Gerry E. Studds Stellwagen Bank National Marine Sanctuary
Marine Mammal Entanglement Working Group Action Plan

Overview

Marine mammal entanglement in fishing gear is a global problem that impacts many species. The immediate effects of entanglement include mortality, serious injury, minor injury, or no injury. Long-term effects include deteriorating health, decreased reproductive ability, or no impact. The deleterious effects of entanglement occur most frequently at the level of the individual. In cases where populations are small or the rate of entanglement is high, entire species might be negatively impacted.

In the area encompassed by the Stellwagen Bank National Marine Sanctuary (SBNMS), a number of marine mammal species are reported to interact with a variety of fisheries. These include baleen whales and trap (e.g., lobster, crab, and hagfish) and gillnet fisheries, small cetaceans (e.g., harbor porpoise or white-sided dolphin) and gillnet fisheries, and pinnipeds (e.g., harbor seals) and gillnet and trap fisheries. In addition, seabirds and marine turtles also are at risk of interacting with these fisheries.

The proximate causes of marine animal entanglement are not well studied or understood. However, the ultimate cause is likely the co-occurrence of marine mammals, seabirds or marine turtles and fishing gear(s) capable of entangling them. This gear could be in the process of being actively fished or derelict. For large whales, an understanding of the cause of entanglement and possible mitigating actions is complicated by the fact that the site of entanglement is not necessarily the location at which an entangled animal was sighted. Large whales can carry fishing gear for many months and travel thousands of miles in the process. *This issue is particularly germane to the SBNMS, where a large and active commercial whale watching industry can report entanglements that are known to have originated elsewhere.* Similarly, whales entangled in the SBNMS might leave the area before they are reported.

The SBNMS is heavily populated by marine mammals and fishing gears capable of entangling them. Relative to other areas, entanglement reports are frequent, which could reflect an increased rate of entanglement, increased observer effort, or both. There is frequent co-occurrence between various marine mammal species and types of fishing gears; however, such co-occurrence varies on a spatial and temporal basis. Public scoping comments indicted that marine mammal entanglement in the SBNMS was seen as a serious problem that needed mitigation, that fishermen should be involved in any process seeking to mitigate the problem, and that fishermen were concerned over any mitigations that might restrict fishing.

As a result of public scoping comments, the SBNMS convened the multi-stakeholder Marine Mammal Entanglement (MME) Working Group (WG) to address the issue of marine animal entanglement in commercial fishing gear, with a focus on marine mammals. During this process, the WG determined that marine mammals did become entangled within the SBNMS, were often reported as entangled while in the SBNMS, and have the potential to become entangled in gear that is fished within the SBNMS. Moreover, the WG determined that sea birds and marine turtles, while at risk, were lesser issues at this time. In particular, there have been few recent

sightings of marine turtles from within the SBNMS and no reported entanglements. The WG also decided that a number of other concerns, not addressed by the public scoping comments, were relevant to the sanctuary's mission and attempted to address them.

To address the entanglement issue and its various components, the MME WG created an Action Plan consisting of four separate strategies. These strategies include:

- MME.1 – Aiding Disentanglement Efforts;
- MME.2 – Reduction of Marine Mammal Interaction with the Trap/Pot Fishery;
- MME.3 – Reduction of Marine Mammal Interaction with the Gillnet Fishery;
- MME.4 – Enforcement of Measures Aimed at Reducing Interactions of Marine Mammals with Fisheries

Each strategy provides a brief introduction to the portion of the entanglement issue being addressed (e.g., disentanglement or trap/pot fisheries). They then provide a description of existing regulations that pertain to the issue at the federal, state, or sanctuary level. Finally, this Action Plan provides a series of strategies to address the issue and a number of recommended actions that the WG believed would help its resolution. When deemed necessary, rationales have been included to substantiate the justification for the proposed action. In cases where the WG was unable to agree upon a course of action, a number of options have been provided. These options always include rationales that can be used to judge the option's merit.

Goal Statement

"To devise a framework to assess and minimize the risk of entanglement of marine mammals, sea turtles and sea birds, without unduly impacting commercial fisheries. To recommend and/or promote methods to successfully disentangle animals, foster cooperation with cross-jurisdictional partners, and educate sanctuary users regarding those issues."

STRATEGY MME.1 – AIDING DISENTANGLEMENT EFFORTS

Introduction and Evaluation of the Disentanglement Issue

One of the two main anthropogenic threats to endangered and protected whales in the western North Atlantic results from entanglements in fishing gear. Approximately half (48-65%) of Gulf of Maine (GOM) humpback whales (*Megaptera novaeangliae*) and 65% of critically endangered North Atlantic right whales (*Eubalaena glacialis*) display scars indicative of past entanglement (Robbins and Matilla, 2001). Entanglements can result in fatalities due to, but not limited to, drowning, infection, restricted mobility, starvation, and stress (Morin, personal communication, 2004). Entanglement can also potentially reduce the reproductive success of animals surviving the event (Robbins and Matilla, 2001).

Because of potential impacts to marine mammals from entanglements, most fixed-gear fishermen are required under Federal Take Reduction Plans to use modified fishing gear and comply with time and area closures to reduce the risk of entanglements. Federally appointed Take Reduction

Teams (TRT), comprised of fishermen, conservationists, scientists, and government representatives are convened to specifically address this issue. National Oceanic and Atmospheric Administration (NOAA) Fisheries has also been working with the New England Fishery Management Council (NEFMC) and other Councils, the Marine Mammal Commission, State parties, and the sanctuary on this issue.

Identifying when and where animals become entangled is confounded by the fact that large whales can tow fishing gear for multiple years and travel thousands of miles. While it is not always clear where a whale became entangled, there is a high co-occurrence of baleen whales and fixed fishing gear within the sanctuary (Wiley, et al., 2003)and evidence that at least some entanglements have occurred there (Weinrich, unpublished observations,1999). Since 1985, 57 confirmed large whale entanglement reports have occurred within the SBNMS boundary including a 5-mile buffer around the borders (Morin, personal communication, 2004). An unknown subset of those animals may have become entangled in gear fished in the SBNMS.

One way to aid entangled animals is to free them from the gear. This process has become known as "disentanglement" and the NOAA Fisheries has authorized the creation of the Atlantic Large Whale Disentanglement Network (ALWDN) to facilitate disentanglement success. In the sanctuary area, the Center for Coastal Studies (CCS) in Provincetown, MA is the primary ALWDN team. While sometimes criticized as a "half-way technology" (i.e., one that treats the symptom of entanglement instead of its cause), disentanglement has proven to be an effective emergency tool for some species. For humpback whales, 75% of reported animals were successfully disentangled (Morin, personal communication, 2004).

Unfortunately, reported animals represent a small subset of the number of animals actually entangled. Evidence suggests that only ~3% of GOM humpback whales determined by scarring studies to have been entangled between 1997 and 1999 were ever reported (Robbins and Matilla, 2000). It is possible that more entangled whales are reported in the SBNMS area because of the large numbers of vessels viewing whales in the SBNMS as compared to other areas along the east coast. However, one way to increase disentanglement success would be to increase the sanctuary's sighting and reporting efficiencies.

Other factors also act to reduce the potential success of disentanglement efforts within the sanctuary. For example, due to the travel distance required to reach entangled whales and the specialized equipment that must be mobilized, the average time for CCS to reach an entangled whale is 2.5 hours. During this time, an entangled whale could range over an area covering 144 sq. mi. of ocean. As a result, disentanglement success is predicated on vessels maintaining contact with or "standing-by" entangled animals. For example, 27 out of 41 entanglement events (66%) involved stand-by vessels leading to 22 disentanglements or non-life threatening assessments (82% success). In 10 cases where no vessels remained with the entangled whales, the success rate was only 10% with most of those whales not seen again after the entanglement report (Morin, personal communication, 2004) [NOTE: There were 10 whales that had no standby, and in the 41 events, there was one individual whale that was reported several times because the CCS counts each individual report separately.]

Almost all reports of entangled whales are initiated by commercial vessels. For example, 74% of entangled whale sightings originate from the commercial whale watch fleet. Fishermen, aerial surveys (tuna and whale), and existing network members make up the rest of the reporting groups (Morin, personal communication, 2004). While reporting vessels and aircraft often show a tremendous willingness to remain with entangled animals, it is extremely difficult for them to stand-by for hours awaiting the arrival of the rescue team. Since 1999, at least 15 disentanglement attempts have failed because vessels were unable or unwilling to stand-by until the rescue team arrived. As many as eight such incidents occurred in 2003 (Morin, pers. comm.). As a result, disentanglement could be aided by the sanctuary developing requirements or a program of incentives that increases the likelihood that vessels would stand-by entangled whales.

As can be seen, successful disentanglement requires a number of sequential actions. First, the entangled whale must be sighted. Second, the sighted animal must be reported to the disentanglement network. Third, vessels or aircraft must stand-by animals, thereby enabling the disentanglement team to make contact with the whale and begin the disentanglement process. This strategy considers each of these three phases and recommends activities to maximize the success of each.

Evaluation of Existing Regulations Addressing the Disentanglement Issue

Founded in 1976, the CCS is a nonprofit organization whose mission revolves around research, education and disentanglement. The CCS is currently the only organization with Federal authorization to disentangle large whales. Since 1984, CCS has been developing and improving the techniques, equipment, and protocols necessary for successfully disentangling large whales. Dating back to its first disentanglement of a humpback whale in 1984, CCS has amassed an outstanding safety record without a serious human related injury despite the extreme dangers and unpredictability inherent in marine mammal disentanglement. Although the program is designed to help all species of entangled marine mammals, its highest priority is the extremely endangered remnant population of North Atlantic right whales. For this reason, the program's primary geographic focus has been the known high-use areas of the North Atlantic right whale including Stellwagen Bank, Cape Cod Bay, the Great South Channel, the Bay of Fundy, and the Florida/Georgia coastline. The CCS's work disentangling large whales is a key element of the right whale and humpback whale recovery plans to date.

NOAA Fisheries Northeast Regional Office (NERO) originally issued a Letter of Authorization (LOA) to the CCS in 1989 giving the CCS a standard authorization to disentangle large whales. Based on the 1994 Marine Mammal Protection Act (MMPA) amendments, NOAA Fisheries recognized that a permit authorizing large whale disentanglement was prudent. The permit has been amended five times since 1999 with the latest revision occurring in June 2003. The amended permit authorizes the CCS to take marine mammals for the purpose of scientific research and enhancement subject to specified provisions of the MMPA, the Regulations Governing the Taking and Importing of Marine Mammals, and the Fur Seal Act of 1966. In general terms, the permit authorizes NOAA Fisheries to take all species of the Orders Cetacea, Pinnipedia, and Sirenia, to: (1) collect, preserve, label, and transport cadavers or tissue and fluid samples for physical, chemical, or biological analyses, import, and export; (2) take stranded or

distressed endangered or threatened marine mammals; and (3) salvage specimens from dead threatened or endangered marine mammals.

Activities (4)

The sanctuary will work in partnership with various agencies, industries, and organizations identifying, reporting, and responding to entangled whales to increase the degree to which entangled whales within the SBNMS are sighted, reported, and assisted. To that end, the following activities and actions are recommended:

(1.1) *Maximize the degree to which entangled animals in the sanctuary are sighted.*

Actions:

1.1.1 It is recommended that the sanctuary secure a permanent vessel large enough to provide a regular presence within the sanctuary. One important use of this vessel would be for the purpose of approaching whales to assess their condition (e.g., indications of entanglement). Any applicable permits or authorizations must be obtained prior to this activity.

1.1.2 It is recommended that the sanctuary work with NOAA Fisheries, Massachusetts Division of Marine Fisheries (MADMF), and other interested parties to develop a proposal to allow certified whale watching vessels to approach right whales within the 500-yard exclusion zone for the purpose of assessing possible entanglement and identifying individuals (through photo-identification procedures).

1.1.3 It is recommended that the sanctuary increase and support current educational efforts alerting boaters of the need to be on the lookout for entangled whales.

(1.2) *Maximize the degree to which entangled animals in the sanctuary are properly reported.*

Actions:

1.2.1 It is recommended that the sanctuary increase educational efforts and partnerships to ensure that all mariners are aware of the need to report sightings of entangled animals and how such sightings should be reported. Possible efforts could include distribution of laminated placards stating the rules for reporting entangled whales to post on vessels and at the piers, and posting this information on the sanctuary website and in the sanctuary newsletter.

(1.3) *Maximize stand-by of entangled animals.*

Actions:

1.3.1 It is recommended that the sanctuary increase the time a sanctuary vessel is on the water to aid in the stand-by of entangled whales as well as

encourage the CCS to continue their efforts to reduce their response time to reports of entangled whales in the SBNMS area.

1.3.2 It is recommended that the sanctuary improve or establish relationships with the Massachusetts Environmental Police (MEP) or other groups, such as the Maine Marine Patrol, that could provide an on-water presence to supplement that of the sanctuary.

1.3.3 It is recommended that the sanctuary facilitate a process by which research, state or federal vessels, or aircraft working in the SBNMS report their presence to the CCS and make themselves available to stand-by.

1.3.4 It is recommended that the sanctuary support a meeting of the CCS, commercial whale watch operators, and naturalists to provide training and informational materials for standing by an entangled whale.

1.3.5 It is recommended that commercial whale watch boats stand-by an entangled whale for a minimum of 45 minutes if no other boats are in the vicinity to hand off the whale to as a means to ensure adequate documentation and a reduced search area for the network responder.

1.3.6 It is recommended that the sanctuary, along with CCS and NOAA Fisheries, support incentive programs (such as certificates, photographs of vessels standing by entangled whales, postings on the sanctuary website, etc.) for vessels that stand by entangled whales.

1.3.7 It is recommended that the sanctuary encourage NOAA Fisheries and NEFMC to develop ways to credit federally permitted vessels under the days-at-sea (DAS) program for the actual fishing time they have lost in order to stand-by entangled whales. Under the current DAS fisheries management system, fishermen would be economically penalized for standing-by entangled whales because this time would be deducted from the limited time they have been allotted to fish.

1.3.8 It is recommended that the sanctuary support an educational program for the fishing community to increase the number of disentanglement Level One trained commercial fishermen.

(1.4) *Research*

Actions:

1.4.1 It is recommended that the sanctuary assist NOAA Fisheries in allowing interested parties to view gear removed from whales entangled or disentangled in the proximity of the sanctuary. This would also allow interested parties to provide comments for NOAA Fisheries records regarding the possible type and origin of the gear viewed. This would

facilitate public participation by individuals knowledgeable about fishing gear without compromising ongoing investigations as to the type or origin of the gear or the potential evidentiary nature of the gear.

1.4.2 It is recommended that the sanctuary be instrumental in investigating a functional gear marking system in order to identify the part and type of gear in which whales are getting entangled.

1.4.3 It is recommended that the sanctuary investigate a means of developing a surface marking system to identify gear type and anchoring systems for the purpose of surface identification.

1.4.4 It is recommended that the sanctuary partner with CCS, NOAA Fisheries, and other parties to support research and development of improved disentanglement technology.

STRATEGY MME.2 – REDUCTION OF MARINE MAMMAL INTERACTION WITH THE TRAP/POT FISHERY

Introduction and Evaluation of the Trap/Pot Fishery Issue

The goal of the National Marine Sanctuaries Act (NMSA) is to protect SBNMS resources, such as marine mammals, while allowing compatible human uses. With regard to large whales, because it is often difficult to identify where whales have been entangled or the gear with which animals were entangled, the exact magnitude of the concern as it relates to the SBNMS is unknown. However, trap-pot fisheries such as American Lobster, whelk, hagfish and Jonah crab are directed fisheries included in the Federal Atlantic Large Whale TRT process. Some of these trap/pot fisheries co-occur with large numbers of baleen whales in the SBNMS, creating an identified risk of entanglement (Wiley, et al., 2003a; 2003b). Since 1985, 57 confirmed large whale entanglement reports have occurred within the SBNMS boundary including a 5-mile buffer around the borders (Morin, personal communication, 2004). An unknown subset of those animals may have become entangled in trap or pot gear fished in the SBNMS.

In addition, the NOAA Fisheries has determined that trap and pot fisheries interact with marine mammals in other areas. For entanglements in the U.S. and Canada between 1993-2002 in which the source could be identified, 71% (10/14) of right whales and 41% (9/22) of humpback whale entanglements were attributed to various pot gears (lobster inshore, lobster offshore, lobster unknown location, unknown pot, crab, conch/whelk, and slime eel; this data was calculated using Kozuck, et al., In Review). The American Lobster Fishery, a subset of which operates within the SBNMS, is classified by NOAA Fisheries as a Category I fishery. Category I fisheries are those which have frequent mortality or serious injury of one or more species of marine mammals. Known "takes" in this fishery have included North Atlantic right whales, humpback whales, finback whales, minke whales, and harbor seals, all of which inhabit the SBNMS.

The mixed species trap/pot fishery, a subset of which also occurs within the SBNMS, is classified by NOAA Fisheries as a Category II fishery. Category II fisheries are those which cause occasional mortality or serious injury to marine mammals. Known takes in this fishery have included finback whales, humpback whales, minke whales, and North Atlantic right whales, all of which utilize the SBNMS.

Therefore the MME WG offers the following strategy to reduce the risk of baleen whale interactions with trap and pot fisheries that occur within the SBNMS. It is acknowledged that this plan closely follows recommendations formulated by NOAA Fisheries Atlantic Large Whale TRT, which addresses interactions with North Atlantic right, humpback and fin whales with an emphasis on the risk these fisheries pose to right whales.

Evaluation of Existing Regulations Addressing the Pot/Trap Fisheries Issue

A number of existing regulations and plans designed to reduce the risk of MME in trap and pot fisheries apply to, but are not specific to, the SBNMS. These are summarized as follows:

- Lobster Gear Summary for SBNMS

  Under current Federal lobster regulations specified at 50 CFR 697, vessels in possession of a Federal lobster permit are required to abide by the most restrictive of state or Federal lobster regulations and the most restrictive management measures for all lobster management areas (LMA) in which the vessel elects to fish.

  a.) *Overlap of SBNMS and LMA*
  The SBNMS is located primarily within lobster Exclusive Economic Zone (EEZ) Nearshore Management Area 1 (Area 1; see §697.18(a) for latitude/longitude coordinates). There is one small section of the southeastern corner of the SBNMS that extends into the EEZ Nearshore Outer Cape LMA (Outer Cape Area; see §697.18(h) for latitude/longitude coordinates).

  b.) *Federal Lobster Trap Limits*
  Vessels are restricted to a maximum of 800 traps in the SBNMS. The actual number of traps a vessel may be authorized to fish may be further reduced if a vessel elects other LMA with more restrictive trap limits or if the vessel is bound by more restrictive state regulations.

  c.) *Lobster Trap Gear Identification*
  All lobster traps deployed in the SBNMS must be marked with a lobster trap tag to provide positive identification of the vessel and/or owner of the gear.

  d.) *Lobster Trap Maximum Size*
  Lobster traps deployed or possessed in the SBNMS shall not exceed 22,950 cubic inches (376,081 cubic centimeters) in volume as measured on the outside portion of the trap, exclusive of the runners.

e.) *Lobster Trap Gear Configuration - Three or Fewer Traps*
Lobster traps and trap trawls of three or fewer traps deployed in the SBNMS must be attached to and marked with a single buoy.

f.) *Lobster Trap Gear Configuration - More Than Three Traps*
Lobster trap trawls consisting of more than three traps must have a radar reflector and a single flag or pennant on the westernmost end, while the easternmost end of a trap trawl must be configured with a radar reflector only. No trawl shall exceed 1.5 nautical miles (2.78 km) in length, as measured from radar reflector to radar reflector.

**Gear configuration requirements specified in e) and f) above apply in the following areas:*

- *Area 1: All waters of the EEZ north of 42°20' N. latitude seaward of a line drawn 12 nautical miles (22.2 km) from the baseline of the territorial sea.*
- *Outer Cape Area: All waters of the EEZ south of 42°20' N. latitude and east of 70°00' W. longitude or the outer boundary of the territorial sea, whichever lies farther east.*

g.) *State Lobster Regulations*
Only Federal lobster regulations are specified in this summary, state regulations may be more restrictive.

h.) *Other Lobster Management Measures*
This is only a summary of Federal lobster trap limits and significant gear configuration requirements applicable to trap gear fished in the SBNMS. Lobster traps must also conform to other gear configuration measures not specified in this summary, such as escape vent and ghost panel requirements. A complete description of current Federal lobster management measures is available at: <http://www.nero.noaa.gov/>\\nerntserver6\sfc_common\BobR\ALobster\Stellwagen Bank\Lob-GearSummary.March2004.doc.

- Summary of Non-Lobster Fisheries for SBNMS (March 2004)

a.) *Hagfish*
There are no Federal regulations for hagfish in Northeast waters (i.e., no Federal Fishery Management Plan [FMP]).

b.) *Jonah Crab*
There are no Federal regulations for Jonah Crab in Northeast waters overlapping SBNMS (i.e., no Federal FMP).

c.) *Scup*
Permits: Any vessel that fishes for scup in the EEZ (Federal Waters) must have a valid scup permit, except recreational vessels. There are two types of scup vessel permits:

- *Charter and Party Permit:* Vessels must have this permit if they are carrying passengers for hire.
- *Moratorium Permit:* Vessels must possess this permit to retain any scup for sale.

Quota: The Mid-Atlantic Fisheries Management Council establishes the coastwide commercial quota annually. All scup landed for sale are applied against the quota regardless of where they were harvested. NOAA Fisheries monitors the harvest of the commercial scup quota and closes the EEZ to commercial scup fishing when the quota is reached.

Harvests:
- *Winter I:* January - April – Allotted 45.11% of annual harvest
- *Summer:* May - October – Allotted 38.95% of annual harvest
- *Winter II:* November - December – Allotted 15.94% of annual harvest

Trap/Pot Gear Restrictions:
- Must have degradable hinges and escape vents
- Must be marked with state identification (home port state) and/or number assigned by the Regional Administrator

Minimum Fish Size:
- Scup Moratorium Permit holders – 9 inches
- Non-Moratorium Permit holders – 10 inches
- Charter and Party vessels – 10 inches

Additional Information:
- Recreational and commercial limit for non-permitted vessels – 50 scup
- Commercial transfers at sea allowed under NOAA Fisheries guidelines
- All commercial permit holders required to maintain Vessel Trip Report (VTR)
- Scup may be sold only to persons possessing a valid scup dealer permit
- Vessels may be replaced under NOAA Fisheries approved guidelines

d.) *Black Sea Bass*

Permits: Any vessel that fishes for black sea bass in the EEZ (Federal Waters) must have a valid black sea bass permit, except recreational vessels. There are two types of black sea bass vessel permits:
- *Charter and Party Permit:* Vessels must have this permit if carrying passengers for hire.
- *Moratorium Permit:* Vessels must possess this permit to retain any black sea bass for sale.

Quota: The Mid-Atlantic Fisheries Management Council establishes the coastwide commercial quota annually. All black sea bass landed for sale are

applied against the quota regardless of where they were harvested. NOAA Fisheries monitors the harvest of the commercial black sea bass quota and closes the EEZ to commercial black sea bass fishing when the quota is reached.

Trap/Pot Gear Restrictions:

- Must have ghost panels and degradable hinges and escape vents
- Must be marked with state registration number and/or U.S. Coast Guard (USCG) documentation number

Minimum Fish Size:

- Black Sea Bass Moratorium Permit Holders – 11 inches
- Non-Moratorium Permit Holders – 12 inches
- Charter and Party Vessels – 12 inches

Additional Information:

- Recreational and commercial limit for non-permitted vessels – 25 black sea bass
- All commercial permit holders required to maintain VTR
- Black sea bass may be sold only to persons possessing a valid black sea bass dealer permit
- Vessels may be replaced under NOAA Fisheries approved guidelines

**Sections c) and d) are only a partial summary of current Federal regulations for scup and black sea bass specified at 50 CFR 648. A complete description of Federal scup and black sea bass management measures is available at: http://www.nero.noaa.gov/. These regulations are subject to change; the recreational specifications for these fisheries for 2004 have not yet been published.*

- Summary of the Atlantic Large Whale Take Reduction Plan (ALWTRP)

A number of existing regulations and plans designed to reduce the risk of MME in trap/pot fisheries apply within, but are not specific to, the SBNMS. These are summarized below (see 50 CFR 229.32 for the complete ALWTRP regulations).

The Atlantic Large Whale TRT was established in 1996 to develop a plan for reducing the incidental take of right whales, humpback whales, and fin whales in commercial fisheries. The plan benefits minke whales as well. The Atlantic Large Whale TRT is composed of fishermen, environmental groups, gear experts, state and federal fishery managers, biologists, academia, and other interested parties.

a.) *ALWTRP Universal Requirements for Lobster Trap/Pot and Anchored Gillnet Gear*
The following universal requirements apply to both lobster trap/pot and anchored gillnet fishing gear in the areas and during the times specified in the Plan

- No floating buoy line at the surface

- No wet storage of gear
- Fishermen are encouraged, but not required, to maintain knot-free buoy lines

b.) *Dynamic Area Management (DAM)*

DAM is a program implemented under the ALWTRP to protect unexpected aggregations of right whales within defined areas north of 40 degree North latitude for 15-day period.

- A DAM zone is triggered by a sighting from a qualified individual of three or more right whales within a 75 square nautical mile area. Qualified individuals include but are not limited to NOAA Fisheries staff, USCG and Navy personnel trained in whale identification through disentanglement training or some other training program deemed adequate by NOAA Fisheries.

- Several factors are considered by NOAA Fisheries when deciding what restrictions to require in a DAM zone, including but not limited to:
  - Location of the DAM zone with respect to other fishery closure areas
  - Weather conditions as they relate to the safety of human life at sea
  - The type and amount of gear already present in the area
  - A review of recent right whale entanglement and mortality data

- Once DAM zone triggered, NOAA Fisheries authorized to:
  - Require the temporary removal of lobster trap/pot and anchored gillnet fishing and require fishermen not to set any new gear;
  - Issue an alert to fishermen requesting the voluntary removal of all lobster trap/pot and anchored gillnet gear, and asking fishermen not to set any new gear; and/or
  - Allow lobster trap/pot and anchored gillnet fishing with gear determined by NOAA Fisheries to sufficiently reduce the risk of entanglement.

- The 2003 DAM Program Amendment
  In 2003, NOAA Fisheries published a final rule identifying gear modifications that could be required in a DAM zone. The following gear modifications apply to lobster trap/pot and anchored gillnet fishing gear:
  - Sinking and/or neutrally buoyant line on groundlines
  - Allowance for two buoy lines, and not more than 1/3 floating line on bottom end
  - Lower weak link breaking strength in Offshore Lobster Waters from 2,000 lb to 1,500 lb
  - Five 1,100lb weak links on net panels and anchored with the holding power of a 22lb Danforth-style anchor for gillnets

c.) *Seasonal Area Management (SAM)*

SAM is also a program developed under the ALWTRP, but unlike DAM, the SAM areas were designed to protect seasonal, predictable aggregations of right whales.

- Gear set in the SAM areas during the designated time must be Level II or Low Risk Gear, which is defined as gear where death or serious injury resulting from entanglement would be highly unlikely.

- Gear modifications are required in SAM West area, which partially overlaps Stellwagen Bank, from March 1 to April 30 each year. In the SAM East area, gear modifications are required annually from May 1 to July 31. The gear modifications required in SAM apply to lobster trap/pot and anchored gillnet fishing gear.

- In addition to other requirements, such as universal gear modifications and gear marking where applicable, major gear modifications include:
  - Ground lines and buoy lines must be made entirely of either sinking or neutrally buoyant line
  - No more than one buoy line per trawl/string
  - Lower weak link breaking strength for Offshore Lobster Waters (2,000 to 1,500 lbs)
  - Gillnet net panels must have five 1,100 lbs weak links
  - All anchored gillnets must be anchored with the holding power of a 22 lb Danforth-style anchor

- Summary of Cape Cod Bay Critical Habitat

  a.) *Lobster Trap/Pot Gear*

  - From January 1 to April 30, the following requirements apply to lobster trap/pot fishing gear in Cape Cod Bay:
    - Buoys marked with two orange flags
    - All buoys must have a weak link (500lb)
    - All traps must be set in either a two-trap string or in a trawl of four or more traps
    - A two-trap string cannot have more that one buoy line
    - All buoy lines made of sinking line except for the bottom third of the line, which may be floating line
    - All ground lines made entirely of sinking line

  - From May 1 to December 31, the following requirements apply to lobster trap/pot gear in the Federal-water portions of Cape Cod Bay Critical Habitat:
    - Buoy lines marked (red)
    - All buoys must have a weak link (600lb)
    - Multiple traps only; trawls of 5 or fewer traps can have only 1 buoy line

  - From May 1 to December 31, the following requirements apply to lobster trap/pot gear in the State-water portions of Cape Cod Bay Critical Habitat:
    - No gear marking (orange flags on buoys removed)
    - All groundlines made of entirely sinking and/or neutrally buoyant line (applies to all of Cape Cod Bay starting in 2004).

- One option from the following:
    1. All buoys must have a weak link (600lb)
    2. All buoy lines made of entirely sinking and/or neutrally buoyant line

b.) *Anchored Gillnet Gear*

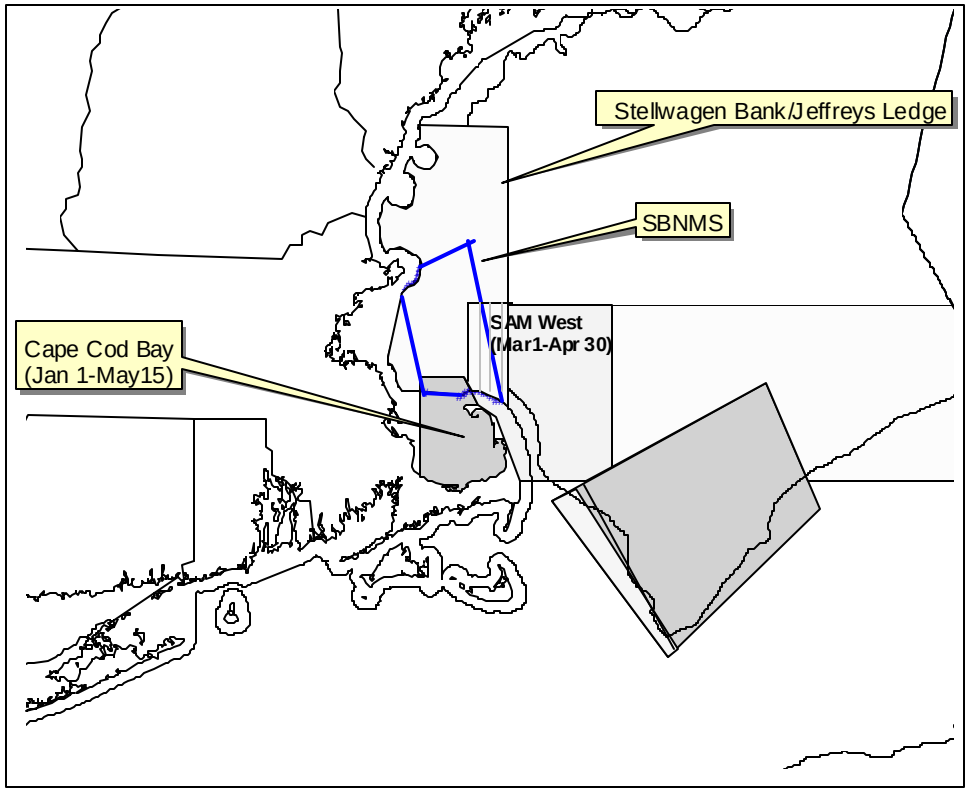
- From January 1 to May 15, Cape Cod Bay is closed to anchored gillnet gear.

- From May 16 to December 31, the following requirements apply to anchored gillnet gear in CCB:
    - Buoy lines marked (green)
    - All buoys must have a weak link (1,100lb)
    - All net panels must contain weak links with a breaking strength no greater than 1,100lb in the center of the float line of each net panel
    - Anchored gillnet strings of 20 or fewer net panels must be secured in one of three ways:
        1. With the holding power of at least a 22lb Danforth-style anchor at each end of the net string;
        2. With at least 50lb of dead weight at each end of the net string; or
        3. With a lead line weighting at least 100lb per 300 ft for each net panel in the net string.

- Stellwagen Bank /Jeffreys Ledge

  The requirements for lobster trap/pot and anchored gillnet gear in Stellwagen Bank/Jeffreys Ledge are the same as those listed above for Cape Cod Bay, except that portions of Stellwagen Bank/Jeffreys Ledge are subject to SAM in addition to those restrictions. Therefore, when those overlapping waters are subject to SAM, the more restrictive requirements apply.

SBNMS & ALWTRP Management Areas



Activities (3)

The sanctuary will work in partnership with various agencies, industries, and organizations to address and investigate the entanglement risk posed by trap and pot fisheries. To that end, the following activities and actions are recommended:

(2.1) *Gear modification*
The goal of gear modification is to reduce the probability of entanglement and/or reduce serious injury or mortality of large whales that do become entangled by trap and pot fisheries by restructuring fishing gear or the way it is used. In this way, the safety of marine mammals is increased without restricting access of the fisheries to their target resource (e.g., shellfish or finfish).

Actions:

2.1.1 It is recommended that, within five years, all current and future trap/pot fisheries shall use sinking groundline within the SBNMS or comply with NOAA Fisheries regulations (whichever is more stringent).

Rationale: Groundlines are lines connecting traps or pots on the seabed. Currently, groundlines are often made from buoyant materials that on average rise to 18 feet (McKiernan, et al., 2002) above the ocean floor. Since traps can be separated by as much as 180 feet, floating line can result in long arches of line looping through the water column creating an entanglement risk. While whales are likely to get entangled in any part of the gear, Kozuck et al. (in review) found no entanglements of humpbacks or right whales in sinking groundline. However, it is also important to note that the apparent risk reduction of groundline may be an artifact of the frequency with which this type of gear is deployed (Kozuck, et al., in review). Still, the WG agreed with the Atlantic Large Whale TRT that minimizing the amount of exposed line in the water column would reduce the risk of entanglement to whales. Analyses by Wiley et al. (2003) indicate that the removal of floating groundline from trap fisheries operating within the SBNMS could result in the cumulative reduction of hundreds or thousands of kilometers of line now believed to be occupying portions of the sanctuary's water column.

NOAA Fisheries will release its proposed rule regarding gear modifications for this fishery sometime in May 2004. Since this WG will have completed its work by that time, the WG has agreed to go forward with recommendations acknowledging that NOAA Fisheries' proposal may be more stringent and, therefore, should be considered as the preferred recommendation from this WG.

2.1.2 It is recommended that the breaking strength of buoy weak links in trap and pot gear throughout the SBNMS should be 600lbs.

Rationale: There are currently two different breaking strength configurations that are used within the SBNMS. As a means of consistency, the WG felt that there should be a uniform breaking strength within the SBNMS.

(2.2) *Outreach and education*

Actions:

2.2.1 It is recommended that the sanctuary develop an outreach program specific to fisherman regarding fishing regulations applicable within the SBNMS.

Rationale: Because regulatory changes are ongoing along the east coast and proposals within the SBNMS may be different, fisherman may not be aware of, or clear on, all issues impacting fishing within the SBNMS.

2.2.2 It is recommended that the sanctuary encourage and assist fishing and conservation interests to apply for funding from NOAA Fisheries,

National Fish and Wildlife Foundation, and other sources to explore whale-safe gear.

Rationale: Since fisherman are most knowledgeable about their fishery, their expertise and advice are a valuable asset to scientists who are working to develop gear modifications that will reduce risk to whales while allowing a commercially viable fishery to operate. Teaming with conservation interests will help ensure that subsequent research meets conservation objectives.

(2.3) *Research*

While the WG acknowledged that the Gear Advisory Group and Atlantic Large Whale TRT are researching modifications to fishing gear as a mechanism to reduce risk, the WG felt that the sanctuary could provide invaluable research assistance. For example, the GOM Ocean Observing System (GOMOOS) buoy data can be used to provide current/tide data when testing and looking at different configurations of fishing gear in the field. GOMOOS data was used to provide current values in a study that looked at the profiles and dynamics of groundlines and endlines both as scaled-models in the laboratory and at full-scale in the field (Lyman and McKiernan, 2004). Gear modifications that appear to be functional in this type of controlled setting could be tested within the SBNMS for a more realistic view of its function. Gear modification found effective within the SBNMS could then be reported to NOAA Fisheries and the Atlantic Large Whale TRT for possible use outside SBNMS boundaries.

Actions:

2.3.1 It is recommended that vertical lines be targeted for intensive research and development. Vertical lines should be investigated for modification during the next sanctuary Management Plan Review (MPR) or sooner as required by NOAA Fisheries.

Rationale: While sinking groundline may reduce the risk of entanglement to whales, the vertical line (from the trap or pot to the surface buoy) still represents a significant risk to the animals. However, at this time, there are no known vertical line configurations or materials that are operationally feasible to reduce risk.

2.3.2 It is recommended that the sanctuary should continue to work with NOAA Fisheries, MADMF, fishermen, and conservationists to develop low risk gear. The sanctuary should act as a testing ground for promising new risk-reduction technologies as they become available.

2.3.3 It is recommended that, within five years, the sanctuary develop a surface buoy marking system to identify gear types and anchoring systems. Such a system could be implemented sooner if required by NOAA Fisheries or the Atlantic States Marine Fisheries Commission (ASMFC).

Rationale: While the habitat use surveys conducted by the sanctuary are helpful, the inability to accurately identify gear types based on surface buoy markings make it difficult to assess the risk of entanglement to whales by gear type. This would also assist in identifying the type of gear on entangled whales, thereby making future MPR plans more productive.

2.3.4 It is recommended that the sanctuary continue to conduct surveys to monitor marine mammals and the type and amount of fishing gear within the SBNMS on a seasonal and annual basis. This information should be used to identify areas of potential interaction between marine mammals and fisheries and identify temporal, seasonal, and effort trends.

Rationale: The baseline information obtained by the sanctuary (Wiley, et al., 2003a; 2003b) has been instrumental in looking at the SBNMS in terms of habitats used by whales and fishermen. However, this type of information may change due to an increase or decrease in fishing effort, thereby modifying temporal, seasonal, and cumulative risk to animals. Therefore, such research should be conducted periodically to provide the best available data for decision-making.

2.3.5 It is recommended that the sanctuary develop research protocols to determine the efficacy of non-floating groundline to reduce entanglement.

Rationale: To test the efficacy of sinking groundlines as a risk reduction tool, it is necessary to determine if these lines are found on entangled whales. For example, a marking system identifying groundlines separate from other components of the gear (i.e., end lines comprised partially of sinking line), would assist in identifying whether animals continued to become entangled in groundlines made of non-floating materials. Such marking should be cognizant of the fact that making all groundlines identical makes it difficult for fishermen to separate lines that become entangled with other fishing gears using the same line. One option would be reserve particular colors only for groundlines. Another would be to place a specifically colored weave into the line at fabrication.

STRATEGY MME.3 – REDUCTION OF MARINE MAMMAL INTERACTION WITH THE GILLNET FISHERY

Introduction and Evaluation of the Gillnet Fishery Issue

Approximately 40 day-boat, gillnet vessels, departing from southern Maine to Green Harbor, Massachusetts fish primarily in the northern section of the SBNMS. Gillnet fishing within the SBNMS has historically occurred year round, with the height of fishing activity during the summer months. However, federal fishing regulations may restrict, or prohibit gillnet fishing within the SBNMS at various times of the year. Additionally, the gillnet fishing effort appears to be declining with 1337 trips reported in 2002, down from 1781 in 2000. The long-term nature of

this decline is further suggested by data collected during monthly, standardized surveys of the SBNMS in 1994/95 and 2001/02. During this time, sightings of actively fishing gillnet vessels decreased from 54 during 1994/95 surveys to 14 during the 2001/02 surveys (Wiley, unpublished data) Comparisons are based on data from the southern ~70% of the SBNMS, the spatial extent of the 1994/95 surveys.

NOAA Fisheries observer data indicates that several species of Pinnipeds (seals) and Odontocetes (dolphins and porpoises) are incidentally taken by gillnets within the SBNMS. Additionally, large whales are known to interact with gillnets and published and anecdotal evidence indicate that these entanglements do occur within the SBNMS (Weinrich 1999).

The goal of the NMSA is to protect SBNMS resources, such as marine mammals, while allowing for compatible human uses. With regard to large whales, because it is often difficult to identify where whales have been entangled or the gear with which animals were entangled, the exact magnitude of the concern as it relates to the SBNMS is unknown. However, gillnet fisheries are directed fisheries included in the Federal Atlantic Large Whale TRT process. This fishery co-occurs with large numbers of baleen whales in the SBNMS, creating an identified risk of entanglement (Wiley, et al., 2003a; 2003b). Since 1985, 57 confirmed large whale entanglement reports have occurred within the SBNMS boundary including a 5-mile buffer around the borders (Morin, personal communication, 2004). An unknown subset of those animals may have become entangled in gillnet gear fished in the SBNMS. In addition, some animals might have become entangled within the SBNMS and left prior to being observed.

In addition, the NOAA Fisheries has determined that the gillnet fishery interacts with marine mammals in other areas. For entanglements in the U.S. and Canada between 1993-2002 in which the source could be identified, 14% (2/14) of right whales and 50% (11/22) of humpback whales were attributed to net gear (Kozuck et al., in review). The northeast sink gillnet fishery is classified by NOAA Fisheries as a Category I fishery. Category I fisheries are those which have frequent mortality or serious injury of one or more species of marine mammals. Known "takes" in this fishery have included North Atlantic right whales, humpback whales, Atlantic white-sided dolphins, common dolphins, harbor porpoise, and several species of seals, all of which inhabit the SBNMS (Waring et al. 2002).

Historically, gillnet fisheries in the northeast (Maine through Rhode Island) have taken substantial numbers of harbor porpoise. From 1994-1998, the mean annual mortality of harbor porpoises incidentally taken in the northeast sink gillnet fishery was 1163 animals (Waring, et al., 2002). Since 1998, this number has been reduced to an average estimate of approximately 388 harbor porpoises incidentally taken annually (1999-2000) in northeast sink gillnet fishery (Waring, et al., 2002). This dramatic reduction was in part due to cooperative work by scientists, conservationists, and fishermen that led to the development of effective acoustic harassment devices known as "pingers" required through the Harbor Porpoise Take Reduction Plan. Takes were also reduced as a result of actions taken by the NEFMC which implemented sweeping time and area closures to protect porpoises and to conserve groundfish stocks.

Therefore the MME WG offers the following strategy to reduce the risk of marine mammal interactions with the gillnet fishery that occur within the SBNMS. It is acknowledged that this

plan contains no further take reduction measures beyond those contained in the NOAA Fisheries' take reduction plans intended to reduce the risk to marine mammals posed by this fishery and closely follows recommendations formulated by the NOAA Fisheries Atlantic Large Whale TRT, which emphasizes the risk this fishery poses to North Atlantic right whales.

Evaluation of Existing Regulations Addressing the Gillnet Fisheries Issue

A number of existing regulations and plans designed to reduce the risk of MME in the northeast sink gillnet fishery applies to, but are not specific to, the SBNMS. These are summarized as follows:

- Summary of the ALWTRP

A number of existing regulations and plans designed to reduce the risk of MME in trap/pot fisheries apply within, but are not specific to, the SBNMS. These are summarized below (see 50 CFR 229.32 for the complete ALWTRP regulations).

The Atlantic Large Whale TRT was established in 1996 to develop a plan for reducing the incidental take of right whales, humpback whales, and fin whales in commercial fisheries. The plan benefits minke whales as well. The Atlantic Large Whale TRT is composed of fishermen, environmental groups, gear experts, state and federal fishery managers, biologists, academia, and other interested parties.

a.) *ALWTRP Universal Requirements for Lobster Trap/Pot and Anchored Gillnet Gear*
The following universal requirements apply to both lobster trap/pot and anchored gillnet fishing gear in the areas and during the times specified in the Plan

- No floating buoy line at the surface
- No wet storage of gear
- Fishermen are encouraged, but not required, to maintain knot-free buoy lines

b.) *DAM*
DAM is a program implemented under the ALWTRP to protect unexpected aggregations of right whales within defined areas north of 40 N latitude for 15-day period.

- A DAM zone is triggered by a sighting from a qualified individual of three or more right whales within a 75 square nautical mile area. Qualified individuals include but are not limited to NOAA Fisheries staff, USCG and Navy personnel trained in whale identification through disentanglement training or some other training program deemed adequate by NOAA Fisheries.

- Several factors are considered by NOAA Fisheries when deciding what restrictions to require in a DAM zone, including but not limited to:
  - Location of the DAM zone with respect to other fishery closure areas
  - Weather conditions as they relate to the safety of human life at sea

- The type and amount of gear already present in the area
- A review of recent right whale entanglement and mortality data

- Once DAM zone triggered, NOAA Fisheries is authorized to:
  - Require the temporary removal of lobster trap/pot and anchored gillnet fishing and require fishermen not to set any new gear;
  - Issue an alert to fishermen requesting the voluntary removal of all lobster trap/pot and anchored gillnet gear, and asking fishermen not to set any new gear; and/or
  - Allow lobster trap/pot and anchored gillnet fishing with gear determined by NOAA Fisheries to sufficiently reduce the risk of entanglement.

- The 2003 DAM Program Amendment in 2003, NOAA Fisheries published a final rule identifying gear modifications that could be required in a DAM zone. The following gear modifications apply to lobster trap/pot and anchored gillnet fishing gear:
  - Sinking and/or neutrally buoyant line on groundlines
  - Allowance for two buoy lines, and not more than 1/3 floating line on bottom end
  - Lower weak link breaking strength in Offshore Lobster Waters from 2,000 lb to 1,500 lb
  - Five 1,100lb weak links on net panels and anchored with the holding power of a 22lb Danforth-style anchor for gillnets

c.) *SAM*

SAM is also a program developed under the ALWTRP, but unlike DAM, the SAM areas were designed to protect seasonal, predictable aggregations of right whales.

- Gear set in the SAM areas during the designated time must be Level II or Low Risk Gear, which is defined as gear where death or serious injury resulting from entanglement would be highly unlikely.

- Gear modifications are required in SAM West area, which partially overlaps Stellwagen Bank, from March 1 to April 30 each year. In the SAM East area, gear modifications are required annually from May 1 to July 31. The gear modifications required in SAM apply to lobster trap/pot and anchored gillnet fishing gear.

- In addition to other requirements, such as universal gear modifications and gear marking where applicable, major gear modifications include:
  - Ground lines and buoy lines must be made entirely of either sinking or neutrally buoyant line
  - No more than one buoy line per trawl/string
  - Lower weak link breaking strength for Offshore Lobster Waters (2,000 to 1,500 lbs)
  - Gillnet net panels must have five 1,100 lbs weak links

- All anchored gillnets must be anchored with the holding power of a 22 lb Danforth-style anchor

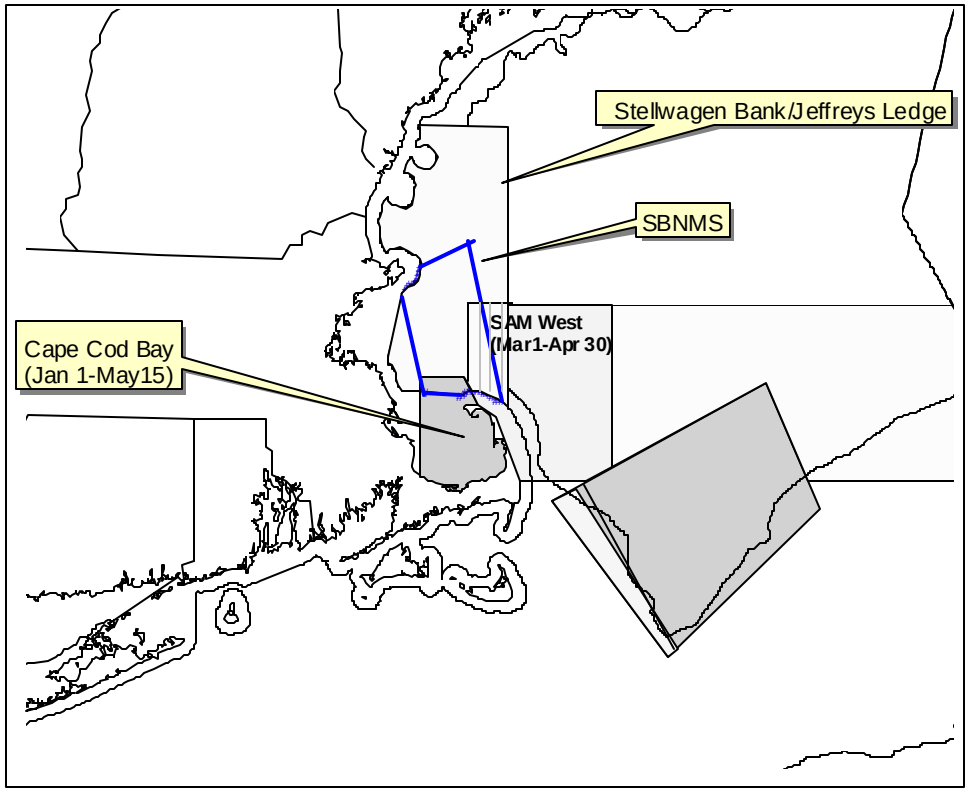
- Summary of Cape Cod Bay Critical Habitat

  a.) *Anchored Gillnet Gear*
  - From January 1 to May 15, Cape Cod Bay is closed to anchored gillnet gear.
  - From May 16 to December 31, the following requirements apply to anchored gillnet gear in Cape Cod Bay:
    - Buoy lines marked (green)
    - All buoys must have a weak link (1,100lb)
    - All net panels must contain weak links with a breaking strength no greater than 1,100lb in the center of the float line of each net panel
    - Anchored gillnet strings of 20 or fewer net panels must be secured in one of three ways:
      1. With the holding power of at least a 22lb Danforth-style anchor at each end of the net string;
      2. With at least 50lb of dead weight at each end of the net string; or
      3. With a lead line weighting at least 100lb per 300 ft for each net panel in the net string.

- Summary of Stellwagen Bank /Jeffreys Ledge

  The requirements for lobster trap/pot and anchored gillnet gear in Stellwagen Bank/Jeffreys Ledge are the same as those listed above for Cape Cod Bay, except that portions of Stellwagen Bank/Jeffreys Ledge are subject to SAM in addition to those restrictions. Therefore, when those overlapping waters are subject to SAM, the more restrictive requirements apply.

SBNMS & ALWTRP Management Areas



- Multispecies Sink Gillnet Regulations

  The most recent management action to affect the gillnet fleet operating in New England is Amendment 13 to the Northeast Multispecies FMP. The amendment was developed by the NEFMC and implemented by NOAA Fisheries beginning on May 1, 2004 primarily to end overfishing on all groundfish stocks and to rebuild those stocks that are overfished. It contains a variety of measures applicable to commercial and recreational fishing that:

  - Address impacts of the fishery on EFH;
  - Minimize bycatch;
  - Implement improved reporting and record keeping requirements; and
  - Address other conservation and management issues.

  The new measures significantly revise the components of the existing program such as target catch rates, adjustments to trip limits, and reductions in the number of DAS that can be fished. In addition, Amendment 13 includes several new elements such as:

  - Leasing and transferring fishing days among limited access northeast groundfish permit holders;

- Allowing sectors of the groundfish fishery to develop their own sector allocation plans;
- Creating a Special Access Program to target healthy stocks such as yellowtail flounder;
- Implementing a U.S./Canada Sharing Understanding whereby an allocation of total allowable catch for portions of some Georges Bank (GB) groundfish stocks would be allocated to U.S. fishing vessels; and
- Implementing phased and adaptive rebuilding strategies for groundfish stocks.

For many small vessel owners, including those who use sink gillnet gear, DAS have been reduced from an average of about 70 days in 2003 to approximately 53 days in 2004. Vessels are now allocated days on an individual basis, therefore some may have more than others, depending on their demonstrated history in the fishery. Various gear requirements (listed in the table below) and area closures also are in place.

	GOM	**GB**	**Southern New England (SNE)**	**Mid-Atlantic (MA)**
MINIMUM MESH SIZE RESTRICTIONS FOR GILLNET GEAR				
Northeast Multispecies Day Gillnet Category	Roundfish nets 8.5" (18.5 cm) mesh; 50-net allowance	All nets 8.5" (18.5 cm) mesh; 50-net allowance	All nets 8.5" (18.5 cm) mesh; 75-net allowance	Roundfish nets 8.5" (18.5 cm) mesh; 75-net allowance
	Flatfish nets 8.5" (18.5 cm) mesh; 100-net allowance			Flatfish nets 8.5" (18.5 cm) mesh; 75-net allowance
Northeast Multispecies Trip Gillnet Category	All nets 8.5" (18.5 cm) mesh; 150-net allowance	All nets 8.5" (18.5 cm) mesh; 150-net allowance	All nets 8.5" (18.5 cm) mesh; 75-net allowance	All gillnet gear 8.5" (18.5 cm) mesh; 75-net allowance

- Northeast Multispecies Closed Area Regulations

Unless otherwise noted, the regulations described below apply to fishing vessels issued valid Federal fishing permits or any vessel fishing in Federal waters. (See 50 CFR § 648.4 for Federal fishing permit requirements.) This information is only a summary (NOAA, 2004) of applicable fishing regulations and is not a substitute for the actual regulations, which can be found at 50 CFR Part 648.

a.) *GOM Rolling Closure Areas and GB Seasonal Closure Areas*

The GOM Rolling Closure Areas and the GB Seasonal Area described below, unless further restricted under the Essential Fish Habitat (EFH) Closure Areas, are closed to

all fishing vessels with the following exemptions: Vessels that do not have a Federal Northeast multispecies permit and are fishing exclusively in state waters; charter, party or recreational vessels; and vessels fishing with spears, rakes, diving gear, cast nets, tongs, harpoons, weirs, dip nets, stop nets, pound nets, pots and traps, purse seines, mid-water trawls, surf clam/quahog dredge gear, pelagic hook and line, pelagic longlines, single pelagic gillnets, shrimp trawls (with properly configured grates), and sea scallop dredge gear (see conditions under GB Seasonal Closure Area).

Charter and party vessels may fish in the GOM Rolling Closure Area provided they have a LOA from the Regional Administrator to enter or fish in these areas. A LOA is valid from the date of enrollment through the duration or the closure of three months duration, whichever is greater, and is available by calling the Permit Office at 978-281-9278.

- GOM Seasonal Rolling Closure Areas

Rolling Closure Area I - Closed March 1 through March 31

Point	**N. Latitude**	**W. Longitude**
GM3	42°00'	(1)
GM5	42°00'	68°30'
GM6	42°30'	68°30'
GM23	42°30'	70°00'
(1) = Cape Cod shoreline on the Atlantic Ocean		

Rolling Closure Area II - Closed April 1 through April 30

Point	**N. Latitude**	**W. Longitude**
GM1	42°00'	(1)
GM2	42°00'	(2)
GM3	42°00'	(3)
GM5	42°00'	68°30'
GM13	43°00'	68°30'
GM9	43°00'	(4)
(1) Massachusetts shoreline		
(2) Cape Cod shoreline on Cape Cod Bay		
(3) Cape Cod shoreline on the Atlantic Ocean		
(4) New Hampshire shoreline		

Rolling Closure Area III - Closed May 1 through May 31

Point	N. Latitude	W. Longitude
GM1	42°00'	(1)
GM2	42°00'	(2)
GM3	42°00'	(3)
GM4	42°00'	70°00'
GM23	42°30'	70°00'
GM6	42°30'	68°30'
GM14	43°30'	68°30'
GM10	43°30'	(4)
(1) Massachusetts shoreline		
(2) Cape Cod shoreline on Cape Cod Bay		
(3) Cape Cod shoreline on the Atlantic Ocean		
(4) Maine shoreline		

Rolling Closure Area IV - Closed June 1 through June 30

Point	N. Latitude	W. Longitude
GM9	42°30'	(1)
GM23	42°30'	70°00'
GM17	43°30'	70°00'
GM19	43°30'	67°32' or (2)
GM20	44°00'	67°21' or (2)
GM21	44°00'	69°00'
GM22	(3)	69°00'
(1) Massachusetts shoreline		
(2) U.S. - Canada maritime boundary		
(3) Maine shoreline		

Rolling Closure Area V - Closed October 1 through November 30*

Point	N. Latitude	W. Longitude
GM1	42°00'	(1)
GM2	42°00'	(2)
GM3	42°00'	(3)
GM4	42°00'	70°00'
GM8	42°30'	70°00'
GM9	42°30'	(1)
(1) Massachusetts shoreline		
(2) Cape Cod shoreline on Cape Cod Bay		
(3) Cape Cod shoreline on the Atlantic Ocean		

*****Raised Footrope Trawl Whiting Fishery
are exempt from Rolling Closure Area V.

- GB Seasonal Closure Area

  For the purposes of the GB Seasonal Closure Area only, vessels fishing with scallop dredge gear when fishing under a scallop DAS when fishing in the Scallop Dredge Fishery Exemption Area are exempt, provided that the vessel use an 8-inch twine top and complies with other applicable Northeast multispecies possession limits. The area is as follows:

GB Seasonal Closure Area - Closed May 1 through May 31

Point	N. Latitude	W. Longitude
GB1	42°00'	(1)
GB2	42°00'	68°30'
GB3	42°20'	68°30'
GB4	42°20'	67°20'
GB5	41°30'	67°20'
CL1	41°30'	69°23'
CL2	40°45'	68°45'
CL3	40°45'	68°30'
GB6	40°30'	68°30'
GB7	40°30'	69°00'
G10	40°50'	69°00'
GB8	40°50'	69°30'
GB9	41°00'	69°30'
GB10	41°00'	70°00'
G12	(1)	70°00'
(1) Northward to its intersection with the shoreline of Mainland Massachusetts		

- Year-Round Groundfish Closure Areas- GOM

  The Western GOM and Cashes Ledge Closure areas are closed year-round to all fishing vessels with the following exemptions: Charter, party (charter and party vessels must have a LOA from the Regional Administrator to enter or fish in this area) or recreational vessels; and vessels fishing with spears, rakes, diving gear, cast nets, tongs, harpoons, weirs, dip nets, stop nets, pound nets, pots and traps, purse seines, mid-water trawls, surf clam/quahog dredge gear, pelagic hook and line, pelagic longlines, single pelagic gillnets, and shrimp trawls (with properly configured grates). A Charter/Party LOA is valid from the date of enrollment until the end of the fishing year and is available by calling the Permit Office at 978-281-9278.

Western GOM Area Closure

Point	N. Latitude	W. Longitude
WGM1	42°15'	70°15
WGM2	42°15'	69°55'
WGM3	43°15'	69°55'
WGM4	43°15'	70°15'
WGM1	42°15'	70°15

Cashes Ledge Closure Area

Point	N. Latitude	W. Longitude
CL1	43°07'	69°02'
CL2	42°49.5'	68°46'
CL3	42°46.5'	68°50.5'
CL4	42°43.5'	68°58.5'
CL5	42°42.5'	69°17.5'
CL6	42°49.5'	69°26'
CL1	43°07'	69°02'

- Year Round Closure Areas - GB and SNE

Closed Area I - Closed Area I, unless further restricted under the EFH Closure Areas, is closed year-round to all fishing vessels, with the following exceptions: Vessels fishing with or using pot gear designed to take lobsters or hagfish, pelagic hook and line gear, pelagic longline gear, harpoon gear, tuna purse seine, pelagic mid-water trawl gear, and tuna purse seine gear.

Point	**N. Latitude**	**W. Longitude**
CI1	41°30'	69°23'
CI2	40°45'	68°45'
CI3	40°45'	68°30'
CI4	41°30'	68°30'
CI1	41°30'	69°23'

Closed Area II – Closed Area II, unless further restricted under the EFH Closure Areas, is closed year-round to all fishing vessels, with the following exceptions: Vessels fishing with or using pot gear designed to take lobsters or hagfish, pelagic hook and line gear, pelagic longline gear, harpoon gear, tuna purse seine outside the portion of Closed Area II known as the Habitat of Particular Concern, pelagic mid-water trawl gear, and vessels fishing in the Closed Area II Yellowtail Flounder Special Access Program (refer to NOAA Fisheries Northeast Region Information Sheet #16).

Point	**N. Latitude**	**W. Longitude**
ClI1	41°00'	67°20'
ClI2	41°00'	66°35.8'
G5	41°18.6'	66°24.8' (the U.S.- Canada Maritime Boundary)
ClI3	42°22'	67°20' (the U.S.- Canada Maritime Boundary)
ClI1	41°00'	67°20'

Nantucket Lightship Closed Area - Nantucket Lightship Closed Area, unless further restricted under the EFH Closure Areas, is closed year-round to all fishing vessels, with the following exceptions: Vessels fishing with or using pot gear designed to take lobsters or hagfish, pelagic hook and line gear, pelagic longline gear, tuna purse seine, harpoon gear, pelagic mid-water trawl gear, surf clam/quahog dredge gear, and charter/ party or recreational vessels. Charter and party vessels must have a LOA from the Regional Administrator to enter or fish in this area. A LOA may be obtained by calling the Permit Office at 978-281-9278.

Point	N. Latitude	W. Longitude
G10	40°50'	69°00'
CN1	40°20'	69°00'
CN2	40°20'	70°20'
CN3	40°50'	70°20'
G10	40°50'	69°00'

- Year-Round EFH Closures

EFH Closure Areas are closed year-round to all bottom-tending mobile gears. Bottom tending mobile gear is defined as the following: Gear in contact with the ocean bottom, and towed from a vessel, which is moved through the water during fishing in order to capture fish, and includes otter trawls, beam trawls, hydraulic dredges, non-hydraulic dredges, and seines (with the exception of a purse seine).

Western GOM Habitat Closure Area

Point	N. Latitude	W. Longitude
WGM4	43°15'	70°15'
WGM1	42°15'	70°15
WGM5	42°15'	70°00'
WGM6	43°15'	70°00'
WGM4	43°15'	70°15'

Jeffrey's Bank Habitat Closure Area

Point	N. Latitude	W. Longitude
JB1	43°40'	68°50'
JB2	43°40'	68°40'
JB3	43°20'	68°40'
JB4	43°20'	68°50'
JB1	43°40'	68°50'

Closed Area I North Habitat Closure Area

Point	N. Latitude	W. Longitude
CI1	41°30'	69°23'
CI4	41°30'	68°30'
CIH1	41°26'	68°30'
CIH2	41°04'	69°01'
CI1	41°30'	69°23'

Closed Area I South Habitat Closure Area

Point	N. Latitude	W. Longitude
CIH3	40°55'	68°53'
CIH4	40°58'	68°30'
CI3	40°45'	68°30'
CI2	40°45'	68°45'
CIH3	40°55'	68°53'

Closed Area II Habitat Closure Area

Point	N. Latitude	W. Longitude
ClIH1	42°00'	67°20'
ClIH2	42°00'	67°00'
ClIH3	41°40'	66°43'
ClIH4	41°40'	67°20'
ClIH1	42°00'	67°20'

Nantucket Lightship Habitat Closure Area

Point	N. Latitude	W. Longitude
NLH1	41°10'	70°00'
NLH2	41°10'	69°50'
NLH3	40°50'	69°30'
NLH4	40°20'	69°30'
NLH5	40°20'	70°00'
NLH1	41°10'	70°00'

- Transiting Regulations

  NE Multispecies GOM Rolling Closure Areas, GB Seasonal Closure Area, Western GOM Closure Area, Cashes Ledge Closure Area, Nantucket Lightship Closed Area, Closed Area I, and the EFH Closure Areas (unless otherwise prohibited): Vessels may transit these areas during the closure periods, provided that the gear is stowed in accordance with the regulations summarized below.

  Closed Area II: Vessels may not transit Closed Area II except for valid safety reasons, provided the operator has determined that there is a compelling safety reason and that fishing gear is stowed in accordance with the regulations summarized below.

- Gear Stowage Requirements

  To legally stow gear, a vessel must meet one or more of the following requirements:

  Trawl Gear:
  - A net stowed below deck provided: It is located below the main working deck from which the net is deployed and retrieved; the towing wires, including the leg wires, are detached from the net; and it is fan-folded (flaked) and bound around its circumference.

    or

  - A net stowed and lashed down on deck, provided: It is fan-folded (flaked) and bound around its circumference; it is securely fastened to the deck or rail of the vessel; and the towing wires, including the leg wires, are detached from the net.

    or

- On-reel stowage for vessels transiting the GOM Rolling Closure Areas and the GB Seasonal Closure Area - A net that is on a reel and is covered and secured, provided: the entire surface of the net is covered with canvas or other similar opaque material that is securely bound; the towing wires are detached from the doors; and no containment rope, codend tripping device, or other mechanism to close off the codend is attached to the codend.

or

- On-reel stowage for vessels transiting the Western GOM Closure Area, Cashes Ledge Closure Area, Closed Area I, Closed Area II, and the Nantucket Lightship Closed Area - A net that is on a reel and is covered and secured, provided: the entire surface of the net is covered with canvas or other similar opaque material that is securely bound; the towing wires are detached from the net; and the codend is removed and stored below deck.

or

- Nets that are secured in a manner authorized in writing by the Regional Administrator

Scallop Dredges:

- The towing wire is detached from the scallop dredge, the towing wire is reeled up onto the winch, and the dredge is secured and covered so that it is rendered unusable for fishing.

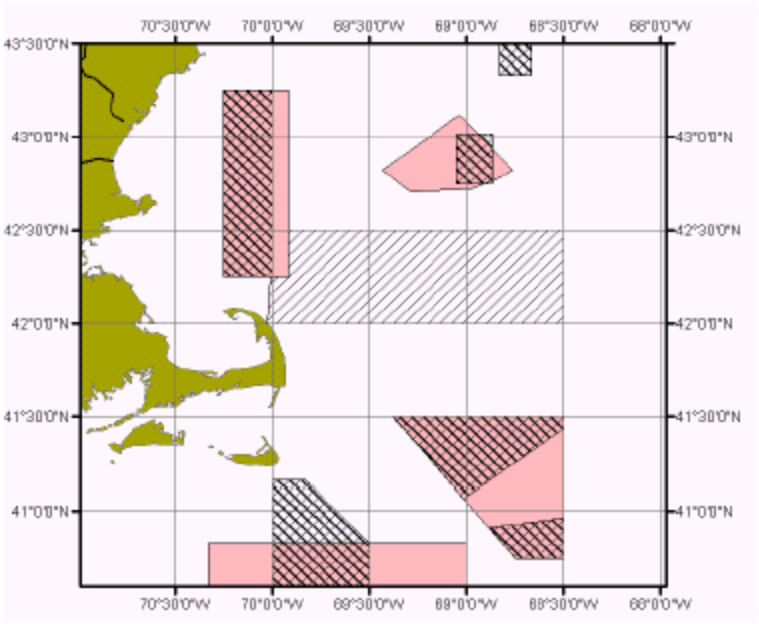
Hook Gear (other than pelagic):

- All anchors and buoys are secured and all hook gear, including jigging machines, is covered.

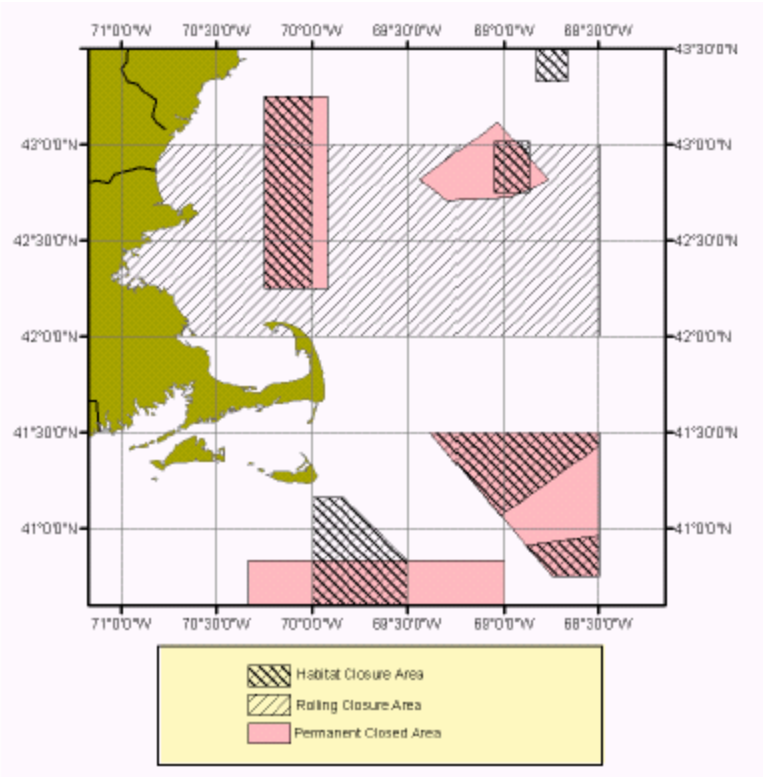
Sink Gillnet Gear:

- All nets are covered with canvas or other similar material and lashed or otherwise securely fastened to the deck or rail, and all buoys larger than 6 inches (15.24 cm) in diameter, high flyers, and anchors are disconnected.

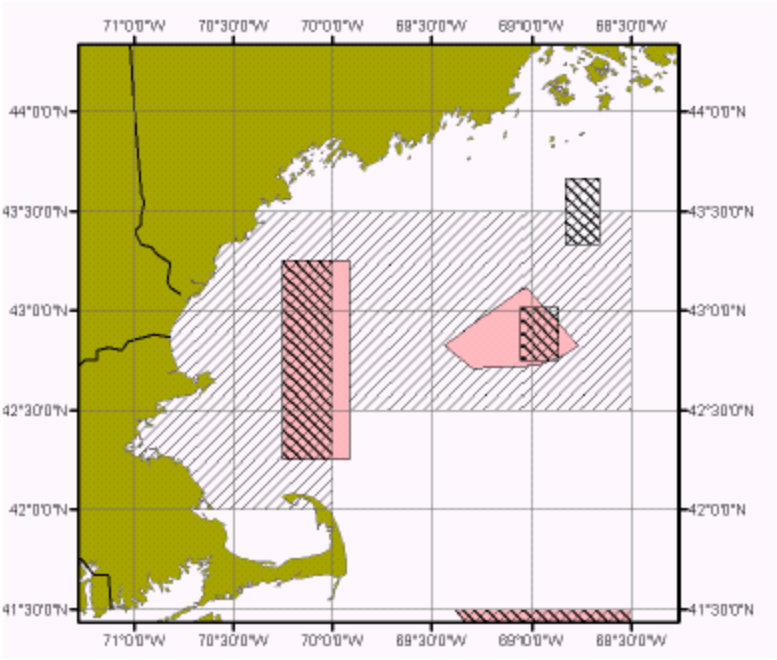
GOM Rolling Closure Area I



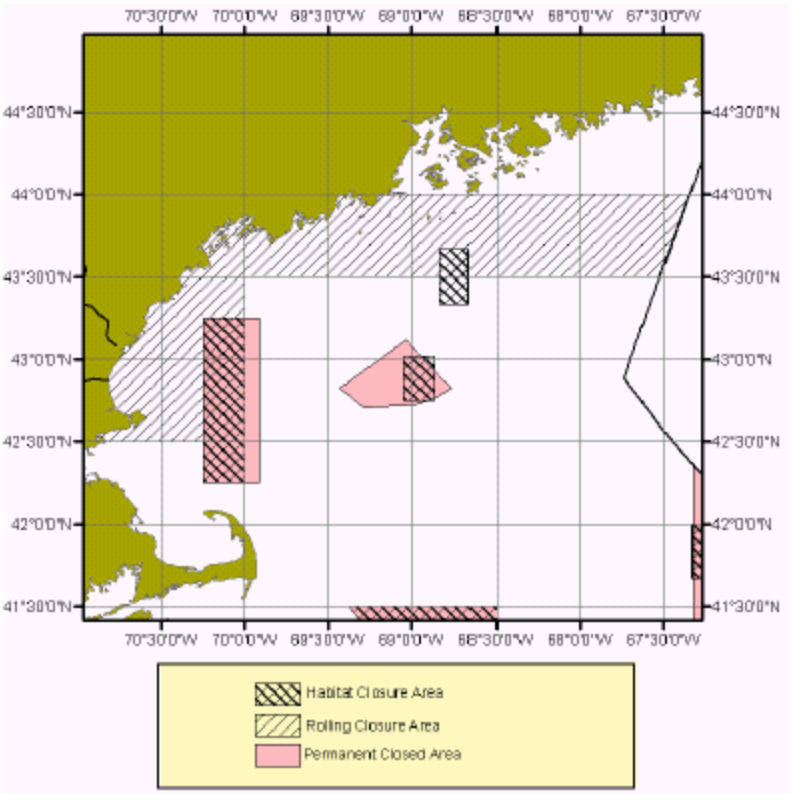
GOM Rolling Closure Area II



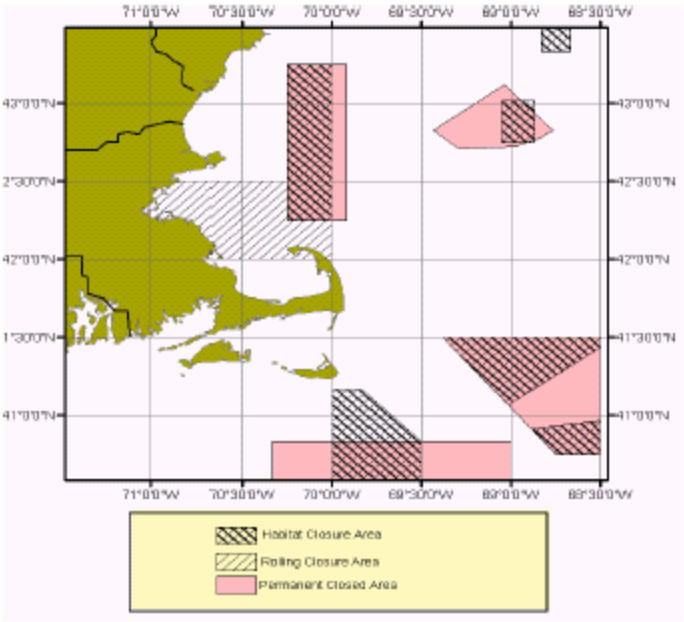
GOM Rolling Closure Area III



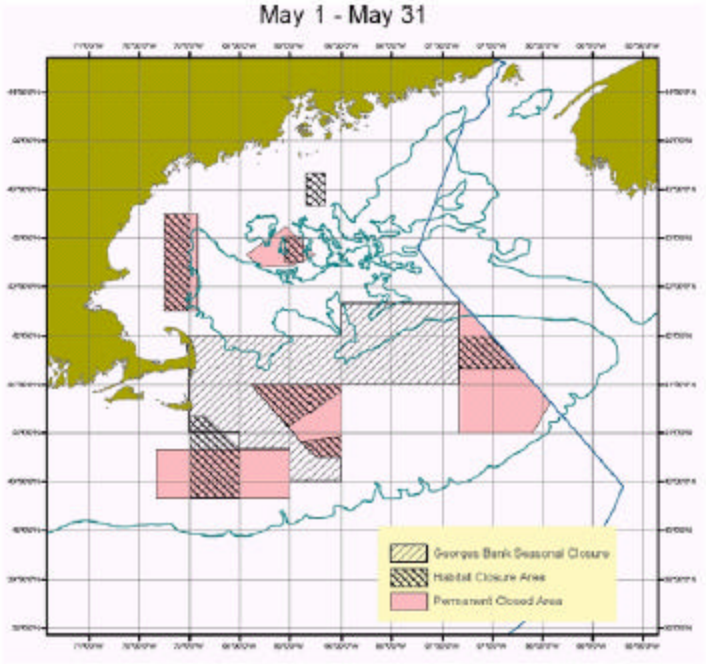
GOM Rolling Closure Area IV



GOM Rolling Closure Area V



GB Seasonal Closure Area



- Summary of the Harbor Porpoise Take Reduction Plan (HPTRP) Regulations Within SBNMS

  Harbor porpoises (*Phocoena phocoena*) are found in coastal waters where they prey on small schooling fish, including some fish that are sought by gillnet fishermen. Harbor porpoises sometimes become entangled in gillnets and drown. In addition, they are difficult to study because they are widely dispersed in small groups and they spend little time at the surface. Their distribution varies unpredictably from year to year depending on environmental conditions, such as water temperature and prey distribution. Along the east coast of North America, they can be found from Labrador to North Carolina. The southern-most stock is the GOM/Bay of Fundy stock. In the winter, part of this stock moves south to waters between New York and North Carolina. Biologists think this stock (commonly called the GOM stock) is composed of approximately 50,000 animals.

  Gillnet gear is used to harvest a variety of species, including groundfish (cod, pollock, haddock, and flounder), monkfish, and dogfish. Some fishermen haul their nets daily while others leave them in the water for an average of two days and as long as five days. Gillnets in the New England fishery are 50 fathoms long and are tied together in strings connecting up to 30 nets. Some fishermen targeting dogfish in Mid-Atlantic waters set strings of nets averaging 4,000 feet in length.

  Harbor porpoises have been taken incidentally in gillnets since the 1960s, when a sink gillnet fishery for groundfish developed in the Bay of Fundy, Canada. The gillnet fisheries along the New England coast developed in the 1970s. NOAA Fisheries estimates that New England and Mid-Atlantic gillnet fisheries now take approximately 2,000 harbor porpoises per year.

  The MMPA directs NOAA Fisheries to reduce marine mammal injuries and deaths caused by fishing gear. In particular, the MMPA requires the federal government to protect any marine mammal stock in which the Potential Biological Removal (PBR) level is being exceeded. PBR is defined as the number of human-caused deaths the stock can withstand annually and still reach and maintain an optimum population level.

  On December 11, 1998, NOAA Fisheries published a final rule to implement the HPTRP. That final rule addressed both the GOM and the Mid-Atlantic coastal waters. The GOM portion of the Plan pertains to all those fishing with sink gillnets and other gillnets capable of catching multispecies in New England waters, from Maine through Rhode Island east of 72 30' W. longitude. The rule includes time and area closures, some of which are complete closures; others are closures to multispecies gillnet fishing unless pingers are used in the prescribed manner. In addition to the closures listed here, other closures are already established under the Northeast Multispecies (groundfish) FMP; these closures are intended both to protect cod and to reduce the take of harbor porpoise. The following are the closures that overlap with the SBNMS.

a.) *Mid-Coast Closure Area*

This area is closed September 15 through May 31 to all vessels using sink gillnet gear or gillnet gear capable of catching multispecies with the exception of gillnet vessels using pingers deployed on the nets according to the specifications found below. Vessel operators are required to have a certification of pinger training aboard the vessel while operating in this area (see below).

Latitude	**Longitude**
42 30' N	Massachusetts shoreline
42 30' N	70 15' W
42 40' N	70 15' W
42 40' N	70 00' W
43 00' N	70 00' W
43 00' N	69 30' W
43 30' N	69 30' W
43 30' N	69 00' W
Maine shoreline	69 00' W

b.) *Massachusetts Bay Closure Area*

This area is closed December 1 through February 28 (or 29) and April 1 through May 31 to vessels using sink gillnet gear or gillnet gear capable of catching multispecies with the exception of gillnet vessel using pingers deployed on the nets according to the specifications found below. Vessel operators are required to have a certification of pinger training aboard the vessel while operating in this area (see below). This area is closed March 1 through March 31 to all vessels using sink gillnet gear or gillnet gear capable of catching multispecies.

Latitude	**Longitude**
42 30' N	Massachusetts shoreline
42 30' N	70 30' W
42 12' N	70 30' W
42 12' N	70 00' W
Cape Cod shoreline	70 00' W
42 00' N	Cape Cod shoreline
42 00' N	Massachusetts shoreline

- Pinger Specifications

  A pinger is an acoustic deterrent device which, when immersed in water, broadcasts a 10 kHz (±2 kHz) sound at 132 dB (±4 dB) re 1 micro Pascal at 1m, lasting 300 milliseconds (±15 milliseconds), and repeating every 4 seconds (±0.2 seconds).

- Pinger Attachment

A pinger must be attached at the end of each string of the gillnet and at the bridle of every net within a string of nets.

- Pinger Training and Certification

  The operator of a vessel may not fish with, set, or haul back sink gillnets or gillnet gear, or allow such gear to be in closed areas where pingers are required unless the operator has satisfactorily completed the pinger certification training program and possesses on board the vessel a valid pinger training certificate issued by NOAA Fisheries. For more information on training dates, please contact the Protected Resource Division at (978) 281-9328.

Activities (3)

The sanctuary will work in partnership with various agencies, industries, and organizations to address and investigate the entanglement risk posed by the northeast sink gillnet fishery. To that end, the following activities and actions are recommended:

(3.1) *Gear modification*
The goal of gear modification is to reduce serious injury or mortality of marine mammals entangled by the northeast sink gillnet fisheries by restructuring fishing gear or the way it is used. In this way, the safety of marine mammals is increased without restricting access of the fisheries to their target resource.

The NOAA Fisheries will release its proposed rule regarding gear modifications for this fishery sometime in May 2004. Since this WG will have completed its work by that time, the WG has agreed to go forward with recommendations acknowledging that NOAA Fisheries' proposal, if more stringent, would be considered as the preferred recommendation from this WG.

Actions:

3.1.1.a The sanctuary should act under Section 304-9 of the NMSA on an expedited basis, to require gillnet fisheries to implement gillnet modifications as outlined in the SAM requirements (see specific listing of required modifications above). The sanctuary should require these modifications throughout the SBNMS and on a year-round basis.

Summary of Rationale: Current gillnet restrictions to protect large endangered whales that are using sanctuary waters are seasonal and focus largely on risk-reduction for right whales, although endangered humpback whales are most at risk of entanglement in gillnet gear (see below) and are known to have been entangled in the SBNMS (Weinrich, 1999). There are three different types of restrictions on gillnet use in the SBNMS, which range from complete closure in some areas, to minimal alteration of normal fishing practice in others. The SAM restrictions provide the greatest measure of risk reduction for whales, while still allowing

gillnetting to occur. The sanctuary should exercise its authority to implement regulations mandating this type of gear modification to protect endangered whales that clearly need uniform protection, regardless of when and where they travel within the sanctuary.

Full Rationale: In the initial designation of the SBNMS in 1993, NOAA lists 13 species of marine mammals that regularly use the waters of the SBNMS and cites its importance as a nursery and feeding ground for endangered species (see http://www.sbnms.nos.noaa.gov/management/1993plan/toc.html).

Endangered species of marine mammals continue to be seriously injured and, in some cases, killed in interactions with gillnet gear. These interactions affect both critically endangered North Atlantic right whales, but to a greater extent, endangered humpback whales (NOAA Marine Mammal Stock Assessment, 2003; See Appendix MME.I and MME.II. The regulation of commercial fishing to protect endangered marine mammals falls to NOAA Fisheries, which develops a take reduction plan designed to reduce risk of serious injury and entanglement. The ALWTRP focuses largely on reducing risk to right whales, whose population is at greatest risk, and the seasonality of the measures in the Plan largely coincide with times and areas of heaviest use by right whales. As a result, even these measures vary from one area of the SBNMS to another, with at least four different types of gear restrictions for gillnets in effect in different portions of the SBNMS. Therefore the restriction on the fishery (and thus the protection to a whale) varies significantly depending on when and where the gillnetter chooses to fish in the SBNMS.

The current listing of the differing requirements under the ALWTRP are as follows:

1. The portion of the Cape Cod Bay Critical Habitat for right whales overlapping the southern boundary of the SBNMS is closed to gillnetting from January 1- May 15 each year.

2. For the southeastern portions of the SBNMS not included in the closure described above (1), gillnetting that occurs between March 1- April 30 must comply with the SAM restriction (i.e., restricted to gear that uses sinking ground lines, has five weak links incorporated in the nets themselves, and the gear must be fished with a single buoy line that has a weak link at the top).

3. In the remaining portion of the SBNMS not covered by either the closure (1) or the SAM restrictions in March and April (2), gillnetters are simply required to securely anchor their gear and have a weak link

in the buoy lines (and they may use two buoy lines) and a single weak link in each net.

4. During the remainder of the times and areas not listed above, the requirements in (3) pertain. Thus, depending on when and where a gillnetter wishes to fish in the SBNMS he may either be prohibited from fishing or be required to comply with either (2) or (3) above (for illustration see SBNMS and ALWTRP Management Areas Map above).

This confusing patchwork of protection that comes and goes within the SBNMS, is designed to coincide with right whale distribution, not humpback distribution; although data indicate that endangered humpback whales are potentially at greatest risk of entanglement in gillnet gear (see NOAA Fisheries Entanglement Summaries for 2000-2003), and data provided to the WG indicates year-round occurrence of humpback whales in SBNMS.

The initial documents establishing the SBNMS assert that sanctuary designation is needed because of a

"…lack of comprehensive and coordinated management for this area. The sanctuary occurs in Federal waters not fully protected from potentially harmful activities and lacking the benefits of coordinated, multiple-use management. Sanctuary designation will provide both the coordination of ongoing and planned human activities, and the mechanism for ensuring long-term protection…"

It further asserts that,

"[t]o ensure enhanced, long-term protection for these resources, the sanctuary resource protection program will include: 1) coordination of policies and procedures among agencies currently possessing resource protection responsibilities…" (op cit).

Clearly this shifting patchwork of protection does not meet the mandate of the sanctuary to coordinate management and protection of its resources. The sanctuary must act to coordinate these protective measures within its own boundary to offer adequate protection for the whales which are unaware of lines drawn in the ocean that offer them greater protection in some areas of the SBNMS than others.

The sanctuary has the ability to take action. It may do so in one of two ways—cooperative agreements or independent rule making. The NMSA states that the draft management plan must include "*proposed mechanisms to coordinate existing regulatory and management authorities within the*

area" (NMSA, 16 U.S.C. 1431, sec. 304[a][1][C][ii]), as well as provide proposed goals and objectives to achieve resource protection. The sanctuary's updated management plan should propose a cooperative management approach with NOAA Fisheries to assure uniform protection of endangered species within its boundaries. While the NMSA provides a process for working through Fishery Management Councils for the management of fisheries, section 304 (a)(5) specifically references the Magnuson-Stevens Act, which is not the authority for conservation management of endangered species of marine mammals. Instead, this function has been carried out under the Endangered Species Act and the MMPA by NOAA Fisheries independent of the Fishery Management Council. Thus, this process would not seem to apply in the case of coordinating protected species management within the SBNMS. Furthermore, while directing the Secretary to cooperate with other agencies (in this case they are all under the Secretary's authority), the NMSA not only gives the Secretary authority to create regulations, but it directs him to do so ("the Secretary shall prepare regulations…") if the management authority either fails to recognize the need for regulations or fails to act in a timely manner (NMSA, 16 U.S.C. 1431, sec. 304[a][1][C][ii]).

In the NMSA (NMSA, 16 U.S.C. 1431, sec. 301 [a][1][C][ii]), Congress stated

"…certain areas of the marine environment posses conservation, recreational, ecological, historical, scientific, educational, cultural, archaeological, or esthetic qualities which give them special national, and in some instances, international, significance. [W]hile the need to control the effects of particular activities has led to enactment of resource-specific legislation, these laws cannot in all cases provide a coordinated and comprehensive approach to the conservation and management of special areas of the marine environment."

Indeed, as stated in its designation, the SBNMS contains waters of international importance to the survival of endangered species. Resource-specific legislation has been created in the form of critical habitat for right whales, some of which overlaps SBNMS boundaries; yet we know that they occur elsewhere in the SBNMS as well. No critical habitat has been designated for humpback whales, yet the sanctuary was founded, in part as a means of protecting their important feeding and nursery areas. As stated in the NMSA, the SBNMS should provide "a coordinated and comprehensive approach to conservation and management" of this special area. Thus, it makes sense to adopt a uniform approach to gear modifications required of gillnets, which we know injure endangered species that use SBNMS waters. Though it may not be necessary to be as restrictive as in a critical habitat, protection in the SBNMS should be

greater than for waters outside of its boundaries that have not been deemed to be of "special importance." The gillnet requirements for the SAM (see above), which provide the greatest measure of risk reduction to large whales at this time, should pertain throughout the SBNMS and throughout the year so that whales that rely on the SBNMS can rely on uniform protection whenever and wherever they travel within the SBNMS.

3.1.1.b All gillnet gear within the SBNMS should be DAM compliant within five years (see specific listing of required modifications above).

Rationale: The sanctuary should consider the DAM measures preferable to the SAM modifications, as SAM modifications would undermine the safety of whales by resulting in an increase in endline usage. When fishing fixed gear of any sort, fishermen tend to use longer strings attached together with two endlines. For example, many fishermen fish 20 gillnets tied together with a buoy on each end. This is essential, as the tide and wind do not consistently run the same direction requiring the fishermen to occasionally haul into the tide. If one buoy line is lost, the fishermen do not always have the option of simply hauling the other buoy line because of the direction of the tide. In cases where they are not hauling leeward of the tide, the fishermen must grapple the bottom gear from the end without the buoy line. Because of the size of the gillnet string, the vessel's safety would be compromised by hauling the existing buoy line, which could cause the gear to foul in the vessel's propellers.

SAM modifications allow for only one buoy line to be used. If fishermen were forced to use one end, they would likely break the gear up into 10 two-net strings allowing the gear to be hauled without concerns about the tide (i.e., two nets equals 600 feet, therefore, most of the gear would be off bottom once the endline was aboard meaning that the tide would not drag the boat and the gear along the bottom causing hang ups and damage). While fishermen, under DAM measures, would generally fish four strings resulting in a total of eight end lines, SAM modifications would likely result in fishermen shortening the number of nets per string resulting in up to 40 endlines. If endlines were a risk to whales, SAM modifications would result in an increased risk. Additionally, some fishermen would not be able fish with SAM modifications putting them out of business.

3.1.2 It is recommended that the sanctuary develop a buy-back program for gillnet fishermen to help them convert their gear to incorporate weak links and sinking line.

Rationale: If the sanctuary take reduction measures are different from those mandated by the NOAA Fisheries, there should be a buy-back or exchange program for fishermen working in the SBNMS. Fishermen will already have spent substantial amounts of money to become compliant

with the NOAA Fisheries regulations. Therefore, the sanctuary requirements will need to absorb the cost of disposing of and replacing the existing compliant gear with newly modified gear

(3.2) *Outreach and Education*

Actions:

3.2.1 It is recommended that the sanctuary develop an outreach program specific to fisherman regarding fishing regulations applicable within the SBNMS.

Rationale: Because regulatory changes are ongoing along the east coast and proposals within the SBNMS may be different, fisherman may not be aware of, or clear on, all issues impacting fishing within the SBNMS.

3.2.2 It is recommended that the sanctuary encourage and assist fishing and conservation interests to apply for funding from NOAA Fisheries, National Fish and Wildlife Foundation, and other sources to explore whale-safe gear.

Rationale: Since fisherman are most knowledgeable about their fishery, their expertise and advice are a valuable asset to scientists who are working to develop gear modifications that will reduce risk to whales while allowing a commercially viable fishery to operate. Teaming with conservation interests will help ensure that subsequent research meets conservation objectives.

(3.3) *Research*

While the WG acknowledged that the Gear Advisory Group and Atlantic Large Whale TRT are researching modifications to fishing gear as a mechanism to reduce risk, the WG felt that the sanctuary could provide invaluable research assistance. For example, the GOMOOS buoy data can be used to provide current/tide data when testing and looking at different configurations of fishing gear in the field. GOMOOS data was used to provide current values in a study that looked at the profiles and dynamics of groundlines and endlines both as scaled-models in the laboratory and at full-scale in the field (Lyman and McKiernan, 2004). Gear modifications that appear to be functional in this type of controlled setting could be tested within the SBNMS for a more realistic view of its function. Gear modification found effective within the SBNMS could then be reported to NOAA Fisheries and the Atlantic Large Whale TRT for possible use outside SBNMS boundaries.

Actions:

3.3.1 It is recommended that the sanctuary aggressively work with gillnet fishermen to assess the feasibility of using reduced-strength weak links (e.g., 600 lbs.) used in gillnet panels within the SBNMS.

Rationale: Current weak links are designed to withstand ~1100 lbs of force. Weak links with a lower breaking strength would allow greater chance for whales to break free before becoming entangled or injured.

3.3.2 It is recommended that the sanctuary work with gillnet fishermen and other agencies to investigate the feasibility of reducing the vertical profile of gillnets in the water column as an entanglement risk reduction measure (e.g., tie-downs, fewer vertical meshes, replacing float line with lead line).

Rationale: By reducing the vertical profile of the nets in the water column, the net area available for entanglement would be reduced, possibly providing a corresponding reduction in entanglement risk.

3.3.3 It is recommended that the sanctuary research whale behavior in the water column to better understand the mechanism of entanglement.

Rationale: Little is known about how whales use the water column within the SBNMS. Such data could help define high or low risk areas, by identifying where and when whales might co-occur with fishing gear in the water column.

3.3.4 It is recommended that the sanctuary work with NOAA Fisheries to evaluate the degree of risk reduction contributed by harbor porpoise take reduction measures vs. fisheries management time and area closures.

Rationale: Pingers are mandated for use within the SBNMS to reduce harbor porpoise bycatch during particular times. Their efficacy needs to be determined to ensure porpoise conservation needs are met and that fishermen are not being unnecessarily burdened.

3.3.5 It is recommended that vertical lines be targeted for intensive research and development. Vertical lines should be investigated for modification during the next sanctuary MPR or sooner as required by NOAA Fisheries.

Rationale: The vertical line (from the net to the surface buoy) represents a significant risk to the animals. However, at this time, there are no known vertical line configurations or materials that are operationally feasible to reduce risk.

3.3.6 It is recommended that the sanctuary should continue to work with NOAA Fisheries, MADMF, fishermen, and conservationists to develop low risk gear. The sanctuary should act as a testing ground for promising new risk-reduction technologies as they become available.

3.3.7 It is recommended that, within five years, the sanctuary develop a surface buoy marking system to identify gear types and anchoring systems (e.g., "G" for gillnet and "L" for lobster). Such a system could be implemented sooner if required by NOAA Fisheries or the ASMFC.

Rationale: While the habitat use surveys conducted by the sanctuary are helpful, the inability to accurately identify gear types based on surface buoy markings make it difficult to assess the risk of entanglement to whales by gear type. This would also assist in identifying the type of gear on entangled whales, thereby making future MPR plans more productive.

3.3.8 It is recommended that the sanctuary should continue to conduct surveys to monitor marine mammals and the type and amount of fishing gear within the SBNMS on a seasonal and annual basis. This information should be used to identify areas of potential interaction between marine mammals and fisheries and identify temporal, seasonal, and effort trends.

Rationale: The baseline information obtained by the sanctuary (Wiley, et al., 2003a; 2003b) has been instrumental in looking at the SBNMS in terms of habitats used by whales and fishermen. However, this type of information may change due to an increase or decrease in fishing effort, thereby modifying temporal, seasonal, and cumulative risk to animals. Therefore, such research should be conducted periodically to provide the best available data for decision-making.

Additionally, it is important for both the sanctuary and NOAA Fisheries to ascertain the contribution to bycatch reduction of harbor porpoise take reduction measures versus fisheries management time area closures. Such information will enable the sanctuary and NOAA Fisheries to more accurately evaluate the potential impact to harbor porpoise bycatch that may result from changes to fishery management measures, and to separately determine which bycatch reduction measures should be solely regulated through the MMPA to ensure that the bycatch reduction target mandated by that Act are met.

3.3.9 It is recommended that the sanctuary develop research protocols to determine the efficacy of fishing gear modifications to reduce entanglement.

Rationale: To test the efficacy of gear modifications as a risk reduction tool, it is necessary to determine if this type of modified gear is found on entangled whales. For example, a marking system identifying the breaking strength of the weak link would assist in identifying whether animals continued to become entangled in gear with a specific breaking strength.

STRATEGY MME.4 – ENFORCEMENT OF MEASURES AIMED AT REDUCING INTERACTION OF MARINE MAMMALS WITH FISHERIES

Introduction and Evaluation of the Enforcement Issue

The MME WG determined that enforcement is a substantial part of each of the WG's strategies. The WG also agreed that, in order to enforce any proposed regulations, the regular presence of a vessel in the SBNMS is necessary. Furthermore, the WG felt there are many reasons for the presence of a sanctuary vessel, including enforcement, research, marine mammal disentanglement and stand-by, and education and outreach.

Because of these overlapping needs, the WG determined that a strategy, specific for Enforcement, was imperative. As such, the WG offers the following strategy to enforce measures aimed at reducing the risk of marine mammal interactions with fisheries that occur within the SBNMS.

Existing Enforcement Resources

The sanctuary carries out enforcement of the NMSA, the MMPA, the Northeast Multispecies FMP and other federal laws and regulations, through a cooperative agreement with the MEP. Currently, sanctuary is also partnering with the U. S. Fish and Wildlife Service (USFWS) to enforce the Migratory Bird Treaty Act. The sanctuary is also encouraging the USCG to increase its patrols and enforce regulations within the SBNMS.

Activities (4)

The sanctuary will work in partnership with various agencies, industries, and organizations to address and investigate the entanglement risk posed by fisheries in the SBNMS:

(4.1) *Enforcement presence*
The WG agrees that there is currently inadequate enforcement of SBNMS regulations and guidelines and the WG feels that an increased enforcement presence is needed in the SBNMS, particularly during high use periods.

Actions:

4.1.1 It is recommended that a sanctuary vessel be secured for permanent duty to provide a regular presence within the SBNMS and to team with other state and federal agencies to achieve the desired coverage. This vessel should be equipped to haul gear to check for compliance with state and federal regulations.

(4.2) *Enforcement program*

Actions:

4.2.1 It is recommended that the sanctuary develop an enforcement plan for enforcing rules and regulations within SBNMS boundaries.

4.2.2 It is recommended that the sanctuary request from the NOAA and Congress, through the federal budget process, additional funds to staff and implement its enforcement programs at levels that will improve compliance with, and education and outreach on, regulations within the SBNMS.

(4.3) *Enforcement actions*

Actions:

4.3.1 It is recommended that the sanctuary ensure that existing and future regulations that affect activities within the boundary of the SBNMS (e.g., requirements for gear modifications and time/area closures) be rigorously enforced by all responsible agencies. This may require clarifying reporting requirements (who reports to whom), interagency coordination of effort, and specifying related protocols.

(4.4) *Outreach and education*

Actions:

4.4.1 It is recommended that the sanctuary make education and outreach to the fishing community a major priority, particularly when any new regulations will be in force.

Rationale: Because of the continual changes to fishery-related and protected species regulations along the East Coast, and because regulations within the sanctuary may differ, it is important to make fishermen aware of regulations that may affect them when they are fishing within the boundaries of the SBNMS.

STRATEGY MME.5 – SBNMS EMERGING ISSUES

The MME WG identified a number of issues that may need to be addressed in the future, either because there is a potential increase in current activity in the SBNMS or because activity that does not currently occur may be proposed for the future.

- **Vessel Anchoring Systems.** Anchoring systems have been implicated in at least three humpback whale entanglements. These whales were all sighted within the boundaries of the SBNMS. The WG recommends that the sanctuary investigate where these systems

are being utilized and require vessel-anchoring systems be brought home when the vessel returns to port.

- **Aquaculture.** Entanglement in aquaculture gear has been documented in at least one occasion in the Bay of Fundy. While there are no current aquaculture operations within the SBNMS, the potential exists. The WG recommends that the sanctuary prohibit this activity.

- **Seal and Turtle Entanglements.** While there are no recent data (2001-2003) regarding turtle and seal entanglements in trap/pot fisheries in the SBNMS, there is evidence that endangered leatherback turtles do become entangled in endlines in coastal Massachusetts's waters and leatherback turtles are known to occur within the SBNMS boundaries. Additionally, leatherback, loggerhead, green, hawksbill, and Kemp's ridley sea turtles have all been documented entangled in buoy lines of pots or traps along other east coast U.S. states (K. Dwyer, personal communication, 2004). As such, the WG agreed that this is not an issue at this time but the sanctuary should continue to monitor this issue and reconsider it in future management plans.

STRATEGY MME.6 –EMERGING ISSUES FOR THE SINK GILLNET FISHERY

The MME WG identified a number of issues that may need to be addressed in the future, either because there is a potential increase in current activity in the SBNMS or because activity that does not currently occur may be proposed for the future.

- **Sea Bird Entanglements**. NOAA Fisheries data indicates that several species of migratory sea birds are incidentally taken by the gillnet fishery within the SBNMS. The WG recommends the sanctuary work with NOAA Fisheries and USFWS to modify fishing habits to ensure there is no discard of fishery waste products, gurry, or bycatch coincident with the setting or retrieval of gillnets. The WG believes that this will reduce bird entanglements by minimizing the attraction of birds to the area of the gillnet when it is at or near the surface. Additionally, the sanctuary should investigate the incidental take of sea birds in the bottom longline fishery. The WG recommends that the sanctuary obtain extrapolated estimates of sea bird bycatch to better understand the magnitude of this issue.

- **Seal Entanglements.** While there are no recent data (2001-2003) regarding seal entanglements in the trap/pot fishery in the SBNMS, there is evidence of that seals are incidentally taken in gillnets in the SBNMS. The WG recommends that the sanctuary obtain extrapolated estimates of seal bycatch to better understand the magnitude of this issue.

- **Turtle Entanglements.** While there were no observed takes of sea turtles in gillnets (2000-2002) in the SBNMS, there is evidence that sea turtles do become entangled in gillnets in other waters along the east coast of the U.S. (M. Rossman, personal communication. 2004). As such, the WG agreed that this is not an issue at this time but

the sanctuary should continue to monitor this issue and reconsider it in future management plans. The WG recommends that the sanctuary should monitor the progress of the development of the NOAA Fisheries sea turtle bycatch strategy and determine if the components of that strategy could benefit sea turtles in the SBNMS.

- **Mid-water Trawl and Pair Trawling.** There have been reports of mid-water and pair trawling fisheries around Southern Jeffreys Ledge incidentally taking seals, porpoises, and minke whales. The WG recommends that the sanctuary support NOAA Fisheries efforts to increase observer coverage to more accurately determine the magnitude of the takes.

The potential for competition between fisheries and marine mammals is an issue that extends outside the purview of the sanctuary. This is an immensely complex and controversial topic, which has generated much debate in the realms of both science and politics; among other things, it is currently the basis for many of the arguments over scientific whaling by Japan and Iceland. Addressing the question of whether fisheries exploitation impacts whales (by removing their food) or, conversely, whether consumption by whales of commercially valuable prey species negatively impacts fisheries, is extremely difficult. Scientific approaches to this issue involve complex ecosystem modeling whose input parameters and conceptual frameworks are both highly debatable, and there is unlikely to be any resolution of this problem in the foreseeable future. Thus, fishery-cetacean competition is a broad issue, which clearly lies outside the realm of the sanctuary (among other things because the ecosystem within the SBNMS cannot be considered separate from the broader marine system of the GOM and beyond).

Furthermore, there is currently no evidence that fishery takes within the SBNMS are of sufficient magnitude to impact the prey base of the marine mammals found there, although it must be acknowledged that no research has been conducted on this topic. Sand lance (*Ammodytes* spp.) appears to be the primary prey of large whales in this region at the present time, and there is currently no fishery for this species here or elsewhere.

However, the WG acknowledged that, should intensive fishery effort for small finfish (including sand lance, herring [*Clupea harengus*] and potentially other species) be proposed within the SBNMS in the future, the sanctuary should consider the question of whether the proposed catches would be of sufficient size to significantly deplete the marine mammal prey base in the area. Research to estimate the abundance of prey species, and to assess the potential energetic requirements of whales, would be required, as well as more challenging studies of the potential ecosystem impact of large catches of fish species. It was recommended that sanctuary staff should immediately enquire with NOAA Fisheries personnel regarding the likelihood that such intensive fishing effort would occur within the SBNMS in the near future.

APPENDICES
(MARINE MAMMAL ENTANGLEMENT)

APPENDIX MME.I - Estimated serious injury and mortality (SI&M) of Western North Atlantic marine mammals listed by U.S. observed fisheries for 1996-2001. Marine mammal species with zero (0) observed SI&M during 1997 to 2001 are not shown in this table.

(tbd = to be determined; n/a = not available; JV = Joint Venture; TALFF = Total Allowable Level of Foreign Fishing; SNE = Southern New England).

Fishery (Estimated # of vessels/persons)	Species	% observer coverage	Yrs. observed	Total annual estimated SI&M (CV)	Ave est. SI&M (CV)	PBR
CATEGORY I						
Gillnet Fisheries:						
Northeast sink gillnet (341)	Harbor porpoise	.06, .05	1997-1998	782 (.22), 332 (.46)		747
	Harbor porpoise - after Take Reduction Plan	.06, .06, .04	1999-2001	270(.28), 507 (.37), 53(.97)	277 (.25)	747
	White sided dolphin	.06, .05, .06, .06, .04	1997-2001	140 (.61), 34 (.92), 69 (.70), 26 (1.0), 26 (1.0)	59 (.37)	364
	Common dolphin	.06, .05, .06, .06, .04	1997-2001	0, 0, 146 (.97), 0, 0	29 (.97)	227
	Risso's dolphin	.06, .05, .06, .06, .04	1997-2001	0, 0, 0, 15 (1.06), 0	3 (1.06)	220
	** Bottlenose dolphin (offshore)	.04, .06, .05, .06, .06	1996-2000	0, 0, 0, 0,132 (1.16)	26 (1.16)	249
	[1] No. Atl. Right whale	.06, .05, .06, .06, .04	1997-2001	0, 0, 0, 0, 0		0
	[2] Humpback whale	.06, .05, .06, .06, .04	1997-2001	0, 0, 0, 0, 0		1.3
	[3] Fin whale	.06, .05, .06, .06, .04	1997-2001	0, 0, 0, 0, 0		4.7
	[4] Minke whale	.06, .05, .06, .06, .04	1997-2001	0, 0, 0, 0, 0		35
	Harbor seal	.06, .05, .06, .06, .04	1997-2001	598(.26), 332(.33), 1,446(.34), 917(.43), 1,471 (.38)	953 (.18)	5,493
	Gray seal	.06, .05, .06, .06, .04	1997-2001	131(.50), 61(.98), 155(.51), 193(.55), 117 (.59)	131 (.26)	n/a
	Harp seal	.06, .05, .06, .06, .04	1997-2001	269(.50), 78(.48), 81(.78), 24(1.57), 26(1.04)	96 (.33)	n/a
	Hooded seal	.06, .05, .06, .06, .04	1997-2001	0, 0, 0, 0, 82(1.14)	16 (1.14)	n/a
Longline Fisheries:						
Atlantic Ocean, Caribbean, Gulf of Mexico large pelagics longline (<200)	** Risso's dolphin	.03, .03, .03, .04, .04	1996-2000	99 (1.0), 0, 57 (1.0), 22 (1.0), 64 (1.0)	48 (.55)	220
	** Long and short-finned pilot whale	.03, .03, .03, .04, .04	1996-2000	0, 0, 0, 381 (.79), 133 (.88)	123 (.53)	221
	** [1] No. Atl. Right whale	.03, .03, .03, .04, .04	1996-2000	0, 0, 0, 0, 0	0	0
	** [2] Humpback whale	.03, .03, .03, .04, .04	1996-2000	0, 0, 0, 0, 0	0	1.3
	** [3] Fin whale	.03, .03, .03, .04, .04	1996-2000	0, 0, 0, 0, 0	0	4.7
	** [4] Minke whale	.03, .03, .03, .04, .04	1996-2000	0, 0, 0, 0, 0	0	35
	** [5] Pygmy Sperm Whale	.03, .03, .03, .04, .04	1996-2000	0, 0, 0, 0, 28(1.0)	6 (1.0)	3.7
Trap/Pot Fisheries:						
Northeast/mid-Atlantic American lobster (13,000)	[1] No. Atl. Right whale		1997-2001	0, 0, 0, 0, 0	0	0
	[2] Humpback		1997-2001	0, 0, 0, 0, 0	0	1.3
	[3] Fin whale		1997-2001	0, 0, 0, 0, 0	0	4.7
	[4] Minke whale		1997-2001	1, 0, 0, 0, 0	0.2 (0)	35
Trawl Fisheries:						
Squid, mackerel, butterfish (620)						
SNE mid-Atlantic Illex	Long and short-finned pilot whale	.062, .010, .028, .111, 0	1997-2001	0, 85 (.65), 0, 34 (.65), n/a	30 (.50)	108
SNE mid-Atlantic Loligo	Long and short-finned pilot whale	.005, .008, .009, .011, .012	1997-2001	0, 0, 49 (.97), 0, 0	10 (.97)	108
	Common dolphin	.005, .008, .009, .011, .012	1997-2001	0, 0, 49 (.78), 273 (.57), 126 (1.09)	90 (.47)	227
SNE mid-Atlantic mackerel domestic	Common dolphin	.007, .00, .01, .04, .03	1997-2001	161 (.49), 0, 0, 0, 0	32 (.49)	227
	White-sided dolphin	.007, .00, .01, .04, .03	1997-2001	161 (1.58), 0, 0, 0, 0	32 (1.58)	364
SNE mid-Atlantic mackerel - foreign [6]	Common dolphin (joint venture (JV))	1.00	1998	17 (0)	17 (0)	227
CATEGORY II						
Trawl Fisheries:						
Gulf of Maine/Georges Bank herring mid-water trawl - Domestic (17)	No marine mammal takes observed	0, 0, 3 trips, 13 trips, 0	1997-2001	0, 0, 0, 0, 0	0	

Fishery (Estimated # of vessels/persons)	Species	% observer coverage	Yrs. observed	Total annual estimated SI&M (CV)	Ave est. SI&M (CV)	PBR
Gulf of Maine/Georges Bank herring mid-water trawl - Foreign [6]	Long and short-finned pilot whale (JV and TALFF)	1.00	2001	11 (n/a)	11 (n/a)	108
	White-sided dolphin (TALFF)	1.00	2001	2 (0)	2 (0)	364
Gillnet Fisheries:						
SE U.S. Atlantic shark gillnet (12)	** [7] Bottlenose dolphin (coastal)		1999-2000	No. Florida 0, 0, Central Florida 43 (.78), 4 (1)	24 (.89)	n/a
US Mid-Atlantic coastal sink gillnet (<655)	Harbor porpoise	.03, .05	1997-1998	572 (.35), 446 (.36)		747
	Harbor porpoise - after Take Reduction Plan	.02, .02, .02	1999-2001	53 (.49), 21 (.76), 26 (.95)	33 (.39)	747
	White-sided dolphin	.03, .05, .02, .02, .02	1997-2001	45 (.82), 0, 0, 0, 0	9 (.82)	364
	Common dolphin	.03, .05, .02, .02, .02	1997-2001	16 (.53), 0, 0, 0, 0	3 (.53)	227
	** Bottlenose dolphin (offshore)	.04, .03, .05, .02, .02	1996-2000	0, 0, 4 (.70), 0, 0	1 (.70)	249
	** [7] Bottlenose dolphin (coastal)	.04, .03, .05, .02, .02	1996-2000	n/a [7]	233 (.16)	n/a [7]
	Long and short-finned pilot whale	.03, .05, .02, .02, .02	1997-2001	0, 7 (1.1), 0, 0, 0	1 (1.1)	108
	[1] No. Atl. Right whale	.03, .05, .02, .02, .02	1997-2001	0, 0, 0, 0, 0	0	0
	[2] Humpback whale	.03, .05, .02, .02, .02	1997-2001	0, 0, 0, 0, 0	0	1.3
	[3] Fin whale	.03, .05, .02, .02, .02	1997-2001	0, 0, 0, 0, 0	0	4.7
	[4] Minke whale	.03, .05, .02, .02, .02	1997-2001	0, 1, 0, 0, 0	0.2 (n/a)	35
	Harbor seal	.03, .05, .02, .02, .02	1997-2001	0, 11(.77), 0, 0, 0	2 (.77)	5,493
	Harp seal	.03, .05, .02, .02, .02	1997-2001	0, 17(1.02), 0, 0, 0	3 (1.02)	n/a
CATEGORY III						
Trawl Fisheries:						
SNE mid-Atlantic mixed groundfish trawl (>1000)	Common dolphin	.002, .001, .003, .003, .004	1997-2001	93 (1.06), 0, 0, 0, 0	19 (1.06)	227
	Long and short-finned pilot whale	.002, .002, .003, .003, .004	1997-2001	0, 0, 228 (1.03), 0, 0	46 (1.03)	108
North Atlantic bottom trawl (1052)						
	[1] No. Atl. Right whale		1997-2001	0, 0, 0, 0, 0	0	0
	[2] Humpback		1997-2001	0, 0, 0, 0, 0	0	1.3
	[3] Fin whale		1997-2001	0, 0, 0, 0, 0	0	4.7
	[4] Minke whale		1997-2001	0, 0, 0, 0, 0	0	35
	Harp seals	.002, .001, .003, .003, .004	1997-2001	0, 0, 0, 0, 49(1.10)	10 (1.10)	n/a

NOTES: The estimated number of vessels/participants is expressed in terms of the number of active participants in the fishery, when possible. If this information is not available, the estimated number of vessels or persons licensed for a particular fishery is provided. Beginning with the 2001 Stock Assessment Report, Canadian records were incorporated into the mortality and serious injury rates to reflect the effective range of this stock. It is also important to stress that serious injury determinations are made based upon the best available information; these determinations may change with the availability of new information. Several factors must be considered: 1) a ship strike or entanglement may occur at some distance from the reported location; 2) the mortality or injury may involve multiple factors; for example, whales that have been both ship struck and entangled are not uncommon; 3) the actual vessel or gear type/source is often uncertain; and 4) in entanglements, several types of gear may be involved. For the purposes of this report, discussion is primarily limited to those records considered confirmed human-caused mortalities or serious injuries.

** 2001 bycatch data analysis is incomplete and mortality/serious injury estimates are not yet available.

[1] No. Atlantic Right Whales - Between 1997-2001, 6 of 10 records of mortality or serious injury (including both U.S. and Canada) involved entanglement or fishery interaction. There were 4 reported serious injuries from unknown gear: 1 east of Manomet, MA, 1 east of Cape Cod and 1 in Bay of Fundy, Canada. There was 1 serious injury from ingestion of unknown gear in Bay of Fundy. One offshore mortality from sink gillnet gear 80 mi. east of Cape Cod and 1 mortality of an animal thoroughly wrapped in gear from the Madgelen Islands, Canada. The other 4 were mortalities from injuries indicating ship strike. The total estimated annual average human-induced mortality and serious injury incurred by this stock was 2.0 right whales per year (USA waters 1.2; Canadian waters, 0.8). This is derived from two components: 1) non-observed fishery entanglement records at 1.2 per year (USA waters, 0.6 ; Canadian waters, 0.6), and 2) ship strike records at 0.8 per year (USA waters, 0.6; Canadian waters, 0.2). As with entanglements, some injury or mortality due to ship strikes almost certainly passes undetected, particularly in offshore waters. Decomposed and/or unexamined animals (e.g., carcasses reported but not retrieved or necropsied) represent 'lost data', some of which may relate to human impacts. For these reasons, the figure of 1.8 right whales per year must be regarded as a minimum estimate.

[2] Humpback Whales - For the period 1997 through 2001, 106 records were reviewed and 85 were eliminated from further consideration due to an absence of any evidence of human impact or, in the case of an entangled whale, it was documented that the animal had become disentangled. Of the remaining records, the Gulf of Maine stock sustained 3 mortalities attributable to fishery interactions and 8 cases of serious injuries — 11 records in the five-year period. In addition, 4 mortalities and 2 serious injuries were documented in the southeastern and mid-Atlantic states that involved interactions with fisheries. The total estimated human-caused mortality and serious injury to the Gulf of Maine humpback whale stock for 1997 to 2001 is estimated as 2.6 per year (USA waters, 2.0; Canadian waters, 0.6). This average is derived from two components: 1) incidental fishery interaction records, 2.2 (USA waters, 1.6; Canadian waters, 0.6); and 2) records of vessel collisions, 0.4 (USA waters, 0.4; Canadian waters, 0). Additional humpback mortalities and serious injuries that occurred in the southeastern and mid-Atlantic states could not be confirmed as involving members of the Gulf of Maine stock. These records represent an additional minimum annual average of 1.6 human-caused mortalities and serious

injuries to humpbacks over the time period, of which 1.2 per year are attributable to incidental fishery interactions and 0.4 per year are attributable to vessel collisions.

[3] There was no reported fishery-related mortality or serious injury to fin whales in fisheries observed by NMFS during 1997 through 2001. A review of anecdotal NMFS records from 1997 through 2001 yielded an average of 2.0 human-caused mortalities per year – 0.6 per year resulting from fishery interactions/entanglements (USA waters, 0.2; Canadian waters, 0.2; Bermudian waters, 0.2), and 1.4 due to vessel collisions--all in USA waters.

[4] Minke Whales - There was 1 reported mortality in the mid-Atlantic coastal gillnet fishery in 1998. Confirmed mortalities that were likely a result of a fishery interaction with an unknown fishery included 3 in 1997, 5 in 1999, 2 in 2000 and 0 in other years. The examination of the minke entanglement records from 1997 indicate that 4 out of 4 confirmed records of mortality were likely a result of fishery interactions, one attributed to the lobster pot fishery, 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. One of the interactions with an unknown fishery in 2000 was a mortality and one was a serious injury. NMFS anecdotal records for 2001 included 3 mortalities and 2 serious injuries attributed to unknown fisheries. Two of the mortalities were reported off Rhode Island and 1 in Massachusetts Bay. One serious injury was reported off Cape Cod and the other on Stellwagen Bank. During 1997 to 2001, the USA total annual estimated average human-caused mortality was 3.6 minke whales per year. This is derived from three components: 0 minke whales per year (CV=0.0) from USA fisheries using observer data, 3.4 minke whales per year from USA fisheries using strandings and entanglement data, and 0.2 minke whales per year from ship strikes. During 1997 to 2001, there were no confirmed mortalities or serious injuries in Canadian waters.

[5] Pygmy Sperm Whales - Twenty-eight seriously injured pygmy sperm whales were reported in 2000 in the pelagic longline fishery. The 2000 mortality estimates were taken from Table 10 in Yeung 2001 (NMFS Miami Laboratory PRD 00/01-17). There have been no observed mortalities or serious injuries by NMFS Sea Samplers in the pelagic drift gillnet, pelagic longline, pelagic pair trawl, Northeast multispecies sink gillnet, mid-Atlantic coastal sink gillnet, nor North Atlantic bottom trawl fisheries.

[6] Ten vessels (3 foreign, 7 American) participated in the 2001 joint venture (JV) fishing operations and 2 of the foreign vessels participated in the 2001 Total Allowable Level of Foreign Fishing (TALFF) operations. Nets that are transferred from domestic to foreign vessels (JV) for processing are observed on board the foreign vessel. There may be nets fished by domestic vessels that do not get transferred to the foreign vessels and would therefore not be observed. During TALFF fishing operations, all the nets fished by a foreign fishing vessel are observed.

[7] Coastal Bottlenose Dolphins - Last year, as an interim measure, pending additional results, several “management units” of the coastal morphotype of bottlenose dolphin along the U.S. Atlantic coast were defined. Annual estimated mortality/serious injury and PBR for each management unit can be found in the Coastal Bottlenose Dolphin chapter (Tables 2 and 3) of the 2002 assessment report.

APPENDIX MME.II - A SUMMARY(including footnotes) OF ATLANTIC MARINE MAMMAL STOCK ASSESSMENT REPORTS FOR STOCKS OF MARINE MAMMALS UNDER NMFS AUTHORITY THAT OCCUPY WATERS UNDER USA JURISDICTION. The "SAR revised" column indicates 200~~2~~3 stock assessment reports that have been revised relative to the 200~~1~~2 reports (Y=yes N=no). If abundance, mortality or PBR estimates have been revised, they are indicated with the letters "a", "m" and "p" respectively. For those species not updated in this edition, the year of last revision is indicated.

Species	Stock Area	SRG Region	NMFS Center	Nmin	Rmax	Fr	PBR	Total Annual Mort.	Annual Fish. Mort.	Strategic Status	SAR Revised
North Atlantic right whale	Western North Atlantic	ATL	NEC	291	0	0.1	0.0	~~1.8~~2.0 [1]	~~1.0~~1.2 [1]	Y	Y m
Humpback whale	Gulf of Maine	ATL	NEC	647	0.04	0.1	1.3	~~3.0~~2.6 [2]	~~2.8~~2.2 [2]	Y	Y a,m,p
Fin whale	Western North Atlantic	ATL	NEC	2,362	0.04	0.1	4.7	~~1.6~~2.0 [3]	~~0.43~~0.6	Y	Y m
Sei whale	Nova Scotia	ATL	NEC	N/A	0.04	0.1	N/A	~~0.00~~0.2	0.0	Y	Y m
Minke whale	Canadian east coast	ATL	NEC	3,515	0.04	0.5	35	~~2.6~~3.6 [4]	~~2.4~~ 3.4 [4]	N	Y m
Blue whale	Western North Atlantic	ATL	NEC	308	0.04	0.1	N/A	0.2	0.0	Y	~~Y~~N ~~p~~(2002)
Sperm whale	North Atlantic	ATL	NEC	3,505	0.04	0.1	7.0	0.0	0.2	Y	~~Y~~N ~~m~~(2002)
Dwarf sperm whale	Western North Atlantic	ATL	SEC	373 [5]	0.04	0.5	3.7	0	0	N	~~Y~~N ~~m~~(2002)
Pygmy sperm whale	Western North Atlantic	ATL	SEC	373 [5]	0.04	0.5	3.7	6	6	Y	~~Y~~N ~~m~~(2002)
Killer whale	Western North Atlantic	ATL	NEC	N/A	0.04	N/A	N/A	0.0	0.0	N	N (1995)
Pygmy killer whale	Western North Atlantic	ATL	SEC	6	0.04	0.5	0.1	0.0	0.0	N	N (1995)
Northern bottlenose whale	Western North Atlantic	ATL	NEC	N/A	0.04	N/A	N/A	0.0	0.0	N	N (1998)
Cuvier's beaked whale	Western North Atlantic	ATL	NEC	2,419 [6]	0.04	0.5	24	0	0 [7]	Y	~~Y~~N ~~m~~(2002)
Mesoplodon beaked whales	Western North Atlantic	ATL	NEC	2,419 [6]	0.04	0.5	24	0	0 [7]	Y	~~Y~~N ~~m~~(2002)
Risso's dolphin	Western North Atlantic	ATL	NEC	22,916	0.04	0.48	220	51	51	N	~~Y~~N ~~m, p~~ (2002)
Pilot whale, long-finned	Western North Atlantic	ATL	NEC	11,343 [8]	0.04	0.48	108	~~199~~ 221 [9]	~~199~~ 221 [9]	Y	Y m
Pilot whale, short-finned	Western North Atlantic	ATL	SEC	11,343 [8]	0.04	0.48	108	199 [9]	199 [9]	Y	~~Y~~N ~~m~~(2002)
Atlantic white-sided dolphin	Western North Atlantic	ATL	NEC	37,904	0.04	0.48	364	~~118~~102	~~118~~102	N	Y m

Species	Stock Area	SRG Region	NMFS Center	Nmin	Rmax	Fr	PBR	Total Annual Mort.	Annual Fish. Mort.	Strategic Status	SAR Revised
White-beaked dolphin	Western North Atlantic	ATL	NEC	N/A	0.04	N/A	N/A	0.0	0.0	N	~~N~~Y ~~(1997)~~ stranding text
Common dolphin	Western North Atlantic	ATL	NEC	23,655	0.04	0.48	227	~~375~~190	~~375~~190	~~Y~~N	Y m
Atlantic spotted dolphin	Western North Atlantic	ATL	NEC	27,785 [10]	0.04	0.5	278	7.8 [11]	7.8 [11]	N	N (2000)
Pantropical spotted dolphin	Western North Atlantic	ATL	SEC	8,450	0.04	0.5	84	1 [11]	1 [11]	N	~~Y~~N ~~m~~(2002)
Striped dolphin	Western North Atlantic	ATL	NEC	44,500	0.04	0.5	445	7.3	7.3	N	N (2000)
Spinner dolphin	Western North Atlantic	ATL	NEC	N/A	N/A	N/A	N/A	0.31	0.31	N	N (1998)
Bottlenose dolphin	Western North Atlantic, offshore	ATL	SEC	24,897 [10]	0.04	0.5	249	27	27	N	Y m
Bottlenose dolphin	Western North Atlantic, coastal	ATL	SEC	N/A~~[14][15]~~	0.04	0.5	N/A~~[14][15]~~	N/A~~[14][15]~~	N/A~~[14][15]~~	Y	~~Y~~N ~~a, m, p~~ (2002)
Harbor porpoise	Gulf of Maine/ Bay of Fundy	ATL	NEC	74,695	0.04	0.5	747	~~459~~365 [12]	~~435~~318 [12]	Y	Y m
Harbor seal	Western North Atlantic	ATL	NEC	~~30,990~~ 91,546	0.12	1.0	~~1,859~~ 5,493	~~857~~972	~~843~~955	N	Y a, m, p
Gray seal	Western North Atlantic	ATL	NEC	NA	~~NA~~ 0.12	~~NA~~ 1.0	NA	~~307~~309	~~118~~131	N	Y m
Harp seal	Western North Atlantic	ATL	NEC	N/A	~~NA~~ 0.12	~~N/A~~ 0.5	N/A	~~321,222~~ 287,949 [13]	~~111~~ 109	N	Y m, p
Hooded seal	Western North Atlantic	ATL	NEC	N/A	~~NA~~ 0.12	~~N/A~~ 0.5	N/A	~~5.6~~ 10,393	~~5.6~~ 16	N	~~N~~Y ~~(1998)~~m
Sperm whale	Northern Gulf of Mexico Oceanic	ATL	SEC	~~411~~ 1035	0.04	0.1	~~0.8~~ 2.1	0.0	0.0	Y	~~N (1995)~~ Y a,,m, p
Bryde's whale	Northern Gulf of Mexico Oceanic	ATL	SEC	~~17~~ 25	0.04	0.5	~~0.2~~ 0.3	0.0	0.0	N	~~N (1995)~~ Y a,m, p
Cuvier's beaked whale	Northern Gulf of Mexico Oceanic	ATL	SEC	~~20~~ 58	0.04	0.5	~~0.2~~ 0.6	0.0	0.0	~~N~~ Y	~~N (1995)~~ Y a,m, p
Blainville's beaked whale	Northern Gulf of Mexico Oceanic	ATL	SEC	~~N/A~~ 70 [14]	~~N/A~~ 0.04	~~N/A~~ 0.5	~~N/A~~ 0.7 [14]	0.0	0.0	N	~~N (1995)~~ Y a,m,p

Species	Stock Area	SRG Region	NMFS Center	Nmin	Rmax	Fr	PBR	Total Annual Mort.	Annual Fish. Mort.	Strategic Status	SAR Revised
Gervais' beaked whale	Northern Gulf of Mexico Oceanic	ATL	SEC	~~N/A~~ 70[14]	~~N/A~~ 0.04	~~N/A~~ 0.5	~~N/A~~ 0.7[14]	0.0	0.0	N	~~N (1995)~~ Y a,m, p
Bottlenose dolphin	Northern Gulf of Mexico Outer continental shelf	ATL	SEC	~~43,233~~ 22,002	0.04	0.5	~~432~~ 220	~~2.8~~ 0.0	~~2.8~~ 0.0	N	~~N (1995)~~ Y a, m, p
Bottlenose dolphin	Northern Gulf of Mexico Continental shelf edge and slope	ATL	SEC	4,530	0.04	0.5	45	2.8	2.8	N	N (1995)
Bottlenose dolphin	Western Gulf of Mexico	ATL	SEC	2,938	0.04	0.5	29	13	13	N	N (1996)
Bottlenose dolphin	Northern Gulf of Mexico Oceanic	ATL	SEC	~~3,518~~ 1,869	0.04	0.5	~~35~~ 19	~~10~~ 0.0	~~10~~ 0.0	N	~~N (1996)~~ Y a, m, p
Bottlenose dolphin	Eastern Gulf of Mexico	ATL	SEC	8,963	0.04	0.5	90	8	8	N	N (1996)
Bottlenose dolphin	Gulf of Mexico bay, sound, and estuarine	ATL	SEC	3,933	0.04	0.5	39	N/A	N/A	Y	N (2000)
Atlantic spotted dolphin	Northern Gulf of Mexico (Outer continental shelf and Oceanic)	ATL	SEC	~~2,255~~ 30,645[16]	0.04	0.5	~~23~~ 307[16]	~~1.5~~ 0.0	~~1.5~~ 0.0	N	~~N (1995)~~ Y a, m, p
Pantropical spotted dolphin	Northern Gulf of Mexico Oceanic	ATL	SEC	~~26,510~~ 79,516	0.04	0.5	~~265~~ 795	~~1.5~~ 0.0	~~1.5~~ 0.0	N	~~N (1995)~~ Y a, m, p
Striped dolphin	Northern Gulf of Mexico Oceanic	ATL	SEC	~~3,409~~ 4,425	0.04	0.5	~~34~~ 44	0.0	0.0	N	~~N (1995)~~ Y a, m, p
Spinner dolphin	Northern Gulf of Mexico Oceanic	ATL	SEC	~~4,465~~ 6,702	0.04	0.5	~~45~~ 67	0.0	0.0	N	~~N (1995)~~ Y a,, m, p
Rough-toothed dolphin	Northern Gulf of Mexico (Outer continental shelf and Oceanic)	ATL	SEC	~~660~~ 1,785[17]	0.04	0.5	~~6.6~~ 18[17]	0.0	0.0	N	~~N (1995)~~ Y a, m, p
Clymene dolphin	Northern Gulf of Mexico Oceanic	ATL	SEC	~~4,120~~ 9,910	0.04	0.5	~~41~~ 99	0.0	0.0	N	~~N (1995)~~ Y a, m, p
Fraser's dolphin	Northern Gulf of Mexico Oceanic	ATL	SEC	~~66~~ 408	0.04	0.5	~~0.7~~ 4.1	0.0	0.0	N	~~N (1995)~~ Y a, m, p

Species	Stock Area	SRG Region	NMFS Center	Nmin	Rmax	Fr	PBR	Total Annual Mort.	Annual Fish. Mort.	Strategic Status	SAR Revised
Killer whale	Northern Gulf of Mexico Oceanic	ATL	SEC	~~197~~ 119	0.04	0.5	~~2.0~~ 1.2	0.0	0.0	N	~~N (1995)~~ Y a,, m, p
False killer whale	Northern Gulf of Mexico Oceanic	ATL	SEC	~~236~~ 587	0.04	0.5	~~2.4~~ 5.9	1.0	1.0	N	~~N (1995)~~ Y a, m, p
Pygmy killer whale	Northern Gulf of Mexico Oceanic	ATL	SEC	~~285~~ 264	0.04	0.5	~~2.8~~ 2.6	0.0	0.0	N	~~N (1995)~~ Y a,, m, p
Dwarf sperm whale	Northern Gulf of Mexico Oceanic	ATL	SEC	~~N/A~~ 617	0.04	~~N/A~~ 0.5	~~N/A~~ 6.2	0.0	0.0	N	~~N (2000)~~ Y a, m, p
Pygmy sperm whale	Northern Gulf of Mexico Oceanic	ATL	SEC	~~N/A~~ 617	0.04	~~N/A~~ 0.5	~~N/A~~ 6.2	0.0	0.0	N	~~N (2000)~~ Y a,, m, p
Melon-headed whale	Northern Gulf of Mexico Oceanic	ATL	SEC	~~2,888~~ 2,139	0.04	0.5	~~29~~ 21	0.0	0.0	N	~~N (1995)~~ Y a, m, p
Risso's dolphin	Northern Gulf of Mexico Oceanic	ATL	SEC	~~2,199~~ 1,345	0.04	0.5	~~22~~ 14	~~19~~ 0.0	~~19~~ 0.0	N	~~N (1995)~~ Y a,, m, p
Pilot whale, short-finned[18]	Northern Gulf of Mexico Oceanic	ATL	SEC	~~186~~ 2,124	0.04	0.5	~~1.9~~ 21	~~0.3~~ 0.0	~~0.3~~ 0.0	~~Y~~ N	~~N (1995)~~ Y a, m, p

1. The total estimated human-caused mortality and serious injury to right whales is estimated at ~~1.8~~2.0 per year (USA waters, 1.2; Canadian waters, 0.~~6~~8). This is derived from two components: 1) non-observed fishery entanglement records at 1.~~0~~2 per year (USA waters, 0.6 ; Canadian waters, 0.~~4~~6), and 2) ship strike records at 0.8 per year (USA waters, 0.6 ; Canadian waters, 0.2).
2. The total estimated human-caused mortality and serious injury to the Gulf of Maine humpback whale stock is estimated as ~~3.0~~2.6 per year (USA waters, 2.~~4~~0; Canadian waters, 0.6). This average is derived from two components: 1) incidental fishery interaction records 2.~~8~~2 (USA waters, ~~2.2~~1.6; Canadian waters, 0.6); and 2) records of vessel collisions, 0.~~2~~4 (USA waters, 0.~~2~~4; Canadian waters, 0).
3. This is based on a review of NMFS ~~anecdotal~~records from ~~1996-2000~~1997-2001, that yielded an average of ~~1.6~~2.0 human caused mortality; 1.~~2~~4 ship strikes (all USA waters) and 0.~~4~~6 fishery interactions/entanglements (0.2 in USA waters; 0.2 in Canadian waters; 0.2 in Bermudian waters).
4. During 199~~6~~7 to 200~~0~~1, the USA total annual estimated average human-caused mortality is ~~2.6~~3.6 minke whales per year. This is derived from three components: 0 minke whales per year (CV=0.0) from USA fisheries using observer data, ~~2.4~~3.4 minke whales per year from USA fisheries using strandings and entanglement data, and 0.2 minke whales per year from ship strikes.
5. This estimate may include both the dwarf and pygmy sperm whales.
6. This estimate includes Cuvier's beaked whales and undifferentiated *Mesoplodon* spp. beaked whales.
7. This is the average mortality of undifferentiated beaked whales (*Mesoplodon* spp.)
8. This estimate may include both long-finned and short-finned pilot whales.
9. Mortality data are not separated by species; therefore, species-specific estimates are not available. This mortality estimate represents both long-finned and short-finned pilot whales.
10. Estimates may include sightings of the coastal form.
11. Mortality data are not separated by species; therefore, species-specific estimates are not available. The mortality estimate represents both Atlantic and Pantropical spotted dolphins
12. The total annual estimated average human-caused mortality is ~~459~~365 (CV=0.23) harbor porpoises per year. This is derived from four components: ~~425~~310 harbor porpoise per year (CV=0.2~~4~~3) from USA fisheries using observer and MMAP data, ~~23~~46 per year (unknown CV) from Canadian fisheries using observer data, ~~1~~8 per year from USA unknown fisheries using strandings data, and 1 per year from unknown human-caused mortality (a mutilated stranded harbor porpoise).

13. The total estimated human caused annual mortality and serious injury to harp seals was ~~321,222~~287,949. This is derived from ~~three~~four components: 1) ~~1996-2000~~1997-2001 average catches of Northwest Atlantic harp seals by Canada and Greenland ~~301,611~~ was 268,337; 2) ~~1996-2000~~1997-2001 average bycatches in the Newfoundland lumpfish fishery (16,000 - 23,000 annually); 3) the ~~1996-2000~~1997-2001 observed USA fisheries was ~~111~~109 harp seals (CV= ~~0.29~~0.31); and 4) average 1997 to 2001 stranding mortalities showing signs of human interaction was 3.
14. This estimate includes all *Mesoplodon spp*.
15. Several seasonal management units have been defined for the coastal bottlenose dolphin. Each has a unique abundance estimate, PBR and mortality estimate provided in the Western North Atlantic coastal bottlenose dolphin species section of the text.
16. This is the sum of the minimum number of Atlantic spotted dolphins seen in the outer continental shelf (21,673) and the oceanic (53) regions combined, and the summed PBR.
17. This is the sum of the minimum number of rough-toothed dolphins seen in the outer continental shelf (384) and the oceanic (532) regions combined, and the summed PBR
18. This estimate includes all *Globicephala sp.*, though it is presumed that only short-finned pilot whales are present in the Gulf of Mexico.

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