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UNUSUAL DEATHS OF TWO FREE-RANGING ATLANTIC BOTTLENOSE DOLPHINS (*TURSIOPS TRUNCATUS*) RELATED TO INGESTION OF RECREATIONAL FISHING GEAR

While fishing gear entanglement by cetaceans has been well documented, limited records exist related to fishing gear ingestion (Hare and Mead 1987). In a survey of major institutions involved in the collection of stomach content information from stranded cetaceans (Walker and Coe 1990), only 43 cases of debris ingestion by 16 different species were documented from 1,790 stomachs examined; of these, few involved the ingestion of fishing gear by free-ranging dolphins. In five documented cases where fishing gear ingestion was described, the foreign material (primarily fish hooks) was not implicated as the cause of death. Similar findings have been documented in Texas (nine cases of foreign material ingestion, including fishing gear, out of 1,542 stomachs examined, Haubold *et al.* 1994). Evidence of fishing gear (loose fish hooks) was found in only a small percentage (<0.02%) of more than 700 bottlenose dolphin stomachs collected between 1973 and 1996 from the southeastern United States (N. Barros, personal communication). Some cases may have been reported in more than one of the summaries described above; thus the proportion of documented cases involving fishing gear ingestion is extremely small. In contrast, two cases of fishing gear ingestion, leading directly or indirectly to the death of two of 23 dead-stranded Atlantic bottlenose dolphins examined during 1995, were documented along the central Florida west coast.

On 27 August 1995 an adult female (239 cm, 36 yr old) bottlenose dolphin, MML9514, was discovered floating dead in Sarasota Bay, Florida. The animal was freshly dead and in good nutritional condition. Internal examination revealed a distention of the esophagus and a partially digested sheepshead (*Archosargus probatocephalus*) at the entrance to the forestomach. Further examination revealed a fishing hook (size equivalent = 1/0) embedded in the left side of the fish, with a 20-cm section of monofilament line extending from the fish anterior to the laryngeal spout (also commonly referred to as the "epiglottal beak" or "goosebeak"), where it was tightly wrapped around the base in a slip-type knot. As this fish moved farther down the esophagus it was likely that the loop of monofilament line around the airway became tighter and ultimately resulted in death by asphyxiation. Other necropsy results (cystic medionecrosis of the aorta, mild fatty liver, and moderate to heavy anthracosis of both lungs and mediastinal lymph nodes) were considered incidental findings which did not contribute to death. The lungs also showed indication of mild inflammation, acute congestion, and edema. The stomach was distended and contained 1,862 g of food matter, comprised of several

fairly-undigested *A. probatocephalus* and the remains of a small stingray. It was estimated that these prey items were consumed within two hours of death (N. Barros, personal communication). With the exception of a single stomach fluke (*Braunina cordiformis*) in the main chamber, the remainder of the stomach was parasite-free. A freeze-brand and dorsal fin photographic identification confirmed that MML9514 was a well-known resident of the Sarasota Bay free-ranging *Tursiops* community (Wells 1991), with more than 204 confirmed sightings dating back to 1976 and including confirmed sightings within six days of death. Behavioral observations of this animal prior to death were considered unremarkable (R. Wells, personal communication).

On 24 December 1995, a dead-stranded adult (274 cm, >25 yr old) male bottlenose dolphin, MML9523, was recovered from Englewood Beach, Charlotte County, Florida. This animal was also in good body condition. A 6-cm long feather-jig-type fishing lure (hook size equivalent = 1/0) was observed protruding from the mouth. Internal examination revealed the entire oropharynx was fiery-red in color, with a monofilament line extending down through the pharynx into the esophagus. The monofilament line was wrapped around the laryngeal spout, with a tangle of line also wrapped around a fish bone in the esophagus. Other findings on this animal included significant bilateral consolidation of both lungs, evidence of pneumonia with debris and bacteria (*Pseudomonas* sp.), and anthracosis of the mediastinal lymph nodes. Significant bacterial colonies were also observed histologically in the kidneys, pharynx, and adrenal gland. In contrast to MML 9514, the stomach of this animal was virtually empty, with a moderate infestation of *Braunina cordiformis*.

MML9523 had been identified photographically on 20 occasions since 1990. Sighting locations indicated that this animal is a member of a coastal *Tursiops* community in the Charlotte Harbor area (R. Wells, personal communication). While sighting data are more limited than for MML9514, the range of MML9523 also overlaps with areas of recreational fishing activity. Examination of sectioned teeth from this animal resulted in an age estimate of 25 yr at time of death. The dolphin was perhaps significantly older given its body size and condition of teeth. While the ranges of MML9514 and MML9523 did overlap somewhat, MML9523 had a more southern range and frequently moved into the northern Charlotte Harbor region. These two animals were never sighted together.

The circumstances leading to the death of two animals in relatively close proximity and within a relatively short span of time are considered highly unusual, yet coincidental. MML9514 was frequently sighted in close proximity to bridges and causeways in the Sarasota Bay area. Sheepshead, a common recreational species inhabiting these types of areas (Johnson 1978, Knopf 1985), were probably part of its regular diet. The most probable scenario was that a sheepshead was hooked by a recreational fisherman, broke the line, and was later consumed by MML9514. The robust condition of MML9514, along with the full stomach and lack of other significant pathology, indicates that death was relatively sudden. In contrast, pathological evidence (pneumonia,

infection, anorexia) in MML9523 suggests that this animal gradually succumbed to the cumulative effect of secondary complications associated with the ingestion of, and entanglement in, fishing gear. MML9523 more likely consumed a fish which had been caught with recreational fishing gear and digested it. It then regurgitated the fishing gear, which became entangled in and around the laryngeal spout but did not completely obstruct the airway.

Inexperience in feeding does not appear to be a factor in these two cases. Both animals were sexually mature adults and had been observed in field studies for several years. These two strandings represent the first documented cases of fishing gear ingestion by Atlantic bottlenose dolphins in this area. By comparison, evidence of external entanglement in either commercial or recreational fishing gear has been documented in 20 of 234 stranded dolphins in the same geographic area since 1983 (Mote Marine Laboratory, unpublished data).

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SEASONAL VARIATION IN RECEPTION OF FIN WHALE CALLS AT FIVE GEOGRAPHIC AREAS IN THE NORTH PACIFIC

In late August 1991 scientists at the National Oceanic and Atmospheric Administration's (NOAA) National Marine Mammal Laboratory (NMML) and Pacific Marine Environmental Laboratory (PMEL) began a pilot study to investigate the capability of hydrophones from the U.S. Navy's fixed array system to detect large whales in the North Pacific by passive reception of their calls. PMEL had previously established a direct data link from five bottom-mounted arrays of the Navy SOSUS (SOund SURveillance System), *via* the Naval Oceanographic Processing Facility (NOPF) at Whidbey Island, Washington, to study low-level seafloor seismicity (Fox *et al.* 1994). PMEL subsequently provided NMML tapes of SOSUS hydrophone data from which whale calls were analyzed. As in an analogous study conducted in the North Atlantic (Nishimura and Conlon 1994, Clark 1995, Mellinger and Clark 1995), calls attributable to whales were received at each SOSUS site at rates that varied seasonally (Anonymous 1996).

Pulsed signals, similar to those recorded from fin whales (*Balaenoptera physalus*), were the most distinctive of the whale calls received during the pilot study. In addition to other sounds, fin whales produce characteristic, loud, short calls termed "20-Hz pulses" (Watkins 1981). These signals are roughly 1 sec long, with energy concentrated near 20 Hz and source levels of ~160–186 dB re 1 μ Pa-m (reviewed in Thomson and Richardson 1995). Such pulses are produced in: (1) long stereotyped bouts, composed of repeated series of either single or "doublet" pulses with regular interpulse intervals, and (2) comparatively short series with irregular interpulse intervals. The long bouts (<1–32.5 h) of stereotyped calling by individual whales are thought to be reproductive displays (Watkins *et al.* 1987, Thompson *et al.* 1992), while the shorter irregular pulse sequences (≤ 5 min) are produced in series by a number of different whales and have been associated with feeding, socializing, and transiting animals (Watkins 1981, McDonald *et al.* 1995). Calls attributed to fin whales during the pilot study had peak energy centered near 20 Hz and