

## ATLANTIC SPOTTED DOLPHIN (*Stenella frontalis*): Puerto Rico and U.S. Virgin Islands Stock

### STOCK DEFINITION AND GEOGRAPHIC RANGE

There are 2 species of spotted dolphin in the Atlantic Ocean, the Atlantic spotted dolphin, *Stenella frontalis*, formerly *S. plagiodon*, and the pantropical spotted dolphin, *S. attenuata* (Perrin *et al.* 1987). The Atlantic spotted dolphin occurs in 2 forms which may be distinct sub-species (Perrin *et al.* 1987, 1994; Rice 1998): the large, heavily spotted form which inhabits the continental shelf and is usually found inside or near the 200m isobath, and the smaller, less spotted island and offshore form which occurs in the Atlantic Ocean and Caribbean Sea but is not known to occur in the Gulf of Mexico (Fulling *et al.* 2003; Mullin and Fulling 2003; Mullin and Fulling 2004). Where they co-occur, the offshore form of the Atlantic spotted dolphin and the pantropical spotted dolphin can be difficult to differentiate at sea. In the Caribbean, the Atlantic spotted dolphin and the pantropical spotted dolphin are sympatric, but the Atlantic spotted dolphin is believed to be more common and abundant (Mignucci-Giannoni *et al.* 2003).

Early records of spotted dolphin sightings in the Caribbean are difficult to interpret prior to the Perrin *et al.* (1987) revision of the spotted dolphins due to confusion over the names, descriptions and number of “spotted” dolphin species. Some references, like Caldwell *et al.* (1971), Caldwell and Caldwell (1975) and Taruski and Winn (1976) clearly distinguished 2 species (with different names) as they are accepted presently (Roden and Mullin 2000). Mignucci-Giannoni (1998) found 31 sighting records of Atlantic spotted dolphins (following Perrin *et al.* 1987) from published and unpublished data between 1958 and 1989 for waters of Puerto Rico and the U.S. and British Virgin Islands, and suggested they occur year-round but with fewer sightings during spring and summer. Eighty-five percent of sightings documented by Mignucci-Giannoni (1998) were in waters less than 183m deep. Three winter NMFS surveys in 1995, 2000 and 2001 sighted Atlantic spotted dolphins in waters of

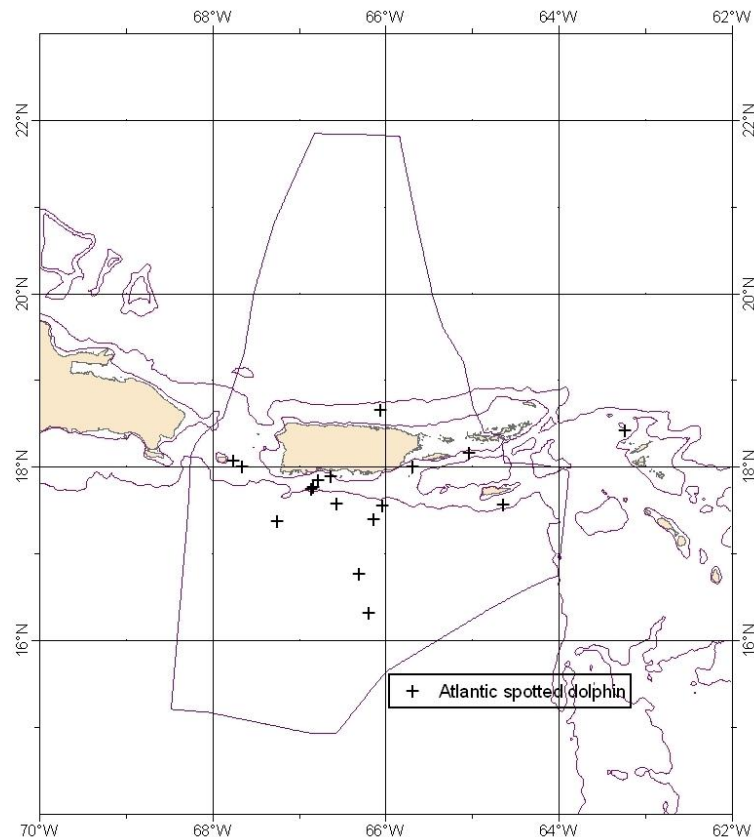


Figure 1. *Distribution of Atlantic spotted dolphin sightings from SEFSC shipboard surveys during winter of 1995, 2000 and 2001. Solid lines indicate the 200-m and 2,000-m isobaths and the boundary of the U.S. EEZ.*

Puerto Rico and the U.S. Virgin Islands and surrounding areas in a wide range of depths in continental slope and oceanic waters (Figure 1); however most waters surveyed were >200m deep due to the bottom topography of the region and the size of the survey vessel (see Population Size section). Examination of stranding records from 1867 through 1995 indicated Atlantic spotted dolphins were one of the most common species to strand in Puerto Rico and the Virgin Islands (Mignucci-Giannoni *et al.* 1999). Atlantic spotted dolphins have recently been described as 1 of 2 predominant species (the other predominant species being the bottlenose dolphin) off the southeastern coast of the Dominican Republic (Whaley *et al.* 2006), and they have also been sighted in Samana Bay in the northern Dominican Republic (Mattila *et al.* 1994; Whaley *et al.* 2006).

The Puerto Rico and U.S. Virgin Islands Atlantic spotted 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. In a recent study, Adams and Rosel (2005) presented strong genetic support for differentiation between Gulf of Mexico and western North Atlantic management stocks using both mitochondrial and nuclear markers. Additional morphological, genetic and/or behavioral data are needed to provide further information on stock delineation for the Puerto Rico and U.S. Virgin Islands stock. Atlantic spotted dolphins of this 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.

#### **POPULATION SIZE**

The abundance of the Puerto Rico and U.S. Virgin Islands stock of Atlantic spotted 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; 6 sightings of Atlantic spotted dolphins were made in U.S. waters (Roden and Mullin 2000). Sightings occurred in water depths ranging from 1098 to 2965 m. 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, and 1 sighting of Atlantic spotted dolphins was made at a depth of 893 m (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. Ten sightings of Atlantic spotted dolphins were made, all in U.S. waters, ranging in depths from 452 to 4499 m (Swartz *et al.* 2002). It was not possible to estimate abundance from these surveys using line-transect methods due to so few sightings.

#### **Minimum Population Estimate**

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

#### **Current Population Trend**

There are insufficient data to determine the 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 Atlantic spotted dolphins is unknown.

#### **ANNUAL HUMAN-CAUSED MORTALITY AND SERIOUS INJURY**

Estimates of annual human-caused mortality and serious injury are unknown for this stock.

#### **Fisheries Information**

The level of past or current, direct, human-caused mortality of Atlantic spotted dolphins in U.S. waters of the Caribbean Sea is unknown. 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 an Atlantic spotted 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).

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; Reeves 1988; Hoyt and Hvenegaard 2002; Romero *et al.* 2001; Mohammed *et al.* 2003; World Council of Whalers 2008), and by Venezuela (Romero *et al.* 2001). It is difficult to determine the extent that the Atlantic spotted 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), and it is difficult to identify animals to species based on common names used by local fisherman (Reeves 1988). However, the Atlantic spotted dolphin has been and is 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.* 2001; Mohammed *et al.* 2003; Vail 2005). Reeves (1988) suggested that dolphins belonging to the genus *Stenella* are commonly caught off St. Lucia.

### **Other Mortality**

No Atlantic spotted 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). 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 present 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, but potential impacts, if any, on Atlantic spotted dolphins are unknown.

### **STATUS OF STOCK**

The status of Atlantic spotted dolphins, relative to OSP, in U.S. waters of the Caribbean Sea is unknown. The size of this stock or any population of Atlantic spotted 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 and PBR undetermined, this stock is a strategic stock.

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