

BOTTLENOSE DOLPHIN (*Tursiops truncatus truncatus*): Puerto Rico and U.S. Virgin Islands Stock

STOCK DEFINITION AND GEOGRAPHIC RANGE

In waters of Puerto Rico and the Virgin Islands in the northeastern Caribbean Sea, the bottlenose dolphin has been described as the most frequently sighted cetacean, especially for inshore waters (Erdman 1970; Erdman *et al.* 1973; Taruski and Winn 1976; Mignucci-Giannoni 1998), as well as the second most common species found stranded (Mignucci-Giannoni *et al.* 1999; Mignucci-Giannoni *et al.* 2009). Sightings have occurred throughout Puerto Rico and the Virgin Islands, primarily over the shelf or near shelf-edge habitats (Erdman 1970; Erdman *et al.* 1973; Taruski and Winn 1976; Mattila and Clapham 1989; Mignucci-Giannoni 1998). The bottlenose dolphin is widely distributed throughout other areas of the Caribbean as well. For example, it has been reported from Cuba (van Waerebeek *et al.* 2006), Dominican Republic (Mattila *et al.* 1994; Whaley *et al.* 2006; Parsons *et al.* 2010), St. Vincent and the Grenadines (Caldwell *et al.* 1971; Caldwell and Caldwell 1975; Yoshida *et al.* 2010), Martinique (J eremie *et al.* 2006), Guadeloupe, St. Lucia and Barbados (Yoshida *et al.* 2010), Trinidad (van Bree 1975), throughout Venezuela, particularly in the east (Romero *et al.* 2001; Romero *et al.* 2002; Oviedo *et al.* 2005), Leeward Netherlands Antilles (Debrot *et al.* 1998), Colombia (Romero *et al.* 2001; Pardo and Palacios 2006; Fraija *et al.* 2009; Pardo *et al.* 2009), Panama (Pardo *et al.* 2009), Belize (Jefferson and Lynn 1994; Grigg and Markowitz 1997; Campbell *et al.* 2002; Kerr *et al.* 2005) and the eastern Caribbean area generally (Guadeloupe to St. Vincent and the Grenadines; Watkins *et al.* 1985).

The Puerto Rico and U.S. Virgin Islands bottlenose dolphin population is provisionally being considered a separate stock for management purposes, although there is currently no information to differentiate this stock from the Atlantic Ocean and Gulf of Mexico stocks. This population potentially consists of multiple stocks. The “coastal/nearshore” and “offshore” ecotypes of bottlenose dolphins are genetically distinct, and both occur in the western North Atlantic Ocean including the Gulf of Mexico (Hersh and Duffield 1990; Hoelzel *et al.* 1998; LeDuc and Curry 1998; Rosel *et al.* 2009). In the northwestern Atlantic Ocean, Torres *et al.* (2003) reported that the offshore ecotype was found exclusively seaward of 34 km and in waters deeper than 34 m. Additional morphological, genetic and/or behavioral data are needed to provide further information on stock delineation. Bottlenose dolphins of the Puerto Rico and U.S. Virgin Islands stock are likely trans-boundary with, at a minimum, waters near adjacent Caribbean islands and are not likely to occur exclusively within the bounds of the U.S. EEZ.

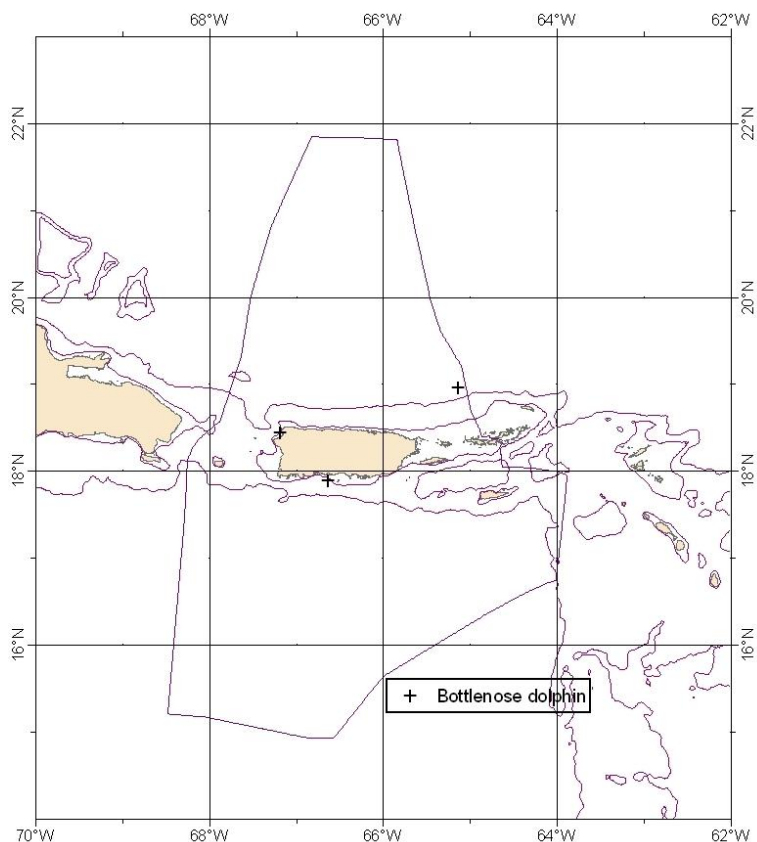


Figure 1. Distribution of bottlenose dolphin sightings from SEFSC shipboard surveys during winters of 1995 and 2001. Solid lines indicate the 200m and 2,000m isobaths and the boundary of the U.S. EEZ.

POPULATION SIZE

The abundance of the Puerto Rico and U.S. Virgin Islands stock of bottlenose dolphins is unknown. A line-transect survey was conducted during January-March 1995 on NOAA Ship *Oregon II*, and was designed to cover a wide range of water depths surrounding Puerto Rico and the Virgin Islands. However, due to the bottom topography of the region and the size of the vessel, most waters surveyed were >200 m deep, and only 1 sighting of bottlenose dolphins was made in U.S. waters (Roden and Mullin 2000). Another line-transect survey for humpback whales was conducted during February-March 2000 aboard NOAA Ship *Gordon Gunter* in the eastern and southern Caribbean Sea. A portion of the survey effort occurred in U.S. waters during transit, but no bottlenose dolphins were sighted (Swartz and Burks 2000). During February-March 2001 a line-transect survey was conducted in waters of the eastern Bahamas, eastern Dominican Republic, Puerto Rico and Virgin Islands. Two sightings of bottlenose dolphins were made, both in U.S. waters (Swartz *et al.* 2002). It was not possible to estimate abundance from these surveys using line-transect methods due to so few sightings (Figure 1).

Minimum Population Estimate

Present data are insufficient to calculate a minimum population estimate for this stock of bottlenose dolphins.

Current Population Trend

There are insufficient data to determine population trends for this stock.

CURRENT AND MAXIMUM NET PRODUCTIVITY RATES

Current and maximum net productivity rates are unknown for this stock. The maximum net productivity rate is assumed to be 0.04. This value is based on theoretical modeling showing that cetacean populations may not grow at rates much greater than 4% given the constraints of their reproductive life history (Barlow *et al.* 1995).

POTENTIAL BIOLOGICAL REMOVAL

Potential biological removal level (PBR) is the product of minimum population size, one-half the maximum productivity rate and a recovery factor (MMPA Sec. 3. 16 U.S.C. 1362; Wade and Angliss 1997). The maximum productivity rate is 0.04, the default value for cetaceans. The “recovery” factor, which accounts for endangered, depleted, threatened stocks, or stocks of unknown status relative to optimum sustainable population (OSP), is assumed to be 0.5 because the stock is of unknown status. PBR for this stock of bottlenose dolphins is unknown.

ANNUAL HUMAN-CAUSED MORTALITY AND SERIOUS INJURY

The level of past or current, direct, human-caused mortality and serious injury of bottlenose dolphins in U.S. waters of the Caribbean Sea is unknown.

Fisheries Information

Spiny Lobster and Mixed Species Trap/Pot Fisheries

During 2008 one dolphin was reported by a local fisherman from Cabo Rojo, Puerto Rico, as dead and entangled in rope with 2 pots attached (fishery could not be confirmed; NOAA National Marine Mammal Health and Stranding Response Database unpublished data, accessed 17 November 2010). The dolphin was cut loose from the rope by the fisherman, and the carcass was not recovered. This mortality was included in the stranding database and is included in the stranding totals below. Since there is no systematic observer program, it is not possible to estimate the total number of interactions or mortalities associated with spiny lobster and mixed species trap/pot fisheries.

Pelagic Longline Fishery

Pelagic swordfish, tunas and billfish are the targets of the longline fishery operating in the Caribbean Sea. There has been no reported fishing-related mortality of a bottlenose dolphin during recent years (2001-2009) in waters surrounding Puerto Rico or the U.S. Virgin Islands (Garrison 2003; Garrison and Richards 2004; Garrison 2005; Fairfield Walsh and Garrison 2006; Fairfield-Walsh and Garrison 2007; Fairfield and Garrison 2008; Garrison *et al.* 2009; Garrison and Stokes 2010). However, it is important to note that for some recent years, 2006, 2008 and 2009, there has been no observer coverage of the pelagic longline fishery in the Caribbean region (Fairfield-Walsh and Garrison 2007; Garrison *et al.* 2009; Garrison and Stokes 2010).

Dolphin Fisheries and Live-Capture Fisheries in the Caribbean

While no whaling or dolphin fishery occurs at present in the waters of Puerto Rico and the U.S. Virgin Islands, small-scale whaling and dolphin fisheries, conducted by local whalers, are still carried out by the eastern Caribbean nations of Dominica, St. Lucia, and St. Vincent and the Grenadines (e.g., Caldwell *et al.* 1971; Caldwell and Caldwell 1975; Price 1985; Hoyt and Hvenegaard 2002; Romero *et al.* 2002; Mohammed *et al.* 2003; World Council of Whalers 2008), and by Venezuela (Romero *et al.* 1997; Romero *et al.* 2002). It is difficult to determine the extent that the bottlenose dolphin, or any other particular dolphin species, has been taken in the dolphin fisheries because the smaller cetacean species hunted have generally been lumped by weight under the heading “porpoise” and reported as such (Caldwell and Caldwell 1975; Price 1985). However, bottlenose dolphins have been and are still being taken in dolphin fisheries in the eastern and southern Caribbean Sea (e.g., Caldwell *et al.* 1971; Caldwell and Caldwell 1975; Romero *et al.* 1997; Romero *et al.* 2002; Mohammed *et al.* 2003; Vail 2005). Bottlenose dolphins have also been the subjects of live-capture fisheries in Cuba, Dominican Republic, Haiti and Honduras for use in dolphinarium locally and around the world (van Waerebeek *et al.* 2006; Parsons *et al.* 2010).

Other Mortality

Six bottlenose dolphins were found stranded in U.S. waters of the Caribbean Sea from 2005 through 2009 (NOAA National Marine Mammal Health and Stranding Response Database unpublished data, accessed 17 November 2010). Of these, 2 showed evidence of human interactions. One case of human interaction involved entanglement in pot gear and was mentioned above, and the second case involved healed marks from an interaction with fishing gear. For 3 of the animals, it could not be determined if there was evidence of human interactions, and for the remaining animal, no evidence of human interactions was found. Stranding data probably underestimate the extent of fishery-related mortality and serious injury because not all of the marine mammals which die or are seriously injured in fishery interactions wash ashore, not all that wash ashore are discovered, reported or investigated, nor will all of those that do wash ashore necessarily show signs of entanglement or other fishery-interaction. Finally, the level of technical expertise among stranding network personnel varies widely as does the ability to recognize signs of fishery interactions.

The potential impact of coastal pollution may be an issue for this species in portions of its habitat. The U.S. Navy and the U.S. Marine Corps used the Atlantic Fleet Weapons Training Facility operated out of Vieques Island, Puerto Rico, from 1948 to 2003, including the training of pilots for live ordnance delivery and amphibious assault landings by the Marine Corps. The U.S. Environmental Protection Agency has designated parts of Vieques Island on the Superfund National Priorities List because various parts of the island and nearby waters have become contaminated by solid and/or hazardous waste resulting from decades of military activity (EPA 2009). Identified areas of concern include ship anchoring areas north of Vieques, waters impacted by target practice on eastern Vieques and waters near western Vieques. Remnants of exploded ordnance and large amounts of unexploded ordnance have been identified in the range areas of Vieques and in the surrounding waters. Hazardous substances associated with ordnance use may include lead, mercury, lithium, magnesium, copper, perchlorate, napalm, TNT, and depleted uranium, among others. At both the eastern and western ends of Vieques, hazardous materials may also include an assortment of chemicals such as pesticides, solvents and PCBs (EPA 2009). The naval station at Roosevelt Roads in Puerto Rico operated from 1943 to 2004 (between 1943 and 1957 it was opened and closed multiple times). It operated as a major training site for fleet exercises; potential impacts, if any, on bottlenose dolphins are unknown.

STATUS OF STOCK

The status of bottlenose dolphins, relative to OSP, in U.S. waters of the Caribbean Sea is unknown. The size of this stock or any population of bottlenose dolphins in the northeast Caribbean has never been assessed. The species is not listed as threatened or endangered under the Endangered Species Act. There are insufficient data to determine population trends for this stock. Total human-caused mortality and serious injury for this stock is not known. There is no systematic monitoring of all fisheries that may take this stock. There is insufficient information available to determine whether the total fishery-related mortality and serious injury for this stock is insignificant and approaching zero mortality and serious injury rate. For these reasons and because the stock size is currently unknown, PBR is undetermined, and there is a recent documented case of human-related mortality, this stock is a strategic stock.

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