

BLUE WHALE (*Balaenoptera musculus*): Western North Atlantic Stock

STOCK DEFINITION AND GEOGRAPHIC RANGE

The distribution of the blue whale, *Balaenoptera musculus*, in the western North Atlantic generally extends from the Arctic to at least mid-latitudes. Blue whales are most frequently sighted in the waters off eastern Canada, with the majority of recent records from the Gulf of St. Lawrence (Sears *et al.* 1987). The species was hunted around Newfoundland in the first half of the 20th century (Sergeant 1966). The present Canadian distribution, broadly described, is spring, summer, and fall in the Gulf of St. Lawrence, especially along the north shore from the St. Lawrence River estuary to the Strait of Belle Isle and off eastern Nova Scotia. The species occurs in winter off southern Newfoundland and also in summer in Davis Strait (Mansfield 1985).

The blue whale is best considered as an occasional visitor in U.S. Atlantic Exclusive Economic Zone (EEZ) waters, which may be the current southern limit of its range (CeTAP 1982; Wenzel *et al.* 1988). All of the five sightings described in the foregoing two references were in August. Yochem and Leatherwood (1985) summarized records that suggested an occurrence of this species south to Florida and the Gulf of Mexico, although the actual southern limit of the species' range is unknown.

The blue whale may be nomadic and open-ocean in habitat. In one example, an individual was tracked from near Newfoundland to south of Bermuda (Gagnon and Clark 1993).

POPULATION SIZE

Little is known about the population size of blue whales except for in the Gulf of St. Lawrence area. Here, 308 individuals have been catalogued (Sears *et al.* 1987). Mitchell (1974) estimated that the blue whale population in the western North Atlantic may number only in the low hundreds. R. Sears (pers. comm.) suggests that no present evidence exists to refute this estimate.

Minimum Population Estimate

The 308 recognizable individuals from the Gulf of St. Lawrence area which were catalogued by Sears *et al.* (1987) is considered to be a minimum population estimate.

Current Population Trend

There are insufficient data to determine population trends for this species. Off west and southwest Iceland, an increasing trend of 4.9% a year was reported for the period 1969-1988 (Sigurjonsson and Gunnlaugsson 1990).

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 (Wade and Angliss 1997). The minimum population size is 308 (CV=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 0.10 because the blue whale is listed as endangered under the Endangered Species Act (ESA). PBR for the western North Atlantic blue whale is 0.6.

ANNUAL HUMAN-CAUSED MORTALITY AND SERIOUS INJURY

There are no records of fishery-related mortality or serious injury to blue whales in the U.S. Atlantic EEZ.

Fishery Information

No fishery information is presented because there are no observed fishery-related mortalities or serious injury.

STATUS OF STOCK

The status of this stock relative to OSP in the U.S. Atlantic EEZ is unknown, but the species is listed as endangered under the ESA. There are insufficient data to determine population trends for blue whales. The total level of human-caused mortality and serious injury is unknown, but it is believed to be insignificant and approaching a zero mortality and serious injury rate. Any fishery-related mortality would be unlawful because there is no recovery plan currently in place. This is a strategic stock because the blue whale is listed as an endangered species under the ESA.

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. NOAA Technical Memorandum NMFS-OPR-6. U.S. Department of Commerce, Washington, D.C. 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 #AA551-CT8-48 to the Bureau of Land Management, Washington, DC, 538 pp.
- Gagnon, G. J. and C. W. Clark. 1993. The use of U.S. Navy IUSS passive sonar to monitor the movement of blue whales. *Abstract*, Tenth Biennial Conference on the Biology of Marine Mammals, Galveston, TX, 11-15 November 1993.
- Mansfield, A. W. 1985. Status of the blue whale, *Balaenoptera musculus*, in Canada. *Canadian Field Naturalist* 99(3): 417-420.
- Mitchell, E. 1974. Present status of northwest Atlantic fin and other whale stocks. Pages 108-169 in W. E. Schevill (editor), *The whale problem: A status report*. Harvard University Press, Cambridge, Massachusetts, 419 pp.
- Sears, R., F. Wenzel, and J. M. Williamson. 1987. The blue whale: a catalog of individuals from the western North Atlantic (Gulf of St. Lawrence). *Mingan Island Cetacean Study*, St. Lambert, Quebec, Canada, 27 pp.
- Sergeant, D. E. 1966. Populations of large whale species in the western North Atlantic with special reference to the fin whale. *Fish. Res. Board. Canada Circular No. 9*, 30 pp.
- Sigurjonsson, J. and T. Gunnlaugsson. 1990. Recent trends in abundance of blue (*Balaenoptera musculus*) and humpback whales (*Megaptera novaeangliae*) off west and southwest Iceland, with a note on occurrence of other cetacean species. *Rep. Int. Whal. Commn.* 40: 537-551.
- 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. NOAA Technical Memorandum NMFS-OPR-12. U.S. Dept. of Commerce, Washington, D.C. 93 pp.
- Wenzel, F., D. K. Mattila, and P. J. Clapham. 1988. *Balaenoptera musculus* in the Gulf of Maine. *Mar. Mam. Sci.* 4(2): 172-175.
- Yochem, P. K. and S. Leatherwood. 1985. Blue whale. Pages 193-240 in S. H. Ridgeway and R. Harrison (editors), *Handbook of Marine Mammals, Vol. 3: The Sirenians and Baleen Whales*, Academic Press, New York.