Bottlenose Dolphin

Tursiops truncatus

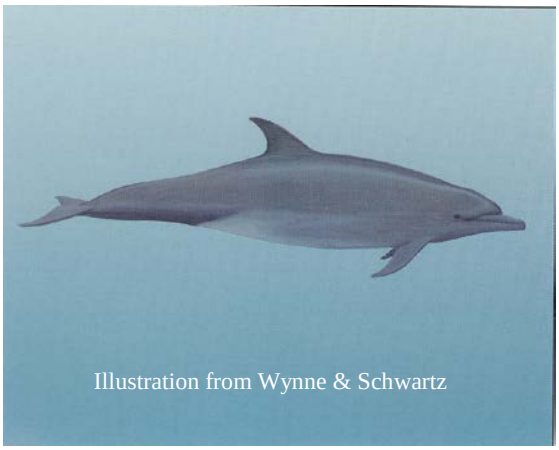

Illustration from Wynne & Schwartz

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DESCRIPTION

Taxonomy and Basic Description

The bottlenose dolphin, *Tursiops truncatus*, was first described by Montagu in 1821. Currently, most researchers agree that there is a single species, *Tursiops truncatus*, with a number of regional forms. The body and head are robust with a short, thick, well-defined beak. Based on distribution, genetics, morphology, parasites and prey items, two "ecotypes" are recognized; the "coastal form" is shorter and slimmer than the larger "offshore form." The flippers are pointed with deeply notched flukes. The teeth are small and conical and number between 40 to 52 in the upper row and 36 to 48 in the lower row. The dorsal fin, located mid-back, is tall and falcate with a broad base. Adult size varies considerably, ranging from 1.9 to 3.6 m (6 to 12 ft.) (Wynne & Schwartz 1999). The bottlenose has been reported to weigh up to 650 kg (1,432 lb) (Minasian et al. 1984).

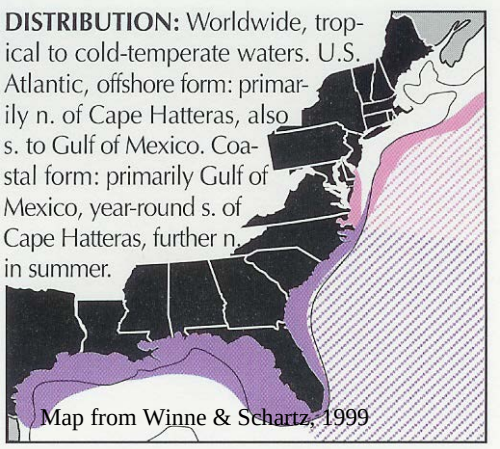
Status

The bottlenose dolphin is not listed as threatened or endangered under the Endangered Species Act (ESA). In 1993, the National Oceanic and Atmospheric Administration (NOAA) Fisheries Service (National Marine Fisheries Service or NMFS), treating the coastal population as a single migratory stock, designated the stock as "strategic" under the Marine Mammal Protection Act (MMPA). The action was due to a massive die-off of coastal bottlenose dolphins between 1987 and 1988 (Waring et al. 2002). From 1995 through 2001, the NMFS recognized only a single migratory stock of coastal bottlenose dolphins in the western North Atlantic; therefore, the entire stock was listed as depleted. Current stock assessments have identified 5 coastal stocks of bottlenose dolphins based on genetic studies (Rosel et al. 2009), photo-id (Zolman 2002), strandings (McLellan et al. 2003), and satellite telemetry data (Southeast Fisheries Science Center, NMFS, unpublished data): the Northern Migratory and Southern Migratory stocks, South Carolina/Georgia Coastal stock, Northern Florida Coastal stock, and the Central Florida Coastal stock (Waring et al 2010). Further, there are at least 7 recognized Estuarine Stocks on the east coast of the US: a Northern NC Estuarine System stock, a Southern NC Estuarine System stock, a Charleston Estuarine System stock, a Northern Georgia/Southern SC Estuarine System stock, a Southern Georgia Estuarine System stock, a Jacksonville Estuarine System stock, and an Indian River Lagoon Estuarine System stock (Waring et al 2009b). Because one or more of the stocks may be depleted, all stocks retain the depleted designation.

The western North Atlantic offshore bottlenose dolphin (offshore ecotype) is also not listed as threatened or endangered under the ESA. Potential Biological Removal level or PBR is an

estimate of the maximum number of animals, not including natural mortalities, which may be removed from a marine mammal stock while allowing that stock to reach or maintain its Optimum Sustainable Population (OSP). PBR's are established under the MMPA. The average annual fishery-related mortality and serious injury for western North Atlantic offshore bottlenose dolphin from 1996 to 2000 is unknown and the PBR is 566 animals; therefore the status of this stock is unknown (Waring et al 2009a).

POPULATION SIZE AND DISTRIBUTION



Map from Winne & Schartz, 1999

Two bottlenose dolphin ecotypes inhabit waters in the western North Atlantic Ocean: a shallow water or nearshore/coastal ecotype and a deep water or offshore ecotype (Curry and Smith 1997). Based on work to date, it appears that the western North Atlantic offshore stock consists primarily of the offshore ecotype. Relatively little is known about the distribution of the offshore ecotype except that it is typically concentrated along the continental shelf break in deeper waters and can, in lower concentrations, extend beyond the continental shelf into continental slope waters (Kenney 1990). However, the offshore ecotype has been documented to occur close to shore near Cape Hatteras, NC and points south. Although the ranges of the coastal and offshore ecotypes overlap to some degree, Torres et al. (2003) found a statistically significant break in the distribution of the two ecotypes at 34 km (18 nautical miles) from shore. Torres reports that the offshore ecotype is found seaward of 34 km and in waters deeper than 34 m (112 ft.), and the coastal ecotype is found within 7.5 km (4 nautical miles) offshore. The best available abundance for the offshore stock of bottlenose dolphins in <40 m (131 ft.) depth is 26,849 and in >50 m (164 ft.) water depth is 44,953. Data are insufficient to determine current population trends for the offshore stock (Waring et al. 2009a).

The coastal ecotype is continuously distributed along the Atlantic coast south of Long Island, around peninsula Florida, and along the Gulf of Mexico coast. However, based on genetic studies, Curry (1997) concluded that the nearshore animals in the northern Gulf of Mexico and the western North Atlantic are separate stocks. Within the western North Atlantic, the stock structure of coastal bottlenose dolphins is complex. Efforts to distinguish stocks are complicated by the fact that animals from different stocks cannot be separated on the basis of appearance and by the fact that different stocks sometimes have geographic ranges that overlap temporally and spatially (MMC 2004). Preliminary results from studies involving genetics, photo-identification, telemetry and stable isotopes suggest the existence of at least 5 coastal ecotype stocks in the western North Atlantic and seven estuarine ecotype stocks (Waring et al. 2010). Estimates of abundance for each stock of western North Atlantic coastal bottlenose dolphins are as follows: Northern migratory (9604); Southern Migratory (12482); SC/GA (7738); Northern Florida (3064); and Central Florida (6318). Estimates of abundance for the Estuarine stocks are: Northern NC Estuarine System Stock (unknown); Southern NC Estuarine System Stock (2454);

and estimates are unknown for the Charleston, Northern GA/Southern SC, Southern Georgia, Jacksonville, and Indian River Lagoon Estuarine System Stocks.

HABITAT AND NATURAL COMMUNITY REQUIREMENTS

Bottlenose dolphins are both a coastal and an oceanic species, with the coastal ecotype preferring waters of less than 30 m (98 ft.) in depth. The habitats they occupy are diverse, ranging from rocky reefs to calm lagoons and open waters. The coastal ecotype is adapted for warm shallow waters. Its smaller body and larger flippers suggest increased maneuverability and heat dissipation. These dolphins occur along the outer coastline and in bays, sounds, inlets, estuaries and other inland waters (Hersh and Duffield 1990).

The offshore ecotype seems to be adapted for cooler, deeper waters. Certain characteristics of their blood indicate that this form may be better suited for deep diving. They typically occur in deep waters of the continental shelf and inner continental slope (Hersh and Duffield 1990).

CHALLENGES

A variety of factors, both natural and human-related, can affect bottlenose dolphins. Natural factors include predation by large sharks, disease, parasites, exposure to naturally occurring biotoxins, changes in prey availability, and reduction or loss of habitat due to environmental variation. Human-related causes of mortality and injury to this species include loss of habitat due to coastal development, exposure to pollutants, vessel strikes, entanglement in debris, as well as noise and pollution related to oil and gas development. Bottlenose dolphins have also increasingly become the target of dolphin watching and wild dolphin interaction programs. There is growing concern that these activities may result in altered behavioral patterns, especially where people enter the water with dolphins and where they are fed. In the latter case, behavioral patterns are altered significantly and increased aggression may occur (Bryant 1994).

In addition, recreational and commercial fisheries directly and indirectly affect bottlenose dolphins. Coastal bottlenose dolphins are taken as bycatch in various kinds of fishing gear including gillnets, seines, longlines, shrimp trawls and crab pots (Waring et al. 2002). Bycatch of offshore bottlenose dolphins has been observed in the pelagic drift gillnet, pelagic pair trawl, New England multispecies sink gillnet, North Atlantic bottom trawl, mid-Atlantic coastal gillnet and pelagic longline fisheries. The pelagic drift gillnets and pelagic pair trawl fisheries no longer exist. Mortalities of bottlenose dolphins due to ingestion of hooks and/or line have also been documented (Gorzelany 1998; Well et al. 1998). The gear most likely had been discarded or was consumed by the dolphin by eating a fish that had been hooked then broke away with the gear. Estimates of fishery-attributed interactions suggest that mortality exceeds the PBR of several coastal stocks considered depleted by the 1987 through 1988 die-off and, thus, may be impeding their recovery.

CONSERVATION ACCOMPLISHMENTS

SCDNR and South Atlantic Fishery Management Council (SAFMC) personnel serve as members of the Bottlenose Dolphin Take Reduction Team (BDTRT), which was convened in

2001. The BDTRT works with NOAA Fisheries to develop the Bottlenose Dolphin Take Reduction Plan (BDTRP) for coastal stocks. The short term goal of the plan is to reduce, within 6 months of its implementation, the incidental mortality or serious injury of western North Atlantic coastal bottlenose dolphins incidentally taken in commercial fishing operations to levels less than the potential biological removal (PBR) level. The long term goal of the take reduction plan is to reduce, within five years of plan implementation, incidental mortality and serious injury of coastal bottlenose dolphins incidentally taken in the course of commercial fishing operations to insignificant levels approaching a zero mortality rate goal (ZMRG). The BDTRT has developed a number of recommendations to achieve these goals and to be incorporated into the BDTRP. The BDTRP was amended in December of 2008 (73 FR 77531) with an effective date of January 20, 2009.

The BDTRT has made a number of recommendations to be incorporated into the BDTRP for coastal stocks including regulatory suggestions, based on management units, which apply to specific fisheries. Generally, these recommendations seek to reduce soak times, the amount of fishing gear in the water at any given time, or to modify practices in order to limit interactions with and the take of bottlenose dolphins. The BDTRT also adopted non-regulatory recommendations for all management units including education and outreach, as well as improved research, monitoring, collection of strandings data, and observer coverage. The finalized specific recommendations were published on April 26, 2006 (FR 50CFR Parts 223 and 229) and SCDNR will continue to explore avenues to implement these recommendations, working together with members of the BDTRT as funding opportunities become available.

SCDNR conducted a marine mammals stranding program from 1991 to 2005 in order to obtain data on marine mammals that strand along the South Carolina coast. Data from the program are used to further our knowledge regarding these animals and the extent to which anthropogenic factors are responsible for or contribute to their stranding. From 2006-2008, the NOAA National Centers for Coastal Ocean Science in Charleston, SC assumed responsibility of the network, and in 2008 Coastal Carolina University has administered the program since 2009 having received grant awards from the Prescott Grant.

CONSERVATION RECOMMENDATIONS

- Improve understanding of stock structure and population trends in order to assess the greatest threats to bottlenose dolphins.
- Determine the significance of periodic die-offs, especially to relatively small, isolated populations of bottlenose dolphins.
- Assess the impact of contaminants on marine mammals, particularly the repercussions of high contaminant loads in individual bottlenose dolphins as well as their offspring.
- Measure the effects of interactions between humans and dolphins in the wild, including behavioral disruption, habituation, injury and death.
- Mitigate threats to bottlenose dolphins posed by entanglement in fishing gear through support of methods proposed by the BDTRT.
- Continue to explore avenues to partner in implementation of recommendations to be published by the BDTRT.

MEASURES OF SUCCESS

A take reduction plan has been developed for coastal bottlenose dolphins to reduce the incidental take of animals in commercial fishing operations to below the Potential Biological Removal (PBR) level. SCDNR personnel will continue to serve on the BDTRT in order to help develop and implement programs and activities designed to reduce bottlenose dolphin non-natural mortalities to insignificant levels approaching a zero mortality and serious injury rate (the Zero Mortality Rate Goal or ZMRG).

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