Bottlenose Dolphin

Tursiops truncatus

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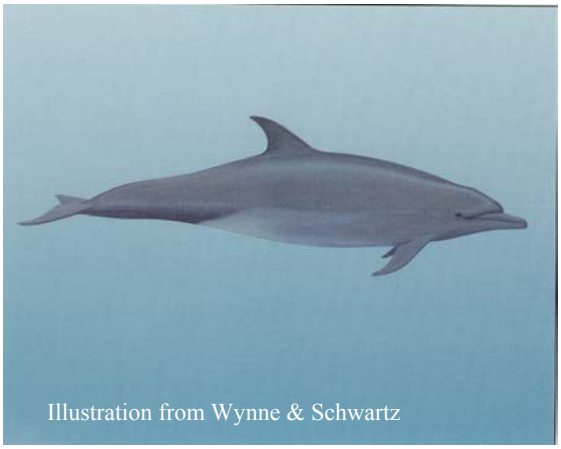


Illustration from Wynne & Schwartz

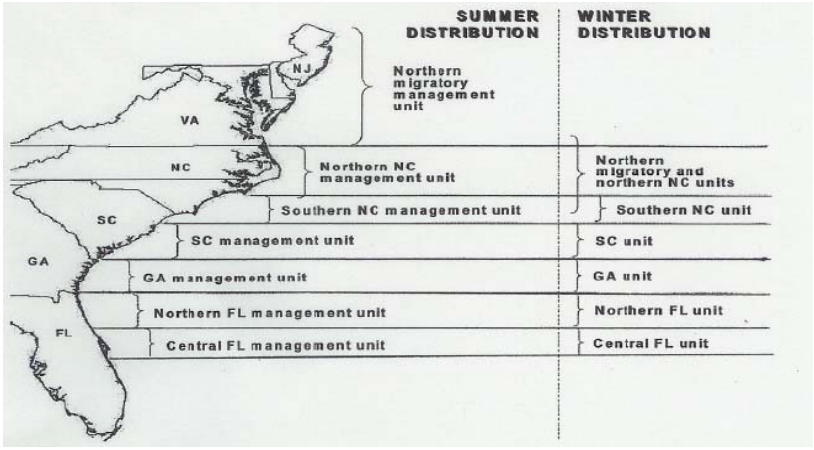
DESCRIPTION

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 truncates*, 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 feet) (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. Separate management units have recently been recognized as an interim measure, pending additional research to better identify stock structure. Seven management units within the range of the "coastal migratory stock" have been defined and are illustrated in the figure below (Hohn 1997). These management units now replace the single coastal migratory stock assumption. Because one or more of the management units may be depleted, all management units retain the depleted designation. Even though the bottlenose dolphin is the most common marine mammal along the U.S. southeastern coast, certain coastal stocks do appear to be depleted based on the most recent stock assessments

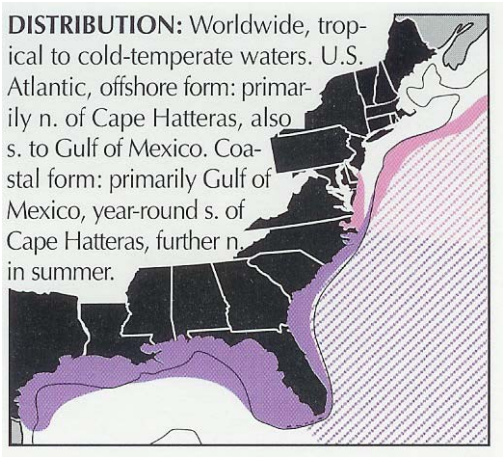


(Waring et al. 2002; MMC 2004).

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 does not exceed the PBR of 242 animals; therefore this is not a strategic stock under the MMPA. However, the total fishery related mortality and serious injury for this stock is not less than 10 percent of the calculated PBR; therefore, this stock cannot be considered to be insignificant or approaching zero mortality and serious injury rate.

POPULATION DISTRIBUTION AND SIZE

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). 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 feet), 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 is 29,774 animals (northern U.S. Atlantic: 16,689; southern U.S. Atlantic: 13,085). Data are insufficient to determine current population trends for the offshore stock (Waring et al. 2004).



Map from Winne & Schartz, 1999

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 seven stocks of the coastal ecotype

in the western North Atlantic from which the current management units were defined (Waring et al. 2002). Estimates of abundance for each management unit of western North Atlantic coastal bottlenose dolphins during the summer (May through October) are as follows: Northern migratory (5681); Northern NC oceanic (3,383); Northern NC estuary (919); Northern NC both (4,302); Southern NC oceanic (1,157); Southern NC estuary (141); and Southern NC both (1,298). Estimates of abundance for the winter (November through April) are: NC mixed (includes northern migratory, Northern NC and Southern NC) (6,474); South Carolina (3,513); Georgia (767); Northern Florida (354); and Central Florida (10,652). There are insufficient data to determine the population trend for the coastal bottlenose dolphin stock (Waring et al. 2002).

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 meters (98 feet) 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, 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 six 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 National Marine Fisheries Service is currently in the process of developing a regulatory package based on the BDTRT's recommendations and public comment to implement the recommendations of the BDTRT and the provisions of the BDTRP.

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 will be published shortly and SCDNR will continue to explore avenues to implement these recommendations working together with members of the BDTRT as funding opportunities become available.

SCDNR has been conducting a marine mammals stranding program since 1991 in order to obtain data on marine mammals that strand along the South Carolina coast. Last year, we applied for and obtained a Prescott Grant for $87,000 to continue our stranding program. 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.

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

MEASUREMENTS 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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