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Bubble use during prey capture by a lone bottlenose dolphin (*Tursiops truncatus*)

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There are only three cetacean species that have been previously documented to use bubbles to corral fish: humpback whale (*Megaptera novaeangliae*), killer whale (*Orcinus orca*), and Atlantic spotted dolphin (*Stenella frontalis*). We observed a lone bottlenose dolphin (*Tursiops truncatus*) blowing bubbles while feeding on a school of striped mullet (*Mugil cephalus*). This account is the first to date of the use of bubbles by bottlenose dolphins for prey containment.

Humpback whales in both the North Atlantic and North Pacific have been documented to use bubbles during some of their feeding behaviors (e.g. Jurasz & Jurasz, 1979; Hain *et al*., 1982). Blowing forceful exhalations underwater, 'bubble bursts', during feeding events has been previously reported in only two delphinid species: killer whales (*Orcinus orca*) (photo in Sigurjonsson *et al*., 1988; Similä & Ugarte, 1993) and Atlantic spotted dolphins (Fertl & Würsig, 1995). Bottlenose dolphins employ a variety of behaviors to capture fish (Würsig, 1986; Shane, 1990*a*); however, the use of bubbles by bottlenose dolphins during feeding events, has not been reported to date.

On 30 December 1991, at 0950 h, a lone bottlenose dolphin was observed feeding in the Galveston Ship Channel (Galveston Bay, Texas) behind a trawling shrimp boat. At 0954 h, the dolphin moved away from the shrimp boat. Shortly thereafter, a school of striped mullet (*Mugil cephalus*) was sighted near the area of the dolphin's last surfacing. (A Beaufort Sea State of 0 facilitated observations. The fish school was initially sighted as disturbance near the water's surface; the fish were identified to species from a photograph.) The dolphin was first observed to circle the fish school (based on adult dolphin body length of approximately 2.0 m, the fish school had an original approximate 3.0 m dimension), making tighter and tighter circles, causing the fish to become more tightly bunched (with a final dimension of less than 1.0 m). A bubble burst was then seen to rise in the center of the fish school, at which time the fish became very active at the surface. The bubble bursts appeared to assist in keeping the fish ball near the water's surface. The dolphin then moved up under the fish and surfaced in the center of the fish ball with just the tip of its rostrum visible at the water surface. The dolphin repeated this activity for a total of 13 minutes, with five bubble bursts observed. The dolphin was sensitive to movements of boats within a 25 m radius; the dolphin moved away from the fish school when we attempted to move in closer, or when other recreational boat traffic passed by.

The bubble bursts blown by the bottlenose dolphin appeared to assist with keeping the fish ball near the water's surface. Bubbles may immobilize and confuse the prey school, causing a clumping response among the prey (Hain *et al*., 1982; Sharpe & Dill, 1993, 1995). In some situations, bubbles also may displace individual fish near the surface from their anti-predator schooling mode, as well as suck sub-surface fish under, resulting in condensing and containing the fish school (Fertl & Würsig, 1995).

Bubble bursts have been observed in the vicinity of feeding bottlenose dolphin groups in coastal waters off Texas (Texas: D. Fertl, pers. obs; D. Weller, Marine Mammal Research Program, pers. comm.; A Schiro, Marine Mammal Research Program, pers. comm.), as well as intracoastal creeks and open ocean off Jacksonville, Florida (M. Caldwell, University of Miami, pers. comm.). Since bubbles have been observed in social interactions between delphinids (e.g. Dudzinski, 1996; Pryor & Kang, 1980; Shane, 1990*b*), it is possible that bubbles in group feeding activities may have a social significance. However, our observations of the single bottlenose dolphin demonstrate that bottlenose dolphins sometimes use bubbles to assist with prey capture.

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