

PURPOSE AND NEED FOR ACTION**CHAPTER 2**

The purpose of the revisions to the Atlantic Large Whale Take Reduction Plan (ALWTRP) that are under consideration is to provide additional conservation and protection to Atlantic large whales, including North Atlantic right whales (*Eubalaena glacialis*), North Atlantic humpback whales (*Megaptera novaeangliae*), and fin whales (*Balaenoptera physalus*). Such revisions would fulfill NMFS' obligations under the Endangered Species Act (ESA) and the Marine Mammal Protection Act (MMPA). The need for the revisions under consideration is demonstrated by the continuing risk of serious injury and mortality of Atlantic large whales due to entanglement in commercial fishing gear. This chapter describes in detail the purpose and need for revisions to the existing ALWTRP. It is organized as follows:

- Section 2.1 provides an overview of the statutory and regulatory context in which the ALWTRP was created. This section includes descriptions of the MMPA and the ESA, and discusses how the ALWTRP allows the National Marine Fisheries Service (NMFS) to fulfill its obligations under both Acts.
- Section 2.2 summarizes the existing ALWTRP.
- Section 2.3 presents historical data on large whale entanglements, and demonstrates the need for additional action under the ALWTRP.

2.1 STATUTORY AND REGULATORY CONTEXT

Right, humpback, and fin whales are protected by the Marine Mammal Protection Act (MMPA) and the Endangered Species Act (ESA). The Atlantic Large Whale Take Reduction Plan (ALWTRP) was created in response to provisions of the MMPA, and under its authority. Sections 2.1.1 and 2.1.2 describe the protections that the MMPA and ESA provide for Atlantic large whales, and the requirements of the MMPA that led to the creation of the ALWTRP.

2.1.1 The Marine Mammal Protection Act (MMPA) and Atlantic Large Whales

The Marine Mammal Protection Act (MMPA) of 1972 provides protection for species or stocks that are, or may be, in danger of extinction or depletion as a result of human activities. The MMPA states that measures should be taken immediately to replenish the population of any marine mammal species or stock that has diminished below its optimum sustainable level. With respect to any stock or species, the "optimum sustainable population" is the number of animals that will result in the maximum productivity of the stock or species, keeping in mind the carrying capacity of the habitat and the health of the ecosystem of which they form a constituent element.

Under the MMPA, the Secretary of Commerce is responsible for the conservation and management of pinnipeds (other than walruses) and cetaceans (whales, dolphins, and porpoises), among other species which spend the majority of their life in marine areas.¹ The Secretary of Commerce has delegated MMPA authority to NMFS. Part of the responsibility that NMFS has under the MMPA involves monitoring populations of marine mammals to maintain optimum levels. If a population falls below its optimum level, it is considered "depleted," and a conservation plan may be developed to guide research and management actions to restore the population to healthy levels.

In 1994, Congress amended the MMPA, establishing new provisions to govern the taking of marine mammals incidental to commercial fishing operations.² These new provisions include the preparation of stock assessments for all marine mammal stocks in waters under U.S. jurisdiction, and development and implementation of take reduction plans for stocks that may be reduced or are being maintained below their optimum sustainable population levels due to interactions with commercial fisheries.

Take reduction plans are required for all "strategic stocks." Under the MMPA, a "strategic stock" is a stock: (1) for which the level of direct human-caused mortality exceeds the Potential Biological Removal (PBR) level; (2) that is declining and is likely to be listed under the Endangered Species Act (ESA) in the foreseeable future; or (3) that is listed as a threatened or endangered species under the ESA or as a depleted species under the MMPA.³ The immediate goal of a take reduction plan is to reduce, within six months of its implementation, the mortality and serious injury of strategic stocks incidentally taken in the course of U.S. commercial fishing operations to below the PBR levels established for such stocks. The long-term goal of a take reduction plan is to reduce, within five years of its implementation, the incidental mortality and serious injury of strategic marine mammals taken in the course of commercial fishing operations to insignificant levels approaching a zero mortality and serious injury rate, taking into account

¹ The Secretary of the Interior is responsible for walruses, sea and marine otters, polar bears, manatees and dugongs.

² As defined in the MMPA, the term "take" means to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal.

³ The Potential Biological Removal (PBR) level is defined in the MMPA as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock annually while allowing that stock to reach or maintain its optimum sustainable population. The parameters for calculating the PBR level are described in the MMPA.

the economics of the fishery, the availability of existing technology, and existing state or regional fishery management plans.⁴

Right whales, humpback whales, and fin whales are listed as endangered species under the ESA and are thus considered strategic stocks under the MMPA. In response to its obligations under the MMPA, NMFS established the Atlantic Large Whale Take Reduction Team (ALWTRT) in 1996 to develop a plan for reducing the incidental take of large whales in commercial fisheries along the Atlantic Coast to below PBR. The ALWTRT consists of representatives from the fishing industry, state and Federal resource management agencies, the scientific community, and conservation organizations. The purpose of the ALWTRT is to provide guidance to NMFS in developing and amending the Atlantic Large Whale Take Reduction Plan to meet the goals of the MMPA with respect to Atlantic large whales. The last meeting of the full ALWTRT was on February 3 and 4, 2004.

2.1.2 The Endangered Species Act (ESA) and Atlantic Large Whales

The Endangered Species Act (ESA) provides for the conservation of endangered and threatened species that are at risk of extinction throughout all or a significant portion of their range and the conservation of the ecosystems on which they depend.⁵ The right whale, humpback whale, and fin whale species are all federally listed as endangered and are therefore subject to protection under the ESA. Section 7 of the ESA directs all Federal agencies to use their existing authorities to conserve threatened and endangered species and to ensure that their actions do not jeopardize listed species or destroy or adversely modify critical habitat. When a proposed Federal action may affect an ESA-listed marine species, Section 7 directs that the "Action agency" consult with the Secretary of Commerce; this is referred to as a Section 7 consultation.^{6,7} The Secretary of Commerce has delegated this consultation authority to the National Oceanic and Atmospheric Administration (NOAA). During a Section 7 consultation initiated to assess impacts of a NMFS action on an endangered whale species, NOAA acts as the Action agency *and* represents the Secretary of Commerce. The following are examples of actions by NMFS that may result in Section 7 consultations:

⁴ Unlike PBR, the MMPA does not define the calculation of "insignificant" mortality and serious injury rates approaching zero. For the purposes of the Atlantic Large Whale Take Reduction Plan (ALWTRP), NMFS has established a long-term goal of reducing incidental mortality rates to no more than ten percent of the PBR level for each stock. NMFS recently developed and published a formal regulatory definition of "zero mortality rate goal." See NMFS' July 20, 2004, final rule (69 FR 43338).

⁵ "Species," as defined by the Act, includes any subspecies of fish, wildlife, or plant and any distinct population segment of any vertebrate species which interbreeds when mature.

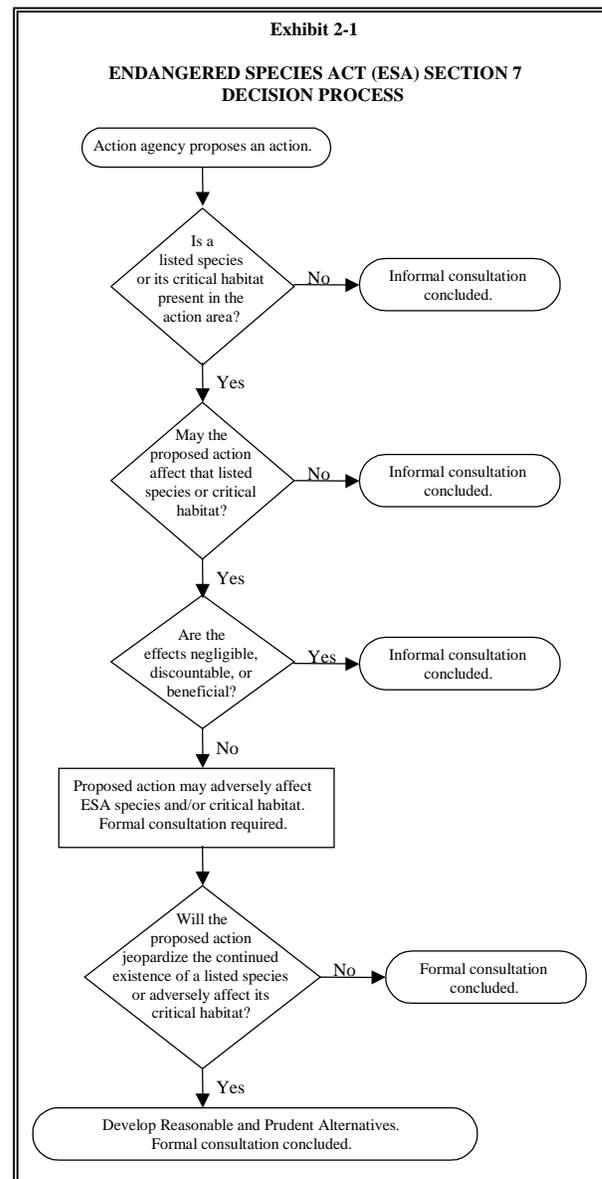
⁶ The "Action agency" is the Federal agency charged with permitting, conducting or funding the proposed activity serving as the basis for the consultation.

⁷ Federal agencies must consult with the Secretary of the Interior when a proposed action may affect an ESA-listed species under the Department of Interior's purview.

- Issuance of measures implementing a fishery management plan;
- Issuance of exempted fishing permits;
- Measures to implement a take reduction plan; and
- Research activities that will occur as a result of receiving funding from NMFS.

Section 7 consultations may be formal or informal. Informal consultation provides an opportunity for communication between the consulting agency (e.g., NMFS) and the Action agency in order to identify whether formal consultation is needed and, if so, to identify how the proposed action could be modified in order to avoid adverse effects. Communication between these parties may occur via letters, phone calls, in-person meetings, or any combination of these. The duration and complexity of these interactions depends on a number of variables, including the species in question, the effects of the proposed activity, and the available data, among others. These discussions are designed to identify and resolve potential concerns at an early stage in the process, thereby avoiding formal consultation. If the conclusion of the informal consultation is that the proposed action is not likely to adversely affect a listed species, the Section 7 process is concluded. If the consulting agency concludes that the proposed action may affect a listed species or designated critical habitat and the Action agency cannot modify the proposed action to avoid the likelihood of adverse effects, then a formal consultation must occur.

A formal consultation requires the consulting agency to prepare a Biological Opinion as to whether or not the proposed action is likely to jeopardize the continued existence of a listed species or adversely modify critical habitat. Under the ESA, if a Biological Opinion finds that a proposed action is likely to jeopardize a listed species or adversely modify critical habitat, the consulting agency must identify "Reasonable and Prudent Alternatives," which the Action



agency should assist in developing. Reasonable and Prudent Alternatives (RPAs) are alternative actions identified during formal consultation that (1) can be implemented in a manner consistent with the intended purpose of the action; (2) can be implemented consistent with the scope of the Action agency's legal authority and jurisdiction; (3) are economically and technically feasible; and (4) avoid the likelihood of jeopardizing the continued existence of listed species or resulting in the destruction or adverse modification of critical habitat. Once the Action agency and NOAA (representing the Secretary of Commerce) agree that the suggested Reasonable and Prudent Alternatives meet these criteria, the consultation is concluded and the consulting agency must implement those Alternatives. Exhibit 2-1 illustrates the ESA Section 7 decision process.

To assess effects on large whale and sea turtle species protected under the ESA, NMFS has prepared Biological Opinions for the continued authorization of Federal fisheries under the Fishery Management Plans for the multispecies, spiny dogfish, and monkfish fisheries, and under Federal regulations for the lobster fishery, amongst others. Section 7 consultations were first initiated for each of these fisheries either at the time that the Fishery Management Plan was created to manage the fishery or, in the case of lobster, at the time of a significant amendment (Amendment 5) to the Federal Lobster Management Plan. The Northeast multispecies fishery has a long consultation history, including formal and informal Section 7 consultations, beginning with a formal consultation initiated on June 12, 1986. Formal consultation was first initiated for spiny dogfish on August 13, 1999; for monkfish on December 21, 1998; and for lobster on March 23, 1994.⁸ Subsequent ESA Section 7 consultations on those fisheries incorporated the Atlantic Large Whale Take Reduction Plan (ALWTRP) as a Reasonable and Prudent Alternative to avoid jeopardy to right whales. NMFS reinitiated consultation on May 4, 2000, for the multispecies, spiny dogfish, and monkfish gillnet fisheries, and on June 22, 2000, for the lobster fishery, following (1) new whale entanglements resulting in serious injuries to right whales; (2) at least one right whale mortality in gillnet gear; (3) new information indicating a declining status for western North Atlantic right whales; and (4) revisions to the ALWTRP.

The Biological Opinions from the May/June 2000 Section 7 consultations, finalized June 14, 2001, found that NMFS' administration of the four Federal fisheries, as modified by the ALWTRP requirements in effect at that time, was likely to jeopardize the continued existence of the western North Atlantic right whale.⁹ The Biological Opinions identified a Reasonable and Prudent Alternative with multiple components designed to avoid the likelihood of jeopardy to right whales. The RPA measures included:

- Seasonal Area Management (SAM);
- Dynamic Area Management (DAM);

⁸ The spiny dogfish and monkfish species were subject to Section 7 consultation as part of the multispecies fishery until managed under their own management plans in 1999. The lobster fishery was first considered in a formal consultation on the effects of all fisheries (including the lobster fishery in Federal waters) on threatened and endangered species conducted for the implementation of the Marine Mammal Exemption Program in 1988.

⁹ The June 14 Biological Opinions also concluded that these fisheries were not likely to destroy or adversely modify habitat critical to right whales or to jeopardize the continued existence of other endangered species.

- An expansion of gillnet gear modification requirements and restrictions to Mid-Atlantic waters and modification of fishing practices in Southeastern waters;
- Continued gear research and modifications; and
- Additional measures that implement and monitor effectiveness of the Reasonable and Prudent Alternative.

These measures were intended, in combination, to reduce the risk of serious injury and mortality to large whales from entanglements in commercial fishing gear and minimize adverse impacts if entanglements occur.

The SAM and DAM programs and revised gear modification requirements and restrictions, as specified in the June 14, 2001, Biological Opinions for the multispecies, spiny dogfish, and monkfish Fishery Management Plans, and Federal regulations for the American lobster fishery, were incorporated into the ALWTRP via a series of final rules, corrections, and technical amendments issued from January 2002 to August 2003. In this way, NMFS implemented the Reasonable and Prudent Alternative specified in the June 14, 2001 Biological Opinions to meet its obligations under Section 7 of the ESA. Section 2.2 summarizes the current ALWTRP, which includes the January 2002 SAM and DAM regulations (67 FR 1142; 67 FR 1133), the January and September 2002 gear modification requirements and restrictions (67 FR 1300; 67 FR 59471), revisions to the DAM program finalized in August 2003 (68 FR 51195), and corrections to the language of the ALWTRP issued in April 2002 (67 FR 15493); October 2002 (67 FR 65722); and April 2003 (68 FR 19464).

2.2 OVERVIEW OF THE ATLANTIC LARGE WHALE TAKE REDUCTION PLAN (ALWTRP)

The Atlantic Large Whale Take Reduction Plan (ALWTRP) seeks to reduce the serious injury to or mortality of large whales due to incidental entanglement in U.S. commercial fishing gear. Although the plan is focused on right, humpback, and fin whales, the measures also benefit minke whales. The ALWTRP consists of restrictions on where and how gear can be set; research into whale populations, whale behavior, and fishing gear; outreach to inform fishermen of the entanglement problem and to seek their help in understanding and solving the problem; and a program to disentangle whales that do get caught in gear.¹⁰ Section 2.2.1 summarizes the gear types, fishing areas, and specific fisheries currently regulated under the plan. Sections 2.2.2 to 2.2.4 describe the three primary regulatory components of the plan – gear modification requirements and restrictions, Seasonal Area Management, and Dynamic Area Management – and outline how each of these components is applied to specific fishing gear and areas.

¹⁰ For more information on NMFS activities undertaken as part of the ALWTRP, see the plan web site at <http://www.nero.noaa.gov/whaletrp/>.

2.2.1 Affected Fisheries and Fishing Areas

As required by the Marine Mammal Protection Act (MMPA), NMFS maintains a List of Fisheries (LOF) that places each commercial fishery into one of three categories. Fisheries are categorized according to the level of serious injury and mortality of marine mammals that unintentionally results from the fishery. The categorization in the LOF determines whether participants in that fishery are subject to certain provisions of the MMPA such as registration, observer coverage, and take reduction plan requirements. Individuals fishing in Category I or II fisheries must comply with requirements of any applicable take reduction plan.¹¹

Categorization of fisheries is based on a two-tiered, stock-specific approach. Tier 1 considers the impacts of all fisheries on a stock. If the total annual mortality and serious injury rates within a stock resulting from all fisheries are less than or equal to ten percent of the stock's potential biological removal rate (PBR), all fisheries associated with this stock fall into Category III. If mortality and serious injury rates are greater than ten percent of PBR, a Tier 2 analysis occurs. This analysis compares fishery-specific annual mortality and serious injury rates to a stock's PBR. If the mortality and serious injury rates associated with a fishery are greater than or equal to 50 percent of PBR, it is classified as Category I. If these rates are greater than one percent but less than 50 percent of PBR, the fishery is classified as Category II. If, under the Tier 2 analysis, the annual mortality and serious injury rates associated with a fishery are less than or equal to one percent of a stock's PBR, the fishery is classified as Category III (68 FR 41726).

The List of Fisheries indicates which fisheries NMFS may regulate under the Atlantic Large Whale Take Reduction Plan (ALWTRP).¹² Specific fisheries were initially identified for inclusion under the ALWTRP based on documented whale interactions. In 1996, NMFS announced its intention to regulate the following Category I or II fisheries under the ALWTRP, based on the following documented whale interactions (61 FR 40819):

- **Gulf of Maine, Mid-Atlantic lobster trap/pot fishery:**¹³ One record of a serious injury and/or mortality of a northern right whale, and 11 records of serious injury and/or mortality of humpback whales were reported for this fishery from 1990 to 1994. In addition, NMFS received several reports of right whale entanglements prior to 1990 and after 1994 which are or may be attributable to the lobster fishery.

¹¹ Once a fishery is elevated to Category I or II status, it may be subject to the ALWTRP; however, NMFS retains discretion regarding which fisheries it covers in the Plan to provide adequate protection to right, humpback, and fin whales.

¹² Marine mammal take reduction plans relevant to Category I and II fisheries in the Atlantic Ocean include the Harbor Porpoise Take Reduction Plan (50 CFR 229.34), the Atlantic Large Whale Take Reduction Plan (50 CFR 229.32), and an upcoming Bottlenose Dolphin Take Reduction Plan.

¹³ Currently the Northeast/Mid-Atlantic American lobster trap/pot fishery in the LOF.

- **Mid-Atlantic coastal gillnet fishery:** Between 1989 and 1992, 31 humpback whales stranded from New Jersey through Virginia. Twenty-five percent of the stranded whales had scars consistent with net entanglement. Between 1990 and 1996, ten humpbacks stranded in Virginia; three animals had rope abrasion injuries consistent with entanglement in gillnets.
- **New England multispecies sink-gillnet fishery:**¹⁴ As of 1996, strategic marine mammal species/stocks seriously injured or killed in this fishery included several humpback whales and a northern right whale.
- **Southeastern U.S. Atlantic shark gillnet fishery:** A right whale calf was observed in February, 1994, approximately ten miles off Jacksonville, Florida, with severe cuts and other injuries. Researchers believe, based on the observed injuries, that the calf was entangled in gillnet gear, then hauled back into the fishing vessel's propeller as the gear was being retrieved. This method of gear retrieval is consistent with the shark gillnet fishery.

Based on NMFS review of entanglement data by fishery and by the types of gear involved in whale entanglements, the ALWTRP was created to mitigate the use of certain gear types likely to entangle whales in areas where whales are likely to occur. Therefore, the ALWTRP regulates fishing activity by gear and fishing location. Specific restrictions on fishing practices (including gear and seasonal requirements) are defined according to gear types and areas, as specified in Exhibit 2-2 (for a list of currently exempted waters within these areas, see Appendix 2A). Exhibits 2-3 and 2-4 illustrate the location of the specified areas.¹⁵

¹⁴ Currently the Northeast sink gillnet fishery in the LOF.

¹⁵ For the specific coordinates of each area, see 50 CFR part 229.32, the Atlantic large whale take reduction plan regulations, available on the ALWTRP web site at <http://www.nero.noaa.gov/whaletrp/>.

Exhibit 2-2	
FISHING GEAR AND AREAS REGULATED UNDER THE ALWTRP	
Specified Gear	Specified Areas
Lobster Traps/Pots	<ul style="list-style-type: none"> • Northern Inshore State Lobster Waters Area • Cape Cod Bay Restricted Area • Great South Channel Restricted Area • Stellwagen Bank/Jeffreys Ledge Restricted Area • Northern Nearshore Lobster Waters Area • Southern Nearshore Lobster Waters Area • Offshore Lobster Waters Area
Anchored Gillnets	<ul style="list-style-type: none"> • Cape Cod Bay Restricted Area • Great South Channel Restricted Gillnet Area • Great South Channel Sliver Restricted Area • Stellwagen Bank/Jeffreys Ledge Restricted Area • Other Northeast Gillnet Waters Area • Mid-Atlantic Coastal Waters Area
Other Gillnets	<ul style="list-style-type: none"> • Mid-Atlantic Coastal Waters Area (drift gillnets) • Southeast U.S. Restricted Area • Southeast U.S. Observer Area
Source: 50 CFR part 229.32, available online at http://www.nero.noaa.gov/whaletrp/ .	

Exhibit 2-3

AREAS AFFECTED BY THE ALWTRP: LOBSTER TRAPS/POTS

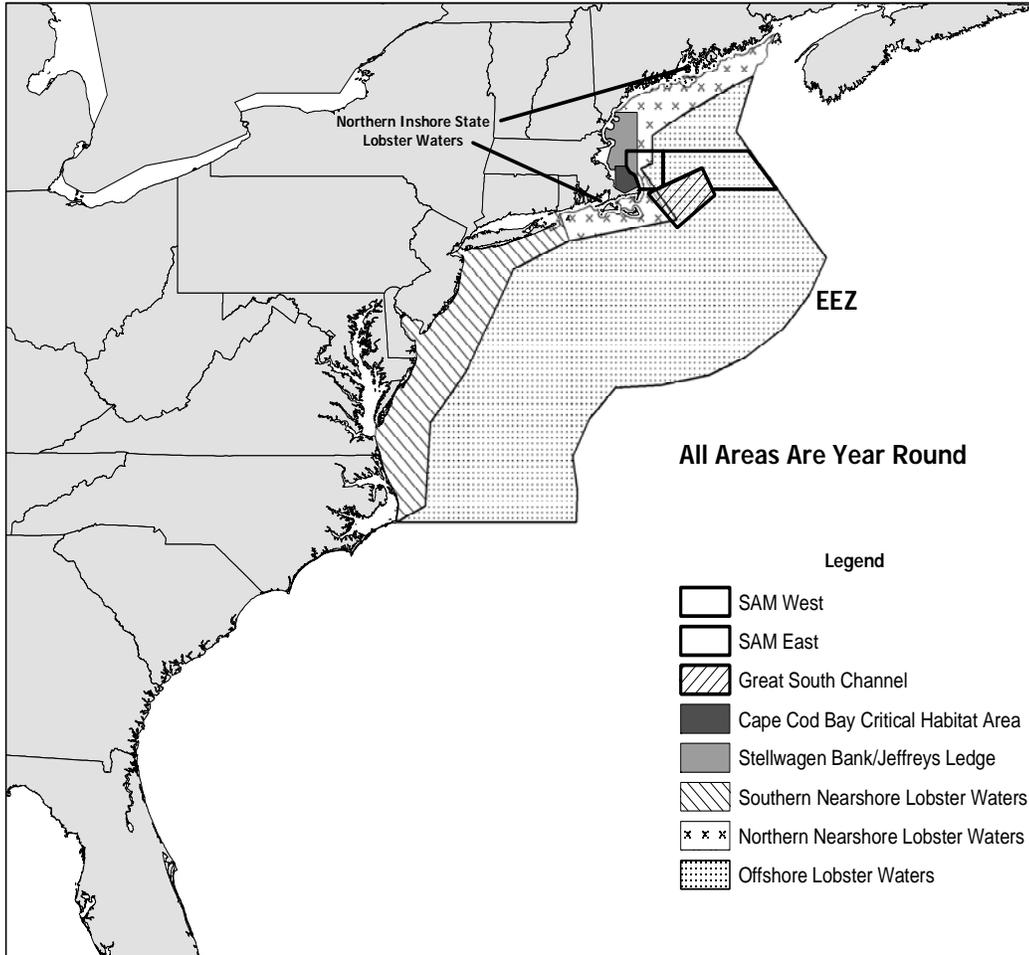
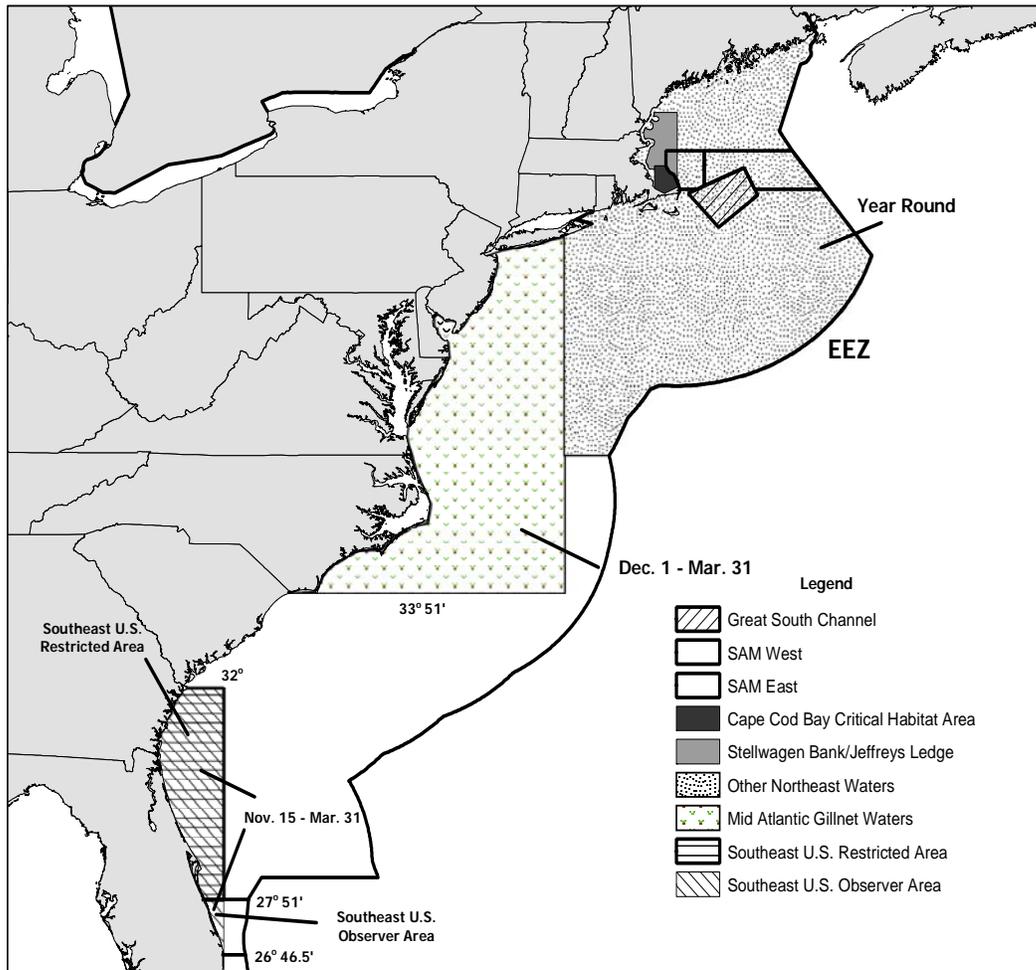


Exhibit 2-4

AREAS AFFECTED BY THE ALWTRP: GILLNETS



The LOF is revised annually based on new information regarding marine mammal interactions (some fisheries take marine mammals in ways other than entanglement, such as hooking). Exhibit 2-5 lists Category I and II fisheries in the Atlantic Ocean that are current as of July 15, 2003.

Exhibit 2-5	
LIST OF FISHERIES, CATEGORY I AND II DESIGNATIONS	
(Atlantic Ocean Fisheries Only)	
<i>Category I Fisheries</i>	
Gillnet Fisheries	Mid-Atlantic coastal gillnet Northeast sink gillnet
Longline Fisheries	Atlantic Ocean large pelagics longline
Trap/Pot Fisheries	Northeast/Mid-Atlantic American lobster trap/pot
Trawl Fisheries	Atlantic squid, mackerel, butterfish trawl
<i>Category II Fisheries</i>	
Gillnet Fisheries	North Carolina inshore gillnet Northeast anchored float gillnet Northeast drift gillnet Southeast Atlantic gillnet Southeastern U.S. Atlantic shark gillnet
Trawl Fisheries	Atlantic herring midwater trawl (including pair trawl)
Trap/Pot Fisheries	Atlantic blue crab trap/pot Atlantic mixed species trap/pot
Haul/Beach Seine Fisheries	Mid-Atlantic haul/beach seine North Carolina long haul seine
Stop Net Fisheries	North Carolina roe mullet stop net
Pound Net Fisheries	Virginia pound net
Source: 68 FR 41725, July 15, 2003.	

The fisheries currently regulated under the ALWTRP are those Category I or II fisheries from the LOF that fish with specified gear in specified areas (see Exhibits 2-3, 2-4, and 2-5). Based on the most recent LOF, the following five fisheries are currently regulated under the ALWTRP:

- Northeast/Mid-Atlantic American lobster trap/pot,
- Northeast sink gillnet,
- Southeast Atlantic gillnet,
- Southeastern U.S. Atlantic shark gillnet, and
- Mid-Atlantic coastal gillnet.

The ALWTRP includes a variety of gear modification requirements and restrictions, a Seasonal Area Management (SAM) program, and a Dynamic Area Management (DAM) program. Each regulatory component of the Plan is summarized in sections 2.2.2 to 2.2.4 below.

2.2.2 Gear Modification Requirements and Restrictions

The Atlantic Large Whale Take Reduction Plan (ALWTRP) specifies both universal gear modification requirements and restrictions, which apply to all lobster traps/pots and anchored gillnets, and area- and season-specific gear modification requirements and restrictions.¹⁶ The universal gear requirements are as follows:

- *No floating line at the surface* – No person may fish with lobster trap or anchored gillnet gear that has any portion of the buoy line that is directly connected to the gear on the ocean bottom floating at the surface at any time. If more than one buoy is attached to a single buoy line or if a high flyer and a buoy are used together on a single buoy line, floating line may be used between these objects.
- *No wet storage of gear* – Lobster traps and/or anchored gillnet gear must be hauled out of the water at least once every 30 days.
- *Knots* – Fishermen are encouraged, but not required, to maintain knot-free buoy lines. Splices are not considered to be an entanglement threat and are thus preferable to knots.

Additional gear modification requirements and restrictions vary by location and date, as well as by gear type. These regulations are summarized in Exhibits 2-6 to 2-8 below.

¹⁶ The requirements specified in the ALWTRP are in addition to existing requirements under the Fishery Management Plans of affected fisheries and any other applicable regulations.

Exhibit 2-6	
LOBSTER TRAP/POT GEAR MODIFICATION REQUIREMENTS AND RESTRICTIONS UNDER THE ALWTRP, BY AREA	
Area	Requirements
Cape Cod Bay Restricted Area (Federal waters)	<p><i>January 1 to May 15:</i></p> <ul style="list-style-type: none"> • Universal gear requirements. • Buoy lines marked as follows: 4" red mark along the buoy line midway in the water column. • All buoy lines attached to the main buoy with a weak link having a maximum breaking strength of 500 pounds.¹ • Traps must be set in either a two-trap string or in trawls of four or more traps. A two-trap string cannot have more than one buoy line. • All buoy lines must be made of sinking line except for the bottom third of the line, which may be floating line. • All ground lines must be made entirely of sinking line. <p><i>May 16 to December 31:</i></p> <ul style="list-style-type: none"> • Universal gear requirements. • Buoy lines marked as follows: 4" red mark along the buoy line midway in the water column. • All buoy lines must be attached to the main buoy with a weak link having a maximum breaking strength of 600 pounds.^{1,2} • Multiple traps only (no single traps allowed); trawls with five or fewer traps can have only one buoy line.
Cape Cod Bay Restricted Area (State waters)	<p><i>January 1 to May 15:</i></p> <ul style="list-style-type: none"> • Universal gear requirements. • Buoy lines marked as follows: 4" red mark along the buoy line midway in the water column. • All buoy lines attached to the main buoy with a weak link having a maximum breaking strength of 500 pounds.¹ • Traps must be set in either a two-trap string or in trawls of four or more traps. A two-trap string cannot have more than one buoy line. • All buoy lines must be made of sinking line except for the bottom third of the line, which may be floating line. • All ground lines must be made entirely of sinking line. <p><i>May 16 to December 31:</i></p> <ul style="list-style-type: none"> • Universal gear requirements. • Traps/pots in compliance with one of the following options from the Lobster Take Reduction Technology List: <ul style="list-style-type: none"> - All buoys attached to the buoy line with a weak link having a maximum breaking strength of 600 pounds;^{1,2} - All buoy lines made entirely of sinking and/or neutrally buoyant line; or - All ground lines made entirely of sinking and/or neutrally buoyant line.
Great South Channel Restricted Area	<p><i>April 1 to June 30:</i></p> <ul style="list-style-type: none"> • Area closed to lobster trap/pot fishing. <p><i>July 1 to March 31:</i></p> <ul style="list-style-type: none"> • Universal gear requirements. • Buoy lines marked as follows: 4" black mark along the buoy line midway in the water column. • All buoy lines attached to the main buoy with a weak link having a maximum breaking strength of 2,000 pounds.^{1,2}

Exhibit 2-6

**LOBSTER TRAP/POT GEAR MODIFICATION REQUIREMENTS AND RESTRICTIONS
UNDER THE ALWTRP, BY AREA**

Area	Requirements
Northern Inshore State Lobster Waters Area ³	<ul style="list-style-type: none"> • Universal gear requirements. • Pots/traps in compliance with one of the following options from the Lobster Take Reduction Technology List: <ul style="list-style-type: none"> - All buoys attached to the buoy line with a weak link having a maximum breaking strength of 600 pounds;^{1,2} - All buoy lines made entirely of sinking and/or neutrally buoyant line; or - All ground lines made entirely of sinking and/or neutrally buoyant line.
Northern Nearshore Lobster Waters Area ³	<ul style="list-style-type: none"> • Universal gear requirements. • Buoy lines marked as follows: 4" red mark along the buoy line midway in the water column. • All buoy lines attached to the main buoy with a weak link having a maximum breaking strength of 600 pounds.^{1,2} • Multiple traps only (no single traps allowed); trawls with five or fewer traps can have only one buoy line.
Offshore Lobster Waters Area ³	<ul style="list-style-type: none"> • Universal gear requirements. • Buoy lines marked as follows: 4" black mark along the buoy line midway in the water column. • All buoy lines attached to the main buoy with a weak link having a maximum breaking strength of 2,000 pounds.^{1,2}
Southern Nearshore Lobster Waters Area	<ul style="list-style-type: none"> • Universal gear requirements. • Buoy lines marked as follows: 4" orange mark along the buoy line midway in the water column. • All buoy lines attached to the main buoy with a weak link having a maximum breaking strength of 600 pounds, placed as close to each individual buoy as is operationally feasible.^{1,2}
Stellwagen Bank/Jeffreys Ledge Restricted Area ³	<ul style="list-style-type: none"> • Universal gear requirements. • Buoy lines marked as follows: 4" red mark along the buoy line midway in the water column. • All buoy lines attached to the main buoy with a weak link having a maximum breaking strength of 600 pounds.^{1,2} • Multiple traps only (no single traps allowed); trawls with five or fewer traps can have only one buoy line.

Notes:

¹ The weak link must be chosen from the following list of combinations approved by the NMFS gear research program: swivels, plastic weak links, rope of appropriate diameter, hog rings, rope stapled to a buoy stick, or other materials or devices approved in writing by the Assistant Administrator.

² Weak links must be designed such that the bitter end of the buoy line is clean and free of any knots when the link breaks. Splices are not considered to be knots for the purposes of this provision.

³ Portions of the Northern Inshore State Lobster Waters, Northern Nearshore Lobster Waters, Stellwagen Bank/Jeffreys Ledge Restricted Area, and Offshore Lobster Waters are subject to Seasonal Area Management (SAM) in addition to the restrictions indicated in this exhibit. When fisheries overlap with a SAM area, and the SAM requirements differ from the fishery-specific gear requirements in that area, fishermen must use the more restrictive requirements.

Source: 50 CFR part 229.32, available online at <http://www.nero.noaa.gov/whaletrp/>.

Exhibit 2-7	
ANCHORED GILLNET GEAR MODIFICATION REQUIREMENTS AND RESTRICTIONS UNDER THE ALWTRP, BY AREA	
Area	Requirements
Cape Cod Bay Restricted Area	<p><i>January 1 to May 15:</i></p> <ul style="list-style-type: none"> • Area closed to anchored gillnetting. <p><i>May 16 to December 31:</i></p> <ul style="list-style-type: none"> • Universal gear requirements. • Buoy lines marked as follows: 4" green mark along the buoy line midway in the water column. • All buoy lines must be attached to the main buoy with a weak link having a maximum breaking strength of 1,100 pounds.^{1,2} • All net panels must contain weak links with a maximum breaking strength of 1,100 pounds in the center of the floatline (headrope) of each net panel in a net string. • Anchored gillnet strings of 20 or fewer net panels must be secured in one of three ways: <ul style="list-style-type: none"> - with anchors with the holding power of at least a 22-pound Danforth-style anchor at each end of the net string; - with at least 50 pounds of dead weight at each end of the net string; or - with a lead line weighing at least 100 pounds per 300 feet for each net panel in the net string.
Great South Channel Restricted Gillnet Area	<p><i>April 1 to June 30:</i></p> <ul style="list-style-type: none"> • Area closed to anchored gillnetting. <p><i>July 1 to March 31:</i></p> <ul style="list-style-type: none"> • Universal gear requirements. • Buoy lines marked as follows: 4" green mark along the buoy line midway in the water column. • All buoy lines must be attached to the main buoy with a weak link having a maximum breaking strength of 1,100 pounds.^{1,2} • All net panels must contain weak links with a maximum breaking strength of 1,100 pounds in the center of the floatline (headrope) of each net panel in a net string. • Anchored gillnet strings of 20 or fewer net panels must be secured in one of three ways: <ul style="list-style-type: none"> - with anchors with the holding power of at least a 22-pound Danforth-style anchor at each end of the net string; - with at least 50 pounds of dead weight at each end of the net string; or - with a lead line weighing at least 100 pounds per 300 feet for each net panel in the net string.
Great South Channel Sliver Restricted Area; Stellwagen Bank/Jeffreys Ledge Restricted Area; and Other Northeast Gillnet Waters Area ³	<ul style="list-style-type: none"> • Universal gear requirements. • Buoy lines marked as follows: 4" green mark along the buoy line midway in the water column. • All buoy lines must be attached to the main buoy with a weak link having a maximum breaking strength of 1,100 pounds.^{1,2} • All net panels must contain weak links with a maximum breaking strength of 1,100 pounds in the center of the floatline (headrope) of each net panel in a net string. • Anchored gillnet strings of 20 or fewer net panels must be secured in one of three ways: <ul style="list-style-type: none"> - with anchors with the holding power of at least a 22-pound Danforth-style anchor at each end of the net string; - with at least 50 pounds of dead weight at each end of the net string; or - with a lead line weighing at least 100 pounds per 300 feet for each net panel in the net string.

Exhibit 2-7

**ANCHORED GILLNET GEAR MODIFICATION REQUIREMENTS AND RESTRICTIONS
UNDER THE ALWTRP, BY AREA**

Area	Requirements
Mid-Atlantic Coastal Waters Area	<p><i>December 1 to March 31:</i></p> <ul style="list-style-type: none"> • Universal gear requirements. • All buoy lines attached to the main buoy with a weak link having a maximum breaking strength of 1,100 pounds, placed as close to each individual buoy line as is operationally feasible.^{4,2} • All net panels must contain weak links each with a maximum breaking strength of 1,100 pounds in the center of the floatline of each 50-fathom net panel in a net string, or every 25 fathoms for longer panels. • All gillnets must return to port with the vessel or be anchored at each end with an anchor having at least the holding power of a 22-pound Danforth-style anchor.

Notes:

- ¹ The weak link must be chosen from the following list of combinations approved by the NMFS gear research program: swivels, plastic weak links, rope of appropriate diameter, hog rings, rope stapled to a buoy stick, or other materials or devices approved in writing by the Assistant Administrator.
- ² Weak links must be designed such that the bitter end of the buoy line is clean and free of any knots when the link breaks. Splices are not considered to be knots for the purposes of this provision.
- ³ Portions of the Other Northeast Gillnet Waters are subject to Seasonal Area Management (SAM) in addition to the restrictions indicated in this exhibit. When fisheries overlap with a SAM area, and the SAM requirements differ from the fishery-specific gear requirements in that area, fishermen must use the more restrictive requirements.
- ⁴ The weak link must be chosen from the following list of combinations approved by the NMFS gear research program: swivels, plastic weak links, rope of appropriate diameter, hog rings, rope stapled to a buoy stick, or other materials or devices approved in writing by the Assistant Administrator.

Source: 50 CFR part 229.32, available online at <http://www.nero.noaa.gov/whaletrp/>.

Exhibit 2-8	
OTHER GILLNET GEAR MODIFICATION REQUIREMENTS AND RESTRICTIONS UNDER THE ALWTRP, BY AREA	
Area	Requirements
Mid-Atlantic Coastal Waters Area (Drift gillnets / driftnets)	<p><i>December 1 to March 31:</i></p> <ul style="list-style-type: none"> • No fishing with driftnet gear at night unless that gear is tended. • All driftnet gear set by a vessel must be removed from the water and stowed on board the vessel before returning to port.
Southeast U.S. Restricted Area	<p><i>November 15 to March 31:</i></p> <ul style="list-style-type: none"> • Area closed to shark gillnet fishing. • No straight sets of gillnet gear at night. • Fishing for sharks with strikenet gear (strikenetting) is exempt from the first two provisions only if <ul style="list-style-type: none"> - no nets are set at night or when visibility is less than 500 yards; - each set is made under the observation of a spotter plane; - no net is set within 3 nautical miles of a right, humpback, or fin whale; and - if a right, humpback, or fin whale moves within 3 nautical miles of the set gear, the gear is removed immediately from the water. • Shark gillnet gear must have a 4" blue marking and a 4" green marking within six inches of each other, both within two feet of the top of the buoy line and midway along the length of the buoy line. Each net panel must be marked along both the float line and the lead line at least once every 100 yards. • Shark gillnet vessel operators must call NMFS' SE Regional Office no less than 48 hours prior to departure to arrange for observer coverage. If the Regional Office requests that an observer be taken on board a vessel, no person may fish aboard that vessel with shark strikenet gear unless an observer is on board.
Southeast U.S. Observer Area (includes the Southeast U.S. Restricted Area)	<p><i>November 15 to March 31:</i></p> <ul style="list-style-type: none"> • Shark gillnet gear must have a 4" blue marking and a 4" green marking within six inches of each other, both within two feet of the top of the buoy line and midway along the length of the buoy line. Each net panel must be marked along both the float line and the lead line at least once every 100 yards. • If fishing with shark gillnet gear, the vessel operator must call NMFS' SE Regional Office not less than 48 hours prior to departure to arrange for observer coverage. If the Regional Office requests that an observer be taken on board a vessel, no person may fish aboard that vessel with shark gillnet gear unless an observer is on board. • Gillnet fishermen fishing within the Southeast U.S. Observer Area north of 27° 51.0' N (the southernmost boundary of the Southeast U.S. Restricted Area) must also comply with regulations for the Southeast U.S. Restricted Area.
Source: 50 CFR part 229.32, available online at http://www.nero.noaa.gov/whaletrp/ .	

If a serious injury or mortality of a right whale occurs in the Cape Cod Bay Restricted Area from January 1 through May 15, in the Great South Channel Restricted Area from April 1 through June 30, or in the Southeast U.S. Restricted Area from November 15 through March 31 as a result of an entanglement by lobster or gillnet gear allowed to be used in those areas and times, the Assistant Administrator shall close that area to that gear type for the rest of that time period and for that same time period in each subsequent year, unless the Assistant Administrator revises the restricted period through a publication in the Federal Register in accordance with the following measures, or unless other measures are implemented through a publication in the Federal Register based on the following measures:

- NMFS verifies that certain gear characteristics are both operationally effective and reduce serious injuries and mortalities of endangered whales;
- New gear technology is developed and determined to be appropriate;
- Revised breaking strengths are determined to be appropriate;
- New marking systems are developed and determined to be appropriate;
- NMFS determines that right whales are remaining longer than expected in a closed area, or have left earlier than expected;
- NMFS determines that the boundaries of a closed area are not appropriate;
- Gear testing operations are considered appropriate; or
- Similar situations occur.

NMFS can modify the ALWTRP based on the occurrence of an entanglement in critical habitat and other measures listed above through publication in the *Federal Register*. NMFS may also modify the ALWTRP using any other emergency authority under the Marine Mammal Protection Act, the Endangered Species Act, the Magnuson-Stevens Fishery Conservation and Management Act, or other appropriate authority.

2.2.3 Seasonal Area Management (SAM)

The Seasonal Area Management (SAM) program was established by NMFS to protect predictable annual aggregations of North Atlantic right whales in the waters off Cape Cod and out to the Exclusive Economic Zone (EEZ) (as observed in aerial surveys from 1999 to 2001) from serious injury or mortality caused by entanglement in lobster trap/pot and gillnet gear. The SAM program incorporates two zones: SAM West, which is in effect from March 1 through April 30, and SAM East, which is in effect from May 1 through July 31. The extent of SAM West and SAM East is shown in Exhibit 2-9.¹⁷

Gear set in the SAM zones during the designated times must be low risk gear. Low risk gear, as defined by the Atlantic Large Whale Take Reduction Team, is gear that is *highly unlikely* to cause death or serious injury to entangled whales. Exhibit 2-10 presents the specific requirements for low risk lobster trap/pot and gillnet gear in a SAM zone. SAM gear requirements primarily affect three groups: (1) those fishing with lobster pots/traps in the Northern Nearshore Lobster Waters Area, Northern Inshore State Lobster Waters Area, or Stellwagen Bank/Jeffreys Ledge Restricted Area; (2) those fishing with lobster pots/traps in the

¹⁷ For the specific coordinates of each SAM zone (SAM West and SAM East), see 50 CFR part 229.32, available online at <http://www.nero.noaa.gov/whaletrp/>.

Offshore Lobster Waters Area; and (3) those fishing with anchored gillnets in the Other Northeast Gillnet Waters Area.

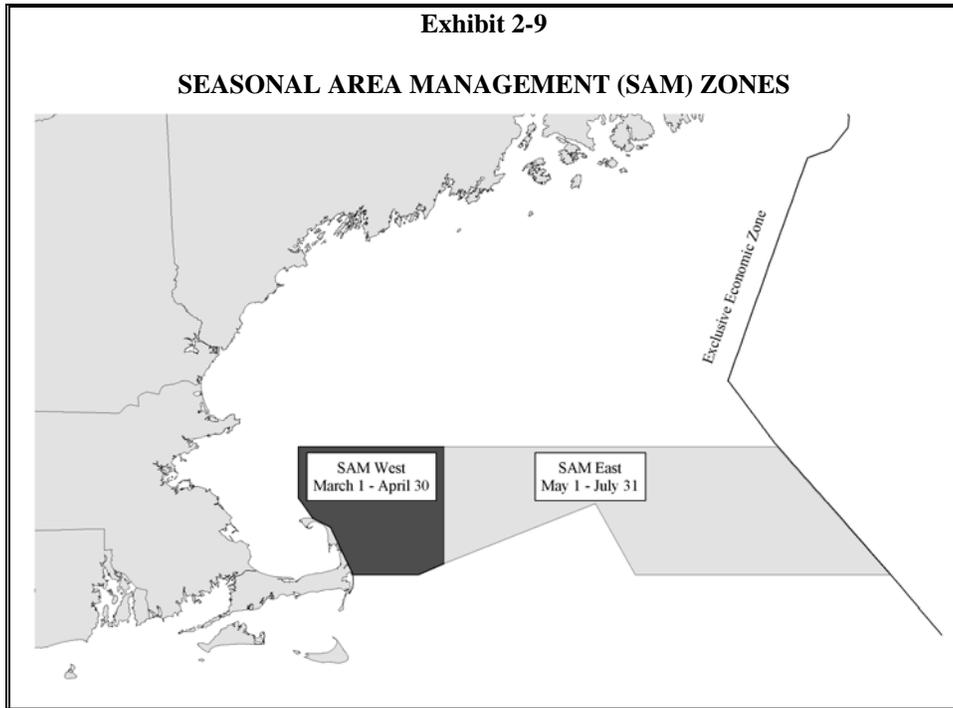
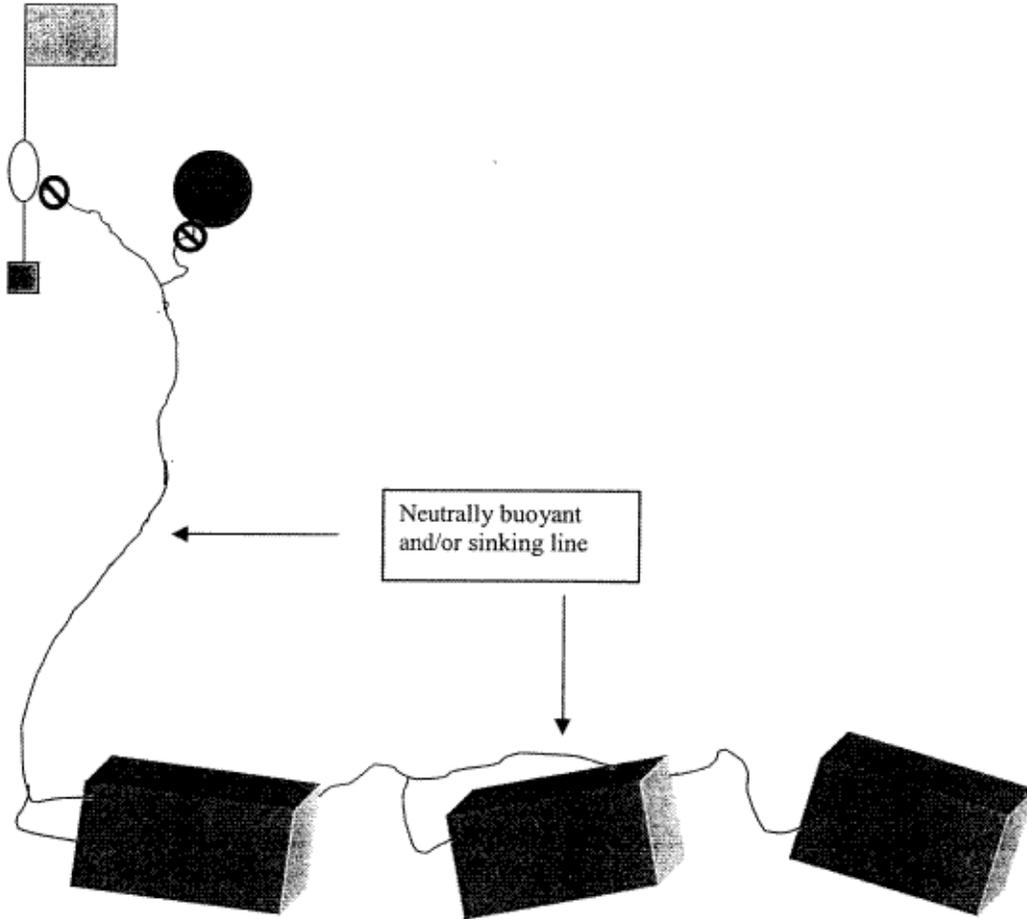


Exhibit 2-10		
SEASONAL AREA MANAGEMENT (SAM) REQUIREMENTS		
Lobster Trap/Pot Gear 1	Lobster Trap/Pot Gear 2	Anchored Gillnet Gear
<ul style="list-style-type: none"> • Northern Nearshore Lobster Waters Area • Northern Inshore State Lobster Waters Area • Stellwagen Bank/Jeffreys Ledge Restricted Area 	<ul style="list-style-type: none"> • Offshore Lobster Waters Area 	<ul style="list-style-type: none"> • Other Northeast Gillnet Waters Area
<ul style="list-style-type: none"> • Groundlines and buoy lines made entirely of sinking or neutrally buoyant line (floating groundlines and buoy lines are prohibited). • All buoy lines attached to the main buoy with a weak link having a maximum breaking strength of 600 pounds.¹ • No more than one buoy line per trawl, deployed at the northern or western end of the trawl depending on the direction of the set.² 	<ul style="list-style-type: none"> • Groundlines and buoy lines made entirely of sinking or neutrally buoyant line (floating groundlines and buoy lines are prohibited). • All buoy lines attached to the main buoy with a weak link having a maximum breaking strength of up to 1,500 pounds.¹ • No more than one buoy line per trawl, deployed at the northern or western end of the trawl depending on the direction of the set.² 	<ul style="list-style-type: none"> • Groundlines and buoy lines made entirely of sinking or neutrally buoyant line (floating groundlines and buoy lines are prohibited). • All buoy lines attached to the main buoy with a weak link having a maximum breaking strength of 1,100 pounds.¹ • A total of five weak links in each net panel, each having a maximum breaking strength of 1,100 pounds. Three of the five weak links located on the floatline – one at the center of the net panel, and two as close as possible to each of the bridle ends of the net panel. The remaining two weak links placed in the center of each of the vertical lines at the panel ends. • No more than one buoy line per net string, deployed at the northern or western end of the gillnet string depending on the direction of the set. • Anchored gillnets secured with the holding power of at least a 22-pound Danforth-style anchor at each end of the net string.
<p>Notes:</p> <p>¹ Weak links may include swivels, plastic weak links, rope of appropriate diameter, hog rings, rope stapled to a buoy stick, or other materials or devices approved in writing by the Assistant Administrator.</p> <p>² These requirements supersede the requirements found at 50 CFR part 697.21, which require one radar reflector at each end of a trawl with more than three traps.</p> <p>Source: 50 CFR part 229.32, available online at http://www.nero.noaa.gov/whaletrp/.</p>		

When any of the areas described in section 2.2.1 overlap with a SAM area, and the SAM requirements differ from the fishery-specific gear requirements in that area (see Exhibits 2-3 to 2-5), fishermen must use the more restrictive requirements. SAM requirements for lobster trap/pot and gillnet gear are illustrated in Exhibits 2-11 to 2-13 below.

Exhibit 2-11

**SAM NORTHERN NEARSHORE, SAM INSHORE, AND STELLWAGEN BANK/JEFFREYS LEDGE
RESTRICTED AREA LOBSTER GEAR**



Key:

⊗ 600 lb required weak link

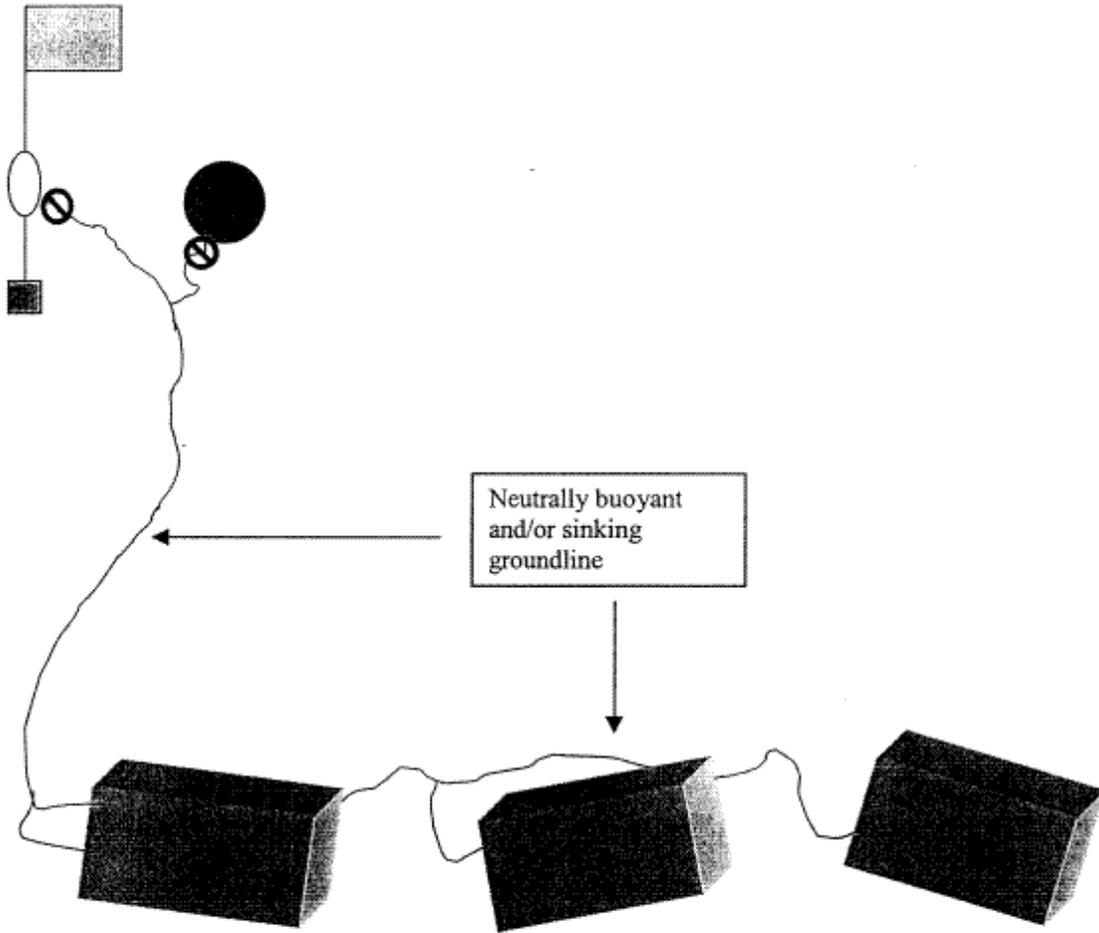
● Buoy

■
○
■ High Flyer or Buoy

Source: 67 FR 65724.

Exhibit 2-12

SAM OFFSHORE LOBSTER GEAR



Key:

⊗ 1500 lb required weak link

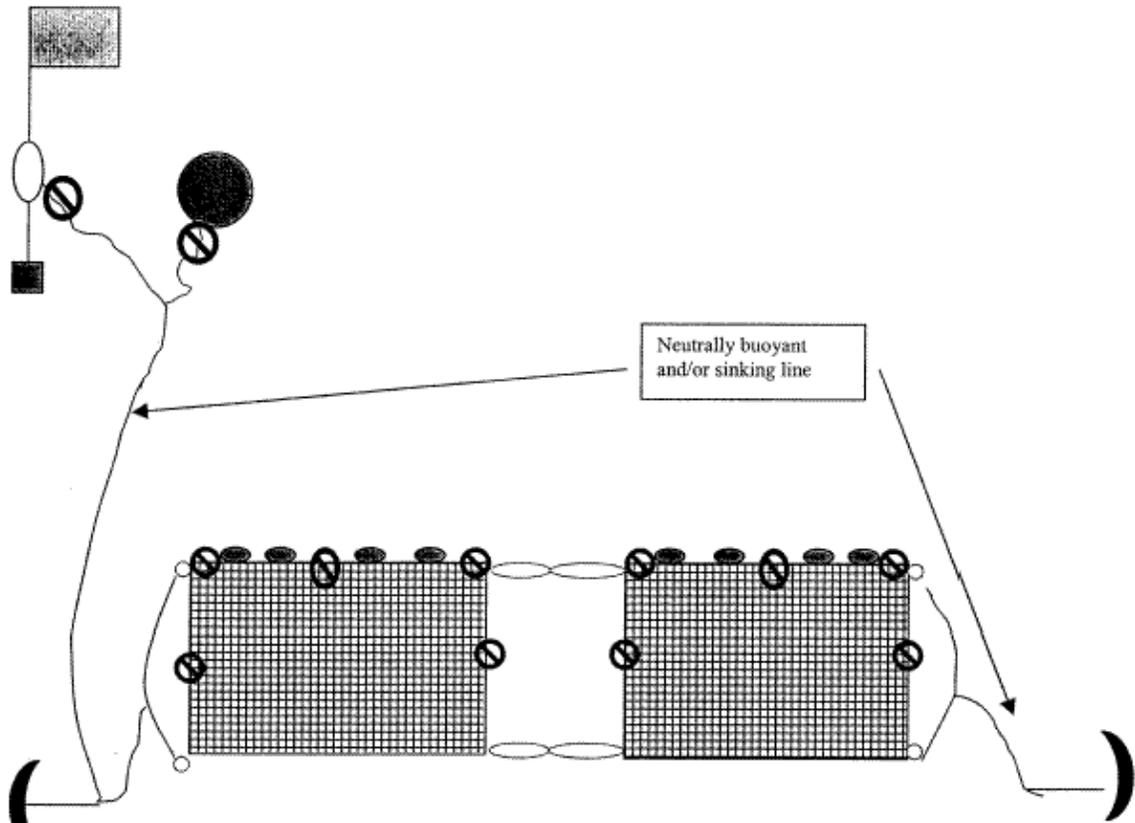
● Buoy

■
○
■ High Flyer

Source: 67 FR 65725.

Exhibit 2-13

SAM ANCHORED GILLNET GEAR



Key:

⊗ 1100 lb required weak link

● Floats

○ Bridle

☾ Holding power of at least a 22 lb Danforth-style anchor

● Buoy

■ High Flyer

Source: 67 FR 65726.

2.2.4 Dynamic Area Management (DAM)

Dynamic Area Management (DAM) is a means by which NMFS can temporarily restrict the use of lobster trap/pot and gillnet fishing gear within defined areas north of 40°00' N latitude to protect right whales. A DAM action is triggered by a single reliable report from a qualified individual of an aggregation of three or more right whales within 75 square nautical miles such that the whale density is equal to or greater than 0.04 right whales per square nautical mile.¹⁸ This area is defined as a core area.

A DAM zone is defined based on the location of core areas north of 40°00' N latitude. A circular buffer zone is drawn to extend 15 nautical miles from the perimeter of a circle around each core area. The DAM zone is then defined by a polygon drawn outside but tangential to the circular buffer zones.¹⁹

Once a DAM zone is identified, NMFS determines whether to impose in the zone restrictions on fishing and/or fishing gear. This determination is based on a variety of factors, including but not limited to the 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, and a review of recent right whale entanglement and mortality data. NMFS has three options for action within a DAM zone:

1. Require lobster trap/pot and anchored gillnet fishermen to remove their gear and refrain from setting additional gear within the DAM zone;
2. Require the use of modified lobster trap/pot and anchored gillnet in the DAM zone; and/or
3. Issue an "alert" and encourage lobster trap/pot and anchored gillnet fishermen to voluntarily stop fishing and remove all gear from the DAM zone.

Acceptable gear within a DAM zone is similar to SAM gear requirements, with allowance for a second buoy line and floating line on the bottom third of each buoy line. When requirements for gear modifications in DAM zones differ from other ALWTRP requirements in overlapping areas and times, the more restrictive modifications apply. DAM gear modification requirements are presented in Exhibit 2-14.

¹⁸ A qualified individual is an individual ascertained by NMFS to be reasonably able, through training or experience, to identify a right whale. Such individuals include, but are not limited to, NMFS staff, U.S. Coast Guard and Navy personnel trained in whale identification, scientific research survey personnel, whale watch operators and naturalists, and mariners trained in whale species identification through disentanglement training or some other training program deemed adequate by NMFS. A reliable report is a credible right whale sighting based upon which a DAM zone would be triggered.

¹⁹ For more details on the procedures and criteria for establishment of a DAM zone, see U.S. Department of Commerce (December 2001) and 67 FR 1133.

Exhibit 2-14			
DYNAMIC AREA MANAGEMENT (DAM) GEAR MODIFICATION REQUIREMENTS			
Area Overlapping with the DAM Zone	<ul style="list-style-type: none"> Northern Nearshore Lobster Waters Southern Nearshore Lobster Waters Northern Inshore State Lobster Waters Cape Cod Bay Restricted Area ¹ Stellwagen Bank / Jeffreys Ledge Restricted Area 	<ul style="list-style-type: none"> Great South Channel Restricted Lobster Area ² Offshore Lobster Waters Area 	<ul style="list-style-type: none"> Other Northeast Gillnet Waters Cape Cod Bay Restricted Area ¹ Stellwagen Bank / Jeffreys Ledge Restricted Area Great South Channel Restricted Area ² Mid-Atlantic Coastal Waters
Approved Gear Modifications within the DAM Zone	<ul style="list-style-type: none"> Universal gear and gear marking requirements. Groundlines must be made of either sinking or neutrally buoyant line. Floating groundlines are prohibited. Buoy lines must be made of either sinking or neutrally buoyant line, except the bottom portion of the line, which may be a section of floating line not to exceed one-third of the overall length of the buoy line. A weak link with a maximum breaking strength of 600 pounds must be placed at all buoys.³ Fishermen are allowed to use two buoy lines per trawl string. 	<ul style="list-style-type: none"> Universal gear and gear marking requirements. Groundlines must be made of either sinking or neutrally buoyant line. Floating groundlines are prohibited. Buoy lines must be made of either sinking or neutrally buoyant line, except the bottom portion of the line, which may be a section of floating line not to exceed one-third of the overall length of the buoy line. A weak link with a maximum breaking strength of 1,500 pounds must be placed at all buoys.³ Fishermen are allowed to use two buoy lines per trawl string. 	<ul style="list-style-type: none"> Universal gear and gear marking requirements. Groundlines must be made of either sinking or neutrally buoyant line. Floating groundlines are prohibited. Buoy lines must be made of either sinking or neutrally buoyant line, except the bottom portion of the line, which may be a section of floating line not to exceed one-third of the overall length of the buoy line. A weak link with a maximum breaking strength of 1,100 pounds must be placed at all buoys.³ A total of five weak links in each net panel, each having a maximum breaking strength of 1,100 pounds. Three of the five weak links must be located on the floatline – one at the center of the net panel, and two as close as possible to each of the bridle ends of the net panel. The remaining two weak links placed in the center of each of the vertical lines at the panel ends. Fishermen are allowed to use two buoy lines per net string. Anchored gillnets must be secured with the holding power of at least a 22-pound Danforth-style anchor at each end of the net string.
<p>Notes:</p> <p>¹ May 16 through December 31.</p> <p>² July 1 through March 31.</p> <p>³ Weak link must be chosen from the following list of NMFS approved gear: swivels, plastic weak links, rope of the appropriate diameter, hog rings, rope stapled to a buoy stick, or devices approved in writing by the NMFS Assistant Administrator.</p> <p>Source: 68 FR 51195.</p>			

DAM zone restrictions go into effect two days after publication of a notice in the *Federal Register* and remain in effect for a minimum of 15 days.²⁰ At the conclusion of the 15-day period, the DAM zone will automatically expire unless whales are still sighted in the DAM zone, in which case NMFS will continue the zone for additional 15-day periods to further protect concentrations of right whales.

In a DAM "alert", NMFS informs fishermen of the location of the DAM zone and the number of right whales within the zone. NMFS will encourage fishermen to remove all lobster trap/pot and gillnet gear and ask that no additional gear be set within the DAM zone for a 15 day period.

NMFS may remove restrictions on a DAM zone or rescind an alert prior to its automatic expiration if there are survey efforts and no confirmed sightings of right whales by qualified individuals for one week, or if other credible evidence indicates that right whales have left the designated zone. Such an action would be announced in the *Federal Register* and through other appropriate media.

2.3 RATIONALE FOR RULEMAKING

The following discussion presents the rationale for revising the Atlantic Large Whale Take Reduction Plan. It begins by describing the means by which whales become entangled in commercial fishing gear. It then provides a historical overview of right, humpback, and fin whale entanglements. Information on minke whale entanglements is also provided, since the ALWTRP should benefit this species. Finally, the discussion demonstrates the need for action by reviewing recent entanglements within the context of the mandates of the Marine Mammal Protection Act and the Endangered Species Act.

2.3.1 Nature of Large Whale Entanglements

Atlantic large whales are at risk of becoming entangled in fishing gear because the whales feed, travel and breed in many of the same ocean areas utilized for commercial fishing. Fishermen typically leave fishing gear such as gillnets and traps/pots in the water for a discrete period, after which time the nets/traps/pots are hauled and their catch retrieved. While the gear is in the water, whales may become incidentally entangled in the lines and nets that comprise trap/pot and gillnet fishing gear.

The effects of entanglement can range from no injury to death. "When... [whales] become fouled in gear, normal breathing and movement may be impaired or stopped completely. If the animal does manage to struggle free, portions of gear may remain attached to the body. This trailing gear, often made of durable synthetic material, may create excess drag, snag onto objects in the environment and impede normal behavior like breathing, feeding, movement, or

²⁰ In addition, NMFS will announce DAM restrictions by sending letters to affected fishing permit holders and by providing notice via other media, such as the ALWTRP web site and electronic mailings to interested parties.

breeding. Other effects include infections and deformations" (Center for Coastal Studies, May 14, 2003).

A scarification analysis conducted by the New England Aquarium (Knowlton et al., 2002), found that juvenile right whales are entangled with greater frequency than adults. Juvenile animals may not have sufficient strength to break free from entangling lines, which can lead to serious injury and infection resulting from the animal "growing into" the lines.

A study of right whale and humpback whale entanglements (Johnson et al., 2005) finds that in cases where the point of gear attachment is known, right whale entanglements frequently (77.4 percent; 24 of 31 entanglement events) involve the mouth, which may indicate that many entanglements occur while whales are feeding.²¹ The study also finds that humpback whales are more commonly reported with entanglements in the tail region (53.0 percent; 16 of 30 entanglement events), in cases where the point of attachment is known.²²

From 1997 to 2002, the NMFS Gear Research Team identified various types of trap/pot and gillnet gear involved in entanglements of right, humpback, fin, or minke whales:

- Right whales became entangled in inshore and offshore lobster, crab, gillnet, seine, and other trap/pot-related gear, as well as aquaculture equipment;
- Humpback whales became entangled in inshore lobster, crab, gillnet, slime eel/hagfish, conch/whelk, tuna, and other trap/pot-related gear, as well as line associated with vessel anchoring systems;
- Fin whales became entangled in crab, slime eel/hagfish, and gillnet gear; and
- Minke whales became entangled in inshore lobster, gillnet, and otter trawl gear (NMFS, 2001; NMFS, 2003a; NMFS, 2003b).

The number of entanglements for which gear type can be identified is too small to detect any trends in the type of gear involved in lethal entanglements. Trap/pot and gillnet gear, however, seem to be the most common, as 89 percent of the entanglement cases for which gear is recovered and identified involves trap/pot and gillnet gear (Johnson et al., 2005). The study confirms that vertical lines and floating groundlines pose risks for large whales; however, the authors conclude that any type and part of fixed gear is capable of entangling a whale, and several body parts of the whale can be involved.

²¹ In some cases, other parts of the body in addition to the mouth may have been entangled.

²² In some cases, other parts of the body in addition to the tail may have been entangled.

2.3.2 History of Large Whale Entanglements

Entanglements are a known source of serious injury and mortality to Atlantic large whales. Although currently available data cannot yet quantify the relative impact of the Atlantic Large Whale Take Reduction Plan (ALWTRP) on the annual number of entanglements, the data do indicate that entanglements resulting in serious injury or mortality continue to be a threat to large whales. Sections 2.3.2.1 to 2.3.2.6 provide an overview of the history of large whale entanglements by species and in summary. These data indicate a need for additional protective measures for large whales.

2.3.2.1 Entanglement Data

The entanglement data presented in this document come primarily from the 2003 *U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessments* report, covering the years from 1997 through 2001 (Waring et al., 2003). These data pertain only to entanglements that NMFS considers to be the primary cause of serious injury or death to a whale. Additional data for 2002 come from the 2002 Large Whale Entanglement Report, which contains data on all confirmed entanglements that are based on animals with an indication of entanglement.²³

Care should be used when interpreting entanglement data. The details of a particular mortality or serious injury record often require a degree of interpretation. The assigned cause is based on NMFS' best judgement of the available data; additional information may result in revisions.²⁴ When reading the following sections on species-specific entanglement data, several factors should be considered: (1) the mortality or injury may involve multiple factors (for example, whales that have been both ship struck and entangled are not uncommon); (2) the actual gear type/source is often uncertain; and (3) several types of gear may be involved in a given reported entanglement.

NMFS limits the serious injury designation to only those reports that offer substantiated evidence that the injury is likely to lead to the whale's death.²⁵ Injuries that impede the whale's locomotion or feeding are not considered serious injuries unless they are likely to be fatal in the foreseeable future. NMFS does not forecast how the entanglement or injury may increase the whale's susceptibility to further injury. Due to this approach, the data presented in this report likely underestimate rates of serious injury due to entanglement (Waring et al., 2003).

²³ An indication of entanglement is provided when a reliable observer reports gear on a whale, gear is photo-documented on a whale, gear is retrieved from a whale, marks or wounds from gear are documented on a whale carcass (excluding healed scars), and/or NMFS or the Center for Coastal Studies (CCS) interviews an inexperienced observer reporting gear on a whale and determines that there is no doubt that the whale was entangled (NMFS, 2003b).

²⁴ The serious injury determinations are most susceptible to revision. There are instances in which an entangled or partially disentangled whale was re-sighted later free of gear. The reverse may also be true: a whale initially seeming in good condition after being entangled is later re-sighted and found to have been seriously injured by the event.

²⁵ Entanglements of juvenile whales are typically considered serious injuries because the constriction on the animal is likely to become increasingly harmful as the whale grows.

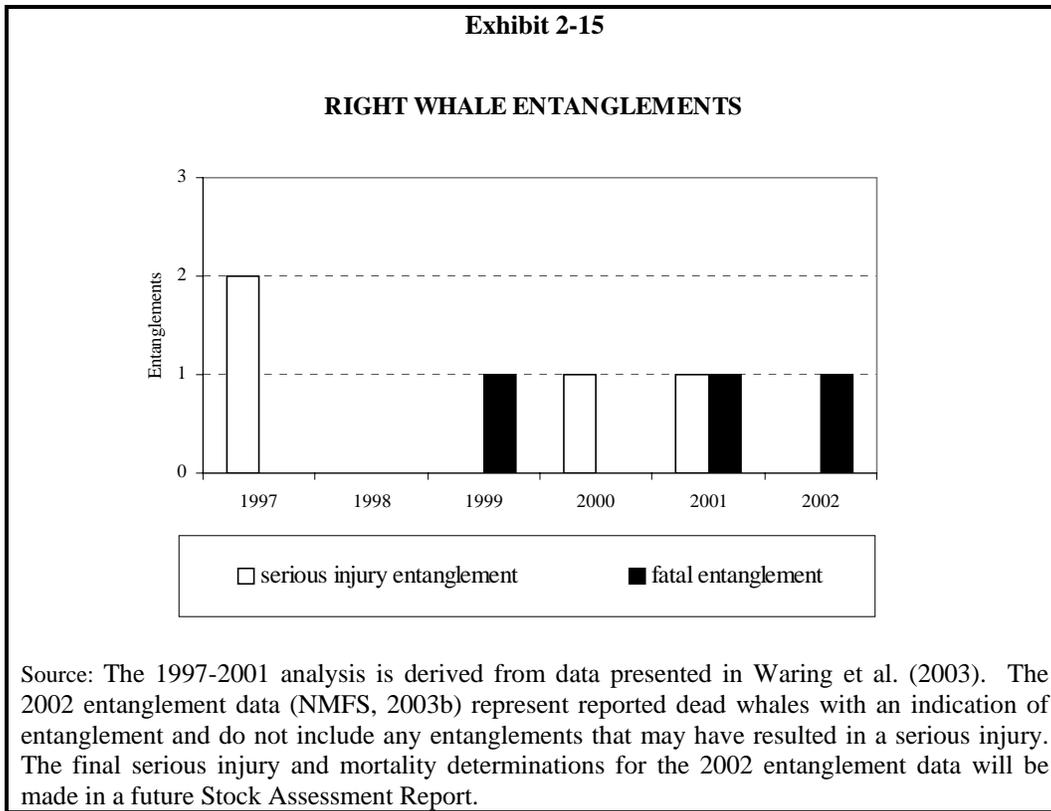
Another source of uncertainty in entanglement data is the size and variability of the detection effort (i.e., the number of people qualified and willing to report a whale entanglement). The number of people on the water and actively reporting whale entanglements also varies from year to year. Compared to the vastness of the Atlantic Ocean, the number of people on the water at any point in time who are qualified and willing to report a whale entanglement is small. As a result, some percentage of whale entanglements likely go unnoted. Therefore, the data reported in this document may underestimate the true number of whale entanglements. The limitations of the detection effort also hinder the development of conclusions regarding changes in the number of entanglements over time.

2.3.2.2 Right Whale Entanglements

From 1997 through 2001, an estimated average of 1.2 right whales per year (0.6 in U.S. waters; 0.6 in Canadian waters) were seriously injured or killed as a result of entanglement or fishery interactions (Waring et al., 2003). In a recent analysis of the scarification of right whales, a total of 61.6 percent of the whales bore evidence of entanglements with fishing gear (Hamilton et al., 1998). Further research using the *North Atlantic Right Whale Catalogue* has indicated that between 10 and 28 percent of right whales are involved in entanglements each year (Knowlton et al., 2002). However, most right whales are eventually able to free themselves, leaving them with scars (Knowlton et al., 2002). Entanglement records maintained by NMFS Northeast Regional Office included at least 72 right whale entanglements or possible entanglements from 1970 through 2000, including right whales in weirs, entangled in gillnets, and trailing line and buoys (Waring et al., 2003).

Exhibit 2-15 presents a summary of estimated right whale entanglements from 1997 through 2002. From 1997 through 2001, the data only include cases in which entanglement was determined to be the primary source of the injury (Waring et al., 2003). As noted above, the 1997 through 2001 data only include serious injury and fatal entanglements; minor entanglements are excluded. The 2002 data include all confirmed entanglements, although determinations have not yet been made regarding the primary source of the injury (NMFS, 2003b). In Exhibit 2-15, the 2002 entanglements represent reported dead whales with an indication of entanglement. In 2002, there were also seven confirmations of live entanglement (NMFS, 2003b), but these animals are not included in Exhibit 2-15 because serious injury designations have not yet been made for these entanglements. Final serious injury and mortality determinations will be made in future Stock Assessment Reports and not in the entanglement reports. However, the Atlantic Scientific Review Group²⁶ concurred with NMFS' early determination that the October 15, 2002, reported right whale death was considered to be an entanglement related mortality. This right whale was first observed entangled on July 6, 2002, and NMFS subsequently determined that the entangling gear was consistent with gear approved for use in the Federal lobster trap fishery. This information will be included a future 2004 U.S. Atlantic and Gulf of Mexico Marine Mammal Stock Assessment.

²⁶ Scientific Review Groups are advisory groups that review NMFS' annual marine mammal Stock Assessment Reports and include representatives from the fishing industry, conservation groups, biologists, and others. There is one each for Atlantic, Pacific, and Alaska stocks.



Of the three known fatal right whale entanglements from 1997 to 2002, one was reported off the Massachusetts coast and two were reported in Canadian waters.²⁷ One of the entangled whales was a male and two were females.

Exhibit 2-15 demonstrates that right whales are becoming entangled in fishing gear and may be seriously injured or killed as a result of that entanglement. Due to the small sample size and the variability in entanglement reports resulting from annual differences in detection effort, the data do not support conclusions indicating historical trends in right whale entanglements.

A recent analysis of the gear involved in right and humpback whale entanglements (Johnson et al., 2005) investigated 31 right whale entanglement events in the U.S. and Canada (involving 29 individuals) during the period from 1993 through 2002. This analysis focused only on entanglement events for which gear was recovered and/or identified by gear specialists or other reliable sources, and events in which the point of gear attachment could be determined. Johnson et al. (2005) document 9 right whale entanglement events in which an animal died or was deemed potentially dead. Gear was recovered in eight of those ten events, and examination of the gear revealed three right whales entangled in lobster gear, one in sink gillnet gear, one in Danish seine gear, and two in unidentified or unknown gear. Gear was not recovered from two animals and thus a determination of gear type could not be made. The outcomes of the 29 right

²⁷ An entanglement may occur at some distance from the location at which an entangled whale is first sighted and reported.

whales involved in the 31 entanglement events are summarized in Exhibit 2-16. Three of the four known right whale deaths listed in Exhibit 2-16 are included in Exhibit 2-15.

Exhibit 2-16	
OUTCOME OF RIGHT WHALE ENTANGLEMENTS INCLUDED IN GEAR ANALYSIS (1993 THROUGH 2002)	
Dead	4
Potentially dead ¹	5
Alive and gear-free	12
Alive and entangled	6
Unknown	2
TOTAL	29
Note: 1 "Potentially dead" applies to identified right whales, and is based largely on a New England Aquarium visual assessment of the health of right whales (Pettis et al., 2004). Source: Johnson et al. (2005).	

2.3.2.3 Humpback Whale Entanglements

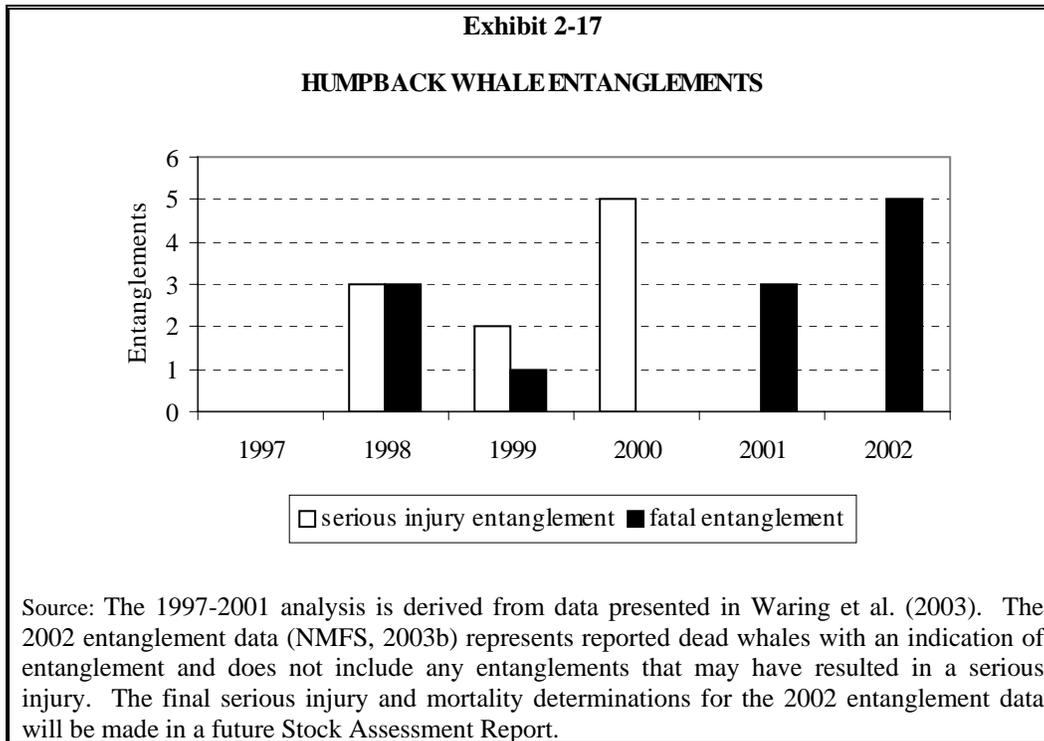
For the period 1997 through 2001, an estimated average of 2.2 Gulf of Maine stock humpback whales per year (1.6 in U.S. waters; 0.6 in Canadian waters) were seriously injured or killed as a result of incidental fishery interactions (i.e., entanglements) (Waring et al., 2003). Fishery interactions in the Southeast and Mid-Atlantic caused, on average, 1.2 additional serious injury or mortality per year during that time period.²⁸ A study of entanglement-related scarring on the caudal peduncle of 134 individual humpback whales from the Gulf of Maine stock suggests that between 48 percent and 65 percent of whales had experienced entanglements (Robbins and Mattila, 2001).

Exhibit 2-17 summarizes western North Atlantic humpback whale entanglements from 1997 to 2002. From 1997 through 2001, the data only include cases in which entanglement was determined to be the primary source of the injury (Waring et al., 2003). As noted above, the 1997 through 2001 data only include serious and fatal entanglements; minor entanglements are excluded.²⁹ The 2002 data include all confirmed entanglements, although determinations have not yet been made regarding the primary source of the injury (NMFS, 2003b).³⁰ In Exhibit 2-17,

²⁸ Humpback whales are listed pursuant to the ESA at the species level only. Under the MMPA, however, NMFS divides humpback whales into separate sub-species and stocks. In the western North Atlantic, humpback whales feed in six regions, representing six relatively discrete sub-populations. Previously, the western North Atlantic population was treated as a single stock for management purposes. However, the decision was recently made to classify whales feeding in the Gulf of Maine as a separate feeding stock. Beginning with the 2002 Stock Assessment Report, records from the southeastern and Mid-Atlantic states involving individuals that could not be identified as members of the Gulf of Maine stock were tallied separately. Conversely, records involving unidentified individuals reported between New York and the Bay of Fundy were assumed to be whales from the Gulf of Maine stock. For more information, see Waring et al. (2003), pages 14 to 23.

²⁹ Exhibit 2-17 does not include the unconfirmed entanglement of a dead humpback whale spotted floating east of Seaside Heights, NJ on September 8, 2001 (NMFS. No. E19-01). In this case, a private citizen noted the

the 2002 entanglements represent reported dead whales with an indication of entanglement. In 2002, there were also 14 confirmations of live entanglement (NMFS, 2003b) but these animals are not included in Exhibit 2-17 because serious injury designations have not yet been made for these entanglements. Final serious injury and mortality determinations will be made in future Stock Assessment Reports and not in the entanglement reports.



Of the 12 known fatal humpback whale entanglements from 1997 to 2002, four were reported off the coast of North Carolina, four off the coast of Massachusetts, two off Virginia, and one each off of Maine and South Carolina.³¹ Seven of the entangled whales were male, two were female, and three were of unknown sex.

Exhibit 2-17 demonstrates that humpback whales are becoming entangled in fishing gear, and may be seriously injured or killed as a result of those entanglements. Due to the small sample size and the variability in entanglement reports (because of variation in detection effort), the data do not support conclusions indicating historical trends in humpback whale entanglements.

presence of gear on the mouth of the whale, and removed the gear before it could be documented by the Stranding Network. The carcass was buried before it could be examined by the Stranding Network for signs of entanglement (NMFS, 2003a).

³⁰ Exhibit 2-17 does not include three reported humpback whale entanglements (NMFS Nos. E12-02, E31-02, and E36-02) for which the available evidence did not support a formal "indication of entanglement."

³¹ An entanglement may occur at some distance from the location at which an entangled whale is first sighted and reported.

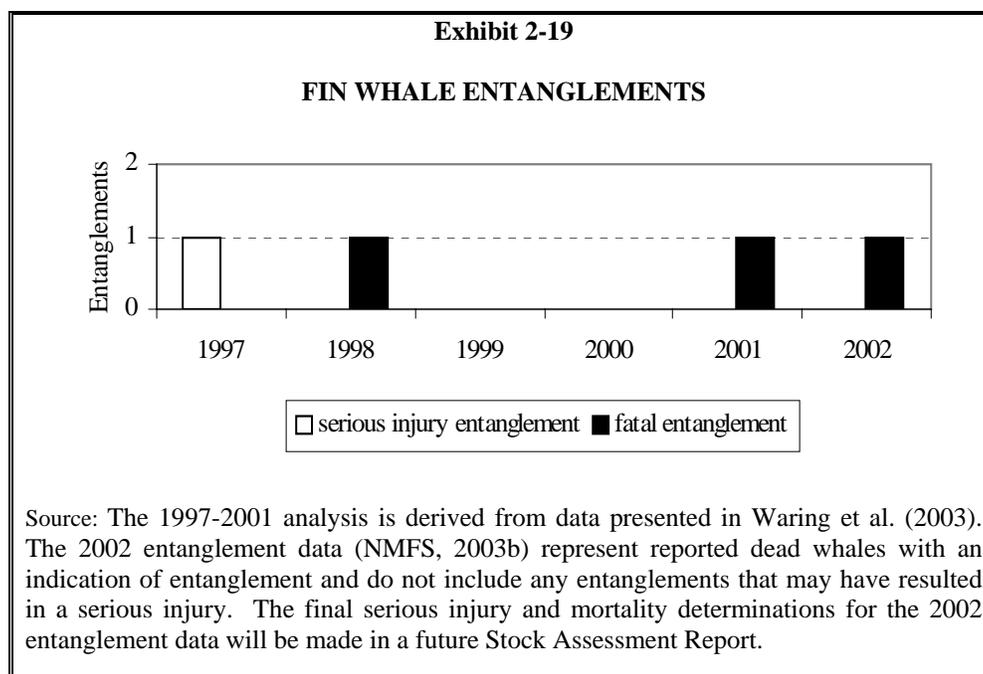
A recent analysis of the gear involved in right and humpback whale entanglements in the U.S. and Canada (Johnson et al., 2005) investigated 30 humpback whale entanglements during the period from 1997 through 2002. This analysis focused only on entanglement events for which gear was recovered and/or identified by gear specialists or other reliable sources, and events in which the point of gear attachment could be determined. Of the three entangled humpback whales known to have died, two of the necropsies revealed entanglements in anchored gillnet gear. The third animal washed up dead two days after it was disentangled from inshore lobster gear. Exhibit 2-18 summarizes the outcomes of the 30 entanglements. The 12 known fatal humpback whale entanglements that are presented in Exhibit 2-17 include the three humpback whale deaths that are presented in Exhibit 2-18.

Exhibit 2-18	
OUTCOME OF HUMPBACK WHALE ENTANGLEMENTS INCLUDED IN GEAR ANALYSIS (1997 THROUGH 2002)	
Dead	3
Alive and gear-free	20
Alive and entangled	5
Unknown	2
TOTAL	30
Note: An outcome of “potentially dead” was not used for humpback whales because a health assessment technique similar to the one for right whales (Pettis et al., 2004) does not exist.	
Source: Johnson et al. (2005).	

2.3.2.4 Fin Whale Entanglements

A review of NMFS records from 1997 through 2001 yielded an average of 0.6 reported fin whale serious injuries or mortalities per year (0.2 in U.S. waters; 0.2 in Canadian waters; 0.2 in Bermudian waters) resulting from fishery interactions or entanglements (Waring et al., 2003).

Exhibit 2-19 summarizes fin whale entanglements from 1997 through 2002. From 1997 through 2001, the data only include cases in which entanglement was the primary source of the injury (Waring et al., 2003). As noted above, the 1997 through 2001 data only include serious and fatal entanglements; minor entanglements are excluded. The 2002 data include all confirmed entanglements, although determinations have not yet been made regarding the primary source of the injury (NMFS, 2003b). In Exhibit 2-19, the 2002 entanglements represent reported dead whales with an indication of entanglement. In 2002, there were no confirmations of live fin whale entanglements. Final serious injury and mortality determinations will be made in future Stock Assessment Reports and not in the entanglement reports.



Of the three known fatal fin whale entanglements, one was reported off the coast of Massachusetts, one in Canadian waters, and one near Bermuda.³² The sex of the three whales is unknown.

Exhibit 2-19 demonstrates that fin whales are becoming entangled in fishing gear, and may be seriously injured or killed as a result of that entanglement. Due to the small sample size and the variability in entanglement reports because of differences in detection effort, the data do not support conclusions indicating historical trends in fin whale entanglements.

2.3.2.5 Minke Whale Entanglements

When fishing gear can be identified, the fisheries most responsible for recent minke whale entanglements in U.S. waters (based on stranding and entanglement records) are the Gulf of Maine and Mid-Atlantic lobster trap/pot, the Mid-Atlantic coastal gillnet, and other unknown fisheries, though all takes have not resulted in mortalities (Waring et al., 2003). From strandings and entanglement data, the estimated mean annual mortality related to the Gulf of Maine and Mid-Atlantic lobster trap/pot fisheries from 1997 through 2001 was 0.2 minke whales per year.³³ The estimated mean annual mortality related to the Mid-Atlantic coastal gillnet fishery from 1997 through 2001 was also 0.2 minke whales per year. Over the same period, the estimated mean annual mortality related to unknown trawl fisheries was 0.4 minke whales per year, and the

³² An entanglement may occur at some distance from the location at which an entangled whale is first sighted and reported.

³³ Data to estimate mortality and serious injury of minke whales come from the U.S. Sea Sampling Program and from records of strandings and entanglements in U.S. waters.

estimated mean annual mortality related to unknown fisheries was 2.6 minke whales per year. The average annual mortality due to fishery interactions from 1997 through 2001 was 3.4 minke whales per year (all in U.S. waters) (Waring et al., 2003).

Exhibit 2-20 summarizes minke whale entanglements from 1997 to 2002. From 1997 through 2001, the data only include cases in which entanglement was the primary source of the injury (Waring et al., 2003). As noted above, the 1997 through 2001 data only include serious and fatal entanglements; minor entanglements are excluded. The 2002 data include all confirmed entanglements, although no determination has been made regarding the primary source of the injury (NMFS, 2003b). In Exhibit 2-20, the 2002 entanglements represent reported dead whales with an indication of entanglement. In 2002, there were also two confirmations of live entanglement (NMFS, 2003b) but these animals are not included in Exhibit 2-20 because serious injury designations have not yet been made for these entanglements. Final serious injury and mortality determinations will be made in future Stock Assessment Reports and not in the entanglement reports.

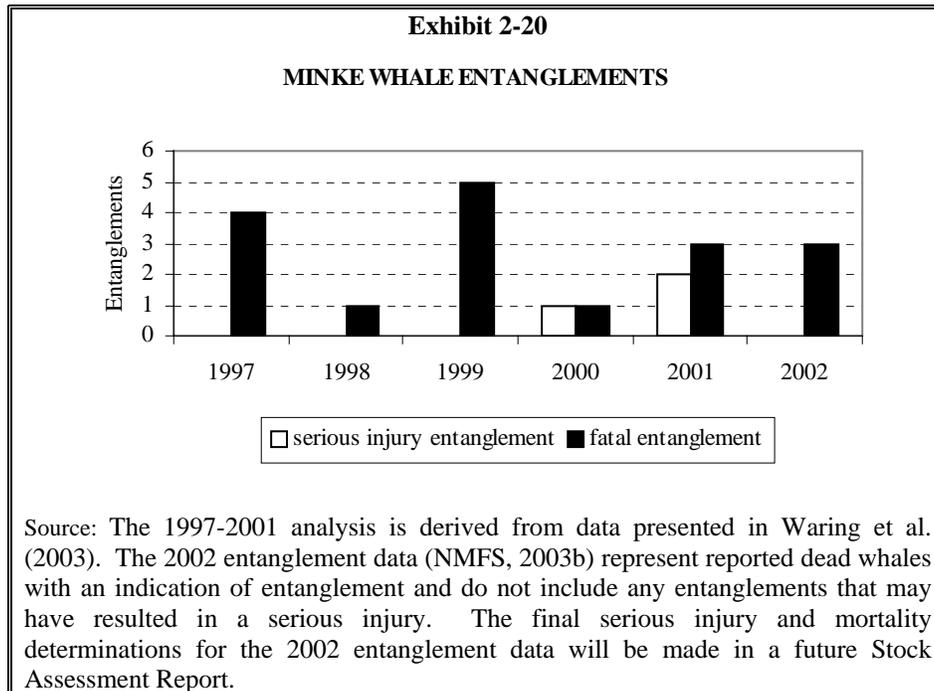


Exhibit 2-20 demonstrates that minke whales are becoming entangled in fishing gear, and may be seriously injured or killed as a result of that entanglement. Due to the small sample size and the variability in entanglement reports (because of variation in detection effort), the data do not support conclusions indicating historical trends in minke whale entanglements.

2.3.2.6 Summary of Recent Entanglements: Right, Humpback, Fin, and Minke Whales

Exhibit 2-21 summarizes all known serious injury entanglements of right, humpback, fin, and minke whales from 1997 through 2001 (serious injury designations have not yet been made

for entanglements reported in 2002). Humpback whales account for the most serious injury entanglements (10), followed by right whales (four), minke whales (three), and fin whales (one).

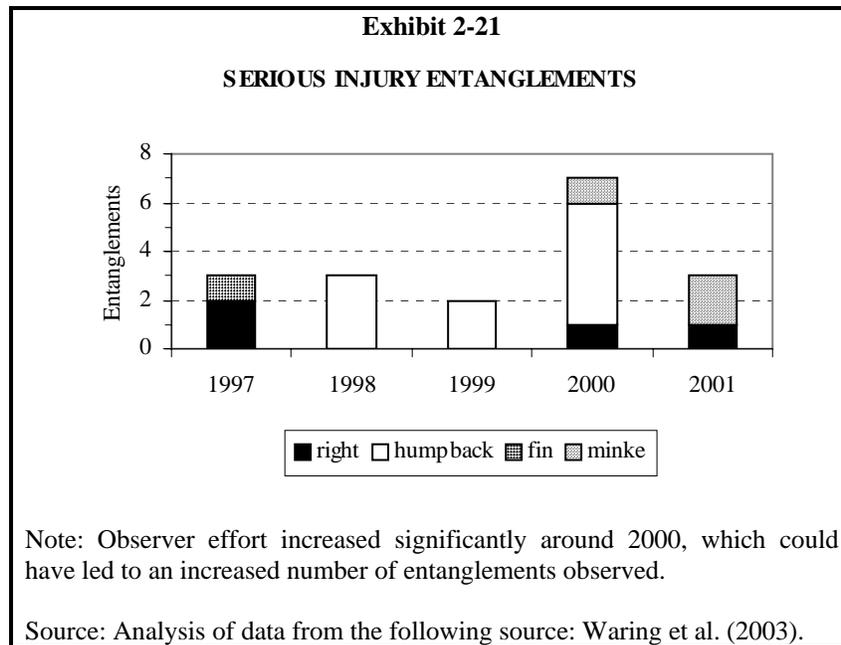


Exhibit 2-22 presents available data on fatal entanglements of Atlantic large whales from 1997 through 2002.³⁴ Minke whales account for the most known entanglement mortalities (17), followed by humpback whales (12), then right whales (three) and fin whales (three).

³⁴ From 1997 through 2001, Exhibit 2-22 includes only those fatalities for which entanglement was the primary cause of death. The 2002 fatalities are associated with confirmed entanglements, although entanglement has not yet been confirmed to have been the primary cause of death. The final mortality determinations for the 2002 entanglement data will be made in a future Stock Assessment Report.

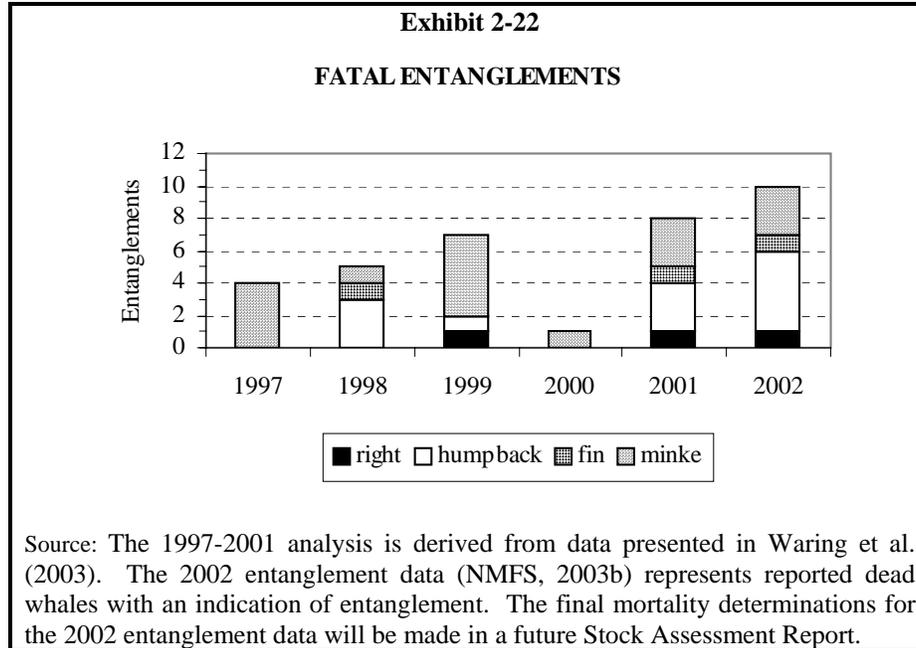


Exhibit 2-23 presents average annual rates of human-caused serious injury and mortality to Atlantic large whales for the period 1997 through 2001 (Waring et al., 2003). For Atlantic large whales, 60 percent (right whales) to 80 percent (fin whales) of human-caused serious injury and mortality was first reported in U.S. waters. Interactions with fishing gear accounted for an estimated 12.5 percent (fin whales) to 94.4 percent (minke whales) of the human-caused serious injury and mortality reported in U.S. waters.

Exhibit 2-23				
AVERAGE ANNUAL HUMAN-CAUSED SERIOUS INJURY AND MORTALITY				
1997 THROUGH 2001				
	Right Whale	Humpback Whale	Fin Whale	Minke Whale
U.S. and Canadian waters	2.0 whales	2.6 whales	2.0 whales	n.a. ¹
U.S. waters only	1.2 whales	2.0 whales	1.6 whales ²	3.6 whales
U.S. waters only, as a percent of U.S. and Canadian waters	60 percent	76.9 percent	80.0 percent	n.a. ¹
Resulting from interactions with fishing gear, U.S. waters only	0.6 whales	1.6 whales	0.2 whales ²	3.4 whales
Resulting from interactions with fishing gear, as a percent of all human-caused serious injury and mortality, U.S. waters only	50.0 percent	80.0 percent	12.5 percent	94.4 percent
Notes:				
¹ n.a. = not available.				
² Data based on a review of NMFS records from 1997 through 2001.				
Source: Waring et al. (2003).				

Exhibits 2-23 also shows that for the years 1997 through 2001, the annual average level of human-caused serious injury and mortality from fisheries interactions for both right and humpback whales exceeded PBR levels shown in Exhibit 2-24 (see Exhibits 2-15 and 2-17 for further details).

Exhibit 2-24			
POTENTIAL BIOLOGICAL REMOVAL (PBR) LEVELS			
Right Whale	Humpback Whale	Fin Whale	Minke Whale
0.0 whales	1.3 whales	4.7 whales	35 whales
Source: Waring et al. (2003).			

2.3.3 Need for Action

The components of the current Atlantic Large Whale Take Reduction Plan – Seasonal Area Management (SAM), Dynamic Area Management (DAM), and revised gear modification requirements and restrictions – came into effect on February 8, 2002 (DAM Final Rule), February 11, 2002 (gear modification Final Rule in the Northeast and Mid-Atlantic), March 1, 2002 (SAM Interim Final Rule), and October 23, 2002 (gear modification Final Rule in the Southeast).³⁵ Entanglements first observed after March 1, 2002, may have occurred after most of the recent revisions to the ALWTRP went into effect.³⁶ Exhibit 2-25 summarizes large whale entanglements observed between March 1, 2002, through December 31, 2002 (the extent of finalized reports). As the exhibit shows, the 2002 Large Whale Entanglement Report data indicate that nine fatal entanglements and 22 live entanglements of Atlantic large whales were observed in 2002 after most of the recent revisions of the ALWTRP went into effect (NMFS, 2003b).

³⁵ Subsequent corrections, technical amendments, and modifications to the ALWTRP were issued in the following subsequent Federal Register notices: 67 FR 15493; 67 FR 65722; 68 FR 19464; 68 FR 51195.

³⁶ Entanglements may have occurred prior to implementation of the major ALWTRP provisions, and the entangled whales were not observed until after March 1, 2002. The whales with available sighting history data were not observed free of gear between March 1 and the date that they were reported to be entangled; therefore, these data cannot confirm that the entanglements occurred after the current ALWTRP implementation.

Exhibit 2-25		
ENTANGLEMENTS UNDER THE CURRENT ALWTRP		
	Indicated Entanglements First Observed From March 1, 2002 through December 31, 2002	
	Fatal	Live
Right whale	1	6
Humpback whale	5	14
Fin whale	1	0
Minke whale	2	2
TOTAL	9	22

Note:
This table provides data on live and fatal indications of entanglement only. Entanglements may have occurred prior to the implementation of current ALWTRP provisions, and the entangled whales were not observed until after March 1, 2002. The whales with available sighting history data were not observed free of gear between March 1 and the date that they were reported to be entangled; therefore, these data cannot confirm that the entanglement occurred after the current ALWTRP implementation.

Source: NMFS (2003b).

In 2003, large whales continued to become entangled in commercial fishing gear. The 2003 Large Whale Entanglement Report (NMFS, 2004) data indicate that four right whales, twenty humpback whales, and two minke whales were first observed live entangled in 2003. Fatal large whale entanglements reported in 2003 include two humpback whales, one fin whale, and seven minke whales.³⁷

Due to the continuing risk of serious injury and mortality of large whales since the most recent revisions of the ALWTRP have gone into effect, NMFS believes additional modifications to the ALWTRP are needed to meet the goals of the Marine Mammal Protection Act (MMPA) and the Endangered Species Act (ESA). In accordance with the MMPA, NMFS' goal for each of the three strategic large whale species (right, humpback, and fin) is to reduce incidental mortalities and serious injuries attributable to interactions with commercial fisheries to levels that do not exceed the Potential Biological Removal (PBR) level for each stock. On the basis of the data presented above, NMFS is considering further modification of the ALWTRP.

NMFS is considering various alternatives for modifying existing ALWTRP requirements, with the intent of identifying only one alternative in the FEIS. The alternatives under consideration seek to reduce the risk of large whale entanglement by measures such as folding in other trap/pot fisheries under the ALWTRP, reducing the profile of groundlines; and mandating gear modifications to vertical lines, for example, by requiring gear marking and the use of weak

³⁷ These reported entanglements were first observed in 2003; however, it is not certain that these entanglements actually occurred in 2003. This may be confirmed by examining the sighting histories of the entangled whales (if available) to determine when they were last sighted free of gear. The 2003 fatalities had indications of entanglement, but entanglement has not yet been confirmed to have been the primary cause of death. Final mortality determinations for the 2003 entanglement data will be made in a future Stock Assessment Report.

links of lower breaking strength. These changes are designed to address ongoing entanglement issues, especially those involving groundline. NMFS will be considering management options to further reduce entanglement risk associated with vertical line through a future rulemaking action. NMFS and others are currently researching other ways to reduce risk associated with vertical line, such as investigating the profiles of vertical line with different buoy line configurations (i.e., sinking/ neutrally buoyant vs. floating) as well as other modifications (i.e., requiring a minimum number of traps per trawl in certain areas). NMFS and others are also investigating how whales utilize the water column, including their foraging ecology and diving behavior, which will help to determine the appropriate mitigation strategies to reduce entanglement risk of vertical line. NMFS is presently developing management options to further discuss with the ALWTRT and is investigating effort reductions that are occurring through fishery management plans and protected species actions (e.g. take reduction plans and sea turtle regulations). Thus, more information and further discussions are needed in order to effectively reduce the risk associated with the profile of vertical line.

NMFS believes that addressing the risk associated with floating groundline by requiring the use of sinking and/or neutrally buoyant groundline will reduce serious injury and mortality of large whales due to incidental entanglement in commercial fishing gear.³⁸ A recent analysis of fishing gear involved in right and humpback whale entanglements confirms that any line rising into the water column presents an entanglement risk to large whales (Johnson et al., 2005). The study includes 45 right and humpback whale entanglement events, reported in both U.S. and Canadian waters, from which gear was recovered and/or identified.

Johnson et al. (2005) identifies four parts of fixed fishing gear that were involved in entanglements: buoy line, groundline, floatline, and surface system lines.³⁹ Where the part of the gear could be identified for both species combined, 56% (14 out of 25) of the animals were entangled in buoy line (seven of each species), 28% (seven out of 25) were entangled in groundline (four right and three humpback whales), 16% (four out of 25) were entangled in gillnet floatline (all humpback whales), and 8% (two out of 25) were entangled in surface system line (both right whales) (Johnson et al., 2005).⁴⁰ Note that these percentages exceed 100% because two animals (one of each species) were entangled in multiple parts of the same gear. These two whales were entangled in both buoy line and groundline, making it difficult to

³⁸ NMFS is proposing that the profile of groundline be reduced through the use of sinking and/or neutrally buoyant line. Although NMFS has received comments regarding the use of “low profile” line, further research and analysis is needed before NMFS can consider this modification. Chapter 3 provides additional information on this topic.

³⁹ Buoy line connects the gear at the bottom to the surface system. Groundline in trap/pot gear connects traps/pots to each other to form trawls; in gillnet gear, groundline connects a gillnet or gillnet bridle to an anchor or buoy line. Floatline is the portion of gillnet gear from which the mesh portion of the net is hung. The surface system includes buoys and high-flyers, as well as the lines that connect these components to the buoy line.

⁴⁰ NMFS gear experts rely on a variety of factors to help them identify the gear parts, including the presence of traps/pots, nets, buoys, and gangions (i.e., rope that attaches traps/pots to the groundline), as well as occasional interviews with gear owners. Interviews provide important information about where, when, and how the gear was set and possibly when the gear was lost. NMFS gear experts may also rely on high-quality photographic documentation of the entanglement.

determine which part of the gear the whales encountered first.⁴¹ It is important to note that when considering the above analysis, although portions of the gear (e.g., buoy line and groundline) were identified, without documentation of the events leading up to the entanglement, it is difficult to compare the relative risks associated with different parts of the gear. The reasons for this are elaborated below.

A large whale entanglement that is reported by an observer may not fully reflect the history of the entanglement (i.e., the exact point of contact and where the gear was located on the animal immediately after it became entangled, what part of the gear was involved, and whether any gear was shed by the whale prior to reporting). Scarring data of both right and humpback whales indicate that in many cases, these animals become briefly entangled in line or another part of the gear, which leaves minor scars. When a large whale encounters gear, it is often powerful enough to carry large amounts of the gear away with it (Clapham et al., 2001) and any gear that trails from a whale has the potential to get caught on other gear. If this occurs before the whale is reported entangled, it is extremely difficult to determine which part of the gear the whale encountered first. Entangling gear can also shift positions on a whale, further complicating an effective analysis of the nature of the entanglement. Finally, large whales may shed some of their entangling gear prior to reporting of the entanglement and, in some cases, not all entangling gear can be removed from an animal during disentanglement.

Based on the above information, NMFS believes that all parts of fixed gear create entanglement risk because all have been identified as entangling large whales. However, at this time, determining which part of fixed gear creates the most entanglement risk for large whales is difficult due to the uncertainties associated with entanglements, as well as unknown biases associated with fishing and reporting effort (Johnson et al., 2005). For example, buoy line may be reported more frequently at sea than groundline, since it is easier to recognize when a buoy or high-flyer is present. Groundline, on the other hand, does not have a distinguishing characteristic that would allow it to be identified without removing it from an entangled animal and analyzing it (Johnson et al., 2005). Therefore, it may appear that vertical line (buoy and surface system line) creates more of an entanglement risk than groundline. In some cases, it is still impossible to determine the gear part even when the gear is recovered and/or identified.⁴² Despite gear recovery and/or identification, 44% (20 out of the total 45) of the right and humpback whale entanglement events analyzed involved an unknown part of the gear (Johnson et al., 2005).

⁴¹ Trap/pot gear entangled one humpback whale and consisted of floating groundline as well as buoy line made of both floating and sinking line spliced together. The NMFS gear research team reports that the majority of lobster trap/pot and gillnet fishermen use buoy line that consists of two-thirds sinking line and one-third floating line. The floating line is located at the bottom end of the buoy line to keep the line from chafing on the seafloor. This humpback whale's entanglement involved gear originating from the mouth, and the whale may have encountered either gear part first. However, without documentation of the events leading up to the entanglement, it is impossible to determine where the whale encountered the gear and whether other body parts may have been involved prior to reporting of the entanglement. For the right whale, the composition of the buoy line and groundline were not determined; however, the gear type was identified as crab trap/pot. This whale's entanglement involved the tail, and as two gear parts were involved, it is difficult to determine which part of the gear the whale encountered first and whether other body parts may have been involved prior to reporting of the entanglement.

⁴² The NMFS gear research team usually identifies groundline based on the presence of a trap/pot and/or other factors such as the presence of gangions that are spaced at intervals which would suggest that the line is groundline.

Currently, the only definitive way to assess the nature of entanglements is through gear removal, as it is difficult to identify a line's origin through photographs alone (Johnson et al., 2005). However, all of the caveats noted above must be considered when gear has been recovered and an assessment is in progress.

NMFS believes that further research and discussions with the ALWTRT are needed to address risks associated with vertical line. Although the alternatives under consideration focus on reducing risks associated with groundline, NMFS addresses vertical line through such measures as mandating a reduction in the breaking strength of weak links, folding additional fisheries into the ALWTRP process, and considering the allowance of two buoy lines per trawl or string in some areas. In the latter case, requiring the use of one buoy line may encourage fishermen to split trawls or strings, thus increasing the number of buoy lines in the water column. In addition, requiring one buoy line may increase the risk of gear loss, thus increasing the entanglement risks associated with ghost gear.

A better scientific understanding about the nature of entanglements, specifically the gear parts involved (e.g., buoy line), would help NMFS to develop better management programs and reduce the risk of serious injury and mortality of large whales due to incidental interactions with commercial fisheries. Therefore, NMFS is also proposing to expand the gear marking requirements for vertical lines, which would provide information about the nature of the gear involved in large whale entanglements. Furthermore, this information may provide valuable insight concerning where, when, and how the entangling gear was set.

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Appendix 2A

WATERS EXEMPTED FROM ALWTRP

Current exempted waters are those waters landward of the first bridge over any embayment, harbor, or inlet and waters landward of the following areas:

Rhode Island

- Sakonnet River
- Narragansett Bay
- Point Judith Pond Inlet
- Ninigret Pond Inlet
- Quonochontaug Pond Inlet
- Weekapaug Pond Inlet

New York

- West of the line from the northern fork of the eastern end of Long Island, NY (Orient Point) to Plum Island to Fisher's Island to Watch Hill, RI (Long Island Sound)
- Gardiners Bay
- Shinnecock Bay Inlet
- Moriches Bay Inlet
- Fire Island Inlet
- Jones Inlet

New Jersey

- Barnegat Inlet
- Beach Haven to Brigantine Inlet
- Cape May Inlet
- Delaware Bay (i.e., from the southern point of Nantuxent Cove, NJ to the southern end of Kelly Island, Port Mahon, DE)

Maryland/Virginia

- Ocean City Inlet
- Chincoteague to Ship Shoal Inlet
- Little Inlet
- Smith Island Inlet

North Carolina to Florida

- All marine and tidal waters landward of the 72 COLREGS demarcation line, as depicted or noted on nautical charts published by NOAA and described in 33 CFR 80

For exact coordinates of the above mentioned exempted waters, see 50 CFR part 229.32.