Stranding response and skeletal rearticulation of an Atlantic spotted dolphin (*Stenella frontalis*)

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INTRODUCTION

Atlantic spotted dolphins (*Stenella frontalis*) are endemic to the tropical, subtropical, and warm temperate waters of the Atlantic Ocean. Off North Carolina they are abundant on continental shelf waters generally beyond five miles from shore (Fig. 1). One or two Atlantic spotted dolphins typically strand each year in N.C. A mass stranding of Atlantic spotted dolphins occurred in Hatteras Inlet in October 2012. On July 23, 2014, Cape Hatteras National Seashore staff responded to a shark-bitten Atlantic spotted dolphin on the ocean beach of Ocracoke, NC (Fig. 2).

METHODS

NC Division of Marine Fisheries retrieved the carcass and transported it to the NC State Center for Marine Sciences and Technology (CMAST) where a necropsy was performed (Fig. 3). We took photos that would later facilitate skeletal rearticulation. The animal (Field #CAHA268) was a 213.6 cm long, 120.7 kg adult male. Post-necropsy, the bones were wrapped in hardware cloth and buried in a shallow, sandy grave (Fig. 4). The bones were exhumed after 2 years (Fig. 5). Further treatment included a 2-week soak in a Dawn/ammonia solution, then a 5-day soak in 3.5% hydrogen peroxide solution (Fig. 6). After thoroughly dried, the bones were painted with 2 coats of diluted Jade 403 bookbinding glue (Fig. 7). A ¼ ” steel rod extends through the vertebral centrums and into the cranium. Ribs were attached using 16 gauge PVC coated annealed wire and casting resin mixed with bone dust (Fig. 8). The pectoral fin bones were mounted using $^{1}/_{16}$” steel rod (Fig. 9), Plexiglas, and E6000 adhesive. Polyethylene foam represents the intervertebral disks. Monofilament fishing line supports the mandibles, chevrons (Fig. 10), and pelvic bones.

RESULTS

The total bone and teeth weight was 5.0 kg (11.0 lbs.). The modular (seven sections) portable display (Fig. 11) weighs 5.54 kg (11.9 lbs.). ~380 person hours were dedicated to this project. The cost of tools, materials, and supplies was approximately $1,200.

Figure 1. Coastal North Carolina with a red star at the Ocracoke stranding site. Atlantic spotted dolphins are abundant on the continental shelf waters beyond 5 miles offshore.

Figure 2. The shark-bitten dead Atlantic spotted dolphin at the stranding site on the ocean beach of Ocracoke, NC on July 23, 2014.

Figure 3. The necropsy team, led by Craig Harms (orange bibs) and Vicky Thayer (above Craig’s right shoulder) included students from the NC State University College of Veterinary Medicine.

Figure 4. Post-necropsy, the skeletal components were wrapped in hardware cloth and buried in a shallow, sandy grave.

Figure 5. After a 2-year burial, students from a Duke University Marine Megafauna class led by K.C. Bierlich (lower left) assisted NC Maritime Museum staff and volunteers in exhuming the bones.

Figure 6. Bone treatments included a 2-week Dawn/ammonia soak and a 5-day 3.5% hydrogen peroxide soak.

Figure 7. After thoroughly dried, the bones were painted with 2 coats of diluted Jade 403 bookbinding glue.

Figure 8. A ¼” stainless steel rod extends through the vertebral centrums into the skull. Re-bar tie wire strengthened the connections to the ribs and costal bones. A temporary jig supporting the thoracic vertebrae and ribs allowed for adjustments as permanent connections were made with casting resin mixed with bone dust.

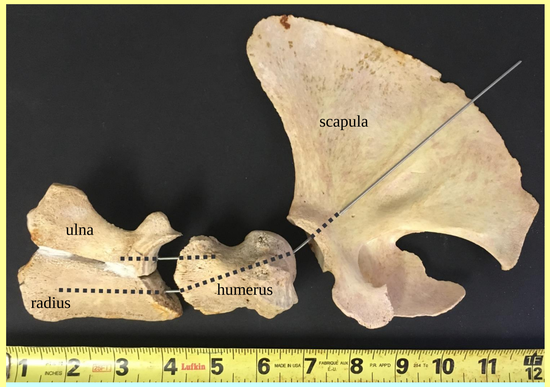

Figure 9. 1/16” stainless steel rod provides strength and attachments in the pectoral fins prior to applying casting resin to the articulating surfaces. Black dashed line shows where the rod extends through the bone.

Figure 10. Barbie LeBrun applies E6000 adhesive to the monofilament fishing line that supports the chevrons.

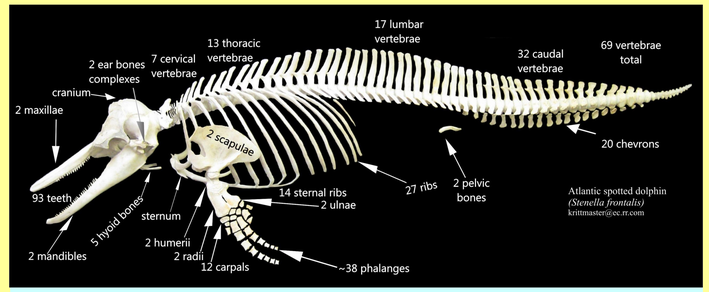

Figure 11. The 5.54 kg (11.9 lbs., 91% of which is bone/teeth) portable modular skeletal mount can be displayed on a stand or suspended.

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RELATED READINGS

Byrd, B. L., Hohn, A. A., Lovewell, G. N., Altman, K. M., Barco, S. G., Friedlaender, A., Harms, C A., McLellan, W. A., Moore, K. T., Rosel, P. E., and Thayer, V. G. (2014). Strandings as indicators of marine mammal biodiversity and human interactions off the coast of North Carolina. Fishery Bulletin, 112(1), 1-23.

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