GRAY SEAL (*Halichoerus grypus*): Western North Atlantic Stock

STOCK DEFINITION AND GEOGRAPHIC RANGE

There is one gray seal stock in the western North Atlantic; it ranges from New England to Labrador and is centered in the Gulf of St. Lawrence (Katona et al. 1993; Davies 1957). This stock is separated by both geography and differences in the breeding season from the eastern Atlantic stock (Bonner 1981). The western Atlantic stock is distributed and breeds principally in eastern Canadian waters; however, small numbers of animals and pupping have been observed on several isolated islands along the Maine coast and in Nantucket-Vineyard Sound, Massachusetts (Katona et al. 1993; Rough 1995; J. R. Gilbert, personal communication).

POPULATION SIZE

A winter breeding colony on Muskeget Island, west of Nantucket Island, may provide some measure of gray seal population trends and expansion in distribution. Sightings in New England increased during the 1980s as the gray seal population and range expanded in eastern Canada. Five pups were born at Muskeget in 1988. The number of pups increased to 12 in 1992, 30 in 1993, and 59 in 1994. Maximum counts obtained during the spring molt did not exceed 13 in any year during the 1970s, but rose to 61 in 1984, 192 in 1988, 503 in 1992, and 1,549 in 1993. Aerial surveys in April and May of 1994 recorded a peak count of 2,035 gray seals for Muskeget Island (Nantucket) and Monomoy (Cape Cod) combined (Rough 1995).

Estimates of the total western Atlantic gray seal population are not available. Pup production on Sable Island, Nova Scotia, has been about 13 percent per year since 1962 (Mohn and Bowen 1994). The 1986 population estimate for individuals that are one year old and older was between 100,000 and 130,000 animals (Stobo and Zwanenburg 1990). The 1993 estimate (Sable Island and Gulf of St. Lawrence stocks) is 143,000 animals (Mohn and Bowen 1994). The population in waters off Maine has increased from about 30 in the early 1980's to between 500-1,000 animals in 1993 (J. R. Gilbert, personal communication, 1994).

Minimum Population Estimate

The minimum population estimate, based on uncorrected total counts (see above), is 2,035 gray seals.

Current Population Trend

Gray seal abundance is likely increasing in the U.S. Atlantic Exclusive Economic Zone (EEZ), but the actual trend is unknown. The population has been increasing for several decades in Canadian waters. Approximately 57% of the western North Atlantic population is from the Sable Island stock.

CURRENT AND MAXIMUM NET PRODUCTIVITY RATES

Current and maximum net productivity rates are not known for this stock. Pup production on Sable Island is about 13% annually (Mohn and Bowen 1994), slightly above the theoretical "default" maximum net productivity rate for pinnipeds (0.12) used in this assessment.

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 1.0 for pinniped stocks that are increasing at about 90% of maximum potential rate. PBR for this stock is 122 gray seals.

ANNUAL HUMAN-CAUSED MORTALITY AND SERIOUS INJURY

Gray seals, like harbor seals, were hunted for bounty in New England waters until the late 1960's. This hunt may have severely depleted this stock in U.S. waters (Rough 1995).

Researchers and fishery observers have documented incidental mortality in several fisheries in recent years, particularly within the Gulf of Maine. There were three records of incidental catch of gray seals in the 1989-1993

Northeast Fisheries Science Center (NEFSC) Sea Sampling database. All occurred in 1993 (February, March, and May) in the sink gillnet fishery. Two records were from the Gulf of Maine, and the third, in May, was from SE of Block Island. In addition, V. Rough (personal communication) has documented several animals with netting around their necks in the Cape Cod/Nantucket area. An unknown level of mortality also occurs in the mariculture industry (i.e., salmon farming) and by deliberate shooting (NMFS unpublished data). There are 79 records of stranded gray seals in the Northeast Marine Mammal Stranding Network database for 1989-1993.

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 may 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.

An unknown number of gray seals have been taken in Newfoundland and Labrador, Gulf of St. Lawrence, and Bay of Fundy groundfish gillnets, Atlantic Canada and Greenland salmon gillnets, Atlantic Canada cod traps, and in Bay of Fundy herring weirs (Read 1994). In addition to incidental catches, some mortalities (e.g., seals trapped in herring weirs) were the result of direct shooting, and there were culls of about 1,700 animals annually during the 1970's and early 1980's on Sable Island (Anon. 1986).

Because of fishermen's concerns regarding gray seal predation on economically important fish stocks and transmission of the cod worm, Canada now has an open season (March-December) on gray seals (J. Conway, personal communication). The number of gray seals shot each year is unknown.

Estimated average annual fishery-related mortality and serious injury to this stock in the U.S. Atlantic EEZ during 1990-1993 was 4.5 gray seals (CV = 2.00). The total fishery-related mortality and serious injury for this stock is less than 10% of the calculated PBR and, therefore, can 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.

Fishery Information

The Atlantic Canadian and Greenland salmon gillnet fishery is seasonal, with the peak from June to September, depending on location. In southern and eastern Newfoundland, and Labrador during 1989, 2,196 nets 91 m long were used. There is no effort data available for the Greenland fishery. However, the fishery was terminated in 1993 under an agreement between Canada and North Atlantic Salmon Fund (Read 1994).

The Canadian Atlantic groundfish gillnet fishery is important and widespread. Many fisherman hold groundfish gillnet licenses but the number of active fishermen is unknown. In 1989, approximately 6,800 licenses were issued to fishermen along the southern coast of Labrador, and northeast and southern coasts of Newfoundland. There were about 3,900 licenses issued in the Gulf of St. Lawrence in 1989, while 659 licenses were issued in the Bay of Fundy and southwestern Nova Scotia.

There were 3,121 cod traps operating in Newfoundland and Labrador during 1979, and about 7,500 in 1980 (Read 1994). This fishery was closed at the end of 1993 due to collapse of Canadian groundfish resources.

Herring weirs are also distributed throughout the Bay of Fundy; it has been reported that 180 weirs were operating in the Bay of Fundy in 1990 (Read 1994).

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 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.

There are approximately 349 vessels (full and part time) in the New England multispecies sink gillnet fishery (Walden, in review). Observer coverage in trips has been 1%, 6%, 7. 5%, and 5% for years 1990 to 1993. The fishery has been observed in the Gulf of Maine and in Southern New England. Three mortalities were observed in this fishery in 1993, in winter off the Massachusetts coast. The estimated mortality in 1993 was 18 gray seals (CV = 1.00). Estimated average annual fishery-related mortality and serious injury to this stock during 1990-1993 attributable to this fishery was 4.5 gray seals (CV = 2.00).

STATUS OF STOCK

The status of the gray seal population, relative to OSP, in U.S. and Canadian Atlantic coast waters is unknown. The species is not listed as threatened or endangered under the Endangered Species Act. Recent data indicate that this population is increasing. In New England waters, both the number of pupping sites and pup production is increasing. In Canada they are protected from harassment and intentional killing under the Marine Mammal Regulations, although some aquaculture operators have been authorized to shoot nuisance animals. The estimated annual level of human-caused mortality and serious injury in the U.S. Atlantic EEZ does not exceed PBR and this is not a strategic stock.

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