

RISSO'S DOLPHIN (*Grampus griseus*): Western North Atlantic Stock

STOCK DEFINITION AND GEOGRAPHIC RANGE

Risso's dolphin is distributed worldwide in tropical and temperate seas. Risso's dolphins generally have an oceanic range, and occur along the Atlantic coast of North America from Florida to eastern Newfoundland (Leatherwood et al. 1976; Baird and Stacey 1990). Off the northeast U.S. coast, Risso's dolphin is distributed along the continental shelf edge from Cape Hatteras northward to Georges Bank during the spring, summer, and autumn (CeTAP 1982; Payne et al. 1984). In winter, the range begins at the mid-Atlantic bight and extends further into oceanic waters (Payne et al. 1984). In general, the population generally occupies the mid-Atlantic continental shelf edge year round, and is rarely seen in the Gulf of Maine (Payne et al. 1984). During 1990, 1991, and 1993 spring/summer surveys conducted in continental shelf edge and deeper oceanic waters, sightings of Risso's dolphins were associated with strong bathymetric features, Gulf Stream warm-core rings, and the Gulf Stream north wall (Waring et al. 1992; Waring 1993). There is no information on stock differentiation of Risso's dolphin in the western North Atlantic.

POPULATION SIZE

The total number of Risso's dolphins off the eastern U.S. and Canadian Atlantic coast is unknown, although several estimates from selected regions do exist. Seasonal abundance estimates are available from an aerial survey program conducted in continental shelf and continental shelf edge waters between Cape Hatteras, North Carolina, and Nova Scotia from 1978 to 1982 (CeTAP 1982). An estimate based on a weighted (variance) pooling of CeTAP (1982) spring and summer data is 4,980 (CV = 0.34). 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 an animal group on the trackline.

Abundance estimates were also derived using data collected during an autumn 1991 aerial survey in the CeTAP study area (NMFS unpublished data), which included an interplatform experiment between a Twin Otter and an AT-11, and from two fine-scale ship surveys (June-July 1991 and June-July 1993) conducted in continental shelf edge and deeper oceanic waters (NMFS unpublished data). For the aerial and shipboard surveys, sightings were almost exclusively in the continental shelf edge and continental slope water areas.

Abundance estimates from the 1991 aerial survey were 16,818 (CV = 0.52) and 6,496 (CV = 0.74), respectively, for the AT-11 and Twin Otter. Data were not pooled, because the areas covered by the two survey platforms were not comparable. Furthermore, these estimates are not fully comparable to the CeTAP estimates, because the 1991 data are from a single survey, August to October, while the CeTAP estimates were based on data pooled over several years of seasonal surveys.

Estimates have been prepared for two of the shipboard surveys in which Risso's dolphins were sighted. An estimate from the 1991 survey, based principally on sighting effort conducted between the 200 and 2,000 meter isobaths

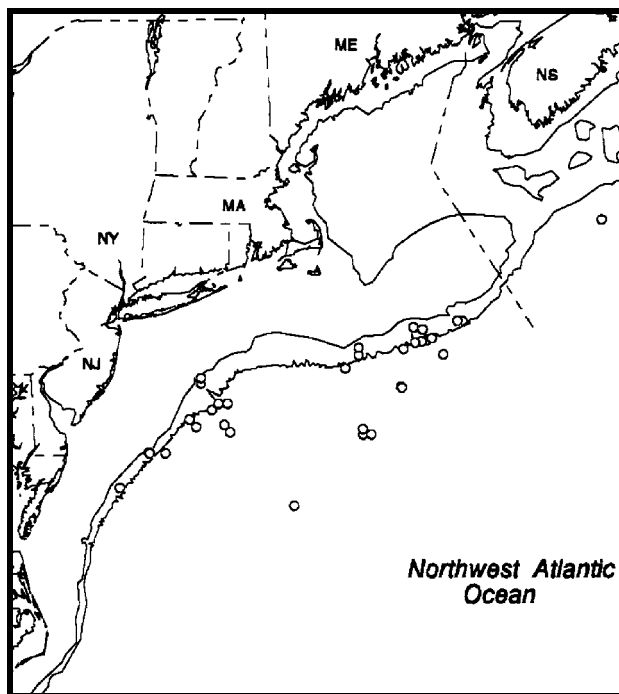


Figure 1. Distribution of Risso's dolphin sightings from NEFSC shipboard surveys during the summer in 1990-1994. Isobaths are at 100 m and 1,000 m.

from Cape Hatteras to Georges Bank is 5,353 Risso's dolphins (CV = 0.68). The estimate for the 1993 survey, conducted principally between the 200 and 2,000 meter isobaths from the southern edge of Georges Bank, across the Northeast Channel to the southwestern edge of the Scotian Shelf is 212 Risso's dolphins (CV = 0.62). The few Risso's dolphin sightings made during August 1990 and 1994 were widely scattered, and therefore were not used to obtain abundance estimates. It should be noted, however, that nearly all of the sightings in these two years were in deeper oceanic waters (Waring 1993; NMFS unpublished data). Although the 1991 and 1993 surveys did not sample exactly the same areas or encompass the entire Risso's dolphin habitat, they did focus on segments of known or suspected high-use habitats off the northeastern U.S. coast. The collective data suggest that at least several thousand Risso's dolphins occupy these waters seasonally; however, survey coverage to date was not judged adequate to provide a definitive estimate of Risso's dolphin abundance in the western North Atlantic.

Present population trends of Risso's dolphins in Canadian waters are unknown due to the scarcity of reported sightings and lack of distribution surveys.

Minimum Population Estimate

The minimum population estimate was based on the AT-11 aerial survey abundance estimate in autumn 1991, of 16,818 Risso's dolphins (CV = 0.52) (NMFS unpublished data). The AT-11 estimate was selected because that survey provided the most complete coverage of continental shelf edge and continental slope waters off the northeast U.S. coast. The minimum population estimate is the lower limit of the two-tailed 60% confidence interval of the log-normal distributed abundance estimate, which is equivalent to the 20th percentile of the log-normal distribution as specified by NMFS (Anon. 1994), and was 11,140 Risso's dolphins.

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 0.50 because of the stock's status relative to its OSP level is unknown. PBR for this stock is 111 Risso's dolphins.

ANNUAL HUMAN-CAUSED MORTALITY

Foreign fishery observers documented the incidental take of a small number of Risso's dolphins in foreign squid (three animals) and tuna longline (one animal) fisheries (Waring et al. 1990). Between 1989 and 1993, 36 mortalities were observed in the large pelagic drift gillnet fishery, one mortality in the pelagic pair trawl fishery, and one in the pelagic longline fishery (NMFS unpublished data, see below). No mortalities were documented for the New England multispecies sink gillnet and groundfish trawl fisheries and no takes were documented in a review of Canadian gillnet and trap fisheries (Read 1994).

Total average annual total fishery-related mortality is 68 Risso's dolphins (CV = 0.53). 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

Prior to 1977, there was no documentation of marine mammal by-catch in distant-water fleet (DWF) activities off the northeast coast of the U.S. With implementation of the Magnuson Fisheries Conservation and Management

Act (MFCMA) in that year, an observer program was established which has recorded fishery data and information of incidental by-catch of marine mammals. DWF effort in the U.S. Atlantic Exclusive Economic Zone (EEZ) under MFCMA has been directed primarily towards Atlantic mackerel and squid. From 1977 through 1982, an average of 120 different foreign vessels per year (range 102-161) operated within the U.S. Atlantic EEZ. In 1982, there were 112 different foreign vessels; 16%, or 18, were Japanese tuna longline vessels operating along the U.S. east coast. This was the first year that the Northeast Regional Observer Program assumed responsibility for observer coverage of the longline vessels. Between 1983 and 1991, the numbers of foreign vessels operating within U.S. Atlantic EEZ each year were 67, 52, 62, 33, 27, 26, 14, 13, and 9, respectively. Between 1983 and 1988, the numbers of DWF vessels included 3, 5, 7, 6, 8, and 8, respectively, Japanese longline vessels. Observer coverage on DWF vessels was 25-35% during 1977-82, and increased to 58%, 86%, 95%, and 98%, respectively, in 1983-86. From 1987-91, 100% observer coverage was maintained. Foreign fishing operations for squid and mackerel ceased at the end of the 1986 and 1991 fishing seasons, respectively. NMFS foreign-fishery observers have reported four deaths of Risso's dolphins incidental to squid and mackerel fishing activities in the continental shelf and continental slope waters between March 1977 and December 1991 (Waring et al. 1990; NMFS unpublished data). Three animals were taken by squid trawlers and a single animal was killed in longline fishing operations.

Data on 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.

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). Thirty seven Risso's dolphin mortalities were observed between 1989 and 1993. One animal was entangled and released alive. By-catch occurred during July, September and October along continental shelf edge canyons off the southern New England coast. Estimated annual mortality and serious injury (CV in parentheses) attributable to the drift gillnet fishery was 87 in 1989 (0.52), 144 in 1990 (0.46), 21 in 1991 (0.55), 31 in 1992 (0.27), and 14 in 1993 (0.42); average annual mortality and serious injury during 1989-1993 was 59 (0.61).

During the period 1989 to 1993, effort in the Atlantic swordfish/tuna/shark pair trawl fishery has increased, from zero hauls in 1989 and 1990, to an estimated 171 hauls in 1991 and then to an estimated 989 and 1087 hauls in 1992 and 1993 respectively. The fishery operated from August to November in 1991, from June to November in 1992, and from June to October in 1993. Sea sampling began in October of 1992 where 101 sets (10% of the total) were sampled. In 1993, 201 hauls (18% of the total) were sampled. Nineteen vessels have operated in this fishery. The fishery extends from 35°N to 41°N, and from 69°W to 72°W. Approximately 50% of the total effort was in a one degree square at 39°N, 72°W, around Hudson Canyon. Examination of the locations and species composition of the by-catch, showed little seasonal change for the 6 months of operation and did not warrant any seasonal or areal stratification of this fishery (Northridge, in review). One mortality was observed in 1992. Estimated annual mortality and serious injury (CV in parentheses) to Risso's dolphins in the Atlantic swordfish/tuna/shark pair trawl fishery was 0.6 in 1991 (1.0), 4.3 in 1992 (0.76) and 3.2 in 1993 (1.0); average annual mortality and serious injury during 1991-1993 was 2.7 (0.98).

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). 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). The fishery has been observed from January to March off Cape Hatteras, in May and June in the entire Mid-Atlantic, and in July through December in the Mid-Atlantic Bight and off Nova Scotia. This fishery has

been monitored with about 5% observer coverage, in terms of trips observed, since 1992. One Risso's dolphin mortality was observed in 1993, producing an estimated total longline fishery-related mortality of 13 Risso's dolphins (CV = 0.19) for 1993, and a 1992-1993 estimated annual average of 6.5 (CV = 0.27).

STATUS OF STOCK

The status of Risso's 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. The 1990-93 average annual fishery-related mortality did not exceed PBR; therefore, this is not a strategic stock.

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