

SPINNER DOLPHIN (*Stenella longirostris*): Western North Atlantic Stock

STOCK DEFINITION AND GEOGRAPHIC RANGE

Spinner dolphins are distributed in oceanic and coastal tropical waters (Leatherwood *et al.* 1976). This is presumably an offshore, deep-water species (Schmidly 1981; Perrin and Gilpatrick 1994), and its distribution in the Atlantic is very poorly known. In the western North Atlantic, these dolphins occur in deep water along most of the U.S. coast south to the West Indies and Venezuela, including the Gulf of Mexico. Spinner dolphin sightings have occurred exclusively in deeper (>2,000 m) oceanic waters (CETAP 1982; Waring *et al.* 1992) off the northeast U.S. coast. Stranding records exist from North Carolina, South Carolina, and Florida in the Atlantic and in Texas and Florida in the Gulf of Mexico. The North Carolina strandings represent the northernmost documented distribution of this species in the Atlantic. Stock structure in the western North Atlantic is unknown.

POPULATION SIZE

The number of spinner dolphins inhabiting the U.S. Atlantic Exclusive Economic Zone (EEZ) is unknown and seasonal abundance estimates are not available for this species since it was rarely seen in any of the surveys.

Minimum Population Estimate

Present data are insufficient to calculate a minimum population estimate.

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 unknown for this stock. For purposes of this assessment, 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 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 minimum population size is unknown. 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 this stock is of unknown status. PBR for the western North Atlantic spinner dolphin is unknown because the minimum population size is unknown.

ANNUAL HUMAN-CAUSED MORTALITY AND SERIOUS INJURY

Total average annual estimated average fishery-related mortality and serious injury to this stock in the Atlantic during 1992-1996 was 0.38 spinner dolphin (CV = 0.35).

Fishery Information

There was no documentation of spinner dolphin mortality or serious injury in distant-water fleet (DWF) activities off the northeast U.S. coast (Waring *et al.* 1990). No takes were documented in a review of Canadian gillnet and trap fisheries (Read 1994).

Data on current incidental takes in U.S. fisheries are available from several sources. In 1986, NMFS established a mandatory self-reported Fishery information 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.

By-catch has been observed by NMFS Sea Samplers in the pelagic drift gillnet fishery, but no mortalities or serious injuries have been documented in the pelagic longline, pelagic pair trawl, Northeast multispecies sink gillnet, mid-Atlantic coastal gillnet, and North Atlantic bottom trawl fisheries.

The estimated total number of hauls in the 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, 1993, 1994, 1995, and 1996 were 233, 243, 232, 197, 164, and 149 respectively. Fifty-nine different vessels participated in this fishery at one time or another between 1989 and 1993. Since 1994, between 10-12 vessels have participated in the fishery (Table 2). Observer coverage, expressed as percent of sets observed, was 8% in 1989, 6% in 1990, 20% in 1991, 40% in 1992, 42% in 1993, 87% in 1994, 99% in 1995, and 64% in 1996. 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 pelagic 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, from 1989 to 1993, were obtained using the aggregated (pooled 1989-1993) catch rates, by strata (Northridge 1996). Estimates of total annual by-catch for 1994 and 1995 were estimated from the sum of the observed caught and the product of the average bycatch per haul and the number of unobserved hauls as recorded in self-reported Fishery information. Variances were estimated using bootstrap re-sampling techniques. One spinner dolphin mortality was observed between 1989 and 1993 and occurred east of Cape Hatteras in March 1993. Estimated annual fishery-related mortality and serious injury attributable to this fishery (CV in parentheses) was 0.7 in 1989 (1.00), 1.7 in 1990 (1.00), 0.7 in 1991 (1.00), 1.4 in 1992 (0.31), 0.5 in 1993 (1.00), and zero from 1994-1996. Total average annual estimated average fishery-related mortality and serious injury to this stock in the Atlantic during 1992-1996 was 0.38 spinner dolphin (CV = 0.35) (Table 1). The 1992-1996 period provides a better characterization of this fishery (i.e., fewer vessels and increased observer coverage).

Table 1. Summary of the incidental mortality of spinner dolphins (*Stenella longirostris*) by commercial fishery including the years sampled (Years), the number of vessels active within the fishery (Vessels), the type of data used (Data Type), the annual observer coverage (Observer Coverage), the mortalities recorded by on-board observers (Observed Mortality), the estimated annual mortality (Estimated Mortality), the estimated CV of the annual mortality (Estimated CVs) and the mean annual mortality (CV in parentheses).

Fishery	Years	Vessels ¹	Data Type ²	Observer Coverage ³	Observed Mortality	Estimated Mortality ⁴	Estimated CVs ⁴	Mean Annual Mortality
Pelagic Drift Gillnet	92-96	1994=12 1995=11 1996=10	Obs. Data Logbook	.40, .42, .87, .99, .64	1, 0, 0, 0, 0	1.4, 0.5, 0, 0 ⁵ , 0	.31, 1.0, 0, 0, 0	0.31 (.35)
TOTAL								0.31 (.35)

¹ 1994 and 1995 - 1996 shown, other years not available on an annual basis.

² Observer data (Obs. Data) are used to measure bycatch rates, and the data are collected within the Northeast Fisheries Science Center (NEFSC) Sea Sampling Program. Mandatory logbook (Logbook) data are used to measure total effort, and the data are collected at the Southeast Fisheries Science Center (SEFSC).

³ The observer coverage and unit of effort for the Pelagic Drift Gillnet is a set.

⁴ For 1991-1993, pooled bycatch rates were used to estimate bycatch in months that had fishing effort but did not have observer coverage. This method is described in Northridge (1996). In 1994 and 1995, observer coverage increased substantially, and bycatch rates were not pooled for this period.

⁵ One vessel was not observed and recorded 1 set in a 10 day trip in the SEFSC mandatory logbook. If you assume the vessel fished 1.4 sets per day as estimated from the 1995 SS data, the point estimate may increase by 0.8 animals. However, the SEFSC mandatory logbook data was taken at face value, and therefore it was assumed that 1 set was fished within this trip, and the point estimate would then increase by 0.1 animals.

STATUS OF STOCK

The status of spinner 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. There are insufficient data to determine the population trends for this species. PBR cannot be calculated for this stock, but no fishery-related mortality and serious injury has been observed since 1992; therefore, total fishery-related mortality and serious injury can be considered insignificant and approaching zero mortality and serious injury rate. Population size and PBR cannot be estimated, but fishery-related mortality is very low; therefore, this stock is not a strategic stock.

REFERENCES

- Barlow, J., S.L. Swartz, T.C. Eagle, and P.R. Wade. 1995. U.S. Marine Mammal Stock Assessments: Guidelines for Preparation, Background, and a Summary of the 1995 Assessments. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-OPR-6, 73 pp.
- CETAP. 1982. A characterization of marine mammals and turtles in the mid- and north Atlantic areas of the U.S. outer continental shelf. Cetacean and Turtle Assessment Program, University of Rhode Island. Final Report, Contract AA51-C78-48, Bureau of Land Management, Washington, DC, 538 pp.
- Leatherwood, S., D.K. Caldwell, and H.E. Winn. 1976. Whales, dolphins, and porpoises of the western North Atlantic. A guide to their identification. U.S. Dept. of Commerce, NOAA Tech. Rep. NMFS Circ. 396, 176 pp.
- Northridge, S. 1996. Estimation of cetacean mortality in the U.S. Atlantic swordfish and tuna drift gillnet and pair trawl fisheries. Final report to the Northeast Fisheries Science Center, Contract No. 40ENNF500045, 18 pp.
- Perrin, W. F. and J. W. Gilpatrick, Jr. 1994. Spinner dolphin. Pages 99-128 in: S. H. Ridgway and R. Harrison (eds), Handbook of marine mammals, Volume 5: The first book of dolphins. *Academic Press*, San Diego, 418 pp.
- Read, A. J. 1994. Interactions between cetaceans and gillnet and trap fisheries in the northwest Atlantic. *Rep. int. Whal. Commn. Special Issue 15: 133-147*.
- Reilly, S. B. and J. Barlow. 1986. Rates of increase in dolphin population size. *Fish. Bull., U.S. 84(3): 527-533*.
- Schmidly, D. J. 1981. Marine mammals of the southeastern United States coast and the Gulf of Mexico. Pub. No. FWS/OBS-80/41, U.S. Fish and Wildlife Service, Office of Biological Services, Washington, DC, 163 pp.
- Wade, P.R., and R.P. Angliss. 1997. Guidelines for assessing marine mammal stocks: Report of the GAMMS Workshop April 3-5, 1996, Seattle, Washington. U.S. Dep. Commer., NOAA Tech. Memo. NMFS-OPR-12, 93 pp.
- Waring, G. T., C. P. Fairfield, C. M. Ruhsam and M. Sano. 1992. Cetaceans associated with Gulf Stream features off the northeastern USA shelf. *ICES Marine Mammals Comm. CM 1992/N:12, 29 pp*.