

## SC SEA GRANT MARINE EXTENSION PROGRAM RESEARCH PROPOSAL

**A. Project Title:** Continuation of a Pilot Study to Document Temperature Preference and Vertical Water Column use by Cobia Found in Port Royal Sound, SC and Dolphinfinh present off the US East Coast through use of Archival Pop-off Satellite Tags.

**B. Project Duration:** From: 1 April 2006 To: 31 March 2007

**C. Project Objectives:** 1. Deploy five pop-off archival satellite tags in cobia captured in or adjacent to Port Royal Sound. 2. Deploy six similar tags in dolphinfinh captured in the South Atlantic Bight. 3. Develop a water temperature selection profile for each species utilizing time-at-temperature as recorded by the archival tags. 4. Analyze vertical movements in the water column for behavioral patterns using time-at-depth as recorded by the archival tags. 5. Attempt to identify nearshore waters utilized by cobia utilizing depth and temperature records. 6. Attempt to document long distance movements using the satellite tag positioning system.

**D. Statement of Work:** Hilton Head Island Reef Foundation (HHIRF) would join with the Marine Resources Division (MRD) of the South Carolina Department of Natural Resources (SCDNR) to complete a pilot study on cobia and dolphinfinh using archival pop-off satellite tags. The HHIRF will contract with a Cooperative Science Services, LLC whose staff has experience working with archival pop-off satellite tags to conduct the tagging and data analysis.

Working in conjunction with the Hilton Head Island Sportfishing Club, the CSS biologist will implant the satellite tag in each cobia. Cobia will be obtained from the general fishing public who will be issued a \$300 check as a reward. The HHIRF will be responsible for promoting the tagging event to generate interest among local anglers. If less than five fish are secured the first weekend, the following weekend will also be worked in an attempt to deploy all tags. Microwave Telemetry, Inc. model PTT-100 satellite tags [4 (four) provided by the SC DNR and 1 (one) by the Hilton Head Island Reef Foundation] will be programmed to record physical water conditions for 30 days (2 tags) or 90 days (3 tags) after which time they will release from the fish, float to the surface and download their data via satellite. Because of results from earlier use of these tags on cobia, the constant pressure over-ride release program built into these tags will be disabled to prevent premature release from a live fish.

Recreational anglers who have demonstrated their abilities to successfully tag dolphinfinh in a previous tagging study conducted by the MRD will be utilized to implant the six satellite tags on dolphinfinh. Selected angler will be carefully instructed in the proper procedure for satellite tag deployment. An attempt will be made to deploy two tags each off south Florida/Florida Straits, South Carolina and North Carolina. Fishermen will be paid a \$200 reward for the successful deployment of each tag.

Data received from the tags will be analyzed for diurnal/nocturnal patterns of movement, overall use of the water column and thermal selection. Data will be used to aid in the identification of primary habitat utilized by each species. A technical report will be prepared reporting the findings of the study with copies of the resulting data being provided to Sea Grant, the SC DNR as well as fishery managers and scientific researchers working on these species. Additionally, an educational report presenting the findings of the study will be published for distribution to the public.

**E. Justification:** This project will attempt to complete the study initiated in 2005 to assess the ability of archival pop-off satellite tags to provide information on the behavior of cobia and dolphinfinh. It will examine the tags ability to provide information into their vertical water column movement behavior as well as identifying thermal preferences. It will assess the instruments ability to document coastal and

offshore depths utilized by each species. Data from dolphinfish will provide some of the first information defining the open water habitat utilized by the species and is of pressing concern to fisheries managers. The study also has the potential to document spawning behavior of cobia as well as long distance movements for both species. Additionally, the project will serve to join recreational fishermen in a collaborative effort with the SC Sea Grant Program and the SC DNR to gain needed information about important marine fish.

Dolphin and cobia are two of the most popular recreational species found off the US's East and Gulf coasts. Both are fast growing species that appears to migrate northward along the east coast during spring. However, relatively little is else is known about the movements of cobia and only recently has information on dolphin movements started to be obtained. This is the first study to utilize satellite tags to on cobia on the US Atlantic seaboard and the first study ever to deploy them on dolphinfish.

Recent studies using traditional dart tags have shown that cobia found in Port Royal Sound show strong site fidelity returning year after year. Port Royal Sound is one of only three east coast estuaries that have been identified as a spawning area for cobia. This significantly increases the importance in acquiring life history data on cobia that utilize the sound. This information could be useful in examining the effects of environmental cues on the species' daily and seasonal movements. Also, because recoveries of traditional tags are rare and only link the release site to the recovery site by a straight line, this work could provide data on the value of satellite tags in examining coastal movements and behavioral patterns never before examined.

The initial attempt to carry out this study in 2005 resulted in one specimen of each species being tagged. The cobia was tracked for five days before the tag prematurely released itself from the fish due to software problems. The dolphinfish was monitored for 10 days before the tag mysteriously surfaced, presumably because the fish may have been eaten by a shark. During this time the collected data show good promise for these instruments to provide valuable information in to the life and behavior of these valuable gamefish. Only one other pilot study to assess archival pop-off satellite tag use on cobia is known. This study was conducted by the University of Southern Mississippi. USM's study is different in that it focused on monitoring cobia in the offshore waters of the Gulf of Mexico. This project will attempt to determine if these archival remote sensing devices can ultimately provide real-time data on the hydrological conditions of the water utilized by these fish.

Cobia over 15kg pounds occur singularly or in small groups while large dolphin, over 12kg, tend to be loners. Due to the large size of the instrument to be attached, only the larger specimens will qualify for tagging. Capturing live large cobia or dolphinfish requires experienced fishermen using the appropriate boats and gear. Because of the low catch rate of large fish, 0 to 3 fish per day per boat usually, a large amount of fishing effort will be required to secure the needed specimens. The initial attempt to conduct this study demonstrated that it is not economically feasible for research biologists to attempt to catch the necessary specimens. Therefore, the practical and cost-effective approach will be to enlist the aid of interested recreational fishermen to accomplish this work by giving them a reward for donating fish or deploying a satellite tag. The cobia tagging will be achieved by advertising this project among recreational fishermen who fish in the Broad River, notifying them that a \$300 reward will be paid anglers who donate their large, live and healthy cobia during a specific weekend in May or June 2006. Tags intended for use on dolphinfish will be distributed to anglers who have either already deployed satellite tags or who have demonstrated their ability to successfully tag the species.

**F. NEPA Considerations.** This work will utilize traditional fishing methods, which will be limited to standard recreational hook and line fishing and will be conducted in accordance to all state and federal regulations. We do not anticipate any interaction with protected or imperiled species. This work will not have any adverse environmental impacts upon habitat or water quality. All appropriate state and federal permits and licenses will be secured as required.

**G. Products:** A completion report presenting the findings of this study will be prepared and submitted to the SC Sea Grant Program within two months following the end of the study. A copy of the actual data generated by this research will also be provided to the SCDNR, the National Marine Fisheries Service and the South Atlantic Fisheries Management Council.

**H. Budget:**

Category	Sea Grant	HHIRF Match	SC DNR Match
<b>Personnel Services</b>	0		
<b>Contractual Services</b>			
Contract with CSS, LLC to carry out or arrange tagging, compile and analyze data and prepare completion report.	11,700		
Angler rewards for donated cobia And for dolphin tagged	2,700		
Argos satellite use & data transmission	16,500		
Printing 1,000 copies of educational Report	2,000		
Transport vessel with captain for 4 days		1,000	
Postage and Shipping	300		
<b>Supplies</b>			
11 Archival Satellite Tags		5,000	37,500
<b>Fixed</b>	0		
<b>Transportation</b>	0		
<b>Travel</b>	0		
<b>Subtotal</b>	33,200	6,000	\$37,500
<b>Total</b>		\$76,700	

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