

Stranding response and skeletal rearticulation of a Risso's dolphin (*Grampus griseus*)

INTRODUCTION

Risso's dolphins are distributed worldwide in tropical and temperate seas. Off North Carolina they concentrate along the continental shelf edge (Figs. 1, 2). One or two typically strand each year in NC. On May 9, 2012, staff and volunteers from the Outer Banks Marine Mammal Stranding Network responded to a live Risso's dolphin awash in the surf at Nags Head, NC (Figs. 2, 3).

METHODS

The non-responsive animal (#KLC123) was euthanized, then transported to NCSU Center for Marine Sciences and Technology for necropsy (Figs. 4, 5). The 276.5 cm, 256.5 kg mature male was in good body condition. No reason for the stranding was determined and the stomach was empty. Brain abnormalities and severe osteoarthritis in the right scapulohumeral and atlanto-occipital joints likely contributed to its decline.

The head was transported to UNC Wilmington for biomechanical testing as part of a conservation study to investigate the impact of longline hooks on pelagic odontocetes. Carteret Animal Hospital prepared radiographs of the pectoral fins (Fig. 6). After a 9-month maceration, bones were treated in a trichloroethylene vapor degreaser in the Anatomy Lab at NCSU's College of Veterinary Medicine. Further bone preparation included a 5-day soak in 4% hydrogen peroxide solution. After thorough drying (Fig. 7) the bones were painted with 2 coats of diluted Jade 403 bookbinder glue. Bone repairs and strengthening were completed using steel pins and casting resin mixed with bone dust. A 1/4" steel rod extends through the vertebral centrum (Fig. 10) and into the cranium. The pectoral fins bones were mounted using 1/8" steel rod, Plexiglas, and hot glue (Fig. 11). Polyethylene foam represents the intervertebral disks. Monofilament fishing line supports the chevrons and mandibles.

RESULTS

Degreasing decreased bone weight by as much as 33% (Figs. 8, 9). The modular (seven sections) portable display (Fig. 12) weighs 11.7 kg. Approximately 380 person hours were dedicated to this project. The cost of materials, supplies, and services totaled approximately \$2,100.



Fig. 1. Risso's dolphin off North Carolina displaying the tall sickle-shaped dorsal fin and conspecific tooth rakes typical for this species.



Fig. 2. Coastal North Carolina with a red star at the Nags Head stranding site. Risso's dolphins concentrate along the continental shelf edge.

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Fig. 3. Volunteer Peggy Cathey of the Outer Banks Marine Mammal Stranding Network responded to a live stranded Risso's dolphin in Nags Head, May 9, 2012.



Fig. 4. The Risso's dolphin necropsy team at the NCSU Center for Marine Sciences and Technology left to right K. Rittmaster, J. Summers, J. Sullivan, R. McAlarney, P. Dailey, V. Thayer, A. Pabst, L. Arthur, Jb Minter.



Fig. 5. Volunteer Paula Dailey holding the right ribs. Careful ordering, stringing, and labeling of the bones during the necropsy helped keep bones organized.

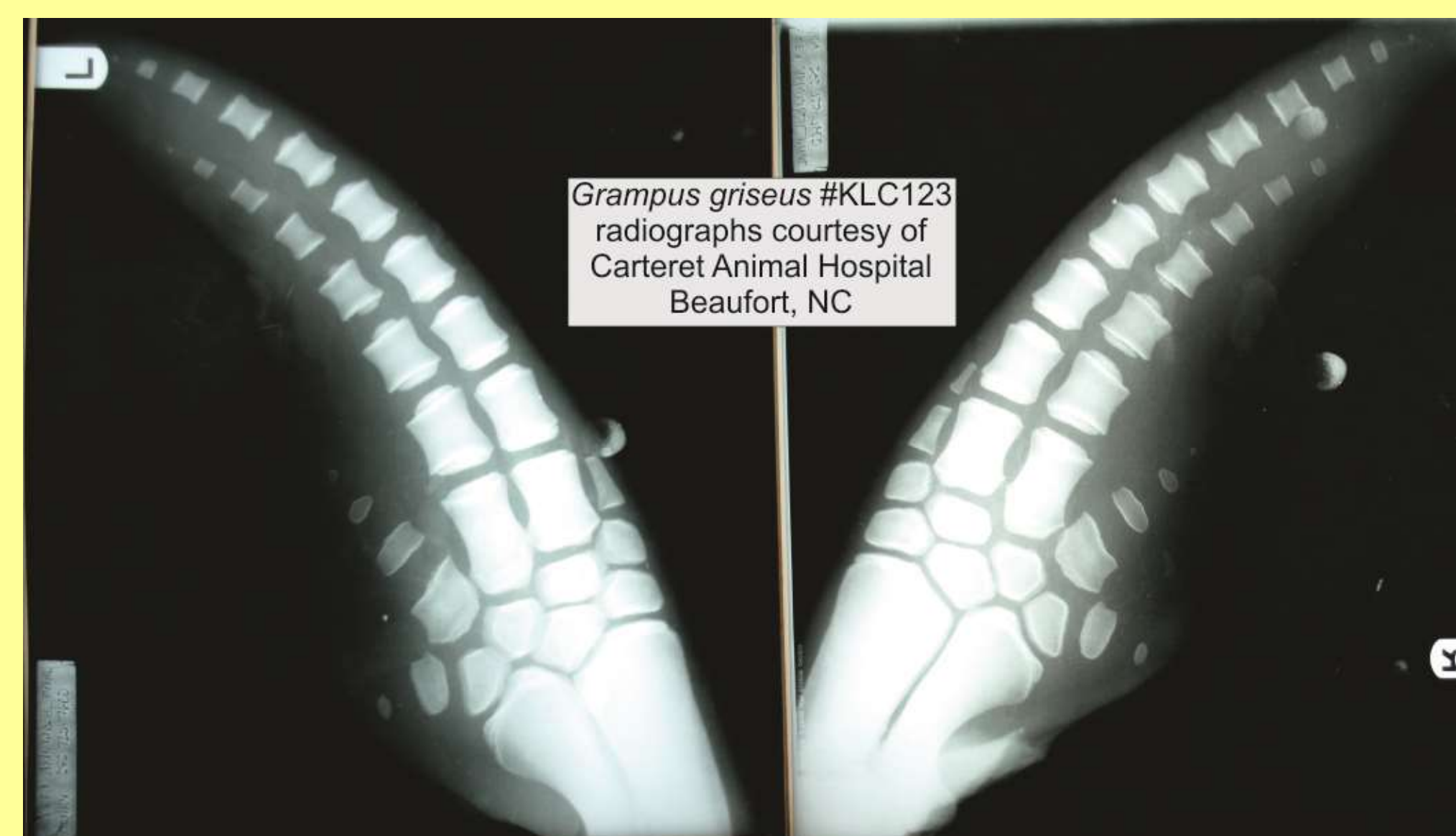


Fig. 6. Pectoral fin radiographs, donated by Dr. Stephanie Henry of the Carteret Animal Hospital in Beaufort, NC, facilitated accurate rearticulation.



Fig. 7. After degreasing and hydrogen peroxide treatment the bones were rinsed and air dried for two sunny weeks.



Fig. 8. Student intern Rob Gourley and volunteer Bobbi Wallinger weighed the bones prior to and after degreasing.



Fig. 9. In the more extreme cases, degreasing resulted in ~33% weight loss. That's a lot of grease!



Fig. 10. Using a drill press, vice, torpedo level, and the previously drilled adjacent vertebra assured proper alignment of the spine on the 1/4" steel rod.



Fig. 11. Nan Bowles used hot glue to layout the phalanges on Plexiglas.

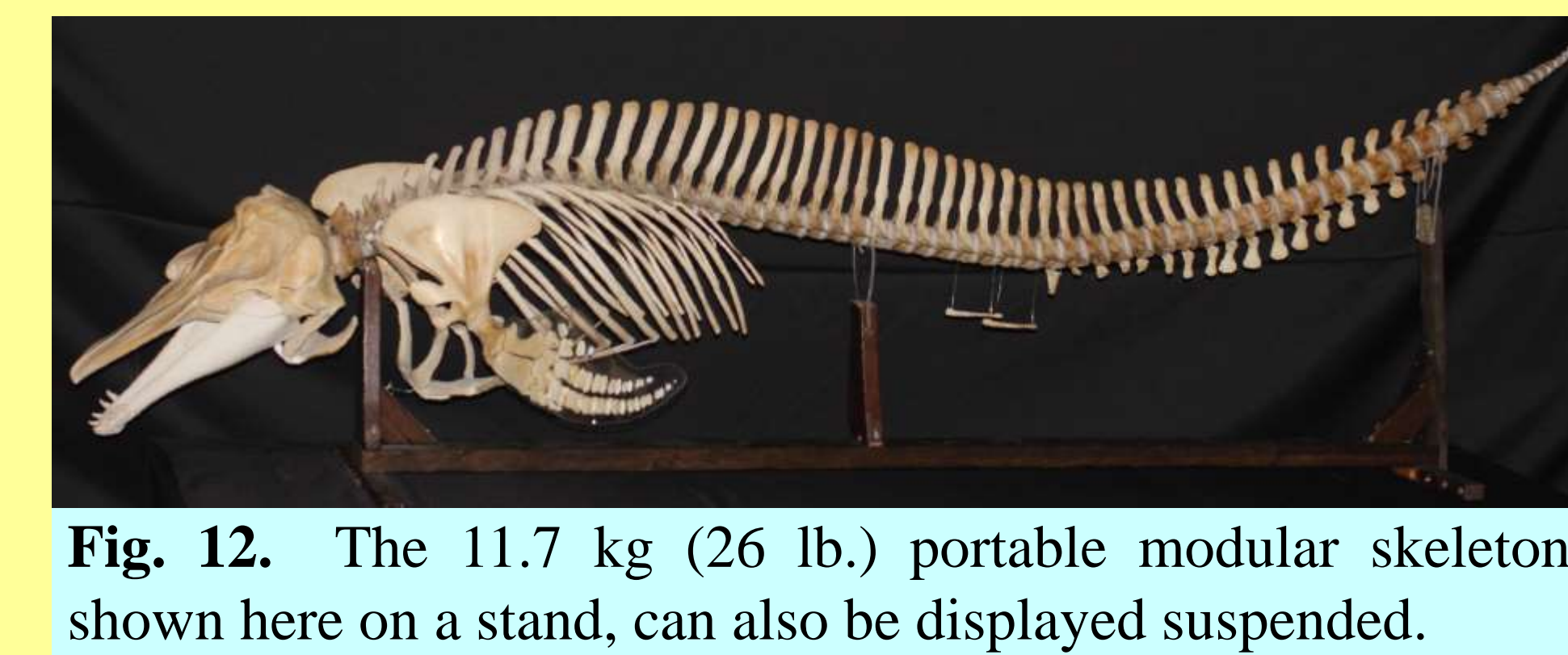


Fig. 12. The 11.7 kg (26 lb.) portable modular skeleton, shown here on a stand, can also be displayed suspended.

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Related Readings

McLellan, William A., Logan H. Arthur, Sarah D. Mallette, Steven W. Thornton, Ryan J. McAlarney, Andrew J. Read, and D. Ann Pabst. 2014. Longline hook testing in the mouths of pelagic odontocetes. *ICES Journal of Marine Science*; doi:10.1093/icesjms/fsu181.

Jefferson, Thomas A., Marc A. Webber, and Robert L. Pitman. 2008. *Marine Mammals of the world a comprehensive guide to their identification*. London: Academic.