

**Summary Report of the North Carolina Division of Marine Fisheries Cobia
(*Rachycentron canadum*) Acoustic Tagging**

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Summary Report of the North Carolina Division of Marine Fisheries Cobia (*Rachycentron canadum*) Acoustic Tagging

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Introduction

Cobia (*Rachycentron canadum*) are a recreationally important species in the US South Atlantic and Gulf of Mexico regions. Currently, the species is managed by the South Atlantic and Gulf of Mexico Fishery Managing Councils under the joint Coastal Migratory Pelagics Fishery Management Plan (CMP FMP 1983). Amendment 18 (2011) to the fishery management plan separated cobia into two stocks at the jurisdictional boundary between the councils. Based on cobia genetics, tagging, and concerns with splitting Marine Recreational Information Program survey regions, the stock boundary was moved to the Florida-Georgia in 2014 (Amendment 20b). Movement and genetics information reviewed during the previous assessment suggested that the Gulf of Mexico and Atlantic stocks were different and that the stock boundary is somewhere along the east coast of Florida (SEDAR 28). However, there was uncertainty in the mixing zone assignments due to the limited biological samples in number and spatial coverage.

In 2016, researchers began telemetry-tagging cobia in Florida, Georgia, and South Carolina to elucidate stock boundary and sub-population structure of the species. However, this effort was not being matched at the northern extent of the species range (North Carolina and Virginia). The North Carolina Division of Marine Fisheries (NCDMF) funded a project through its Coastal Recreational Fishing License (CRFL) Fund to use telemetry and genetic techniques to inform population structure of cobia (CRFL Project # 2017-F-052). However, due to the timing of funds disbursements, tagging could not commence until 2018. In an effort to fill the gap in research, the NCDMF began tagging cobia with telemetry tags following the protocols and study design of the funded CRFL project.

Methods

Tagging effort occurred in Bogue Sound, Back Sound, and coastal waters around Cape Lookout, North Carolina during the spring and summer of 2017. Fish were captured using hook-and-line gear with 6/0 circle hooks and live bait. Only fished in good condition (i.e. no deep hooking or bleeding from gills, no cuts or lesions on body, and lively upon capture) were selected for transmitter implantation and conventional tagging.

VEMCO sonic transmitters (V16-6H VEMCO) were surgically implanted in the fish and are programmed to be active for approximately 2,500 days. Upon being brought on board, fish were covered with wet towels and transferred to a cradle and the hook was removed. The fish were placed ventral side up and a local anesthetic (buffered lidocaine, 1:1) was injected at the incision site. A sanitized scalpel was used to make a 5-cm incision through the skin and musculature approximately 15 cm anterior of the vent. The transmitter was then placed into the abdomen of the fish through the incision and 2-0 monocryl sutures were used to close the incision and Betadine was applied to the incision. Fork length was then recorded and a nylon dart tag (Floy FiM-96) with a unique tag number and contact information for the North Carolina Multi Species Tagging Program was placed in the dorsal side of the fish. The fish was then placed back over board and released.

Transmitter numbers and release location information for tagged fish were provided to the Atlantic Cooperative Telemetry (ACT) Network to facilitate exchange of transmitter detection

information between research groups. The NCDMF maintains an array of VEMCO receivers in some of the state's tidal rivers and estuaries. However, due to budgetary constraints and staff work load, the NCDMF does not place receivers in coastal waters. Cobia detections are provided to the NCDMF by other collaborators with the ACT Network.

Results and Discussion

A total of three cobia were implanted with transmitters during 2017. All fish were tagged and released in the same location (Middle Marsh, North Carolina) on the same date (31 May 2017) and ranged in size from 1,000 mm to 1,100 mm fork length (Table 1).

Two fish (tag numbers 45145 and 45138) were detected post release from receiver arrays in North Carolina and Virginia. Both fish showed a similar pattern in northerly movement from the tagging site to the Chesapeake Bay, Virginia (Figures 1 & 2). However, the timing of the arrival and the duration of time spent in Chesapeake Bay was different.

Fish 45145 was the only fish detected by the University of North Carolina Institute of Marine Science's Middle Marsh array post release, during the first week of June (Figure 1). The fish was then detected approximately one month later inside the mouth of the Chesapeake Bay by the United States Navy array. Detections in this area and offshore of Virginia Beach continue through the month of August. The final detections occur during the month of September offshore of Cape Charles, Virginia from the Virginia Institute of Marine Sciences array.

Fish 45138 was first detected by the NCDMF array near Hatteras Inlet, North Carolina and shortly after near Ocracoke Inlet, North Carolina during the month of July (Figure 2). Initial movement of this fish was south from Hatteras inlet to Ocracoke Inlet over a week-long period. This fish was not picked up on the North Carolina State University array around Beaufort or Bardens Inlet suggesting the it either did not leave the estuary prior to be detected on the Hatteras and Ocracoke Inlet receivers, or it entered the ocean and returned through one of the unmonitored inlets along Portsmouth Island. The fish was then detected by the United States Navy array the last week of September and the whole month of October offshore of Virginia Beach, Virginia.

References

- GMFMC and SAFMC (Gulf of Mexico Fishery Management Council and South Atlantic Fishery Management Council). 1983. Fishery Management Plan, Final Environmental Impact Statement, Regulatory Impact Review, Final Regulations for the Coastal Migratory Pelagic Resource (Mackerels). Prepared by the Gulf of Mexico and South Atlantic Fishery Management Councils, February, 1983. Tampa, Florida and Charleston, South Carolina. 399 pp.
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- SEDAR 28. 2013. Stock Assessment Report South Atlantic Cobia. prepared by the Southeast Data, Assessment, and Review. North Charleston, South Carolina. 420 pp.

Tables and Figures

Table 1. Transmitter number (last five digits), fork length (FL), capture location, and date of tagging for three cobia in Middle Marsh, North Carolina.

Transmitter #	FL (mm)	Latitude	Longitude	Date
45145	1000	34.70148	-76.60183	31 May 2017
45138	1075	34.70148	-76.60183	31 May 2017
29732	1100	34.70148	-76.60183	31 May 2017

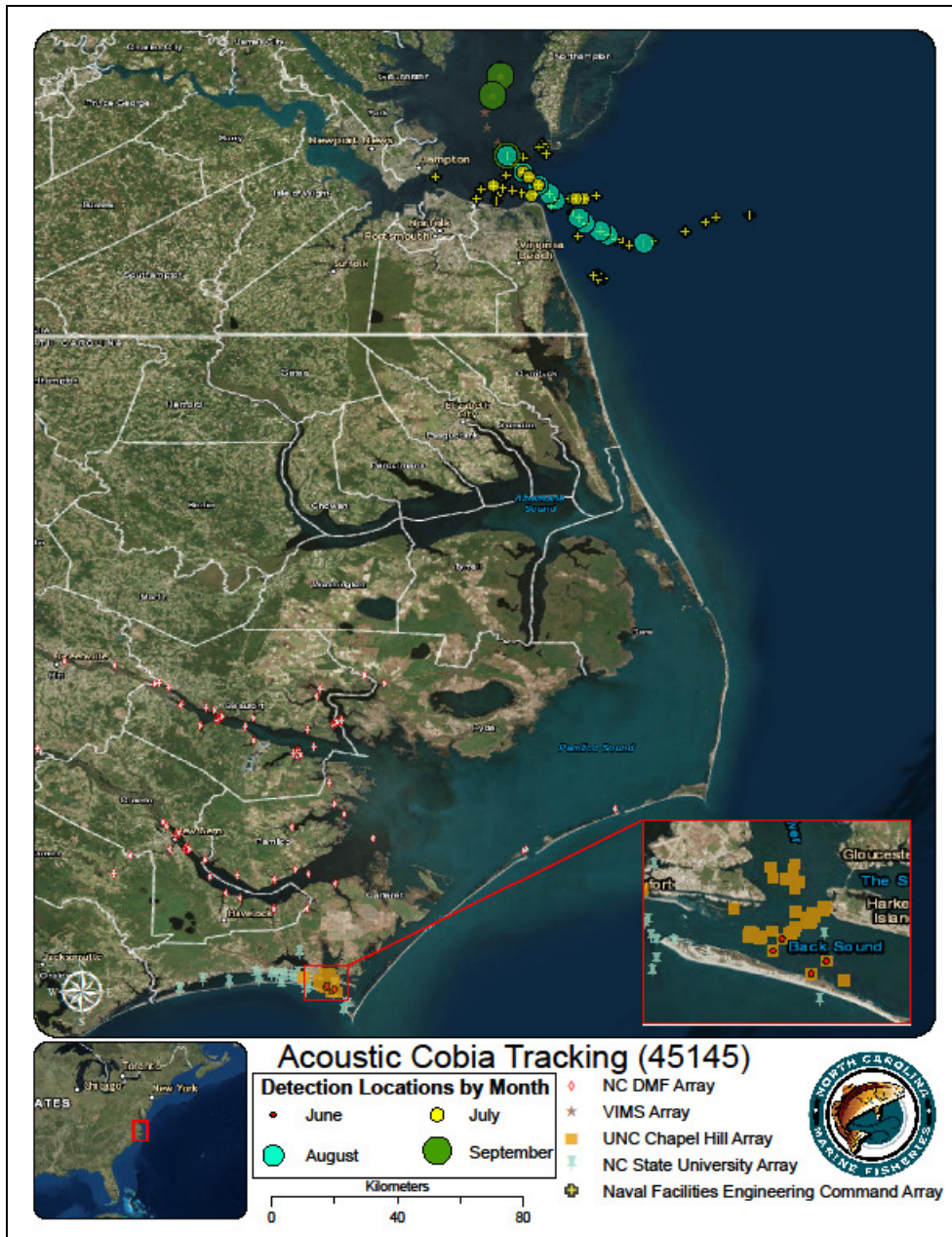


Figure 1. Receiver detections, color coded by month the detection occurred, and receiver locations by array for fish 45145.

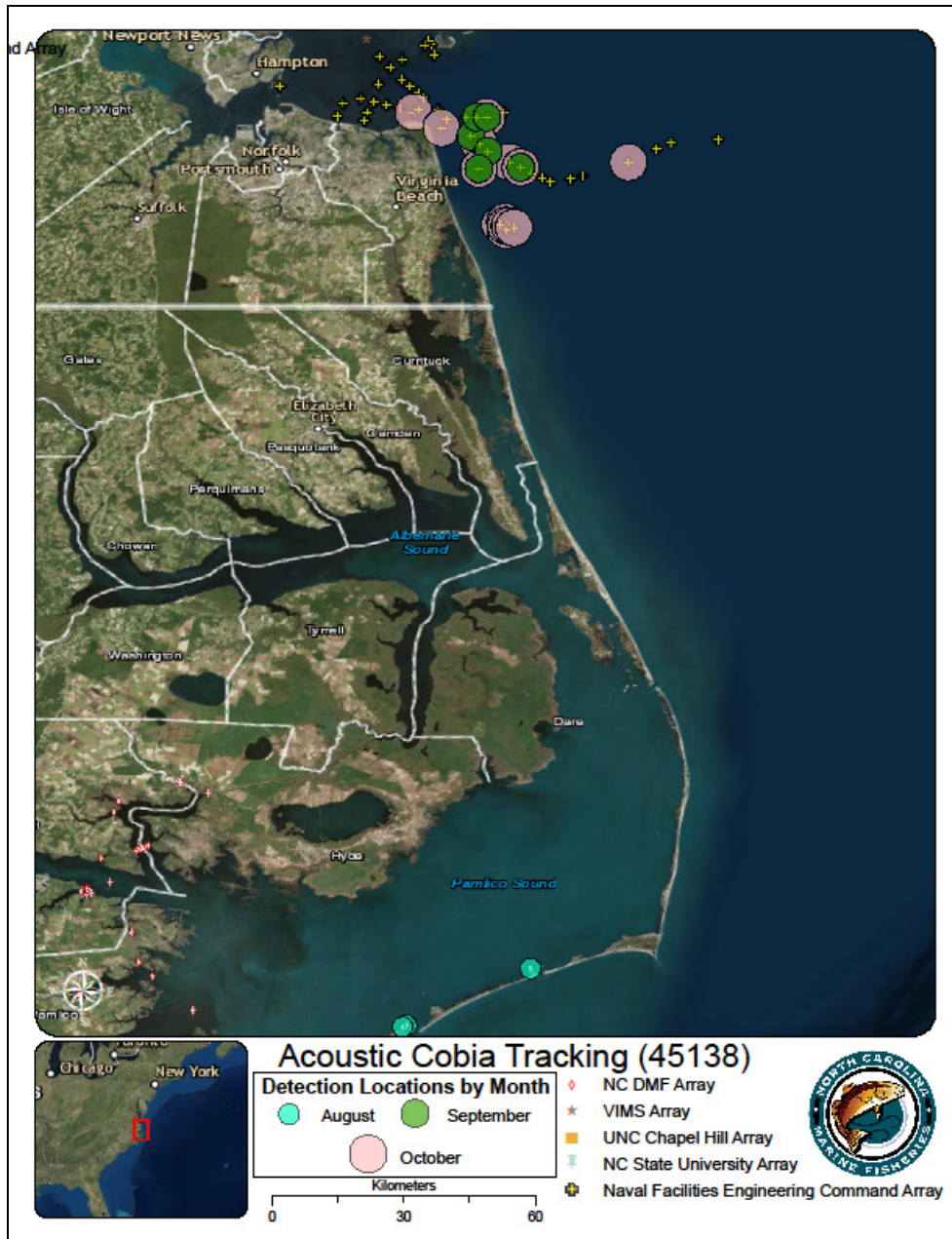


Figure 2. Receiver detections, color coded by month the detection occurred, and receiver locations by array for fish 45138.