

ATLANTIC SPOTTED DOLPHIN (*Stenella frontalis*): Western North Atlantic Stock

STOCK DEFINITION AND GEOGRAPHIC RANGE

There are two species of spotted dolphin in the Western Atlantic — the Atlantic spotted dolphin, *Stenella frontalis*, formerly *S. plagiodon* (Perrin et al. 1987), and the pantropical spotted dolphin, *S. attenuata*. These species are difficult to differentiate at sea.

Atlantic spotted dolphins are distributed in tropical and warm temperate waters of the western North Atlantic (Leatherwood et al. 1976). Their distribution is from southern New England, south through the Gulf of Mexico and the Caribbean to Venezuela (Leatherwood et al. 1976; Perrin et al. 1987). The large, heavily spotted form of the Atlantic spotted dolphin along the southeastern and Gulf coasts of the United States inhabits the continental shelf, usually being found inside or near the 200 m isobath (within 250-350 km of the coast) but sometimes coming into very shallow water adjacent to the beach. Off the northeast U.S. coast, spotted dolphins are widely distributed on the continental shelf, along the continental shelf edge, and offshore over the deep ocean south of 40° N (CeTAP 1982). Atlantic spotted dolphins regularly occur in the inshore waters south of Chesapeake Bay and near the continental shelf edge and continental slope waters north of this region (Payne et al. 1984). Sightings have also been made along the north wall of the Gulf Stream and warm-core ring features (Waring et al. 1992). Stock structure in the western North Atlantic is unknown.

POPULATION SIZE

The total number of spotted dolphins off the eastern U.S. coast is unknown. Seasonal abundance estimates for a portion of the known range are available from an aerial line transect survey program conducted in the continental shelf and continental shelf edge waters between Cape Hatteras, North Carolina and Nova Scotia from 1978 to 1982 (CeTAP 1982). R. Kenney (personal communication) provided abundance estimates for both species of spotted dolphins combined that accounted for survey effort in two continental slope survey blocks and uncertainties resulting from sightings of unidentified small dolphins. An estimate based on inverse variance-weighted pooling of the revised CeTAP (1982) spring and summer data is 6,107 spotted dolphins (CV = 0.27). An average for these two seasons was chosen because the greatest proportion of the population off the northeast U.S. coast appears to be in the CeTAP study area in these seasons. This estimate was not corrected for $g(0)$, the probability of detecting dolphins on the trackline. Furthermore, this survey did not cover important spotted dolphin habitat in the continental shelf between Cape Hatteras and Florida, and Atlantic deep oceanic waters.

Spotted dolphin sighting data were collected during the autumn 1991 aerial line transect survey in the CeTAP study area and from several fine-scale ship line transect surveys (August 1990, June-July 1991 and June-July 1993) conducted in continental shelf edge and deeper oceanic waters (NMFS unpublished data). Spotted dolphin sightings during these surveys are shown in Figure 1. These data were too limited for use in estimating abundance because these surveys did not adequately sample spotted dolphin high-use habitats off the northeastern U.S. coast.

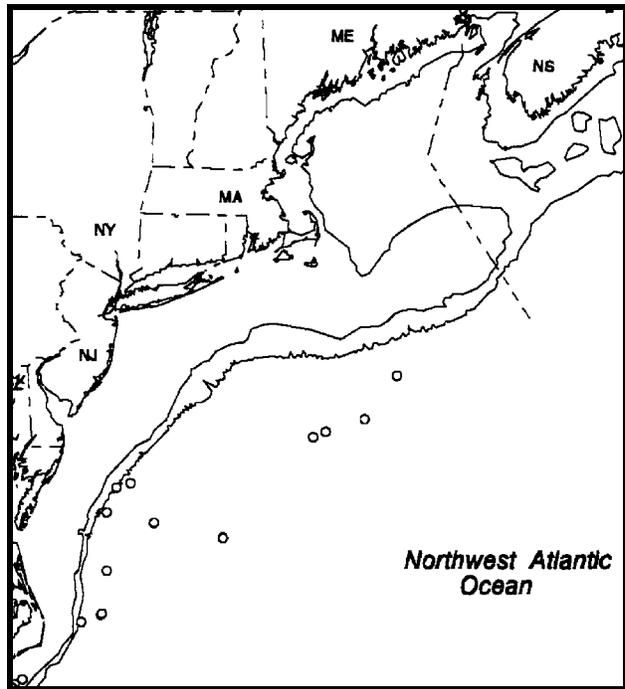


Figure 1. Distribution of spotted dolphin sightings from NEFSC shipboard surveys during the summer in 1990-1994. Isobaths are at 100 m and 1,000 m.

Minimum Population Estimate

The minimum population estimate for both species of spotted dolphins combined was based on the CeTAP (1982) abundance estimate which was 6,107 spotted dolphins (CV = 0.27). The minimum population estimate is the lower limit of the two-tailed 60% confidence interval of the log-normal distributed abundance estimate and was 4,885 spotted dolphins. This is equivalent to the 20th percentile of the log-normal distribution as specified by NMFS (Anon. 1994).

Current Population Trend

There are insufficient data to determine the population trends for this species.

CURRENT AND MAXIMUM NET PRODUCTIVITY RATES

Current and maximum net productivity rates are not known for this stock. The maximum net productivity rate was assumed to be 0.04 for purposes of this assessment. This value is based on theoretical calculations showing that cetacean populations may not generally grow at rates much greater than 4% given the constraints of their reproductive life history (Reilly and Barlow 1986).

POTENTIAL BIOLOGICAL REMOVAL

Potential biological removal (PBR) was specified as the product of minimum population size, one-half the maximum productivity rate, and a "recovery" factor for endangered, depleted, threatened stocks, or stocks of unknown status relative to optimum sustainable population (OSP) (Anon. 1994). The recovery factor was set at 0.16 because of the stock's status relative to OSP is unknown and the minimum population estimate is 11 years older than the latest fishery-related mortality estimate. PBR for both species of spotted dolphins combined would be sixteen; however, it is inappropriate to calculate a PBR for the Atlantic spotted dolphin (*S. Frontalis*) stock because it was impossible to separately identify the two species.

ANNUAL HUMAN-CAUSED MORTALITY AND SERIOUS INJURY

No spotted dolphin mortalities were observed in 1977-1991 foreign fishing activities. Nineteen mortalities have been documented between 1989 and 1993 (see below) in the pelagic drift gillnet fishery. Six whole animal carcasses that were sent to the Smithsonian were identified as Pantropical spotted dolphins (*Stenella attenuata*). The remaining 13 animals were not identified to species. No mortalities were documented in the Atlantic swordfish/tuna/shark pair trawl, New England multispecies sink gillnet, and groundfish trawl fisheries; and no takes have been documented in a review of Canadian gillnet and trap fisheries (Read 1994).

Total annual estimated average fishery-related mortality and serious injury to both species of spotted dolphins combined in the Atlantic by both fisheries is 31 spotted dolphins (CV = 1.13). Total fishery-related mortality and serious injury for this stock is not less than 10% of the calculated PBR and, therefore, cannot be considered to be insignificant and approaching zero mortality and serious injury rate. This determination cannot be made for specific fisheries until the implementing regulations for Section 118 of the MMPA have been reviewed by the public and finalized.

Fisheries Information

Data on current incidental takes in U.S. fisheries are available from several sources. In 1986, NMFS established a mandatory logbook system for large pelagic fisheries. Data files are maintained at the Southeast Fisheries Science Center (SEFSC). The Northeast Fisheries Science Center (NEFSC) Sea Sampling Observer Program was initiated in 1989 and since that year several fisheries have been covered by the program. In late 1992 and in 1993, the SEFSC provided observer coverage of pelagic longline vessels fishing off the Grand Banks (Tail of the Banks) and provides observer coverage of vessels fishing south of Cape Hatteras. Total fishery-related mortality and serious injury cannot be estimated separately for the two species of spotted dolphins in the U.S. Atlantic Exclusive Economic Zone (EEZ) because of the uncertainty in species identification by fishery observers. The Atlantic Scientific Review Group advised adopting the risk-averse strategy of assuming that either species might have been subject to the observed fishery-related mortality and serious injury.

Pelagic swordfish, tunas, and billfish are the targets of the U.S. longline fishery in the U.S. Atlantic and Gulf of Mexico EEZ (SEFSC unpublished logbook data). Interactions between the longline swordfish/tuna fishery and

spotted dolphins have been reported; however, a vessel may fish in more than one statistical reporting area and it is not possible to separate estimates of fishing effort other than to subtract Gulf of Mexico effort from Atlantic fishing effort, which includes the Caribbean Sea. This fishery has been monitored with about 5% observer coverage, in terms of trips observed, since 1992. Total longline effort for the Atlantic pelagic fishery (including the Caribbean), based on mandatory logbook reporting, was 11,279 sets in 1991, 10,605 sets in 1992, and 11,538 in 1993 (Cramer 1994). Estimated take was based on a generalized linear model (Poisson error assumption) fit to the available observed incidental take and self-reported incidental take and effort data for the fishery (SEFSC unpublished data). Annual estimates of mortality and serious injury were based on observed takes across the entire Atlantic longline swordfish/tuna fishery (including the Gulf of Mexico). All observed takes were used because the species occurs throughout area of the fishery, but observed takes were infrequent in any given region of the fishery. There was no mortality or serious injury reported in 1992 and estimated fishery-related mortality and serious injury to spotted dolphins (both species) in the Atlantic longline swordfish/tuna fishery in 1993 was 16 (CV = 0.19); average annual mortality and serious injury attributable to this fishery in 1992-1993 was 8.0 spotted dolphins (CV = 0.27).

The estimated total number of hauls in the Atlantic large pelagic drift gillnet fishery increased from 714 in 1989 to 1,144 in 1990; thereafter, with the introduction of quotas, effort was severely reduced. The estimated number of hauls in 1991, 1992, and 1993 were 233, 243, and 232 respectively. Fifty-nine different vessels participated in this fishery at one time or another between 1989 and 1993. Observer coverage, expressed as percent of sets observed, ranged from 8% in 1989, 6% in 1990, 20% in 1991, to 40% in 1992, and 42% in 1993. Effort was concentrated along the southern edge of Georges Bank and off Cape Hatteras. Examination of the species composition of the catch and locations of the fishery throughout the year, suggested that the drift gillnet fishery be stratified into two strata, a southern or winter stratum, and a northern or summer stratum. Estimates of the total by-catch, for each year, were obtained using the aggregated (pooled 1989-1993) catch rates, by strata (Northridge, in review). Nineteen spotted dolphin mortalities were observed in the drift gillnet fishery between 1989 and 1993 and occurred northeast of Cape Hatteras within the 183 m isobath in February-April, and near Lydonia Canyon in October. Estimated annual mortality and serious injury attributable to this fishery (CV in parentheses) was 23 in 1989 (2.14), 51 in 1990 (1.12), 11 in 1991 (1.21), 20 in 1992 (0.35), and 8.4 in 1993 (0.79).

STATUS OF STOCK

The status of Atlantic spotted dolphins, relative to OSP in the U.S. Atlantic EEZ is unknown. The species is not listed as threatened or endangered under the Endangered Species Act. In Canada, the Cetacean Protection Regulations of 1982, promulgated under the Standing Fisheries Act, prohibit the catching or harassment of all cetacean species. There are insufficient data to determine the population trends for this species. This is a strategic stock because the average annual fishery-related mortality and serious injury of spotted dolphins would exceed PBR for this stock (if it could be calculated) even if the minimum population estimate for spotted dolphins were exclusively *S. frontalis*.

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