

Distribution of the Atlantic Bottlenose Dolphin (*Tursiops truncatus*) in the Chesapeake Bay Drainage in Virginia

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INTRODUCTION

Coastal and estuarine Atlantic bottlenose dolphins (*Tursiops truncatus*) in Virginia are part of the coastal migratory stock listed as depleted under the Marine Mammal Protection Act (Wang et al., 1994). Live observations, strandings, and behavioral activity of bottlenose dolphins are well documented at the mouth of the Chesapeake Bay and along the southern coastline of Virginia (Blaylock, 1988; Barco, 1995; however, few data are available on occurrences in mainstem rivers and tributaries of the state. Bottlenose dolphins are known to occur in Virginia from April through November (Barco, 1995) and ascend into tributary rivers of the Chesapeake Bay, but only anecdotal data of bottlenose dolphin occurrences in rivers are available. Historically (pre-1900), bottlenose dolphins were observed 29 km downstream of Washington D.C. in the Potomac River and above the Aqueduct Bridge near Washington D.C. (Paradiso, 1969). More recent anecdotal data in Virginia indicate the presence of bottlenose dolphins in the Rappahannock River at Tappahannock, Cypress Swamp near Smithfield, Elizabeth River at Craney Island, and York River at Gloucester Point. In Florida, bottlenose dolphins are known to occur 120 km upstream in the St. Johns River (R. Wells, personal communication, Mote Marine Laboratory) and in the Indian/Banana estuarine system (Odell & Asper, 1990).

In 1995, a marine mammal management plan for Virginia, funded by the Virginia Coastal Program at

the Virginia Department of Environmental Quality, was completed by federal and state agencies, members of academia, and conservation organizations. The overall objective of the plan is to protect, manage, and enhance marine mammal populations and promote education, participation, and coordination in Virginia (Terwilliger & Musick, 1995). This study addressed three objectives under the 1995 management plan for marine mammals: (1) to describe the spatial distribution of bottlenose dolphins in the mainstem rivers and tributaries; (2) to establish observation programs; and (3) to improve public participation and interest. Similar comprehensive surveys and long term observation programs were conducted in Georgia and Maryland (Wang et al., 1994).

MATERIALS AND METHODS

Volunteers were recruited to record observations of bottlenose dolphins from May through October 1996 in tidal portions of river mainstems (James, York, Rappahannock, Potomac), mainstem tributaries, peninsula tributaries, and bay and oceanside areas of the Eastern Shore, Virginia. The primary observation group consisted of water quality monitors (WQM) representing the Alliance for the Chesapeake Bay who are responsible for weekly water quality monitoring at fixed locations throughout the Bay region. Topographic maps (1:24,000) were distributed to WQMs to develop ARC INFO/GIS coverages, and observation effort (minutes) was calculated for each WQM. Secondary (i.e. incidental)

observers consisted of volunteers and staff from river organizations, federal and state agencies, military installations, and private entities. These included Dahlgren Installation, Fort Belvoir, Fort Eustis, Mason Neck National Wildlife Refuge, Department of Conservation and Recreation-Division of State Parks, Department of Health-Division of Shellfish Sanitation, Virginia Marine Resources Commission-Law Enforcement, Virginia Institute of Marine Science, American Rover Sailing Vessel, The Bay Institute, Chesapeake Bay Foundation-York River Chapter, Christopher Newport University, Friends of the Elizabeth River, Surfrider Foundation, and Virginia Power. Survey forms were issued to WQM and incidental observers to record date, waterbody, location, dolphin abundance (maximum, minimum, estimate), and water quality parameters (salinity, temperature, tide period). Volunteer workshops were conducted by the Virginia Department of Game and Inland Fisheries, Richmond, Virginia, and the Virginia Marine Science Museum, Virginia Beach, Virginia, to educate participants on the biology and ecology of bottlenose dolphins, and survey protocols. Aerial surveys were conducted along mainstem rivers and peninsulas on 16 August and 20 September 1996 from 0800 to 1800 hours to augment land-based volunteer efforts (Fig. 1). A World Wide Web site (<http://www.vims.edu/cbnerr/teach/dolphome.htm>) was also developed to capture similar incidental data in 1997 using an electronic data sheet, and to provide long term observations.

RESULTS AND DISCUSSION

Forty-six WQMs and 15 incidental observer groups participated in the survey. One hundred and fifty-seven WQM reports were submitted at the end of the study period, representing a total effort of 63.5 hours. The greatest amount of effort and number of observations were in the Elizabeth (n=10) and Rappahannock (n=10) river systems. Based on the estimated number of individuals per observation, the average number of dolphins in a group was 14. Several small individuals were observed, indicating the presence of calves or subadults. Urbanna Creek, a tributary of the Rappahannock River, was the most upstream observation point of bottlenose dolphins in tidal mainstem river tributaries during the period of observation (Fig. 2). The most upstream point for mainstem river dolphin observation was at Stove Point along the Rappahannock River near Water View, Virginia.

We were unable to generate effort analyses (i.e., number of dolphins observed per hour of observation per area) for the WQM observers because so few observations were recorded (n=3). This may be attributable to the short duration of observation time (<5 minutes) and the fact that many water quality monitoring

stations were located outside bottlenose dolphin preferred habitat. We did not ask incidental observers to record effort because many observations were made while observers were participating in other activities (e.g., fishing, sailing, swimming).

Despite difficulties in calculating effort, these data provided the first recorded upper extent movements of bottlenose dolphin in mainstem rivers and tributaries. This information is being disseminated to wildlife managers, federal and state natural resource agencies, local planners, and schools. This study also provided an initial assessment of the effectiveness of volunteer observers to obtain dolphin sightings and determined that volunteers can be utilized in large scale distributional research. However, future studies should incorporate stationary boat-based observation stations where effort and area can be documented and compared among stations. Data generated from this type of study will allow delineation of relative abundance areas.

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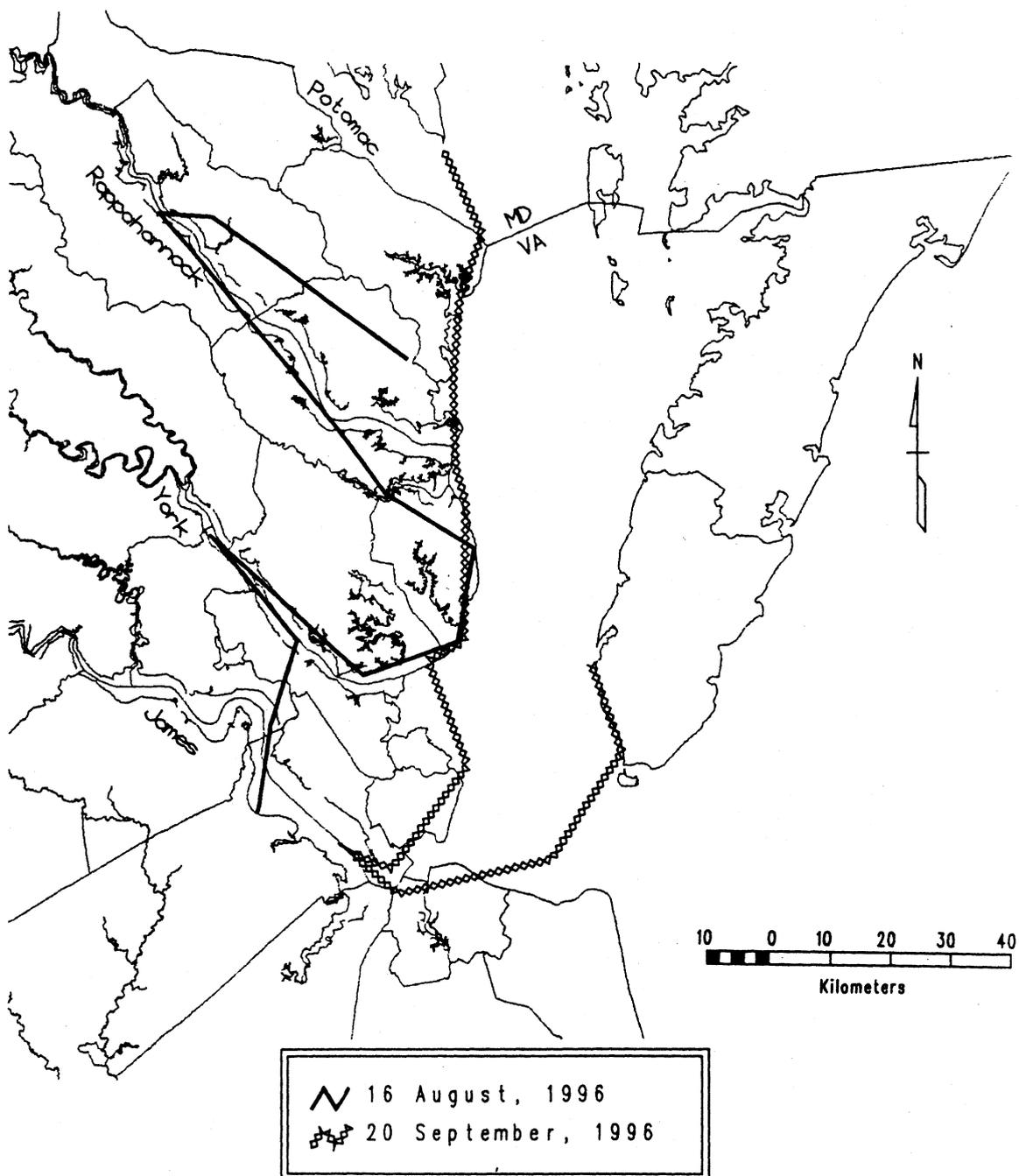


Fig. 1. Flight patterns on 16 August and 20 September 1996 in the Chesapeake Bay drainage in Virginia.

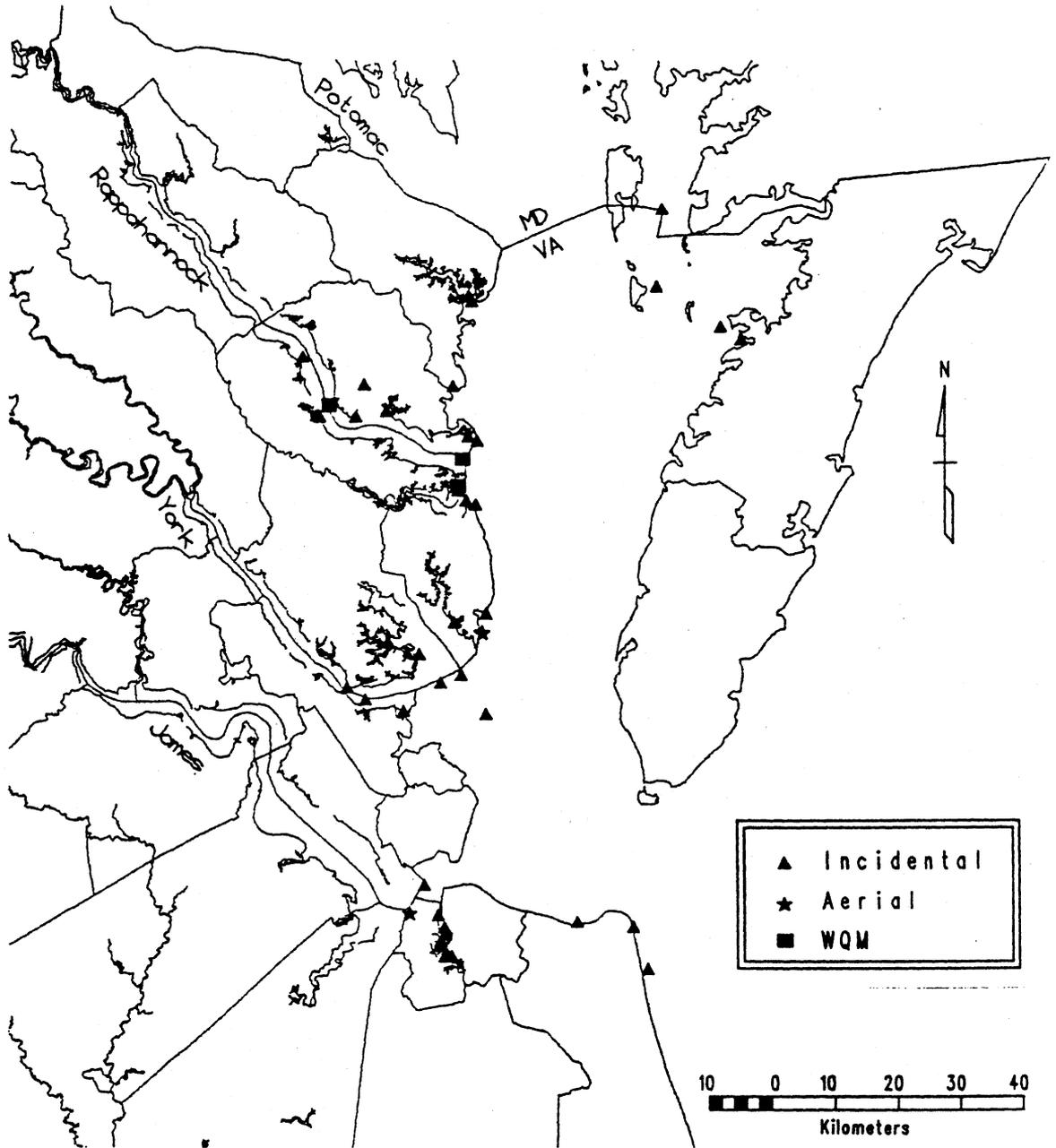


Fig. 2. Dolphin observations from May 1996 - November 1997 in the Chesapeake Bay drainage of Virginia.

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