

PANTROPICAL SPOTTED DOLPHIN (*Stenella attenuata*): Northern Gulf of Mexico Stock

STOCK DEFINITION AND GEOGRAPHIC RANGE

The pantropical spotted dolphin is distributed worldwide in tropical and some sub-tropical oceans (Perrin et al. 1987; Perrin and Hohn 1994). Sightings of this species occurred over the deeper waters of the northern Gulf of Mexico, and rarely over the continental shelf or continental shelf edge [Mullin et al. 1991; Southeast Fisheries Science Center (SEFSC) unpublished data]. Pantropical spotted dolphins were seen in all seasons during recent seasonal GulfCet aerial surveys of the northern Gulf of Mexico during 1993-1995 (Hansen *et al.* 1996). Some of the Pacific populations have been divided into different geographic stocks based on morphological characteristics (Perrin et al. 1987; Perrin and Hohn 1994); however, there is no information on stock differentiation for the Atlantic population.

POPULATION SIZE

Estimates of abundance were derived through the application of distance sampling analysis (Buckland et al. 1993) and the computer program DISTANCE (Laake et al. 1993) to sighting data collected during 1991-1994 spring-summer, visual sampling, line-transect vessel surveys of the northern Gulf of Mexico (Hansen et al. 1995) (Fig. 1), which includes data collected as part of the GulfCet program (Hansen *et al.* 1996). These surveys were conducted throughout the area from approximately the 200 m isobath along the U.S. coast to the seaward extent of the U.S. Exclusive Economic Zone. The seasonal GulfCet aerial surveys included only a small portion of the stock range and these data were not used for abundance estimation. Estimated abundance of pantropical spotted dolphins by survey year [coefficient of variation (CV) in parentheses] was 19,767 in 1991 (0.45), 15,280 in 1992 (0.36), 29,414 in 1993 (0.29), and 71,847 in 1994 (0.31) (Hansen et al. 1995). Survey effort-weighted estimated average abundance of pantropical spotted dolphins for all surveys combined was 31,320 (CV = 0.20) (Hansen et al. 1995).

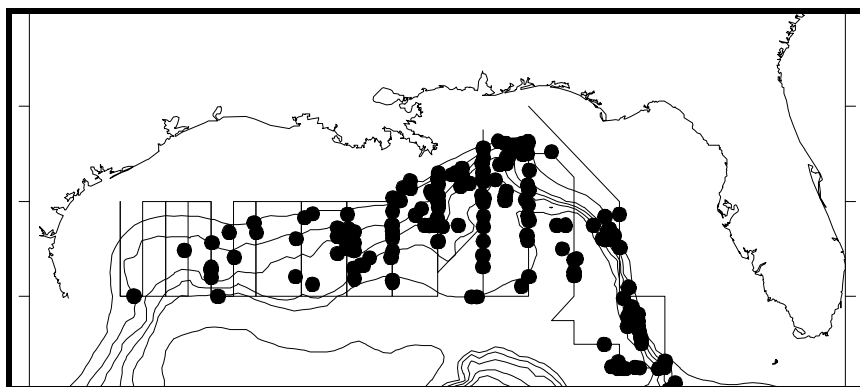


Figure 1. Distribution of pantropical spotted dolphin sightings during NOAA Ship Oregon II marine mammal surveys during 1991-1994. The straight lines show transects during two surveys and are examples of typical survey transects. Isobaths are in 183 m (100 fm) intervals.

Minimum Population Estimate

The minimum population size was estimated from the average estimated abundance of pantropical spotted dolphins which was 31,320 (CV = 0.20) (Hansen et al. 1995). The minimum population estimate is the lower limit of the two-tailed 60% confidence interval of the log-normally distributed abundance estimate. This is equivalent to the 20th percentile of the log-normal distribution as specified by Wade and Angliss (1997). The minimum population estimate is 26,510 pantropical spotted dolphins.

Current Population Trend

The 1994 abundance estimate was larger than the estimates for 1991-1993. The 1992 and 1994 estimates were significantly different using the criteria of no overlap of log-normal 95% confidence intervals, but differences within 1991-1993 estimates and differences between 1991, 1993, and 1994 were not significant. The observed differences in abundance estimates may have been caused by inter-annual variation in distribution patterns and spatial sampling, rather than changes in population size.

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. 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 (PBR) is the product of the minimum population size, one half the maximum net productivity rate, and a “recovery” factor (Wade and Angliss 1997). The “recovery” factor, which accounts for endangered, depleted, and threatened stocks, or stocks of unknown status relative to optimum sustainable population (OSP) is assumed to be 0.5 because this stock is of unknown status. The PBR for this stock is 265 animals.

ANNUAL HUMAN-CAUSED MORTALITY AND SERIOUS INJURY

The level of past or current, direct, human-caused mortality of pantropical spotted dolphins in the northern Gulf of Mexico is unknown; however, interactions between spotted dolphins and fisheries have been observed in the northern Gulf of Mexico.

There was one documented stranding of a pantropical spotted dolphin in the northern Gulf of Mexico during 1987-1994 which was classified as likely caused by fishery interactions. Stranding data probably underestimate the extent of fishery-related mortality and serious injury because not all of the dolphins which die or are seriously injured in fishery interactions wash ashore, 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 interaction.

Total estimated average annual fishing-related mortality and serious injury of spotted dolphins (both species) is 1.5 spotted dolphins annually (CV = 0.33).

Fisheries Information

Pelagic swordfish, tunas, and billfish are the targets of the longline fishery operating in the U.S. Gulf of Mexico. Total longline effort for the Gulf of Mexico pelagic fishery, including OCS edge, continental slope, and Mexican territorial waters, based on mandatory logbook reporting, was 4,400 sets in 1991, 4,850 sets in 1992, and 3,260 sets in 1993 (Cramer 1994). This fishery has been monitored with about 5% observer coverage, in terms of trips observed, since 1992. There were two observed incidental takes and releases of spotted dolphins in the Gulf of Mexico during 1994, but no observed lethal takes of Atlantic spotted dolphins by this fishery in the Gulf of Mexico.

Estimates of fishery-related mortality and serious injury were based on a generalized linear model (Poisson error assumption) fit to the available observed incidental take for the entire Atlantic longline swordfish/tuna fishery (which includes the Gulf of Mexico) (SEFSC, unpublished data). Takes observed throughout the range of this fishery were used because the species occurs generally throughout the area of the fishery, but observed takes were infrequent in any given region. Either spotted dolphin species may have been involved in the observed fishery-related mortality and serious injury incidents, but because of the difficulty of species identification by fishery observers, they cannot currently be separated. Estimated mortality and serious injury to spotted dolphins attributable to the longline fishery for the entire fishery (including waters outside of the Gulf of Mexico) for 1993 was 16 (CV = 0.19). Estimated fishery-related mortality and serious injury for the Gulf of Mexico, based on proportionality of fishing effort (number of sets) in 1993 was 4.4 spotted dolphins. Estimated average annual fishing-related mortality and serious injury of spotted dolphins attributable to this fishery during 1991-1993 was 1.5 annually (CV = 0.33).

Pair trawl fishing gear has the potential to capture marine mammals, but there have been no reports of mortality or serious injury to marine mammals in the Gulf of Mexico. This fishery has not been observed by NMFS observers, and there are no other data available as to the extent of this fishery in the Gulf of Mexico. It is assumed that it is very limited in scope and duration.

STATUS OF STOCK

The status of this stock relative to OSP is unknown and there are insufficient data to determine population trends. This species is not listed under the Endangered Species Act. Observed fishery-related mortality and serious injury for spotted dolphins is less than 10% of PBR and can be considered insignificant and approaching zero mortality and serious injury rate for this stock. The total level of human-caused mortality and serious injury is unknown, but it is believed to be insignificant relative to PBR; therefore, this is not a strategic stock.

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