MINKE WHALE (*Balaenoptera acutorostrata*): Canadian East Coast Stock

STOCK DEFINITION AND GEOGRAPHIC RANGE

Minke whales have a cosmopolitan distribution in polar, temperate and tropical waters. In the North Atlantic there are four recognized populations — Canadian East Coast, west Greenland, central North Atlantic, and northeastern North Atlantic (Donovan 1991). These four population divisions were defined by examining segregation by sex and length, catch distributions, sightings, marking data and pre-existing ICES boundaries. However, there were very few data from the Canadian East Coast population.

Minke whales off the eastern coast of the United States are considered to be part of the Canadian East Coast stock, which inhabits the area from the eastern half of the Davis Strait (45ºW) to the Gulf of Mexico. The relationship between this and the other three stocks is uncertain. It is also uncertain if there are separate stocks within the Canadian East Coast stock.

The minke whale is common and widely distributed within the U.S. Atlantic Exclusive Economic Zone (EEZ) (CETAP 1982). There appears to be a strong seasonal component to minke whale distribution. Spring and summer are times of relatively widespread and common occurrence, and during this time they are most abundant in New England waters. During fall in New England waters, there are fewer minke whales, while during winter, the species appears to be largely absent. Like most other baleen whales, the minke whale generally occupies the continental shelf proper, rather than the continental shelf edge region. Records summarized by Mitchell (1991) hint at a possible winter distribution in the West Indies and in mid-ocean south and east of Bermuda. As with several other cetacean species, the possibility of a deep-ocean component to distribution exists but remains unconfirmed.

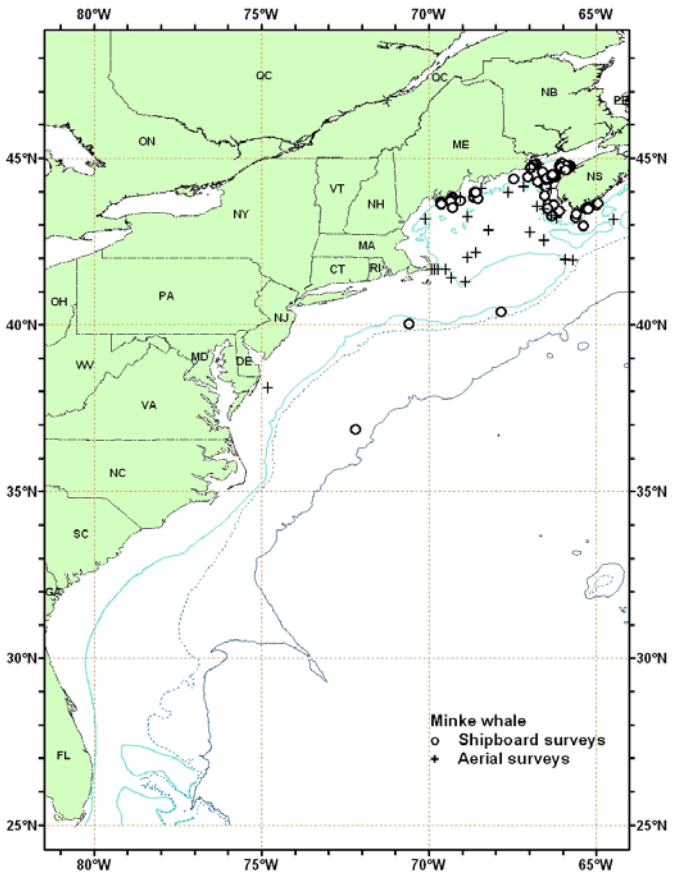

Figure 1. *Distribution of minke whale sightings from NEFSC and SEFSC shipboard and aerial surveys during the summers of 1998, 1999, and 2004. Isobaths are the 100m, 1000m and 4000m depth contours.*

POPULATION SIZE

The total number of minke whales in the Canadian East Coast population is unknown. However, seven estimates are available for portions of the habitat — a 1978-1982 estimate, a shipboard survey estimate from the summers of 1991 and 1992, a shipboard estimate from June-July 1993, an estimate made from a combination of shipboard and aerial surveys conducted during July to September 1995, an aerial survey estimate of the entire Gulf of St. Lawrence conducted in August to September 1995, an aerial survey estimate from the northern Gulf of St. Lawrence conducted during July and August 1996, and an aerial/shipboard survey conducted from Georges Bank to the mouth of the Gulf of St. Lawrence during July and August 1999 (Table 1; Figure 1).

An abundance of 320 minke whales (CV=0.23) was estimated from an aerial survey program conducted from 1978 to 1982 on the continental shelf and shelf edge waters between Cape Hatteras, North Carolina and Nova Scotia (CETAP 1982).

An abundance of 2,650 (CV=0.31) minke whales was estimated from two shipboard line-transect surveys conducted during July to September 1991 and 1992 in the northern Gulf of Maine-lower Bay of Fundy region. This abundance estimate is a weighted-average of the 1991 and 1992 estimates, where each annual estimate was weighted by the inverse of its variance, using methods as described in Palka (1995).

An abundance of 330 minke whales (CV=0.66) was estimated from a June and July 1993 shipboard line-transect sighting survey conducted principally between the 200 and 2,000m isobaths from the southern edge of Georges Bank, across the Northeast Channel to the southeastern edge of the Scotian Shelf (NMFS 1993).

An abundance of 2,790 (CV=0.32) minke whales was estimated from a July to September 1995 sighting survey conducted by two ships and an airplane that covered waters from Virginia to the mouth of the Gulf of St. Lawrence (Palka Unpub. Ms.). Total track line length was 32,600 km. The ships covered waters between the 50 and 1000 fathom isobaths, the northern edge of the Gulf Stream, and the northern Gulf of Maine/Bay of Fundy region. The airplane covered waters in the Mid-Atlantic from the coastline to the 50 fathom depth contour, the southern Gulf of Maine, and shelf waters off Nova Scotia from the coastline to the 1000 fathom depth contour. Data collection and analysis methods were described in Palka (1996).

Kingsley and Reeves (1998) estimated there were 1,020 (CV=0.27) minke whales in the entire Gulf of St. Lawrence in 1995 and 620 (CV=0.52) in the northern Gulf of St. Lawrence in 1996 (Table 1). During the 1995 survey, 8,427km of track lines were flown in an area of 221,949 km^2 during August and September. During the 1996 survey, 3,993km of track lines were flown in an area of 94,665 km^2 during July and August. Data were analyzed using Quenouille's jackknife bias reduction procedure on line-transect methods that model the left truncated sighting curve. These estimates were uncorrected for visibility biases such as *g(0)*, the probability of detecting a group on the track line.

An abundance of 2,998 (CV=0.19) minke whales was estimated from a July to August 1999 sighting survey conducted by a ship and airplane covering waters from Georges Bank to the mouth of the Gulf of St. Lawrence (Table 1; D. Palka, Unpub. Ms.). Total track line length was 8,212km. Using methods similar to that used in the above 1995 Virginia to Gulf of St. Lawrence survey, shipboard data were analyzed using the modified direct duplicate method that accounts for school size bias and *g(0)*. Aerial data were not corrected for *g(0)* (Palka 2000).

The best available current abundance estimate for minke whales, 3,618 (CV=0.186), is the sum of the 1999 Georges Bank to Gulf of St. Lawrence estimate (2,998 (CV=0.19)) and the 1996 northern Gulf of St. Lawrence estimate (620 (CV=0.52)), because these surveys are recent and provided the most complete coverage of the known habitat.

Table 1. Summary of recent abundance estimates for Canadian East Coast minke whales. Month, year, and area covered during each abundance survey, and resulting abundance estimate (N_{best}) and coefficient of variation (CV).

Row Number	Month/Year	Area	N_{best}	CV
1	Jul-Aug 1996	northern Gulf of St. Lawrence	620	0.52
2	July-Aug 1999	Georges Bank to mouth of Gulf of St. Lawrence	2,998	0.19
3	Jul-Aug 1996 + July-Aug 1999	Georges Bank to Gulf of St. Lawrence (COMBINED)	3,618	0.18

Minimum Population Estimate

The minimum population estimate is the lower limit of the two-tailed 60% confidence interval of the log-normally distributed best abundance estimate. This is equivalent to the 20th percentile of the log-normal distribution as specified by Wade and Angliss (1997). The best estimate of abundance for minke whales is 3,618. The minimum population estimate for the Canadian East Coast minke whale is 3,113.

Current Population Trend

There are insufficient data to determine population trends for this species.

CURRENT AND MAXIMUM NET PRODUCTIVITY RATES

Current and maximum net productivity rates are unknown for this stock. Life history parameters that could be used to estimate net productivity include: females mature when 6-8 years old; pregnancy rates are approximately 0.86 to 0.93; thus, the calving interval is between 1 and 2 years; calves are probably born during October to March, after 10 to 11

months gestation; nursing lasts for less than 6 months; maximum ages are not known, but for Southern Hemisphere minke whales the maximum age appears to be about 50 years (Katona *et al.* 1993; IWC 1991).

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 3,113. The maximum productivity rate is 0.04, the default value for cetaceans. The "recovery" factor, which accounts for endangered, depleted, threatened, 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 Canadian east coast minke whale is 31.

ANNUAL HUMAN-CAUSED MORTALITY AND INJURY

Recent minke whale takes have been observed in or attributed to the Gulf of Maine and Mid-Atlantic lobster trap/pot, and unknown fisheries; although not all takes have resulted in mortalities (Tables 2 to 5).

Data to estimate the mortality and serious injury of minke whales come from the U.S. Sea Sampling Program and from records of strandings and entanglements in U.S. waters. Estimates using the Sea Sampling Program data are discussed by fishery under the Fishery Information section below. Strandings and entanglement records are discussed under the lobster trap fishery, and "Unknown Fisheries" within the Fishery Information section and under the Other Mortality section (Tables 2 to 5). Ship strike mortalities and serious injuries are discussed under the Other Mortality section (Tables 3 and 4). For the purposes of this report, only those strandings and entanglement records considered confirmed human-caused mortalities or serious injuries are shown in Tables 3 and 4.

During 1999 to 2003, the U.S. total annual estimated average human-caused mortality was 3.2 minke whales per year (CV=unknown). This is derived from three components: 0 minke whales per year from U.S. fisheries using observer data, 3.2 minke whales per year (unknown CV) from U.S. fisheries using strandings and entanglement data, and 0.0 minke whales per year from ship strikes. During 1997 to 2001, there were no confirmed mortalities or serious injuries in Canadian waters as reported by the various, small-scale stranding and observer data collection programs in Atlantic Canada. No additional information is available on Canadian mortalities from 2002 to present.

Fishery Information

Detailed fishery information is reported in Appendix III.

Earlier Interactions

Little information is available about fishery interactions that took place before the 1990's. Read (1994) reported that a minke whale was found dead in a Rhode Island fish trap in 1976. A minke whale was caught and released alive in the Japanese tuna longline fishery in 3,000 m of water, south of Lydonia Canyon on Georges Bank, in September 1986 (Waring *et al.* 1990).

Two minke whales were observed taken in the Northeast sink gillnet fishery between 1989 and the present. The take in July 1991, south of Penobscot Bay, Maine resulted in a mortality, and the take in October 1992, off the coast of New Hampshire near Jeffreys Ledge, was released alive.

A minke whale was trapped and released alive from a herring weir off northern Maine in 1990.

Four minke whale mortalities were observed in the Atlantic pelagic drift gillnet fishery during 1995 so the estimated annual fishery-related mortality and serious injury was 4.5 (CV=0).

In an Atlantic tuna purse seine off Stellwagen Bank, one minke whale was reported caught and released uninjured in 1991(D. Beach, NMFS NE Regional Office, pers. comm.) and in 1996. The minke caught during 1991 escaped after a crew member cut the rope that was wrapped around the tail. The minke whale caught during 1996 escaped by diving beneath the net.

One minke whale, reported in the strandings and entanglement database, maintained by the New England Aquarium and the Northeast Regional Office/NMFS, was taken in a 6-inch gill net on 06 July 1998 off Long Island, New York. This take was assigned to the Mid-Atlantic coastal gillnet fishery. No minke whales have been taken from this fishery during observed trips in 1993 to 2003.

U.S.

Gulf of Maine and Mid-Atlantic Lobster Trap/Pot Fishery

The strandings and entanglement database, maintained by the New England Aquarium and the Northeast Regional Office/NMFS, reported 7 minke whale mortalities and serious injuries that were attributed to the lobster fishery during 1990 to 1994; 1 in 1990 (may be serious injury), 2 in 1991 (1 mortality and 1 serious injury), 2 in 1992 (both mortalities), 1 in 1993 (serious injury) and 1 in 1994 (mortality) (1997 List of Fisheries 62FR33, January 2, 1997). The 1 confirmed

minke whale mortality during 1995 was attributed to the lobster fishery. No confirmed mortalities or serious injuries of minke whales occurred in 1996. From the 4 confirmed 1997 records, 1 minke whale mortality was attributed to the lobster trap fishery. One minke whale was disentangled and released alive from lobster gear on 21 August 2002 (Table 2). One minke whale mortality was attributed to this fishery for 2003 (Tables 3 and 4). Annual mortalities due to this fishery, as determined from strandings and entanglement records that have been audited, were 1 in 1991, 2 in 1992, 1 in 1994, 1 in 1995, 0 in 1996, 1 in 1997, 0 in 1998 to 2002, and 1 in 2003. Estimated average annual mortality related to this fishery during 1999 to 2003 was 0.2 minke whales per year (Table 3).

Unknown Fisheries

The strandings and entanglement database, maintained by the New England Aquarium and the Northeast Regional Office/NMFS, included 36 records of minke whales within U.S. waters for 1975-1992. The gear included unspecified fishing nets, unspecified cables or lines, fish traps, weirs, seines, gillnets, and lobster gear. A review of these records is not complete. One confirmed entanglement was an immature female minke whale, entangled with line around the tail stock, that came ashore on the Jacksonville, Florida jetty on 31 January 1990 (R. Bonde, USFWS, Gainesville, FL, pers. comm.).

The audited NE Regional Office/NMFS entanglement/stranding database contains records of minke whales, of which the confirmed mortalities and serious injuries are reported in Table 4. Mortalities (and serious injuries) that were likely a result of a fishery interaction with an unknown fishery include 3 (0) in 1997, 3 (0) in 1999, 1 (1) in 2000, 2 (0) in 2001, 2 (0) in 2002, 4 (0) in 2003, and 0 in other years. The examination of the minke entanglement records from 1997 indicate that 4 out of 4 confirmed records of mortality are likely a result of fishery interactions, one attributed to the lobster pot fishery (see above), and three not attributed to any particular fishery because the reports do not contain the necessary details. Of the 5 mortalities in 1999, 2 were attributed to an unknown trawl fishery and 3 to some other fishery. Of the 2 interactions with an unknown fishery in 2000, 1 was a mortality and 1 was a serious injury. In 2001, of the 2 confirmed fishery interactions, both were with an unknown fishery. In 2002, there were 2 mortalities in an unknown fishery. In 2003, 4 of 5 confirmed mortalities were due to interactions with an unknown fishery (Tables 3 and 4).

In general, an entangled or stranded cetacean could be an animal that is part of an expanded bycatch estimate from an observed fishery and thus it is not possible to know if an entangled or stranded animal is an additional mortality. During 1997 to 2003, there were no minke whales observed taken in any fishery that participated in the Sea Sampling Program, therefore, the strandings where mortality was due to a fishery interaction can be added into the human-caused mortality estimate. During 1999 to 2003, as determined from strandings and entanglement records, the estimated average annual mortality is 0.4 minke whales per year in unknown trawl fisheries, and 2.6 minke whales per year in unknown fisheries (Table 3).

CANADA

In Canadian waters, information about minke whales interacting with fishing gear is not well quantified or recorded, though some records are available. Read (1994) reported interactions between minke whales and gillnets in Newfoundland and Labrador, cod traps in Newfoundland, and herring weirs in the Bay of Fundy. Hooker *et al.* (1997) summarized bycatch data from a Canadian fisheries observer program that placed observers on all foreign fishing vessels operating in Canadian waters, on between 25% and 40% of large Canadian fishing vessels (greater than 100 feet long), and on approximately 5% of smaller Canadian fishing vessels. During 1991 through 1996, no minke whales were observed taken.

Herring Weirs

During 1980 to 1990, 15 of 17 minke whales were released alive from herring weirs in the Bay of Fundy. Due to the formation of a cooperative program between Canadian fishermen and biologists it is expected that now most minke whales will be able to be released alive. During January 1991 to September 2002, 26 minke whales were trapped in herring weirs in the Bay of Fundy. Of these 26, 1 died (H. Koopman, pers. comm.) and several (number unknown) were released alive and unharmed (A. Westgate, pers. comm.).

Other Fisheries

Six minke whales were reported entangled during 1989 in the now non-operational groundfish gillnet fishery in Newfoundland and Labrador (Read 1994). One of these animals escaped and was still towing gear, the remaining 5 animals died.

Salmon gillnets in Canada, now no longer being used, had taken a few minke whales. In Newfoundland in 1979, one minke whale died in a salmon net. In Newfoundland and Labrador, between 1979 and 1990, it was estimated that 15% of the Canadian minke whale takes were in salmon gillnets. A total of 124 minke whale interactions were documented in cod traps, groundfish gillnets, salmon gillnets, other gillnets and other traps. The salmon gillnet fishery ended in 1993 as a result of an agreement between the fishermen and North Atlantic Salmon Fund (Read 1994).

Five minke whales were entrapped and died in Newfoundland cod traps during 1989. The cod trap fishery in Newfoundland closed in 1993 due to the depleted groundfish resources (Read 1994).

Table 2. Summary of minke whales (*Balaenoptera acutorostrata*) released alive, by commercial fishery, years sampled (Years), ratio of observed mortalities recorded by on-board observers to the estimated mortality (Ratio), the number of observed animals released alive and injured (Injured), and the number of observed animals released alive and uninjured (Uninjured). (N/A = Not Available)

Fishery	Years	Ratio	Injured	Uninjured
Lobster trap pot	None	NA[a]	1[a]	0

[a] Minke whale disentangled and released alive from lobster gear by owner of gear on 21 August 2002 near Mount Desert Island, ME.

Table 3. From strandings and entanglement data, summary of confirmed incidental mortalities and serious injuries of minke whales (*Balaenoptera acutorostrata*) by commercial fishery: includes years sampled (Years), number of vessels active within the fishery (Vessels), type of data used (Data Type), mortalities and serious injuries assigned to this fishery (Assigned Mortality), and mean annual mortality and serious injuries. See Table 4 for details. (NA=Not Available)

Fishery	Years			Assigned Mortality	Mean Annual Mortality
GOM and Mid-Atlantic Lobster Trap/Pot	99-03	1997=6880 2000=7539 licenses	Entanglement & Strandings	0, 0, 0, 0, 1	0.2
Unknown Trawl	99-03	NA	Entanglement & Strandings	2, 0, 0, 0, 0	0.4
Unknown Fisheries	99-03	NA	Entanglement & Strandings	3, 2, 2, 2, 4	2.6
TOTAL					3.2 (unk)

[a] Data from records in the entanglement and strandings data base maintained by the New England Aquarium and the Northeast Regional Office/NMFS (Entanglement and Strandings).

Table 4. Summarized records of mortality and serious injury likely to result in mortality. Canadian East Coast stock of minke whales, January 1999 - December 2003. This listing includes only confirmed records related to U.S. commercial fisheries and/or ship strikes in U.S. waters. Causes of mortality or injury, assigned as primary or secondary, are based on records maintained by NMFS/NER and NMFS/SER.

Date[a]	Report Type[b]	Sex, age, ID, length	Location[a]	Assigned Cause[c]: P=primary, S=secondary		Notes
				Ship strike	Entang./ Fsh.inter	
5/22/99	mortality	female, 4.6m	Cape Lookout Bight (34˚41'N 76˚54'W)		P	Unknown fishery. Fresh open wounds around fluke and line marks from pectoral fins through mouth.
6/16/99	mortality	female, 6.9m	Orleans, MA (41˚48'N 65˚56'W)		P	Unknown fishery. Extensive rope markings with hemorrhaging.

7/3/99	mortality	female, 4.1m	Sakonnet River, RI (41˚48'N 71˚12'W)		P	Trawl fishery. 4.5 inch stretched mesh driven into rostrum.
8/2/99	mortality	female, 4.1m	Point Judith Light, RI (41˚23'N 71˚28'W)		P	Trawl fishery. 6 inch stretched mesh tightly wrapped around rostrum.
10/2/99	mortality	female, 7.2m	Provincetown, MA (42˚03'N 70˚21'W)		P	Unknown fishery. Rope marks on left gape of mouth, left pectoral fin, caudal peduncle, and dorsal and ventral surfaces of fluke blades.
8/11/00	serious injury	unk sex and size	Port Clyde, ME (43˚55'N 69˚11'W)		P	Unknown fishery. Dark line with several bullet buoys. Unusual minke behavior - whale probably anchored.
10/3/00	mortality	unk sex and size	Rockland ME (44˚05'N 69˚01'W)		P	Unknown fishery. Very fresh carcass with fresh entanglement wounds on tail stock.
8/17/01	mortality	male, 3.9m	Middletown, RI (41˚28'N 71˚15'W)		P	Unknown fishery. Severe rope entanglement around mouth and rostrum caused malnutrition and infection.
12/13/01	mortality	unk sex, 7m (est)	Massachusetts Bay (42˚21'N 70˚43'W)		P	Unknown fishery. Pictures show evidence of fairly fresh entanglement marks on tail stock and across tail flukes.
7/17/02	mortality	female, 4.6m (est)	Bar Harbor, ME (44˚18.22'N 68˚7.43'W)		P	Unknown fishery. Carcass had a rope scar on the peduncle with associated hemorrhaging. Additional bruising around the epiglottis and larynx
10/15/02	mortality	female, 5.1m	Gloucester, MA (42˚36'N 70˚39W)		P	Whale was entangled through the mouth and around the pectoral flippers. Gear was still on the whale.
5/24/03	mortality	male, 7.6m	Glouster, MA (42˚40.8'N 70˚39.6'W)		P	Unknown fishery. Line marks on head and dorsal fin, no line present. Cut across back anterior to dorsal fin.
5/31/03	mortality	female, 3.6m (est)	Martha's Vineyard, MA (41˚21.0'N 70˚47.5'W)		P	Probable trawl gear. Whale stranded live wrapped in about 15 feet of 5.5 inch mesh netting.
8/9/03	mortality	unk sex, 3.5m (est)	Harwich, MA (41˚37.3'N 70˚03.0'W)		P	Unknown fishery. Hemorrhaging in areas with net marks on whale. Gear not found.

6/28/03	mortality	male, 9.1m	Chatham, MA (41˚40'N 69˚55'W)		P	Lobster fishery. Wrapped in lobster gear.
9/13/03	mortality	female, 6m (est)	Maine (43˚42'N 69˚58'W)		P	Unknown fishery. Fresh dead. External chaffing marks and belly slit open.

a. The date sighted and location provided in the table are not necessarily when or where the serious injury or mortality occurred; rather, this information indicates when and where the whale was first reported beached, entangled, or injured.
b. National guidelines for determining what constitutes a serious injury have not been finalized. Interim criteria as established by NERO/NMFS (62 FR 33, Jan. 2, 1997) have been used here. Some assignments may change as new information becomes available and/or when national standards are established.
c. Assigned cause based on best judgment of available data. Additional information may result in revisions.

Other Mortality

Minke whales have been and are still being hunted in the North Atlantic. From the Canadian East Coast population, documented whaling occurred from 1948 to 1972 with a total kill of 1,103 animals (IWC 1992). Animals from other North Atlantic minke populations are presently still being harvested at low levels.

U.S.

Minke whales inhabit coastal waters during much of the year and are subject to collision with vessels. According to the NMFS/NER marine mammal entanglement and stranding database, on 7 July 1974, a necropsy of a minke whale suggested a vessel collision occurred; on 15 March 1992, a juvenile female minke whale with propeller scars was found floating east of the St. Johns Channel entrance (R. Bonde, USFWS, Gainesville, FL, pers. comm.); and on 15 July 1996 the captain of a vessel reported they hit a minke whale offshore of Massachusetts. After reviewing this record, it was concluded the animal struck was not a serious injury or mortality. On 12 December 1998, a minke whale was struck and presumed killed by a whale watching vessel in Cape Cod Bay off Massachusetts.

During 1999 to 2003, no minke whale was confirmed struck by a ship, thus, there is an annual average of 0.0 minke whales per year struck by ships (Table 4).

In October 2003 an Unusual Mortality Event was declared involving minke whales and harbor seals along the coast of Maine. Two of the seven criteria established to designate such an event were met by these species. Specifically, there was a marked increase in mortalities when compared with historical records and the mortalities were occurring in a localized area of the Maine coast. From September 11-30, 2003, nine minke whales were reported along the mid-coast to southern Maine. Results from analyses for biotoxins failed to show the presence of either of the biotoxins, saxitoxin or domoic acid (by ELISA and Receptor Binding Assay). Most whale carcasses reported that were examined appeared to be in good body condition immediately prior to death. Since October 2003, the number of minke whale stranding reports has returned to normal.

CANADA

Whales and dolphins stranded between 1991 and 1996 on the coast of Nova Scotia were documented by the Nova Scotia Stranding Network (Hooker *et al.* 1997). Strandings on the beaches of Sable Island were documented by researchers with Dept. of Fisheries and Oceans, Canada (Lucas and Hooker 2000). Sable Island is approximately 170 km southeast of mainland Nova Scotia. Lucas and Hooker (2000) report 4 minke whales stranded on Sable Island between 1970 and 1998, 1 in spring 1982, 1 in January 1992, and a mother/calf in December 1998. On the mainland of Nova Scotia, a total of 7 reported minke whales stranded during 1991 to 1996. The 1996 stranded minke whale was released alive off Cape Breton on the Atlantic Ocean side, the rest were found dead. All the minke whales stranded between July and October. One was from the Atlantic Ocean side of Cape Breton, 1 from Minas Basin, 1 was at an unknown location, and the rest stranded in the vicinity of Halifax, Nova Scotia. It is unknown how many of the strandings can be attributed to fishery interactions.

Whales and dolphins stranded between 1997 and 2004 on the coast of Nova Scotia as recorded by the Marine Animal Response Society (MARS) and the Nova Scotia Stranding Network are as follows (Table 5): 4 minke whales stranded in 1997 (1 in June and 3 in July), 0 documented strandings in 1998 to 2000, 1 in September 2001, 4 in 2002 (1 in July, 1 in August, and 2 in November), 2 in 2003 (1 in August and 1 in October) and 0 in 2004.

Table 5. Documented number of stranded minke whales along the coast of Nova Scotia during 1999 to 2003 by year, according to records maintained by the Canadian Marine Animal Response Society.

Area	Year					
	1999	**2000**	**2001**	**2002**	**2003**	**Total**
Nova Scotia	0	0	1	4	3	8

STATUS OF STOCK

The status of minke whales, relative to OSP, in the U.S. Atlantic EEZ is unknown. The minke whale is not listed as endangered under the Endangered Species Act (ESA). The 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 is not a strategic stock because estimated fishery-related mortality and serious injury do not exceed PBR and the minke whale is not listed as a threatened or 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. 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.

Donovan, G.P. 1991. A review of IWC stock boundaries. Rep. Int. Whal. Commn., Special Issue 13: 39-68.

Hooker, S.K., R.W. Baird and M.A. Showell. 1997. Cetacean strandings and bycatches in Nova Scotia, Eastern Canada, 1991-1996. Meeting document SC/49/O5 submitted to the 1997 International Whaling Commission meeting in Bournemouth, UK.

IWC [International Whaling Commission]. 1991. Appendix 11. Biological parameters of North Atlantic minke whales in Annex F Report of the sub-committee on North Atlantic Minke whales. Rep. Int. Whal. Commn. 41: 160.

IWC [International Whaling Commission]. 1992. Annex K. Report of the working group on North Atlantic Minke trials. Rep. Int. Whal. Commn. 42: 246-251.

Katona, S. K., V. Rough and D.T. Richardson. 1993. A field guide to whales, porpoises, and seals from Cape Cod to Newfoundland. Smithsonian Institution Press. Washington D.C. 316 pp.

Kingsley, M.C.S. and R.R. Reeves. 1998. Aerial surveys of cetaceans in the Gulf of St. Lawrence in 1995 and 1996. Can. J. Zool. 76:1529-1550.

Lucas, Z.N. and S.K. Hooker. 2000. Cetacean strandings on Sable Island, Nova Scotia, 1970-1998. Canadian Field-Naturalist 114(1): 46-61.

Mitchell, E.D. 1991. Winter records of the minke whale (*Balaenoptera acutorostrata* Lacepede 1804) in the southern North Atlantic. Rep. Int. Whal. Commn. 41: 455-457.

NMFS [National Marine Fisheries Service]. 1993. Cruise results, NOAA ship DELAWARE II, Cruise No. DEL 93-06, Marine Mammal Survey. 5 pp. Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543-1026.

Palka, D. 1995. Abundance estimate of the Gulf of Maine harbor porpoise. pp. 27-50. *In*: A. Bjørge and G.P. Donovan (eds.) Biology of the Phocoenids. Rep. Int. Whal. Commn., Special Issue 16.

Palka, D. 1996. Update on abundance of Gulf of Maine/Bay of Fundy harbor porpoises. NOAA-NMFS-NEFSC Ref. Doc. 96-04; 37p. [Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543.]

Palka, D. 2000. Abundance of the Gulf of Maine/Bay of Fundy harbor porpoise based on shipboard and aerial surveys during 1999. NOAA/NMFS/NEFSC Ref. Doc. 00-07; 29 pp. [Available from: National Marine Fisheries Service, 166 Water Street, Woods Hole, MA 02543.]

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.

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., P. Gerrior, P. M. Payne, B. L. Parry and J. R. Nicolas. 1990. Incidental take of marine mammals in foreign fishery activities off the northeast United States, 1977-1988. Fish. Bull., U.S. 88(2): 347-360.