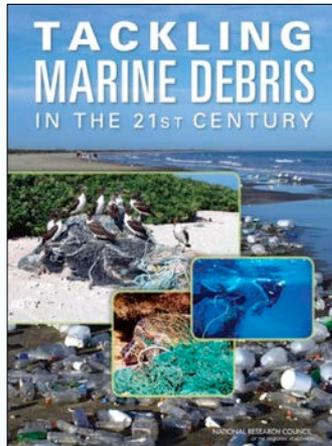


Public-Private Research Partnerships

Government Agencies, Non-Governmental Research Organizations, Industry



The National Academies of Science, Engineering and Medicine (2009)



Although there is clear evidence that marine debris is a problem, there has not been a coordinated or targeted effort to thoroughly document and understand its sources, fates, and impact.

NOAA Marine Debris Program Strategic Plan, 2016-2020 (2015)

Identify, assess and reduce the impacts of marine debris through detection, monitoring, source identification and innovative solutions.

OPEN ACCESS [Results available on PLOS](#)

Fatal Asphyxiation in Bottlenose Dolphins (*Tursiops truncatus*) from the Indian River Lagoon

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Abstract
Multiple single case reports of asphyxiation in dolphins caused by fish lodged in the oropharynx exist. However, the significance of this cause of mortality in a single population has not been documented. We performed a retrospective evaluation of pathology records from stranded bottlenose dolphins (*Tursiops truncatus*) from the Indian River Lagoon to evaluate the impact of this cause of death on this population. From 1992 to 2013, asphyxiation due to choking was identified as the cause of death in 14 of 350 cases (4%). Sampling of an unrelieved but adjacent population over this same period yielded 180 necropsy cases of bottlenose dolphins with no cases of asphyxiation. Asphyxiated animals presented with a fish lodged in the oropharynx associated with a dilated and obstructed or compressed larynx. There was no clear size predilection. Affected animals included 12 adults and seven juveniles. The fish species involved included sheepshead, black chin shiners and striped mullet. In five cases, recreational fishing gear was also present. Cetacean choking is related to selection of prey fish species with strong dorsal spines and may be secondarily associated with fish attached to fishing gear. Prey abundance and dolphin behavior may influence these selections. Environmental alterations leading to changes in prey availability or increased interactions with fishing gear may change the significance of fatal choking in dolphin populations.

Introduction
The Indian River Lagoon (IRL) is a shallow estuary system that extends approximately 200 km along the east coast of central Florida [1]. Within the estuary system to the Atlantic Ocean at five inlets, there is a population of bottlenose dolphins (*Tursiops truncatus*) within the lagoon that demonstrates high site fidelity. These animals comprise a defined stock [2] and are monitored regularly within the lagoon.

Methods
Fish specimens recovered from stranded dolphins were compared to the gross examination, fish found floating (unrelieved observation), necropsy and detailed histological comparison to a standard identification guide [6]. When possible, the fish were measured to determine length or length was



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Behavioral Responses and Habituation of Pinnipeds and Small Cetaceans to Novel Objects and Simulated Fishing Gear With and Without a Pinger

Ann E. Bowles and Rindy C. Anderson

Abstract
Marine mammals are vulnerable to entanglement in nets and lines. To quantify their interactions with fishing gear, pinnipeds and small cetaceans were exposed to novel objects and simulated fishing gear in a zoological environment at SeaWorld San Diego. The objects included a line, a frame covered with gillnetting, and a pinger. Exposures were delivered using a baseline-exposure protocol, documenting naive responses and using repeated trials to measure habituation or sensitization. Responses to objects paired with the pinger differed strikingly from others, stimulating behaviors consistent with aversion in all species. Among pinnipeds, harbor seals (*Phoca vitulina*) left the test pool or touched the pinger-associated object less often, although some eventually manipulated it extensively. California sea lions (*Zalophus californianus*) reacted initially with avoidance, defensive, and agonistic behaviors. However, they quickly returned to baseline activities and readily took fish from pingered nets. Northern elephant seals (*Moronega angustirostris*)

Key Words: net alarm, pinger, fishing gear, entanglement, guilt, behavior, neophobia, aversion, habituation, sensitization, agonistic behaviors, pinnipeds, small cetaceans

Introduction
Entanglement of cetaceans and pinnipeds in fishing gear and marine debris has become a significant cause of mortality worldwide (Zydlewski et al., 2009). The most recent effort to estimate global marine mammal losses was based on bycatch data from U.S. fisheries, estimating a take of over 650,000 marine mammals annually, split roughly equally between pinnipeds and cetaceans (Read et al., 2006). In U.S. waters, gillnets were the greatest cause of bycatch for both taxa (Carretta et al., 2004; Read, 2005), but they were also commonly entangled in lines (e.g., float lines). California sea lions (*Zalophus californianus*), harbor seals (*Phoca vitulina*), and northern elephant seals (*Moronega angustirostris*)





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