocols, and data caveats are included to assist the data user in acquiring a thorough understanding of the survey before querying the SEAMAP-SA database for South Carolina Department of Natural Resources – Marine Resources Division (SCDNR-MRD) MARMAP program data. The data user is responsible for reading all of the following text and fully comprehending every aspect of the requested data. Each requestor is solely accountable for any further analyses, manipulations, or presentations. It is also the responsibility of the data user to cite and acknowledge SEAMAP-SA and MARMAP (see SEAMAP-SA Intellectual Property protocol)

II. BACKGROUND

For over 40 years the Marine Resources Research Institute (MRRI), through the Marine Resources Monitoring, Assessment and Prediction (MARMAP) program, has conducted fisheries-independent research on groundfish, reef fish, ichthyoplankton, and coastal pelagic fishes within the region between Cape Lookout, North Carolina, and Cape Canaveral, Florida. The overall mission of the program has been to determine distribution, relative abundance, and critical habitat of economically and ecologically important fishes of the South Atlantic Bight (SAB), and to relate these features to environmental factors and exploitation activities. Research toward fulfilling these goals has included trawl surveys (from 6-350 m depth), ichthyoplankton surveys, location and mapping of reef habitat, sampling of reefs throughout the SAB, life history and population studies of priority species, tagging studies of commercially important species and special studies directed at specific management problems in the region. Survey work has also provided a monitoring framework that has allowed for the standardized sampling of fish populations over time, and development of an historical base for future comparisons of long-term trends in relative abundance and life history parameters. The trend data are critical for use in stock assessments, and greatly enhance the assessment of abundance of many reef species within the region.

Major field and laboratory efforts since 1990 were directed at economically valuable reef fishes. The purpose was to continue monitoring relative abundance of reef fish populations in the SAB using standardized methods, as well as developing monitoring techniques to reduce manpower needed for surveys of these habitats. Reef habitats in depths of 15-200 m support many species of sessile and motile invertebrates, as well as a great diversity of fishes. Reef fishes of economic importance include black sea bass (*Centropristis striata*), gag (*Mycteroperca microlepis*), scamp (*M. phenax*), *Epinephelus* groupers, red snapper (*Lutjanus campechanus*), vermilion snapper (*Rhomboplites aurorubens*), red porgy (*Pagrus pagrus*) and other porgies (*Calamus* spp.), triggerfishes (*Balistes* spp.), white grunt (*Haemulon plumieri*), tilefish (*Lopholatilus chamaeleonticeps*), and blueline tilefish (*Caulolatilus microps*). Also included are species of

potential commercial importance such as tomtate (*Haemulon aurolineatum*), bank sea bass (*Centropristis ocyurus*), and blackbelly rosefish (*Helicolenus dactylopterus*). Many of these species are included in the SAFMC snapper-grouper management complex (SAFMC, 2011).

Over the years, areas of improvement within the MARMAP program have been identified, primarily through the SEDAR process, an integrated stock assessment process that provides a critical review and research recommendations for the data inputs used for stock assessments. The two most frequent recommendations to improve the MARMAP program have been to increase sampling at the northern and southern ends of the sampling area (the MARMAP program is headquartered in Charleston, SC), and to increase sampling in waters less than 90 ft deep. In addition, a need for data to support Ecosystem Based Fisheries Management, in particular diet information, was identified as a priority area. Finally, several stock assessments identified the lack of data on juvenile stages of important reef fishes as a research deficiency for developing indices of abundance for early life stages, in particular those with estuarine dependent early life stages, such as gag grouper.

The primary objectives of the project were to enhance the fishery-independent reef fish data collected by MARMAP by increasing sampling in under-represented regions of the sampled area. In particular, efforts concentrated on:

1. Adding live bottom, reef and deepwater reef sampling areas to the current MARMAP database, and include these sites for sampling and incorporation of the data into the fishery-independent indices of abundance calculated for reef fish species. Particular focus was on supplementing the existing MARMAP reef fish survey with additional samples collected from live bottom habitats in waters less than 90 ft deep, and shelf break and deepwater reefs in the northern and southern portions of the sampling area. In addition, efforts were aimed at obtaining additional life history data from specimens associated with the new locations for incorporation into regional descriptions of the life history of reef fish species.
2. Conducting gut content analyses on reef fish species of interest for incorporation into ecosystem models and ecosystem based fisheries management.
3. Monitoring the ingress of reef fish larvae into estuaries along the Atlantic coast of the southeastern United States. Specifically, investigating the use of estuarine habitats by larval and juvenile reef fish species, and (if appropriate) begin to develop a pre-recruit index of abundance for these species, particularly gag grouper.
4. Management and processing of data aimed at incorporation of additional live bottom sites into a GIS database, procurement and integration of data acquisition software to allow the rapid and accurate measurement of sampled specimens, and incorporating the data into the SEAMAP-SA database.

III. METHODOLOGY

Overview

The MARMAP fishery-independent reef fish survey is an annual fishery-independent survey of reef fish in the South Atlantic Bight (SAB), with particular emphasis on species included in the South Atlantic Fisheries Management Council's Snapper-Grouper Fishery Management Plan. MARMAPhas been conducting the Survey along the continental shelf and shelf edge to provide necessary information for reliable stock assessments and evaluation of management plans. For each gear used, data include information regarding sampling (i.e. latitude, longitude, time of gear deployment, etc.) and information regarding the fish collected in each deployment or collection. The database currently contains data through the 2009 sampling year. Data from more recent years will be added to the database in the near future and can be obtained by contacting MARMAP (see information ****).

Standardized Gears Deployed:
Biology:
Chevron trap (1990-2009; code 324)
Short-bottom longline (previously called vertical longline; 1996-2009; code 061)
Long-bottom longline (previously called horizontal longline; 1996-2009; code 087)
Florida Antillean trap (1980-1989; code 074)
Blackfish trap (1977-1989; code 053)

Data Collected by Species:
Biomass, Abundance, and Length Frequency by species for all species collected (for each deployment)
Age/Growth and Reproductive Parameters for individual fish of selected species.

How Data Is Provided:
Project codes denote sampling performed by the MARMAP (P05).

Catch codes denote the purpose and results of sampling:

Code	**Purpose**	**Result**
0	Monitoring	No catch
1	Monitoring	Catch of finfish
2	Monitoring	Catch without finfish.
3	Monitoring	Gear lost or damaged – no catch
4	Monitoring	Catch inadvertently mixed or lost
6	Monitoring	Gear damaged or moved – catch questionable
7	Monitoring	CTD deployment
8	Monitoring	Finfish sub-sampled
9	Reconnaissance	Catch result denoted by second digit when available
90, 91, 92,...,98	Reconnaissance (denoted by 1st digit)	Catch denoted by 2nd digit, as above

Individual gear deployments can be tracked by their unique Event code, which is a concatenation of the project code, collection number, and gear code.

Abundance, biomass, and length frequency can be linked to collection information through the unique Event and a species ID.

Age/Growth and reproductive parameter data can be linked to collection information, abundance, biomass, and length frequency through the unique Event, species ID, and specimen number (PCGSS).