

ENVIRONMENTAL ASSESSMENT
and
REGULATORY IMPACT REVIEW
of the
ATLANTIC LARGE WHALE
TAKE REDUCTION PLAN
and
IMPLEMENTING REGULATIONS

JULY 1997

National Marine Fisheries Service
National Oceanic and Atmospheric Administration
DEPARTMENT OF COMMERCE

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**Environmental Assessment of the
NMFS Atlantic Large Whale Take Reduction Plan and
Implementing Regulations**

1.0 Introduction

Per the 1994 amendments to the Marine Mammal Protection Act (MMPA), the National Marine Fisheries Service (NMFS) convened a team of stakeholders to develop a plan for reducing the incidental by-catch of large whales in four commercial fisheries along the Atlantic coast. The team, called the Atlantic Large Whale Take Reduction Team (ALWTRT), consisted of representatives from the fishing industry, the fishery management council, state and federal resource management agencies, the scientific community, and conservation organizations. The immediate goal of the ALWTRT was to draft a plan to reduce the incidental take of the four primary large whale species that interact with fisheries -- the northern right whale (*Eubalaena glacialis*), humpback whale (*Megaptera novaeangliae*), fin whale (*Balaenoptera physalus*), and minke whale (*Balaenoptera acutorostrata*) -- to a level less than the potential biological removal level (PBR) within six months of implementation of the team's plan. The PBR is defined as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock, while allowing that stock to reach or maintain its optimum sustainable population. Although consensus was not reached on some aspects of the plan the facilitator provided a report documenting the substantial deliberations of the ALWTRT.

The northern right whale is the most endangered of the large whale species. The minimum population estimate is only 295 animals, and the species seems susceptible to serious injury and mortality through fishery entanglements and ship strikes. The PBR for this stock is 0.4 animals per year. Serious injuries and mortalities of right whales in fishing gear averaged 1.1 animals per year from 1991 through 1996. This level exceeds PBR. Humpback whales and fin whales are also considered endangered species. The minimum population estimate for the western North Atlantic stock of humpback whales is estimated to be 4,848 whales and the PBR is 9.7 animals per year. The minimum estimate of portion of the fin whale population that inhabits US waters is 1,704 animals and the PBR for the stock is 3.4 whales. Minke whales are not listed under the Endangered Species Act (ESA) but are protected under the MMPA. The population estimate for the portion of the western North Atlantic stock that inhabits US waters is estimated to be a minimum of 2,053 animals and its PBR is 21 whales (Waring, 1996). The humpback, fin, and minke estimates are believed to represent a fraction of larger stocks whose ranges extend into Canadian waters and North Atlantic waters to the north and east of the US, but right whales elsewhere in the North Atlantic are extremely rare.

The Gulf of Maine sink gillnet fishery, the Gulf of Maine/ U.S. mid-Atlantic lobster trap/pot fishery, the mid-Atlantic coastal gillnet fishery and the Southeastern U.S. Atlantic shark gillnet fishery have been identified as fisheries which incidentally take large whales along the US

Atlantic Coast. It is recognized that these gear types are not the only source of fishery related mortality. Takes in the swordfish driftnet fishery are addressed in the Atlantic Offshore Cetacean Take Reduction Plan. Takes in Canadian fisheries have been documented, although their impact is not directly addressed in this plan. Takes by other US fisheries have occurred historically at low levels; however, these records have not yet been analyzed to determine serious injury or mortality rates.

In accordance with Section VII of the ESA, NMFS is required to consider what impacts fishing activities governed by its Fishery Management Plans (FMP) may have on ESA-listed species. This deliberative process is called a Section VII consultation. NMFS had previously completed consultations on the Northeast Multispecies FMP and the American Lobster FMP. NMFS had also reinitiated consultation and issued new biological opinions (NMFS, 1996b and 1996c respectively) which assessed new information regarding the overall fisheries practices carried under the two plans and to consider new data on the status of the northern right whale. Each Biological Opinion concluded that continued fishing activities under the FMP would jeopardize the existence of the northern right whale. NMFS then, as required by the ESA, implemented certain Reasonable and Prudent Alternatives to alleviate the threat of jeopardy to right whales. Framework Adjustment 23 to the Multispecies FMP (50 CFR 648.87) and emergency regulations affecting the lobster fishery (50 CFR 229.30), issued under the MMPA, have implemented a portion of the Reasonable and Prudent Alternatives. The Atlantic Large Whale Take Reduction Plan (ALWTRP) is expected to provide continued protection to right whales, as well as the other large whale species, and will serve as additional measures to those issued under Framework 23 and the emergency MMPA regulations.

2.0 PURPOSE AND NEED FOR ACTION

2.1 Background

NMFS issues this interim final rule to introduce a plan to reduce the bycatch of several large whale stocks that occur incidental to fishing for multiple groundfish species, including monkfish and dogfish, in the Gulf of Maine sink gillnet fishery; for multiple species in the U.S. mid-Atlantic coastal gillnet fishery; for lobster in the Gulf of Maine, U.S. mid-Atlantic lobster trap/pot fishery; and for sharks in the Southeastern U.S. Atlantic shark gillnet fishery. Although consensus was not reached by the ALWTRT, the NMFS is required to prepare an Atlantic Large Whale Take Reduction Plan (ALWTRP) pursuant to Section 118(f)(7)(B)(ii) of the MMPA. In accordance with this requirement, NMFS published a proposed ALWTRP with implementing regulations on April 7, 1997 (62FR16519-16538). The interim final rule for which this EA was prepared revises that proposed rule substantially.

Since it was first passed in 1972, one of the underlying goals of the Marine Mammal Protection Act (MMPA) has been to reduce the take of strategic stocks of marine mammals incidental to commercial fishing operations to insignificant levels approaching a zero mortality and serious injury rate (Section 101(a)(2) of the MMPA). Section 11 of the 1994 amendments

to the MMPA reaffirmed this Zero Mortality Rate Goal [(ZMRG)(Section 118 (b)(1))] and requires NMFS to review each fishery's progress toward the ZMRG within 3 years of enactment (April 30, 1997), and report the results of this review to Congress within 4 years of enactment [April 30, 1998)(Section 118(b)93)]. The amendments specify that all fisheries must attain this goal within 7 years of enactment [(April 30, 2001)(Section 118(b)(2))].

To facilitate reduction of incidental serious injury and mortality to high priority marine mammal stocks, Section 118(f) requires NMFS to develop and implement a take reduction plan to assist in the recovery or to prevent the depletion of each strategic stock that interacts with a Category I or II fishery. Category I or II fisheries are fisheries that have frequent or occasional incidental mortality and serious injury of marine mammals, respectively. A strategic stock is a stock: (1) for which the level of direct human-caused mortality exceeds the potential biological removal (PBR) level; (2) which is declining and is likely to be listed under the Endangered Species Act (ESA) in the foreseeable future; or (3) which is listed as a threatened or endangered species under the ESA or as a depleted species under the MMPA. The immediate goal of a take reduction plan is to reduce, within 6 months of its implementation, the mortality and serious injury of strategic stocks incidentally taken in the course of commercial fishing operations to below the PBR levels established for such stocks. The long-term goal of the plan is to reduce, within 5 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.

The Gulf of Maine sink gillnet fishery is a Category I fishery that has an historical incidental bycatch of humpback, minke, and possibly fin whales. This gear type has been documented to take right, humpback, fin, and minke whales in Canadian waters. Additionally, entanglements of right whales in unspecified gillnets have been recorded historically for U.S. waters. Although U.S. sink gillnets have not been conclusively identified as having taken right whales, it is likely that a fraction of the unspecified gillnet entanglements in U.S. waters involved sink gillnet gear. Therefore, the potential for the severely depleted right whale to become entangled in U.S. sink gillnet gear clearly exists. The Gulf of Maine/ U.S. mid-Atlantic lobster trap/pot fishery is a Category I fishery that has an historical incidental bycatch of right, humpback, fin and minke whales. The mid-Atlantic coastal gillnet fishery is a Category II fishery that has an historical incidental bycatch of humpback whales. The Southeastern U.S. Atlantic shark gillnet fishery is a Category II fishery that is believed to be responsible for bycatch of at least one right whale. These four fisheries are therefore addressed in the ALWTRP.

NMFS established the ALWTRT on August 6, 1996 (61FR40819), to prepare a draft take reduction plan to reduce takes of humpback, fin and right whales, which are listed as endangered species under the ESA (and are thus considered strategic stocks under the MMPA) by the four above-mentioned Category I and II fisheries that interact with them. Although

minke whales are not considered strategic at this time, the ALWTRT was also asked to consider measures that would reduce takes of minke whales if time permitted.

The ALWTRT included representatives of NMFS, NOAA National Marine Sanctuary Program, the Marine Mammal Commission, Maine Department of Marine Resources, Massachusetts Division of Marine Fisheries, Rhode Island Division of Fish and Wildlife, Maryland Department of Natural Resources, Virginia Marine Resources Commission, North Carolina Division of Marine Fisheries, Georgia Department of Natural Resources, Florida Department of Environmental Protection, New England Fishery Management Council, Mid-Atlantic Fishery Management Council, environmental organizations, academic and scientific organizations, and participants in the fisheries considered in this plan. In selecting these team members, NMFS sought an equitable balance among representatives of resource user and non-user interests.

The ALWTRT was tasked with developing a consensus plan for reducing mortality and serious injury of strategic large whale stocks, and of minke whales if time permitted, in the fisheries considered in this plan. The ALWTRT met 6 times between September 1996 and January 1997 and submitted a report to NMFS on February 5, 1997 (ALWTRT 1997). The report submitted by the team's facilitator reflects the best effort to develop a consensus-based plan. While consensus was not reached on all issues, the team provided NMFS with a significant and useful framework for developing proposed implementing regulations. The submitted report includes (1) A review of the current information on the status of the affected strategic marine mammal stocks; (2) descriptions of the Gulf of Maine multispecies sink gillnet fishery, the mid-Atlantic coastal gillnet fishery, the Gulf of Maine and U.S. mid-Atlantic lobster trap/pot fisheries, and the Southeastern U.S. Atlantic shark gillnet fishery; (3) proposed recommendations to reduce the bycatch of large whales; and (4) other recommendations regarding research needs for implementation of the plan.

Immediately following the final meeting of the ALWTRT, NMFS received several additional comments and recommendations from ALWTRT members. These comments were considered as part of the complete submission by the ALWTRT, including majority/minority views, pursuant to Section 118(f)(7)(A)(ii) of the MMPA. Based on these comments, NMFS published a proposed ALWTRP in the Federal Register on April 7, 1997 (62 FR 16519).

Subsequent to the publication of the proposed ALWTRP, NMFS conducted 12 public hearings and received numerous written comments about the proposal (see comment section below). In addition, it convened a Gear Advisory Group composed of fishermen and gear technology experts to provide additional advice on ways to rig lobster and gillnet gear to lower the risk of entangling large whales. The group met on June 4-5 and provided NMFS with lists of currently available gear modifications that it felt would reduce the risks of entanglement. It also developed lists of potential gear modifications that are not yet operational but which might further reduce entanglement risks after further research and development. NMFS also received approximately 13,000 written comments and petitions on the proposed rule.

NMFS evaluated the draft report submitted by the ALWTRT, the extensive comments received both at the public hearings as well as written comments received during the public comment period, and the advice of the gear advisory group in terms of the potential effectiveness of each measure toward reaching both the 6-month goal of reducing incidental serious injuries and mortalities of large whales to levels below PBR and toward the 5-year goal of reducing takes to insignificant levels approaching ZMRG. NMFS has developed the final plan to both require regulations and implement proactive programs designed to reach the specific take reduction goals. NMFS is committed to work with appropriate State and other federal agencies to meet and monitor progress toward those goals.

This plan differs substantially from the one proposed in April (see section 3.7, "Changes from the proposed rule"). Therefore, it is being issued as an interim final rule. This interim final rule will become effective on November 15, 1997, unless superseded by the final rule. Comments on the interim final rule are due by October 15, 1997.

2.2 Status of the Large Whales

Northern Right Whale

The northern right whale is the most severely depleted of the large whales that frequent the US East coast. The 1995 Stock Assessment Report prepared by NMFS (Waring, 1996) references the 1992 estimate of 295 (Knowlton et. al. 1994) as the current minimum population estimate for the northern right whale. The size of the population may have been as low as 50 or fewer animals at the turn of the century, suggesting that the stock is showing signs of slow recovery. Due to the limited size of the population, the lengthy calving interval, and other factors that may be affecting population growth (Waring, 1996), it is expected that each mortality will further inhibit recovery of this species. Recent increased cooperation among state and federal agencies in reporting sightings of both dead and living whales has resulted in more information on mortalities. Other than the few calves that have died from natural causes, many of these known deaths are related to human activity, specifically ship strikes and fishery interactions.

The right whale distribution patterns have been long studied but are still incomplete. Mating activity, is seen in all waters, although calving is concentrated in the SEUS critical habitat area off Georgia and Florida. The period of highest use in this area is from November to March. Cow/calf pairs are often seen migrating north along the east coast as they move toward feeding areas in New England. Right whales begin congregating in Cape Cod Bay in December, and some right whales are generally in the Bay through April. The whales then tend to move offshore to feed in the rich and productive waters of the Great South Channel. They are joined there by significant numbers of humpback and fin whales through June. The whales then move north to the Canadian feeding grounds in the lower Bay of Fundy and Browns/Baccarro Banks regions. Right whales leave these northern feeding grounds in October or November. Although it is clear that females about to give birth move south to the Georgia-Florida area, more than half of the population are not seen during the winter months.

Furthermore, the high use areas described above are not the exclusive habitats for this species. Sighting information, confirmed by satellite tracking data have shown that individuals will periodically move away from these high use areas and undertake long foraging trips to other areas.

North Atlantic Humpback Whale

The 1995 Stock Assessment Report (Waring, 1996) lists the minimum population estimate for the Western North Atlantic humpback stock as 4,848. The mean calving rate for the population has been observed to be about 8% per year. The humpback whale distribution patterns have been long studied, with mating and calving activity concentrated in the Caribbean on the banks off the Dominican Republic in the winter months. Juvenile humpbacks have been recently sighted in the winter off the Mid-Atlantic coast of Virginia. Humpback whales begin congregating in the rich and productive waters of the Great South Channel in April and May. The whales then move north to the Gulf of Maine feeding grounds in the Stellwagen Bank and Jeffreys Ledge area as well as lower Bay of Fundy. Other feeding areas are known to be off Newfoundland and Labrador, Canada. Humpback whales leave these northern feeding grounds in October or November.

Humpback whales are occasionally seen entangled in fishing gear in all of their northern feeding grounds. Scarring evidence from photo-identification work also suggest they are susceptible to ship strikes. The PBR (9.7) for this species is close to the numbers of animals known to be killed or injured in fishing gear. However, the continued high calving rate for this species and the increasing population estimates suggest that these mortality factors are not having as significant effect on this population as with the right whale.

Fin Whale

The 1995 Stock Assessment Report (Waring, 1996) lists the minimum population estimate for the Western North Atlantic fin stock as 1,704, although this estimate is derived from surveys that did not cover the complete range of the stock. Entanglement and ship strikes have continued to contribute to the total known mortality rate for fin whales on the U.S. East Coast. It is possible that known fin mortality is under-represented relative to humpback and right whale estimates due to the fact that fin carcasses are more likely to sink immediately after death. In addition, fins tend to spend less time in inshore waters, so they are less likely to encounter certain anthropogenic impacts. Floating carcasses would be less likely to be observed further offshore.

Fin whale distribution is not well known. Sighting information describes a general distribution of this species all along the continental shelf edge in the summer and fall. They are also sighted along the shelf edge in the winter, but in fewer numbers suggesting an offshore movement in winter. They are fast whales capable of feeding on large schooling fishes which are found all along the continental shelf edge in all seasons.

Minke Whale

Of the large whale species addressed under this plan, the minke whale is the smallest and this species is not listed under the ESA. Minke whales enjoy broad distribution from polar through tropical waters. The minke is found in all waters within the US Atlantic EEZ, and whales sighted in these waters are considered part of the Canadian East Coast Stock. The whales are common and widespread on the continental shelf, particularly off New England, during the spring and summer. Evidence suggests a tropical and deep-ocean component to the species' distribution during the cooler months. The minimum population estimate for the Gulf of Maine/lower Bay of Fundy is 2053 whales although this estimate is derived from surveys that did not cover the complete range of the stock. The PBR is 21 animals per year (Waring, 1996).

2.3 Prior NMFS and NEFMC Actions

The NMFS reinitiated the extant Biological Opinions issued for the Northeast Multispecies and American Lobster Fishery Management Plans (NMFS 1996b and 1996c, respectively) in order to assess new information regarding the overall fisheries practices carried out under the two plans and to consider new data on the status of the northern right whale. Both Biological Opinions reached jeopardy conclusions for right whales that recommended certain Reasonable and Prudent Alternatives to avoid jeopardy to right whales. Framework Adjustment 23 to the Multispecies Plan (50 CFR 648.87) and emergency regulations (50 CFR 229.30) issued pursuant to the MMPA have implemented a portion of the Reasonable and Prudent Alternatives for both plans. Framework 23 prohibits fishing with a sink gillnet, or other gillnet capable of catching multispecies, in the designated right whale critical habitat areas during periods of peak whale abundance; namely, April 1 through June 30 in the Great South Channel critical habitat and January 1 through May 15 in the federal portion of the Cape Cod Bay critical habitat. Until amended by NMFS and the NEFMC, its restrictions and the protections afforded the whales will stand. The emergency rule under the MMPA prohibited the use of lobster trap/pot gear in the Great South Channel critical habitat area and allowed only modified lobster gear in the federal portion of Cape Cod Bay critical habitat during the same periods of the Framework 23 restrictions, but for calendar year 1997 only. That emergency rule expired on June 30, 1997.

The ALWTRP will establish the provisions of Framework 23 and the lobster gear restriction of the emergency MMPA action as a permanent (as opposed to a temporary emergency) regulations under the MMPA. Doing so will provide continued protection to right whales, as well as humpback, fin, and minke whales. Implementation of the ESA Reasonable and Prudent Alternatives and the MMPA take reduction plans is expected to reduce the impact of fisheries gear interactions to a level that is unlikely to jeopardize the continued existence of the right whale. These efforts, in conjunction with measures implemented to reduce other sources of right whale serious injury/mortality, such as ship strikes, are expected to reduce these cumulative impacts to the point where human activities no longer restrict the species' ability to recover to optimum levels, given the carrying capacity of its habitat.

3.0 PROPOSED ACTION AND RATIONALE

This interim final rule has been substantially modified from the rule proposed by NMFS on April 7, 1997. Major changes have been made to boundaries of affected areas, gear and marking requirements, and contingency measures. Because the changes from the proposed rule are so significant, NMFS is issuing these regulations as an interim final rule to allow comments on this version of the ALWTRP. This rule will become effective on November 15, 1997, unless it is superseded by a notice in the Federal Register prior to that date.

3.1 Plan Goals

As stated above and as required by the MMPA, the plan has two goals. The first goal is to reduce serious injuries and mortalities of right whales in fishing gear to below 0.4 animals per year by January 1998. The second goal is to reduce by April 30, 2001, entanglement-related serious injuries and mortalities of right whales, humpback whales, fin whales and minke whales to insignificant levels approaching a zero mortality and serious injury rate, taking into account the economics of the fisheries, the availability of existing technology and existing State and regional fishery management plans.

Certain waters outside critical habitat are exempt from this plan, specifically gear set in rivers, harbors, most bays, Long Island Sound and waters landward of barrier islands. These are areas where right whale occurrences are so rare that NMFS does not believe gear requirements will have any effect on reducing entanglements. For a precise definition of the exempted areas, see Section 3.6.

3.2 Steps to Achieve the Short Term Goal

The actions and regulations contained in this interim rule, plus those either in place or to be taken under other Take Reduction Plans being implemented in the Northeast Region, including the Atlantic Offshore Take Reduction Plan, are designed to assist in the recovery of the large whale populations. This plan is expected to achieve the necessary take reductions within six months through: 1) closures of critical habitats to some gear types during times when right whales are usually present; 2) restricting the way strike nets are set in the southeastern U.S. driftnet fishery to minimize the risk of entanglement; 3) requiring that all lobster and sink gillnet gear be set in such a way as to prevent line from floating at the surface; 4) requiring all lobster and anchored gillnet gear to have at least some characteristics that are likely to reduce the risks of entanglements, 5) requiring that drift gillnets in the mid-Atlantic be either tended or stored on board at night; 6) improving the voluntary network of persons trained in disentangling right whales; and 7) prohibiting storage of inactive gear in the ocean.

The ALWTRP calls for certain measures to take place in specific area by gear category. The areas are depicted in Figure 1 (Lobster Gear) and Figure 2 (Gillnet Gear) that follow.

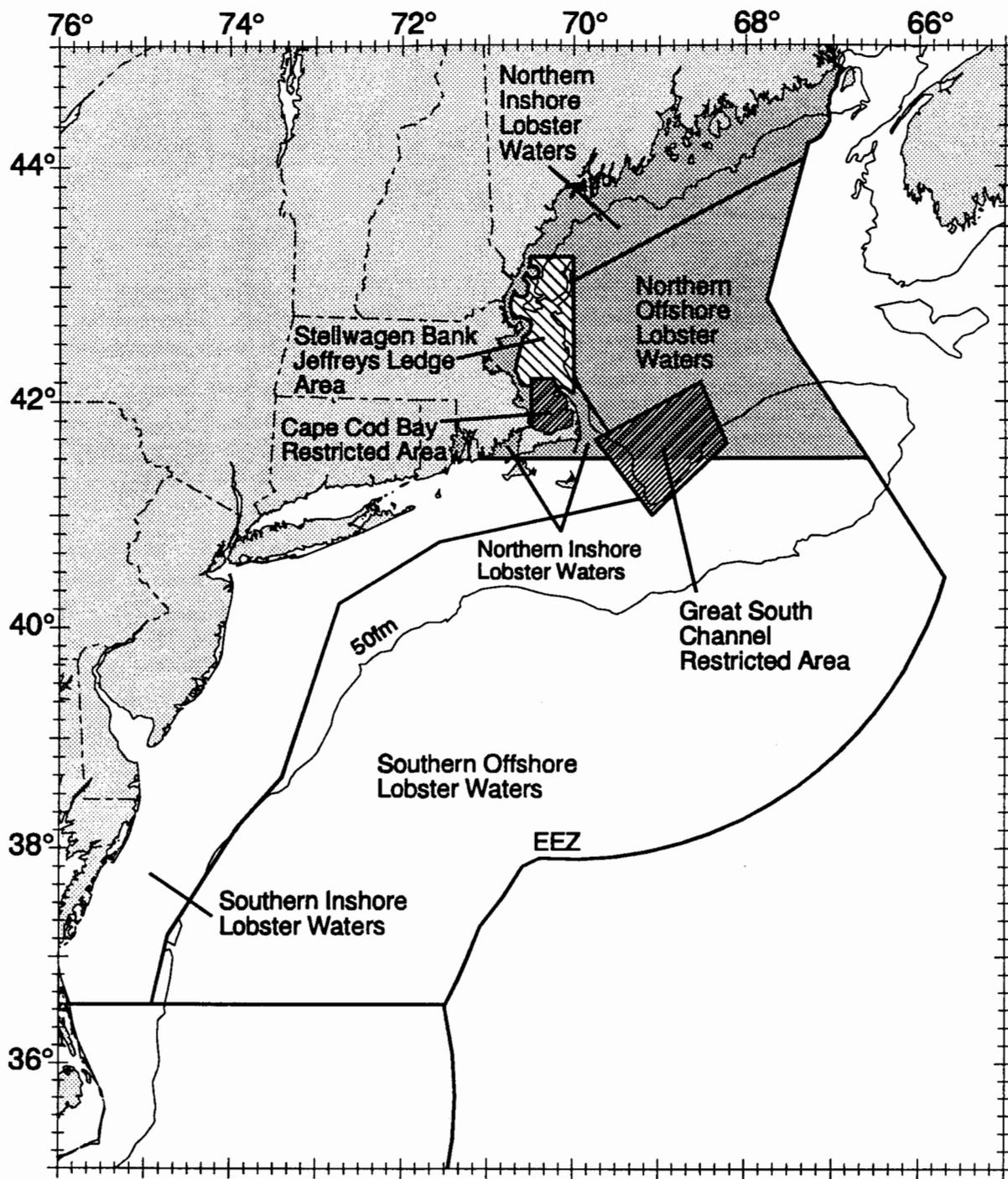


FIG.1 Lobster Gear Restrictions



National Oceanic and Atmospheric Administration
 National Marine Fisheries Service
 Northeast Regional Office
 Gloucester, MA

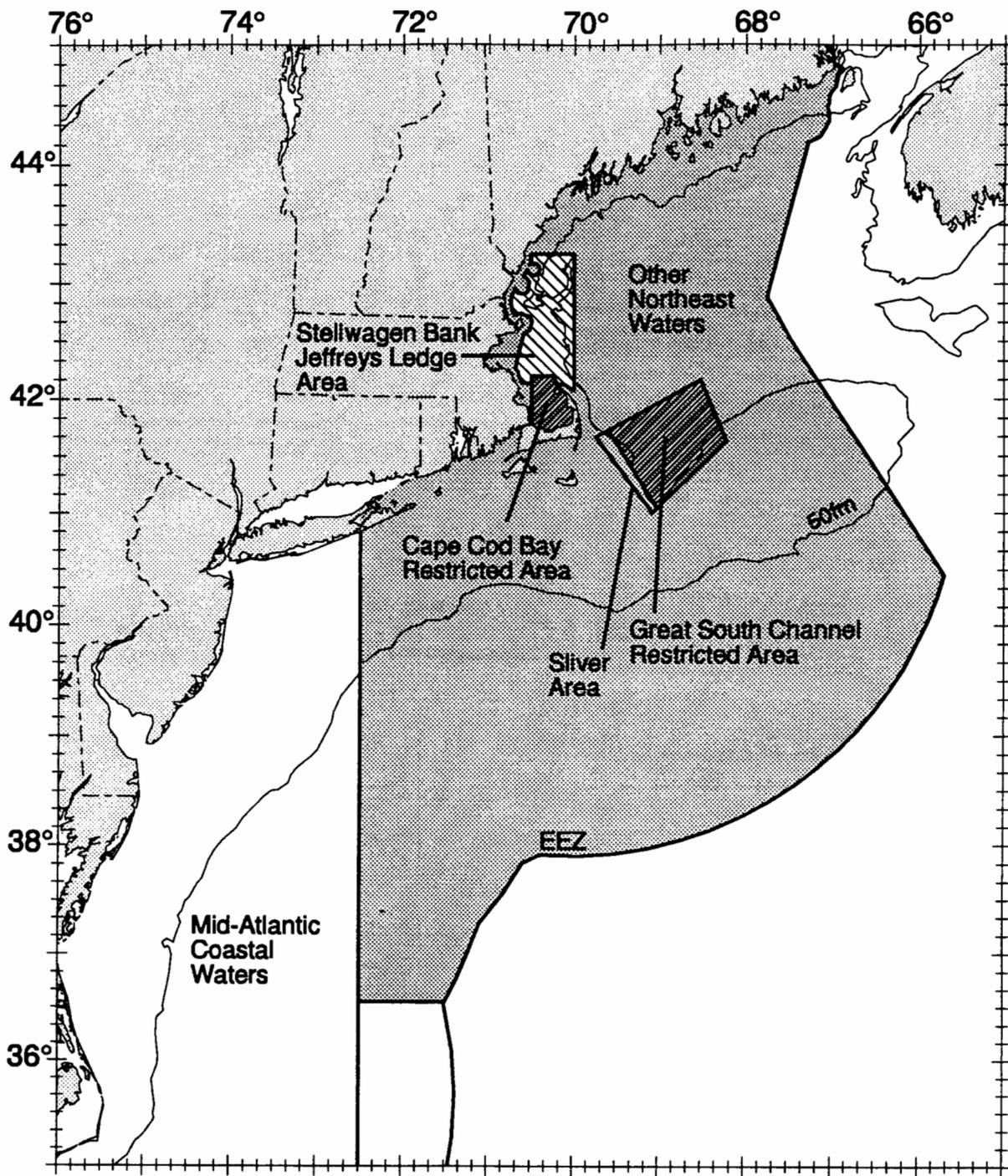


FIG. 2 Gillnet Gear Restrictions



National Oceanic and Atmospheric Administration
 National Marine Fisheries Service
 Northeast Regional Office
 Gloucester, MA

Right whales are typically found in the Cape Cod Bay Critical Habitat from January 1 through May 15 and in the Great South Channel critical habitat from April 1 to June 30. In order to more fully protect right whales during these times, in April 1997, NMFS implemented framework adjustment 23 to the New England Fisheries Management Council's Multispecies Management Plan. NMFS also issued emergency regulations regarding lobster management. This interim final rule implements on a permanent basis the temporary closures established by those two actions. Specifically, this interim final rule closes the Cape Cod Bay Critical Habitat to sink gillnet fishing during the high right whale use period (January 1 through May 15). Lobster gear in that area will be allowed but will have to be substantially modified to minimize the risk of entangling right whales. Lobster Gear will be prohibited during the high right whale use months in the Great South Channel (April 1 through June 30), most of which will also be closed to gillnet fishing.

NMFS will allow sink gillnets to be set during the April through June high right whale use period in a "sliver area" of the Great South Channel critical habitat. The sliver area is comprised of the waters in the Great South Channel critical habitat west of the LORAN C 13710 line. Only three percent of right whale sightings in the Great South Channel have occurred in that area.

Although not allowing lobster pot gear in the area west of the Loran C 13710 line from April 1 to June 30 may appear inconsistent with what NMFS proposes for sink gillnet gear in this area, NMFS believes that lobster pot gear poses a greater threat to right whales than does sink gillnet gear in this area. The offshore location generally requires that gillnetters tend their gear, whereas lobster pot gear in this area is often not checked for extended periods especially if there is bad weather.

NMFS is closing the Great South Channel critical habitat to lobster pot gear during the high right whale use period, but will require gear modifications in the Cape Cod Bay critical habitat over the comparable period. The rationale for this difference is that there is a higher likelihood that an entangled whale in Cape Cod Bay will be sighted and reported, due to the high level of vessel traffic and more research efforts in that area. Potential whale entanglements in Cape Cod Bay are considered more likely to be observed and reported to the disentanglement network. In addition, disentanglement efforts may be more effective in reducing the potential for serious injuries and mortalities in these relatively shallow, near-shore waters than in offshore waters. The Great South Channel critical habitat is further offshore and little whale watching or survey effort exists there. The likelihood of observing an entangled whale offshore is lower, and offshore disentanglement efforts are subject to greater logistical impediments.

An area from Sebastian Inlet, Fl. to Savannah, Ga. out to 80° W longitude will be closed to all shark driftnet fishing, except for strikenetting, each year from November 15 to March 31. This closed area includes the southeastern U.S. right whale critical habitat, which is a nursery area for mothers and calves.

Strikenetting in southeast waters will be permitted during the high risk period only if: (1) no nets are set at night or when visibility is less than 500 yards (460 m), (2) each set is made under the observation of a spotter plane, (3) no net is set within 3 miles of a right, humpback or fin whale, and (4) if a whale comes within 3 miles of set gear, the gear is removed from the water immediately. NMFS believes these measures will minimize the risk of entangling any large whale.

This rule also requires that all lobster and anchored gillnet gear be rigged in such a way as to prevent the buoy line from floating at the surface at any time. All large whales are vulnerable to entanglement in any line floating on the surface of the water. Right whales are particularly vulnerable to this entanglement threat, since they are known to "skim feed" by swimming slowly at the surface with their mouths open.

NMFS is also establishing lists of gear characteristics that are expected to decrease the risks of entanglement if used (see below for lists). Lobster gear and anchored gillnet gear used in low risk areas will be required to have at least one of the characteristics. Similar gear set in high risk areas are required to have at least two of these characteristics. The lists published in this interim rule are based on public comments and the recommendations of the Gear Advisory Group and generally reflect current general fishing practices. NMFS believes that most fishermen will be in compliance with the current list without changes to their gear. Some fishermen will have to modify their gear to comply with this regulation, hence there will be a small immediate risk reduction from this requirement. The main purpose of this measure is to initiate a flexible process of gear modification over the next four years (see discussion under "steps to achieve ZMRG" below). There are slightly different lists for inshore and offshore lobster fisheries, because of the much heavier gear requirements for fishing offshore. Because inshore and offshore lobster gear have different requirements, NMFS will require that the gears be marked differently as well.

This rule also requires that mid-Atlantic drift gillnet gear be either removed from the water each night or be attached to the vessel. The purpose of this measure is to reduce the chances that a whale will encounter gear that is not anchored. This provision will be in effect from November 1 to March 31 of each year, during the time when whales, primarily right and humpback whales, are expected to be migrating through the mid-Atlantic.

Disentangling a whale can reduce the seriousness of an injury or prevent death due to entanglement. NMFS continues to commit funds to support and improve the disentanglement effort to help meet the both the six month and the long-term goal (see following discussion under "steps to achieve ZMRG").

3.3 Steps to Achieve the Zero Mortality Rate Goal

Unlike PBR, the MMPA does not define how to calculate ZMRG. For the purposes of this rule, NMFS intends to interpret ZMRG to be 10 percent of the PBR level for each stock until

a formal definition of ZMRG is established. The plan has the realistic potential to reach the 5 years by continually reducing the number of entanglements causing serious injury and mortality to a level of 10% of PBR. If the plan succeeds in reaching 10% of PBR (0.04 for right whales), this would be the equivalent of achieving the most conservative estimate of ZMRG. The likelihood of succeeding in reducing such entanglement to 10% of PBR will hinge on many factors. Achieving ZMRG with this plan depends on continued improvements to the disentanglement response teams and through gear research that identifies appropriate gear modifications that further reduce either the likelihood or the seriousness of an entanglement. This effort will only succeed with the willing participation of the fishing industry, especially in reporting and assisting in disentanglement efforts and in developing gear that will reduce the risks of entanglement. Accordingly, this plan emphasizes research on gear modifications, outreach and education efforts to share information between NMFS and fishermen, and active involvement of interest groups through the Take Reduction Team process. This does not rule out the possibility of further limited closures if gear modifications and disentanglement do not appear able to achieve ZMRG.

The steps in this ALWTRP designed to facilitate continued reductions in entanglements include: 1) a commitment to improve public involvement in take reduction efforts, including consulting with the ALWTRT and the Gear Advisory Group and conducting outreach and educational workshops for fishermen; 2) instituting "Take Reduction Technology Lists" from which fishermen must choose gear characteristics that are intended to decrease the risks of entanglement; 3) facilitating further gear modification research; 4) continuing to improve the disentanglement effort, including encouraging more cooperation from fishermen; 5) prohibiting "wet storage" of gear; 6) implementing a gear marking program, 7) developing contingency plans in cooperation with States for when right whales are present at unexpected times and places; 8) working with Canada to decrease entanglements in its waters; 9) improving monitoring of the right whale population distribution and biology, and 10) an abbreviated rulemaking process to allow NMFS to change the requirements of the plan through notification in the Federal Register, thereby improving the responsiveness of NMFS.

NMFS intends to make active use of the Large Whale Take Reduction Team to review progress and make recommendations on how to continue to decrease serious injuries and mortalities due to entanglements. As a first step in that process, NMFS will convene the ALWTRT in the Fall of 1997 to review this plan and its associated interim final rule. NMFS may modify the plan if it receives a consensus recommendation from the team to do so. In addition, NMFS plans to reconvene the ALWTRT in 1998 to review the progress made during the six months of the plan and to evaluate whether the short-term goal has been met.

NMFS is developing fishermen outreach and education programs. These programs will have two main goals: (1) to inform fishermen of the status of whales, the requirements of the MMPA and this plan and to improve cooperation with disentanglement efforts, and (2) to exchange views and solicit advice from fishermen on appropriate gear modifications for their area or other take reduction methods.

The use of gear modifications to minimize the risks of entangling large whales will be a key to the long-term success of this plan. As a first step in that direction, NMFS will require that by January 1998 all lobster and anchored gillnet gear, including sink and coastal gillnet gear, have some characteristics that reduce the risks associated with entanglement. Because fishing conditions vary throughout the Atlantic, NMFS will not require specific modifications to be applied to all gear at this time. Instead, this interim rule contains lists of acceptable gear characteristics based on information received from public comments, including discussions of the Gear Advisory Group. Vessels fishing in low risk areas will be required to ensure that their gear has at least one of the listed characteristics. Those fishing in areas where the risk of entanglement is high (i.e., Stellwagen and Jeffreys Ledge and in critical habitats during periods of relatively low right whale use) are required to ensure that their gear has at least two of the listed characteristics. Because fishing conditions require heavier gear offshore, for the time being there are different tensile breaking strengths for offshore and inshore lobster gear.

The lists of acceptable gear characteristics from which fishermen may select to comply with the regulations in this plan are as follows:

Lobster Take Reduction Technology List

1. Buoy lines are 7/16 inches in diameter or less,
2. Buoys are attached to the buoy line with a weak link having a maximum tensile strength of 1100 pounds. Weak links may include swivels, plastic weak links, rope of appropriate diameter, hog rings, or rope stapled to a buoy stick.
3. For gear set in offshore lobster areas only, buoys are attached to the buoy line with a weak link having a maximum tensile strength of 3780 pounds.
4. For gear set in offshore lobster areas only, buoys are attached to the buoy line by a section of rope no more than 3/4 the diameter of the buoy line.
5. Buoy lines are composed entirely of sinking line.
6. Ground lines are made of sinking rope.

Gillnet Take Reduction Technology List

1. Buoy lines are 7/16 inches in diameter or less,
2. Buoys are attached to the buoy line with a weak link having a maximum tensile strength of 1100 pounds. Weak links may include swivels, plastic weak links, rope of appropriate diameter, hog rings, or rope stapled to a buoy stick.
3. Gear is anchored with the holding power of a 22 pound danforth-style anchor at each end,
4. Gear is anchored with a 50 pound dead weight at each end,
5. Nets are attached to a lead line weighing more than 100 pounds per 300 feet,
6. Weak links with a breaking strength of up to 1100 pounds are installed in the float rope between net panels.
7. Buoy lines are composed entirely of sinking line.

The above lists may be modified in the future if new gear is developed and tested in field trials or if any of the characteristics on the list published with this interim rule are determined by NMFS to be insufficient to reduce entanglement risks. NMFS intends to seek the advice of the Take Reduction Team, the Gear Advisory Group and to seek public comment before adding items to the lists.

The Gear Advisory Group also made several suggestions for gear characteristics that are not included in the lists above. Specifically, the Group recommended that light-colored line be used because it might increase visibility and that sections of buoy lines be joined with a splice rather than a knot. NMFS recommends that fishermen adopt these techniques, because they may help reduce entanglements. NMFS is not including these measures on the Take Reduction Technology Lists at this time, however. NMFS has no scientific evidence that the color of the line has any effect on entanglements, and, although NMFS believes that spliced line will generally be smoother than lines with knots in them, fishermen have developed some knots that are almost as smooth as splices (in order to pass through the hauler more easily). Knotted line is also weaker than spliced line and may part more easily if a whale is entangled in it.

NMFS is also supporting research and development of gear modifications that may reduce the risk of entangling large whales. The Gear Advisory Group identified several techniques that might be effective with further development. NMFS has committed funds to study several of these this year and plans to continue to provide funding for this kind of research in the future. NMFS expects to reconvene the Gear Advisory Group to review progress on gear research and development and to continue to suggest future research directions.

In addition to the regularly funded disentanglement team in the Gulf of Maine, disentanglement efforts have been initiated outside New England waters. NMFS will continue to work with the disentanglement network to form local "first response" teams which can respond to entanglements in other areas and of other species prior to (or in some cases in lieu of) dispatching the disentanglement teams. NMFS is also funding and/or working cooperatively with other groups to expand the current survey effort to better monitor at-risk areas. These surveys will increase opportunities for sighting entangled whales, as well as warning ships of the presence of right whales in an area.

The removal of lost or unused gear from the water will also help reduce the risk of entanglement. This rule contains a prohibition on "wet storage" of lobster gear--the practice of storing gear in the water--through a requirement that gear be hauled at least every thirty days. (Note that this provision was characterized in the proposed rule as a 30-day "inspection" requirement, a term which caused confusion.)

Through the gear marking requirements, NMFS hopes to obtain more data regarding where entanglements occur and what gear types need further attention. NMFS will require marks on six categories of gear--inshore and offshore lobster gear, anchored gillnets in northeast and

mid-Atlantic waters, mid-Atlantic driftnet gear and shark driftnet gear. The gear marking measure is still under review by the Office of Management and Budget for compliance with the Paperwork Reduction Act, and it will not become effective until a notice is published in the Federal Register. Note that this measure will not itself reduce entanglements, but may provide useful information for designing future bycatch reduction measures to achieve ZMRG.

Although NMFS can predict where some right whales will be found at some times of the year, right whales have been sighted in virtually all coastal and offshore waters from Florida to Maine. Generally these sightings are of small, transient groups or individuals. On occasion, however, larger groups of right whales are resident at times and in locations that are unexpected, including times when large amounts of fishing gear may be deployed in the area. Under these circumstances, the risk of entanglement is higher. For example, all right whale entanglements in U.S. lobster gear where the location was known occurred either outside critical habitat or outside the peak season in critical habitat. There may be a number of ways to decrease that risk, including continuous monitoring of the whales' movements to alert a disentanglement team immediately in the event that a whale happens to get entangled. NMFS will work with States and fishermen's associations to develop quick response networks to these unusual right whale distribution patterns.

NMFS will continue to cooperate with the Canadian Department of Fisheries and Oceans (DFO) towards take reduction efforts for large whales. NMFS will share data with DFO scientists and will continue to invite DFO's participation on the Team as a means of promoting effective bycatch reduction measures for large whales throughout western North Atlantic waters.

3.4 Monitoring Strategies

NMFS, as a part of its requirement to develop annual marine mammal Stock Assessment Reports, estimates annual serious injury and mortality rates based on a 5-year period. Expected rates of entanglement during any 6-month period may vary from the 5-year annual average. This variation may be most pronounced where the sample size is particularly small, as is the case with right whale entanglements. Consequently, it will be impossible to prove that the goal of reducing incidental takes of right whales to below the PBR level has been achieved within 6 months. NMFS will assume the six-month goal has been reached if there are no known cases of serious injury or mortality to right whales within the first six months of the plan. If more than two serious injuries or mortalities incidental to commercial fishing operations are observed within 5 years after the plan is promulgated, then it will be known that the PBR goal will not have been maintained.

NMFS will continue to monitor entanglements of all large whale species. Assessment of the success in bycatch reduction measures will be based on reports from the NMFS observer program, examination of stranded whales, abundance and distribution surveys, fishermen's reports and opportunistic reports of entanglement events. NMFS plans to expand field survey

efforts to assess population abundance and distribution, particularly in the Great South Channel. The effectiveness of implemented take reduction measures may be most apparent through monitoring the entanglement rate for humpback whales, since this species has the highest known entanglement rate of the large whales on the U.S. Atlantic coast. A decrease in entanglements of humpback whales will be taken as supportive but not conclusive evidence that the risk of entangling right, fin and minke whales has been reduced.

NMFS will also continue to gather information on how and where entanglements occur. For the duration of this plan, NMFS will form a repository for gear removed from entangled whales. This gear will be available to the public for inspection and study.

NMFS intends to increase observer coverage of some fisheries that are included in this plan. All gillnet vessels fishing from West Palm Beach, Florida to Sebastian Inlet from November 15 to March 31, must notify NMFS 48 hours before departure so that observer coverage can be arranged. In addition, because whales may find it harder to break free from the heavier gear required in the offshore lobster fishery, NMFS intends to increase observer coverage of that fleet.

To further reduce "ghost gear", NMFS will notify all Atlantic fisheries permit holders of the importance of bringing gear back to shore to be discarded properly as called for under the Protocol of 1978 relating to the International Convention for the Prevention of Pollution from Ships (MARPOL Protocol). Additionally, NMFS, in coordination with the USCG, plans to review regulations currently in place that concern fishing gear or fishing practices that may increase or decrease marine "ghost" gear and to determine what additional measures may be useful in reducing the potential for whale entanglement by this gear.

In the proposed plan, NMFS suggested a gear marking system that was intended to provide information about where entanglements occur and what gear is causing the entanglements. Knowing this information would be important to help devise any further take reduction measures. However, the proposed system was considered too cumbersome by many commenters and questions were raised about whether marked gear retrieved from a whale would determine definitively where that whale was entangled. Furthermore, some marking of lobster pots, gillnets and associated surface gear is currently required or being considered under Federal or State fishery management plans for the four groups of fisheries covered by this plan. In this plan, NMFS intends to implement a simplified gear-marking requirement as soon as OMB clearance is obtained. NMFS will also consult with State governments, the Take Reduction Team, and members of the Gear Advisory Group with a view to improving the gear marking system by 1999.

3.5 Exempted Waters

The majority of public comment received believed that the observed distribution of right whales along the US East Coast supported development of exempted waters in which these

regulations were not needed to achieve the take reduction goals of the MMPA. NMFS has analyzed the overall distribution data for right, humpback, fin and minke whales. It is clear that these species are rarely found within the bays, harbors, or behind barrier beaches in the Southeast and Mid-Atlantic areas. Therefore, this interim final rule is written to exempt those waters. The ragged coastline of Maine creates a problem. The coast of Maine is generally used as a migratory path and an infrequent foraging area for right whales, although their primary zooplanktonic prey is not abundant within the Maine bays and harbors. Fin whales generally inhabit offshore waters and are not a problem in the inner coastal areas of Maine. Humpbacks and minkes do forage infrequently into some bays in Maine to follow schooling fish in the summer. Using the sighting records for humpback and right whales within 12 NM of Maine, NMFS has defined inshore waters that will exclude over 90% of those sightings (right whales - 95%; humpback whales - 92%), and has identified a series of exempted water zones where the gear modification requirements of the ALWTRP are not in effect. The exempted waters are in areas where observations of whales are likely to be reported to NMFS, USCG, or the State of Maine. This will allow an early warning system to work with greatest efficiency to notify fishers of unexpected whale sightings or concentrations. We expect to monitor these events and have the ability to take appropriate emergency action if necessary. (See Figures 3 and 4).

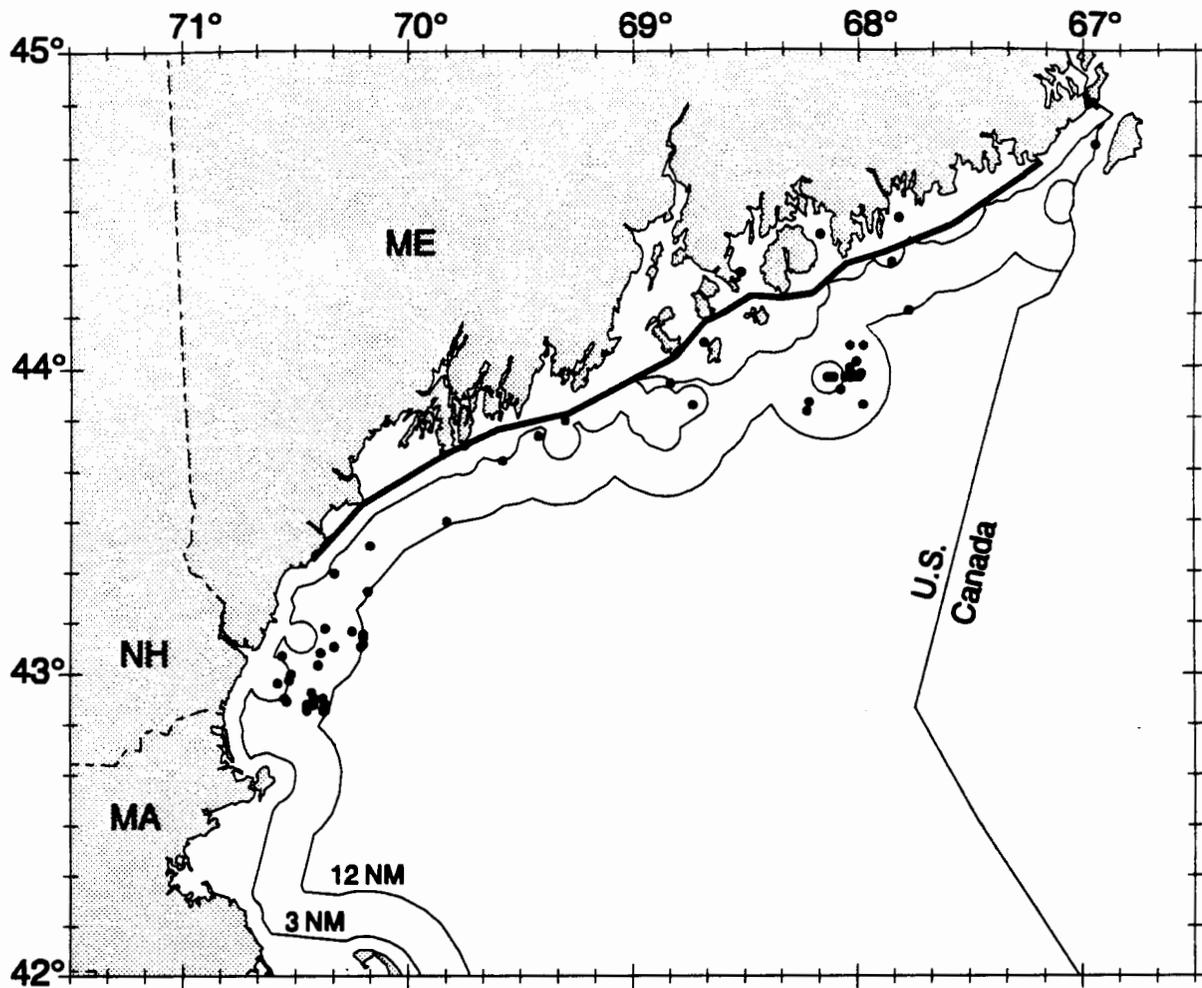
The basic rule for the exempted water boundaries is that all waters landward of the first bridge over any embayment, harbor or inlet will be exempted. In order to cover those waters for which that basic rule does not apply, those areas landward of the following boundary lines are also exempted.

BOUNDARY LINES FOR EXEMPTIONS

Maine and New Hampshire:

44° 49.52'N 66° 56.10'W TO 44° 48.90'N 66° 57.00'W	The Boring Stone to West Quoddy Head
44° 38.60'N 67° 11.50'W TO 44° 36.26'N 67° 15.70'W	Western Head to Double Head Shot Is.
44° 36.26'N 67° 15.70'W TO 44° 27.80'N 67° 32.85'W	Double Head Shot Is. to Freeman Rk.
44° 27.80'N 67° 32.85'W TO 44° 26.48'N 67° 36.00'W	Freeman Rk. to Crumple I.
44° 26.48'N 67° 36.00'W TO 44° 21.75'N 67° 52.85'W	Crumple I. to Petit Manan I.
44° 21.75'N 67° 52.85'W TO 44° 19.60'N 68° 03.00'W	Petit Manan I. to Schoodie I.
44° 19.60'N 68° 03.00'W TO 44° 14.40'N 68° 11.55'W	Schoodie I. to Baker I.
44° 14.15'N 68° 11.90'W TO 44° 13.25'N 68° 20.20'W	Baker I. to Bass Harbor Head
44° 13.25'N 68° 20.20'W TO 44° 13.71'N 68° 28.31'W	Bass Harbor Head to Pond I.
44° 13.21'N 68° 29.44'W TO 44° 10.48'N 68° 35.80'W	Pond I. to Sheep I.
44° 10.48'N 68° 35.80'W TO 44° 08.80'N 68° 40.80'W	Sheep I. to Moose I.
44° 08.80'N 68° 40.80'W TO 44° 02.25'N 68° 48.25'W	Moose I. to Vinalhaven I.
44° 02.10'N 68° 48.40'W TO 43° 51.25'N 69° 17.10'W	Vinalhaven I. to Burnt I.
43° 51.25'N 69° 17.10'W TO 43° 48.15'N 69° 35.90'W	Burnt I. to Ram I.
43° 48.15'N 69° 35.90'W TO 43° 42.94'N 69° 51.00'W	Ram I. to Small Pt.
43° 42.94'N 69° 51.00'W TO 43° 33.47'N 70° 12.35'W	Small Pt. to Cape Elizabeth
43° 33.47'N 70° 12.35'W TO 43° 21.90'N 70° 24.90'W	Cape Elizabeth to Cape Porpoise

Rhode Island



**FIG. 3 Maine Exempt Waters
Right Whales inside 12 Nautical Miles**



**National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northeast Regional Office
Gloucester, MA**

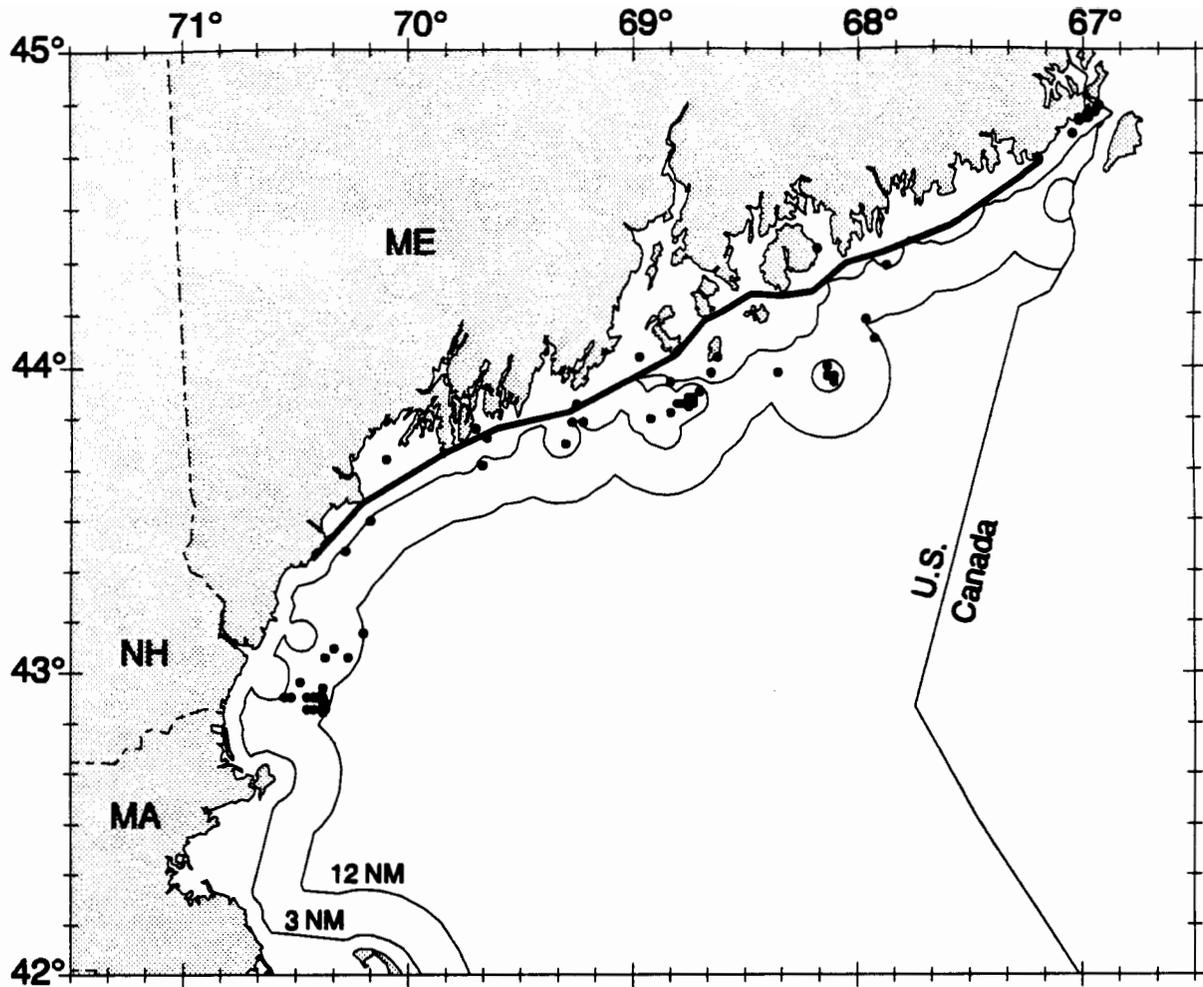


FIG. 4 **Maine Exempt Waters**
Humpback Whales inside 12 Nautical Miles



National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northeast Regional Office
Gloucester, MA

41° 22.41'N 71° 30.80'W TO 41° 22.41'N 71° 30.85'W Pt. Judith Pond Inlet
41° 21.31'N 71° 38.30'W TO 41° 21.30'N 71° 38.33'W Ninigret Pond Inlet
41° 20.00'N 71° 43.08'W TO 41° 20.00'N 71° 43.10'W Quonochontaug Pond Inlet

New York

Long Island Sound

West of the line from the Northern fork of the eastern end of Long Island, NY (Orient Pt.) to Plum Island to Fisher's Island to Watch Hill, RI.

41° 11.40'N 72° 09.70'W TO 41° 04.50'N 71° 51.60'W Gardiners Bay
40° 50.30'N 72° 28.50'W TO 40° 50.36'N 72° 28.67'W Shinnecock Bay Inlet
40° 45.70'N 72° 45.15'W TO 40° 45.72'N 72° 45.30'W Moriches Bay Inlet
40° 37.32'N 73° 18.40'W TO 40° 38.00'N 73° 18.56'W Fire Island Inlet
40° 34.85'N 73° 34.55'W TO 40° 35.08'N 73° 35.22'W Jones Inlet

New Jersey

39° 45.90'N 74° 05.90'W TO 39° 45.15'N 74° 06.20'W Barnegat Inlet
39° 30.70'N 74° 16.70'W TO 39° 26.10'N 74° 19.75'W Beach Haven to Brigantine Inlet
38° 56.20'N 74° 51.70'W TO 38° 56.20'N 74° 51.90'W Cape May Inlet
39° 16.70'N 75° 14.60'W TO 39° 11.25'N 75° 23.90'W Delaware Bay

Maryland/Virginia

38° 19.48'N 75° 05.10'W TO 38° 19.35'N 75° 05.25'W Ocean City Inlet
37° 52.50'N 75° 24.30'W TO 37° 11.90'N 75° 48.30'W Chincoteague to Ship Shoal Inlet
37° 11.10'N 75° 49.30'W TO 37° 10.65'N 75° 49.60'W Little Inlet
37° 10.00'N 75° 54.30'W TO 37° 05.30'N 75° 56.50'W Smith Island Inlet

North Carolina to Florida

All marine and tidal waters landward of the 72 COLREGS demarcation line (International Regulations for Preventing Collisions at Sea, 1972), as depicted or noted on nautical charts published by the National Oceanic and Atmospheric Administration (Coast Charts 1:80,000 scale), and as described in 33 CFR part 80.

3.6 Fishery Specific Measures

3.6.1 American Lobster Trap/Pot Fisheries

All Lobster gear must be set in such a way as to avoid having line floating at the surface at any time, except that lobster gear set in exempted waters described in Section 3.6 above are exempt from this and all regulations under this plan. Floating line is allowed between two buoys on the same buoy line and between a buoy and a highflyer.

Lobster gear will be prohibited from the Great South Channel critical habitat area from April 1 through June 30, until the Assistant Administrator determines that alternative fishing practices

or gear modifications have been developed that reduce the risk of serious injury or mortality to whales to acceptable levels. From July 1 through March 31, lobster gear set in the Great South Channel critical habitat must have at least two characteristics from the inshore take reduction technology list. Note that although portions of the Great South Channel critical habitat would be considered offshore, NMFS believes that the weaker maximum tensile strengths allowed for inshore gear are more appropriate in the critical habitat, since right whales may return to the area when not expected.

From January 1 to May 15, lobster gear set in the Federal portion of the Cape Cod Bay critical habitat must conform to the requirements set by the State of Massachusetts for its portion of the critical habitat during that period. From May 16 to December 31, lobster gear set in the Federal portion of the Cape Cod Bay critical habitat must have at least two characteristics from the inshore take reduction technology list.

For either critical habitat, if NMFS determines that the right whales have departed from that area for the season, the Assistant Administrator may allow lobster gear to be set, provided that it meets the requirements for Stellwagen Bank and Jeffreys Ledge.

The Stellwagen Bank/Jeffreys Ledge (SB/JL) area is defined as all Federal waters in the Gulf of Maine that lie to the south of the 43°15'N latitude line and west of the 70° W longitude line, except right whale critical habitat. Note that the boundaries of the Stellwagen Bank/Jeffreys Ledge Area have been changed from what NMFS proposed in April. State waters are no longer included, and the northern boundary has been changed. The new boundaries more accurately reflect the area where the risk of whale/fishery interactions is high.

In the Stellwagen/Jeffreys Ledge area, lobster gear must always have at least two characteristics from the inshore Take Reduction Gear Technology list. Fishermen should be aware that humpback and/or right whales are present in the SB/JL area most months of the year. If the gear modifications are not sufficient to reduce serious injury and mortality to right and humpback whales to achieve the 6-month PBR goal or the 5-year ZMRG goal, additional restrictions or closures of certain portions of SB/JL may be necessary. A decision to close any portion of this area would be made in consultation with the ALWTRT.

In all other areas, lobster gear must be set with at least one characteristic from the Inshore Lobster Take Reduction Gear Technology list. Note that this area includes those state waters inshore of the SB/JL area that are not specifically described as exempted waters (see Section 3.6 above). This requirement applies year round in the inshore lobster fishery north of 41°30'N latitude and from December 1 through March 31 in the inshore lobster fishery south of 41°30'N latitude. Some of the gear characteristics are only applicable to offshore lobster fishing because conditions offshore require heavier gear. However, offshore fishermen are encouraged to use the inshore standards, if possible.

3.6.2 Anchored Gillnet Fishery

All sink gillnet gear must be set in such a way as to avoid having line floating at the surface at any time, except that gillnet gear set in exempted waters described in Section 3.6 above are exempt from this and all regulations under this plan. Floating line is allowed between two buoys on the same buoy line and between a buoy and a highflyer.

Sink gillnet gear will be prohibited from most of the Great South Channel critical habitat area from April 1 through June 30, until the Assistant Administrator determines that alternative fishing practices or gear modifications have been developed that reduce the risk of serious injury or mortality to whales to acceptable levels. Sink gillnets may be used year round in the "sliver area" and may be used from July 1 to March 31 in the Great South Channel critical habitat provided that such gear has at least two characteristics from the Gillnet Take Reduction Gear Technology list.

From January 1 to May 15, the Federal portion of the Cape Cod Bay critical habitat is closed to sink gillnet gear, except if NMFS determines that the right whales have departed from that area for the season, the Assistant Administrator may allow gillnet gear to be set, provided that it meets the requirements for gillnet fishing for Stellwagen Bank and Jeffreys Ledge. From May 16 to December 31, gillnet gear set in the Federal portion of the Cape Cod Bay critical habitat must have at least two characteristics from the gillnet take reduction technology list.

Gillnet gear in the Stellwagen Bank/Jeffreys Ledge area (as defined above for lobster gear) must always have at least two characteristics from the gillnet Take Reduction Gear Technology list. Fishers should be aware that humpback and/or right whales are present in the SB/JL area most months of the year. If the gear modifications are not sufficient to reduce serious injury and mortality to right and humpback whales to achieve the 6-month PBR goal or the 5-year ZMRG goal, additional restrictions or closures of certain portions of SB/JL may be necessary.

3.6.3 Northeast Sink Gillnet Fisheries

In all other northeast sink gillnet waters (defined as Federal and State waters east of 72°30'W latitude), gillnet gear must be set with at least one characteristic from the gillnet Take Reduction Gear Technology list at all times, except that gillnet gear set in exempted waters described in Section 3.6 above are exempt from this and all regulations under this plan.

3.6.4 Mid-Atlantic Gillnet Fisheries

Mid-Atlantic gillnets (defined as Federal and State waters east of 72°30'W latitude) must have at least one characteristic from this list from December 1 to March 31, except that gillnet gear set in exempted waters described in Section 3.6 above are exempt from this and all regulations under this plan.

3.6.5 Mid-Atlantic Driftnets

From December 1 through March 31, all vessels using driftnets in the mid-Atlantic gillnet area are required to haul all such gear and stow all such gear on the vessel before returning to port. If driftnets are set at night they must remain attached to the vessel.

3.6.6 Southeast U.S. Driftnet Fishery

The area from 27°51'N latitude (near Sebastian Inlet, FL) to 32°00'N latitude (near Savannah, GA) extending from the shore outward to 80°W longitude will be closed to driftnet fishing, except for strikenetting, each year from November 15 through March 31. Strikenetting is permitted under certain conditions set forth in the rule. In addition, NMFS will require observer coverage for the use of driftnets in the area from West Palm Beach (26°46.5'N latitude) to Sebastian Inlet (27°51'N latitude) from November 15 through March 31 and for the use of strikenets in the area between West Palm Beach, FL and Savannah, GA for the same time period. Vessel operators intending to use these gear types in these areas must notify NMFS at least 48 hours in advance of departure to arrange for observer coverage. In addition, shark drift gillnets must be marked, as directed in the implementing regulations for this rule, to identify the fishery and region in which the gear is fished.

3.7 Changes from the proposed rule

This interim final rule has been substantially modified from the rule proposed by NMFS on April 7, 1997. In the proposed rule, NMFS specifically solicited comments on many of the issues discussed below. Public comments have clarified several issues presented in the proposed rule and have substantially shaped this interim final rule. Major changes have been made to boundaries of affected areas, gear and marking requirements, and contingency measures. Because the changes from the proposed rule are so significant, NMFS is issuing these regulations as an interim final rule to allow comments on this version of the ALWTRP. Except for the gear marking requirements, this rule will become effective on November 15, 1997, unless it is superseded by a notice in the Federal Register prior to that date. The gear marking requirements will become effective on January 1, 1998 or on the date that OMB gives approval for this collection of information, whichever is later. Note that right whales tend to be in Canadian waters from July until November, so the risk of entanglements in U.S. fishing gear is relatively low until November 15.

3.7.1 Changes in boundaries and area designations

The Stellwagen Bank/Jeffreys Ledge restricted area is defined in this rule as all Federal waters in the Gulf of Maine south of 43°15'N lat. line and west of the 70°W long. line. The proposed rule contained waters where the frequency of right whale sightings was quite low, especially in state waters. The northern boundary (43°15'N lat.) was proposed by the TRT

and other groups. North of this line right whale sightings are also quite low. The eastern boundary remains the same as in the proposed rule.

NMFS has also changed the dividing line between northern and southern lobster waters to be 41°30'N lat. This allows all waters south of Cape Cod to be managed on the same seasonal basis, which is consistent with the usual large whale distribution patterns.

NMFS includes a new boundary in this interim final rule. This divides lobster waters into inshore and offshore components. The boundaries of the offshore lobster area are the same as for the areas sometimes known as Lobster Area III. Because offshore lobster pot gear is generally heavier than inshore gear, many commenters advised that the offshore gear have different requirements. In addition, because of the heavier gear used offshore, which might be harder for a whale to break, there is a specific marking code for offshore lobster pot gear. If offshore gear is found to pose a significant risk to whales, additional restrictions can be imposed.

In response to public comments, NMFS has exempted a number of areas from regulation that would have been covered by the proposed rule. NMFS analyzed the overall distribution data for right, humpback, fin and minke whales. It is clear that these species are rarely found within the bays, harbors, or behind barrier beaches in the Southeast and Mid-Atlantic areas. These are areas where right whale sightings are so low that NMFS believes regulation of fishing activity will have no practical benefit for right whale conservation. Exempted areas include all waters landward of the first bridge over any embayment, Long Island Sound, Delaware and Chesapeake Bays, some coastal areas in the Gulf of Maine and, in the southeast region, waters landward of the demarcation line of the International Regulations for Preventing Collisions at Sea, also known as the 1972 COLREGS line.

3.7.2 Changes to proposed gear modifications

In its April 1997 Federal Register notice, NMFS proposed to mandate a number of specific modifications to lobster and gillnet gear that were intended to reduce the risk of entangling large whales. For example, NMFS proposed to require that buoy lines be made entirely or mostly of sinking line. It also proposed that buoys be attached with a weak link and sought comments on whether the breaking strength of that link should be 150 lb, 300 lb, 500 lb or any other breaking strength. In addition, NMFS proposed to require a suite of modifications to sink gillnets, including requiring weak links between nets on both the lead-line and the float-line.

NMFS has subsequently determined that some of these proposed modifications would not work under any circumstances. For example, field testing, since publication of the proposed rule, has shown that the 150-lb breaking strength would be too weak to keep a buoy attached to a line under the normal range of working conditions. Requiring weak links between both the lead-line and the float-line would not have allowed gillnetters to haul their nets without high

risk of loss. Both proposed modifications, if implemented, would have created additional lost gear, thereby perhaps increasing the risks of entanglement rather than decreasing them.

Other proposed modifications have worked in some areas but would not work elsewhere where fishing conditions are different. For example, sinking ground line or buoy lines can work and are used in some places but cannot work where the bottom is rocky.

Fishing conditions and practices differ widely throughout the range of this plan. Therefore a uniform application of gear requirements is not likely to be practical. NMFS has therefore decided that one set of regulations applying to all areas affected by this plan is not appropriate. Instead, in this interim final rule NMFS is establishing a "menu" of gear characteristics that are expected to reduce the risk of entanglements, based on the advice of the Gear Advisory Group and other public comments. Fishermen are required to comply with some of these characteristics but are allowed to select the characteristic or characteristics that are most appropriate for their region. This requirement contributes to achieving the goals of the plan in two ways. First, some fishermen will need to change their gear immediately; hence, there will be an immediate risk reduction, although NMFS believes that this will be only a small contribution. Second, these lists can be modified over time to help achieve the ZMRG. As new technology becomes available, it can be added to the list. If items on the list do not appear to reduce the risk of entanglements, they can be dropped.

Some of the proposed modifications are still in the development stage. For example, NMFS suggested that a weak buoy line, when developed, might substantially reduce the risk of entanglements. Other concepts for gear development were discussed by the Gear Advisory Group. NMFS noted in the proposed rule that further research on gear modifications were necessary, and it committed to funding research on this topic. NMFS intends to modify the gear "menus" when new take reduction technology is demonstrated to be operational on the water.

3.7.3 Changes to gear marking proposal

The proposal to place identifying marks on gear met with generally favorable reviews, although a number of requests were made for a simpler system. There was general agreement that it would be useful to know what type of gear was entangling whales and where that gear was set, although several commenters warned that it might be difficult to interpret data from marked gear. A chief concern was that the proposed system of marking was too complicated and time-consuming.

In this interim final rule, NMFS implements a simpler, quicker method of marking gear. The marking system keeps the general concept of identifying anchored gillnet, lobster and driftnet gear, but it substantially reduces the number of areas that are to be designated. This allows the use of only two color marks instead of three. The NMFS marking system incorporates two specific suggestions made in the public comment period. First, marking gear with paint is

acceptable, provided the mark is refreshed when faded. Second, there were suggestions that marking the ground lines between lobster pots would be time consuming and expensive and the marks would not last long. NMFS has decided to defer the requirement to mark groundlines and will seek the advice of the TRT on the value of this measure.

3.7.4 Changes to lobster restrictions in Cape Cod Bay critical habitat

NMFS proposed a series of gear restrictions for lobster pot gear set in the Cape Cod Bay critical habitat during the period when right whales are likely to be present (January 1 through May 15). These were based on requirements instituted by the State of Massachusetts. Of the proposed requirements, two are not implemented in this interim final rule. These are: (1) The requirement that all buoy lines be sinking line and (2) the requirement that the buoy be attached with a 150-lb weak link. The purpose of the sinking buoy line requirement was to avoid having a loop of rope floating in the water column when tides were slack. (When there is a tidal current, all buoy lines are likely to be straight.) However, buoy lines made entirely of sinking line rest on the ocean bottom. They will chafe more quickly than buoy lines with some floating line at the bottom and are more likely to be caught on rocks. This requirement would have led to more lost gear. NMFS believes that the increased gear loss creates a larger risk to whales than the benefit of avoiding loose line in the water at slack tide conveys. Therefore, these regulations allow up to one third of the bottom portion of the buoy line to be made of floating line. This is consistent with the current requirements of the State of Massachusetts for this area.

The purpose of the 150-lb breaking strength was to minimize the chance that a buoy would get caught on a whale. Tests in Cape Cod Bay have shown definitively that 150 lb is too weak to keep buoys on during storms. This requirement would also increase ghost gear. For the time being, instead of a 150 lb weak link, NMFS will require that all buoys in the Cape Cod Bay critical habitat have weak links of a maximum strength of up to 1100 lb. This breaking strength is based on the advice of the Gear Advisory Group, which believed that a weak link with a breaking strength of 1100 lb will allow gear to be effectively deployed under all normal inshore conditions, including some areas where currents and other oceanic conditions are more difficult than in Cape Cod Bay. Right whales can exert a pull stronger than 1100 lb, although the gear attached to the weak link would have to weigh more than 1100 lb, or be anchored or snag on the bottom for a weak link of that breaking strength to actually break. If ongoing research shows that weaker breaking strengths can be used in the Cape Cod Bay critical habitat without an increase in lost gear, this requirement will be revised.

3.7.5 Changes to contingency closures

NMFS proposed that if four or more right whales are present in an area for two or more consecutive weeks, that area would be closed to lobster and gillnet gear until the right whales had left the area. NMFS does not intend to implement this regulation at this time, although it will seek the advice of the TRT on whether this would be a useful measure. There are two

reasons for not including this in the interim final rule. First, fishermen said that if forced to move gear, they would tend to set it just on the periphery of the closed area. This would create a denser area of gear around the right whales, increasing the risk that the whales would encounter gear on leaving the area. Second, NMFS has not identified a process for closing an area that can be put in place quickly enough to take into account the movements of the animals. If NMFS were to decide to close an area 2 weeks after four or more right whales were seen, it would take at least a week to publish a Federal Register notice, after which it could take a week or more for fishermen to move their gear. Thus, it would be difficult to close an area on account of unusual right whale movements in a timely way before the whales moved out of an area. There would be a high likelihood of closing an area after the departure of the whales. NMFS would still have authority to take emergency measures, including area closures, under the MMPA and Endangered Species Act if it is deemed necessary for the protection of the whales.

NMFS initially proposed authorizing a suite of specific gear requirements which, if used, would allow a person to fish in critical habitat. NMFS further proposed that if a right whale were entangled in a critical habitat by such authorized gear, NMFS would close that area. Because this interim final rule does not authorize any specific gear, this measure is not included in the regulations. However, if a right whale is entangled in any gear in any critical habitat during the high right whale use periods, NMFS will close that critical habitat to that gear.

4.0 General Take Reduction Alternatives

In this section the various alternatives considered by the Take Reduction Team and NMFS are defined and discussed in a generic sense. Some of the measures below were initially proposed by NMFS as part of the ALWTRP. The general categories into which the alternatives fall are gear removal/closures and gear modification. The general descriptions of these take reduction alternatives are followed (in Section 4.0) by consideration of these same alternatives in the context of the specific geographic regions and/or specific fisheries. In Section 4.0 the various alternatives will be weighed to determine the best solution to the entanglement problems for that geographic area with the least adverse affects on local marine biota and the fishery.

4.1 Area closures

4.1.1 Area closure for specified gear types, year round

Under this alternative, fishing with the specified gear type would be prohibited in a defined area throughout the year. It would not be sufficient to store gear -- for example, leave traps in the area unbaited, but all gear of the specified type would have to be removed from the area. The removal of fishing gear affords large whales the greatest degree of protection from entanglement in the affected area. The fishing effort that took place in the affected area is likely to be displaced.

Proposed action: None of the areas affected by this plan are closed year round for the purposes of whale conservation.

4.1.2 Area closure for specified gear types, during periods of peak right whale abundance

Under this alternative, fishing with the specified gear type would be prohibited in a defined area during the periods when right whales are at peak abundance. It would not be sufficient to store gear -- for example, leave traps in the area unbaited -- but all gear of the specified type would have to be removed from the area. The periods of the closure would be determined by considering the historical use of areas by the migratory whales. It is known for example, based on years of observations, that northern right whales occur in the Great South Channel critical habitat area from March through July. The greatest frequency and density of sightings in the area is in the period from April 1 through June 30. A prohibition during that time-area of the gear types with which the right whale is known to have become entangled would afford significant protections to the concentrations of whales. A similar approach may be developed for other areas and/or for each of the large whale species.

This alternative would provide full protection for the whales from entanglement in the specified gear types in the known whale high-use periods and areas. Fishing effort may be displaced outside those known high-use periods and areas. If the density of effort in adjacent areas increases, the risk of entanglement in those adjacent areas may increase, as well. If whales enter the area out of season, that is, outside the period in which high-use has been recorded and outside the gear-specific closure, this alternative alone would not afford the whales any reduction in entanglement risk.

Proposed actions: Fishing with sink gillnets and other gillnets capable of catching multispecies would be prohibited in the federal portion of Cape Cod Bay critical habitat area and in most of the Great South Channel critical habitat area during the period of peak right whale abundance in the area, January 1 through May 15 of each year for Cape Cod Bay and from April 1 through June 30 of each year for Great South Channel.

Fishing with lobster pot/trap gear would be prohibited in the entire Great South Channel critical habitat area from April 1 through June 30 of each year. Lobstering would allowed in Cape Cod Bay critical habitat from January 1 through May 15 of each year only if certain modifications are made to the fishing gear.

Fishing with a shark driftnet would be prohibited in the Southeastern US critical habitat area annually from November 1 through March 31 of the following year.

4.1.3 Fixed gear emergency closure contingent upon the presence of right whales

If a group of right whales, as the most critically endangered of the large whale species, should show up and linger for several days in an area where they typically do not linger, it may be necessary to implement emergency entanglement risk reduction measures in that area until the whales pass. One alternative would be the prohibition of fishing with specific gear types in the area where the whales seem to have become resident for a given period.

Under this alternative, for example, if four or more right whales are sighted consistently in a particular geographic area for a period of two weeks NMFS would issue emergency regulations to restrict fishery activities in the area to minimize the risk of entanglement. The restrictions may include, but are not limited to, requiring the removal of fixed fishing gear from the area. NMFS would remove these additional temporary restrictions if right whales are determined to have left the area based on sighting efforts that produce no confirmed sightings for 1 week. Notices of emergency closure or restrictions would be published in the *Federal Register*.

This alternative would provide NMFS with the authority to respond quickly to unusual congregations of whales in areas where risk of entanglement occurs. While in theory it could provide protections to the whales, in practice this contingency closure/restriction is not likely to be available in a timely manner. Though rulemaking procedures are streamlined somewhat for “emergency” actions, the implementation of the closure is likely to lag the whale’s activities by several days or even weeks. If gear removal is required, NMFS must provide a grace period in which fishers can retrieve their gear. It is possible that the vessel traffic required by an emergency gear removal would imperil the resident whales.

Furthermore, situations that would meet the criteria initially proposed for invoking this contingency authority -- confirmed sighting of four or more whales in a limited geographic area for a period of two or more weeks -- are exceedingly rare. The affected fisheries may be better served and the whales may be better protected by case-by-case consideration of the special situations, close cooperation between NMFS and the fisheries, improved monitoring of such “residency” incidents, and enhanced disentanglement response.

Proposed action: Specific authority to exercise an emergency closure would not be provided in the ALWTRP for a contingency closure in response to the unusual, prolonged presence of right whales in an area. However, NMFS would consider a temporary closure under emergency regulations as one of several available management alternatives should such an unusual “residency” event occur.

4.1.4 No fixed gear area closure

Under this alternative no areas would be closed to fishing with specific gear types for the purpose of whale conservation. No protections would be afforded the whales by removal of

gear, and other alternatives, such as required gear modifications, would have to be relied upon to reduce the risk of entanglement. As this alternative would not directly affect fishing effort, it may be perceived as the least onerous on the fishery. However, reliance entirely upon gear modifications to achieve the goals of this plan would likely result in a significant expenditure of resources to effect and maintain the modifications. Furthermore, as discussed below, gear modifications do not provide the same assurance as gear removal that the risk of serious injury and mortality of whale entanglement has been reduced.

Proposed action: Fixed gear closures are not proposed for those areas where the risk of large whale entanglement is not high.

4.1.5 Removal of wet-stored gear

This measure would not be an *alternative* to area closures, as much as it would be a requirement that would minimize the practice of wet storage of fishing gear. This measure would require that all gear used by the four specified fisheries be hauled for inspection by the fisher at least once every 30 days. It is recognized that most gear is hauled more frequently. Under this requirement, each fisher would be responsible for not allowing any individual piece of gear to remain in the water for longer than 30 days, *i.e.*, maximum 30-day “soak time”, and for examination of the gear to ensure that it is in compliance with the regulations. This provision was discussed by the ALWTRT for certain gear types to encourage fishers not to “store” gear at sea.

Proposed action: The wet storage of gear would be prohibited by a provision in the ALWTRP which requires that gear be hauled at least once every 30 days.

4.2 Gear modifications

The Take Reduction Team recognized that the gear used in the affected fisheries may be modified in ways that would reduce the risk of serious injury or mortality should entanglements of whales occur. The Team discussed ways of minimizing the number of vertical lines in gear sets, rigging gear so that it would breakaway should a whale become entangled in it, and marking it so that the fishery and area of origin could be determined should gear be recovered from an entangled whale. The subparagraphs below describe the specific measures considered by the team and NMFS. Several of the measures were initially proposed by NMFS, and the agency received an immense volume of public comment on the measures. NMFS also convened a gear advisory group, consisting of fishers, fishing gear engineers, representatives of several state governments, a few NMFS employees to discuss and refine the gear modification measures.

4.2.1 Limit size and materials of buoy lines

Under this alternative, NMFS would require all buoy lines in lobster pot gear and anchored gillnet gear considered in this plan be equipped with a breakaway buoy at the top of the buoy line, or that traditional buoy lines be replaced with a weak buoy line. The breakaway buoy or weak buoy line would be designed to break in a whale entanglement situation. The Take Reduction Team and NMFS considered requiring a maximum tensile breaking strength of either 150, 300, or 500 lbs (68 kg, 136 kg, and 227 kg, respectively). The Commonwealth of Massachusetts Endangered Whale Working Group adopted a requirement for 150 lb breaking strength. Comments were sought from the public regarding the need for this measure and suggested breaking strengths.

The purpose of this measure would be to reduce the potential for serious injury and mortality associated with an entanglement in the buoy line of fixed gear. The goal of a breakaway buoy would be to ensure that the buoy itself does not contribute to the entanglement problem. A line without a buoy or knot at the bitter end is expected to pass more easily through the baleen of a whale and to slip more easily past an appendage. A line which does not catch on the baleen or on an appendage is believed to be less likely to initiate thrashing behavior. It is believed that, once a whale starts to thrash, line can be wrapped around appendages and/or begin to cut into tissue. The breakaway buoy is intended to prevent the entanglement from progressing to that stage. While this modification may not reduce the incidence of entanglement, breakaway buoys are expected to reduce the severity of an entanglement.

The intent of a weak buoy line is that it would snap if a whale became entangled in it but would be strong enough to haul up a heavier, traditional buoy line that would in turn be used to haul up the fishing gear. This measure may be the most effective gear modification of any discussed by the Team for reducing the serious injury and mortality rate from entanglement. Right and humpback whales have been sighted entangled in buoy lines of lobster and sink gillnet gear. If a brittle buoy line could be designed to break every time it was encountered by a whale, this modification could reduce and possibly eliminate the risk that entanglement in the buoy line would occur or at least ensure that entanglement in a buoy line would not result in serious injury or mortality. NMFS assumes that use of such a brittle buoy line may not be practicable, but that a weak line can be developed that will break at least half of the time. Since a breakaway buoy is not expected to reduce the possibility of injury once a whale gets wrapped in line, the weak buoy line may represent a greater conservation gain than would be achieved through the breakaway buoy. However, the development of a weak buoy line is not as far along as the development of a breakaway buoy. In addition, the cost of developing and implementing a weak buoy line system may be substantially greater than a breakaway buoy system.

There are a number of ways to achieve the requisite breaking strength. In addition to the use of a weak segment of line to achieve the breakaway effect, mechanical links, shackles, and other hardware with known breaking strengths may be used. To enable the gear set to reach

the breakaway strain, substantial anchors or weights may be useful, particularly on gillnets. If a whale should become entangled, the anchors or weights would hold fast to the sea floor, and the whale's efforts would stress the lines in excess of the tensile strength of the breakaway device and free the whale of all or part of the gear.

Proposed action: Instead of specified, required measures to achieve the desired breakaway effect, the ALWTRP would allow fishers to choose measures from a menu of alternatives. See section 4.2.8 for details.

4.2.2 Maximum number of floats per gear set

Under this alternative the number of surface floats on New England and Mid-Atlantic coastal gillnet gear and all lobster trap trawls would be limited to a maximum of two, that is, one at each end of the string of traps or nets. This measure would reduce the number of floats and vertical lines into which the whales may collide when swimming. Current fishing practices vary widely along the coast. Some fishers may already comply with this measure, others may use only one float per gear set, and still others may intersperse floats throughout a long pot trawl or string of gillnets. The number of vertical lines currently in use in the fisheries is unknown. It is generally accepted that more than two floats/vertical lines per gear set are currently in use broadly, particularly in the offshore fisheries. If this assumption is correct, this measure should reduce, albeit to an undeterminable degree, the risk that whales will become entangled in the fishing gear. A disadvantage of limiting the number of buoy lines is that it may make it more difficult for other vessels to determine where long trawls or strings of nets lie. This could lead to an increase in gear conflicts and lost gear.

Proposed action: The ALWTRP would not restrict the number of floats to a maximum per trawl in any area. However, one requisite for lobster gear set in Cape Cod Bay during the period of right whale abundance is that the trawls must be of four or more traps. Assuming that the no additional floats are affixed to the trawls, this measure, by prohibiting short trawls of one, two, or three traps, would reduce the number of vertical lines in the water.

4.2.3 Spliced line

This alternative would require that wherever two sections of line are joined, they would be joined by a splice rather than by a knot. The alternative stems from the assumption that knots contribute to the potential for fishing gear to become wrapped around and stuck on the large whales. However, although fewer knots or splices may help remove some of the potential that line will get caught in baleen or behind a flipper, it is unknown if splicing would actually be an improvement in practice. The ease of knotting is preferred by many fishers to splicing. Also, knotted line may be weaker than spliced line, making it easier for a whale to break a line. Therefore, this option will be left up to further development by the GAG.

Proposed action: The ALWTRP does not require, specifically or as an alternative on a gear menu, the use of splices in lieu of knots.

4.2.4 Light colored buoy line

The Gear Advisory Group and a number of commenters responding to the proposed rule have suggested that light colored buoy lines may be more easily seen and avoided by whales than would darker lines. This recommendation assumes that the whales use visual cues, at least part of the time, for navigating around hazards.

Proposed action: The ALWTRP does not require, specifically or as an alternative on a gear menu, the use of light colored buoy line. The efficacy of this alternative at reducing the risk of whale entanglement is unknown, but thought to be small.

4.2.5 Gear marking

Gear marking is a modification that is not intended to directly reduce the risk of whales becoming seriously injured or killed by entanglement in fishing gear; it would be, rather, a passive monitoring system. The purpose of a gear marking requirement would be to collect, through the long term observation of entanglements, information on the gear type and area of origin of fishing gear found on an entangled whale or retrieved as “ghost” gear. Marking requirements would be specific for gear type and area to increase the value of information obtained from reports of entangled whales.

Currently, many entanglement reports archived by NMFS involve gear which cannot be traced to a particular fishery or area because the recovered gear includes only a fragment of line or net. In addition, many reports of free-swimming entangled whales involve gear which is trailing at depth and cannot therefore be described by observers at the surface who may see only line draped over the flukes or hanging from the mouth of a whale. For the duration of this plan, NMFS will form a repository for gear removed from entangled whales. This gear will be available to the public for inspection and study.

NMFS originally proposed a gear marking system for the fisheries affected by this plan. While the concept of gear marking was generally supported, the details of the plan were criticized. In this interim final rule, NMFS implements a simpler, quicker method of marking gear. It keeps the general concept of identifying anchored gillnet, lobster and driftnet gear, but it substantially reduces the number of areas that are to be designated. The NMFS marking system incorporates two specific suggestions made in the public comment period. First, marking gear with paint is acceptable, provided the mark is refreshed when faded. Second, there were suggestions that marking the ground lines between lobster pots would be time consuming and expensive and the marks would not last long. Therefore, NMFS is not requiring marks on groundlines as proposed. Since marking or groundline was not proposed to start until 1999, NMFS has decided to defer the implementation of this requirement and will

seek the advice of the ALWTRT on whether the cost of marking ground lines is worth the information likely to be gained.

Proposed action: The ALWTRP would require simple system of color banding on buoy lines. Two color bands of four to six inches wide would indicate the fishery in which the gear is being used and the general area in which the gear is deployed.

<u>Fishery</u>	<u>Color bands</u>
Lobster pot gear, inshore	red over green
Lobster pot gear, offshore	red over blue
Sink and other gillnet, northeast	green over yellow
Coastal gillnet, Mid-Atlantic	green over black
Driftnet, Mid-Atlantic	blue over yellow
Shark driftnet, southeastern	blue over black

Gear marking via such color-codes must be accomplished such that the result is a smooth line with no snags which could catch in a whale's baleen and which would safely roll over a block when being hauled. These gear-marking modifications would be required within two feet of the buoy and midway along each buoy line for all affected gear.

4.2.6 Sinking Buoy Line

Buoy lines are typically constructed of a section of sinking line near the surface which is spliced or knotted to a section of floating line that is attached to the anchor of a gillnet or the first pot of a lobster pot trawl. Sinking line is currently preferred near the surface to decrease the chance that the line will be severed by propellers of vessels passing through an area. Using floating line near the bottom can prevent the line from wrapping around gear or rocks on the bottom and reduce chafing as the gear is moved by currents in the area. The length of buoy line used depends on water depth and tidal influence. In some areas the buoy line may be longer than twice the water depth, and the tautness of the line is influenced by the tidal cycle and other currents. Therefore, the line may be slack during part of the current cycles in certain areas.

Slack floating line appears to represent a greater risk of entanglement than taut line, particularly if the line is laying at or near the surface. Right whales may be particularly susceptible to entanglement in such lines due to the feeding behavior known as "skim feeding" during which whales move slowly forward through a patch of zooplankton, keeping the mouth slightly ajar for hours at a time. Right and humpback whales are also known to feed at depth; however, the behavior when feeding near the bottom or in the water column is poorly understood.

The purpose of the sinking buoy line requirement was to avoid having a loop of rope floating in the water column when tides were slack. (When there is a tidal current, all buoy lines are

likely to be straight.) However, buoy lines made entirely of sinking line rest on the ocean bottom. They will chafe more quickly than buoy lines with some floating line at the bottom and are more likely to be caught on rocks. This requirement would have led to more lost gear. NMFS believes that the increased gear loss creates a larger risk to whales than the benefit of avoiding loose line in the water at slack tide conveys.

NMFS initially proposed to require sinking buoy lines, or modified sinking buoy lines, in all lobster pot gear and gillnet gear used by anchored gillnet fisheries covered by this plan by January 1, 1998. In the Cape Cod Bay critical habitat and the SB/JL area, NMFS proposed requiring that the entire groundline be made of sinking rope. Elsewhere, in rockier areas, NMFS proposed that the bottom 10 percent of the buoy line could be floating line. There were many comments received indicating that this amount of floating line was insufficient and would lead to an increase in lost gear.

Proposed action: Sinking buoy lines are among the alternatives on the Take Reduction Technology List. Sinking rope is required for the top two-thirds of buoy lines for lobster gear set in Cape Cod Bay during the period of right whale abundance.

4.2.7 No gear modifications

Under this alternative no gear modifications would be required as part of the plan to reduce the whale injuries and mortalities that result from entanglements in the subject fisheries. The plan would focus instead on the removal of fishing gear from the whales' habitat. Unfortunately, too little is known about the annual movements of the whale species to schedule narrow time-area closures which would assure that the goals of the ALWTRP would be met. Though general movements of the stocks may be understood, individuals are commonly observed outside the areas where they are expected. The gear modifications described would provide some risk reduction for whales outside the high-use time areas. Without the gear modifications, far broader time-area closures would be needed.

Proposed action: The ALWTRP would set forth exemption areas in which risk of a whale becoming entangled is thought to be essentially nil. See section 3.5. No gear modifications would be required in those areas.

4.2.8 Summary of changes in gear modifications from the proposed rule

In the proposed ALWTRP, NMFS proposed to mandate a number of specific modifications to lobster and gillnet gear that were intended to reduce the risk of entangling large whales. NMFS proposed to require that buoy lines be made entirely or mostly of sinking line. It also proposed that buoys be attached with a weak link and sought comments on whether the tensile strength of that link should be 150, 300, 500 or any other breaking strength. In addition, NMFS proposed to require a suite of modifications to sink gillnets, including weak links between nets on both the lead-line and the float rope.

Some of these proposed modifications would not work under any circumstances. For example, field testing has shown that the 150 pound tensile strength would be too weak to keep a buoy attached to a line under any normal range of working conditions. Requiring weak links between both the lead-line and the float-line would not have allowed gillnetters to haul their nets. Both proposed modifications, if implemented, would have created additional lost gear, thereby perhaps increasing the risks of entanglement rather than decreasing them.

Other proposed modifications work in some areas but would not work elsewhere where fishing conditions are different. Sinking ground line or buoy lines can work and are used in some places, but cannot work where the bottom is rocky.

Fishing conditions and practices differ widely throughout the range of this plan. Therefore a uniform application of gear requirements is not likely to be practical. Therefore, NMFS has determined that applying one set of gear modification regulations to all areas affected by this plan is not appropriate at this time. Instead, in the interim final rule NMFS is establishing a "menu" of gear characteristics that are expected to reduce the risk of entanglements. The menus are based on the advice of the Gear Advisory Group. Depending on the fishery and the location in which it operates, fishers will be required to select one or two of alternative modifications from the gear technology menus.

Some of the proposed modifications are still in the development stage. For example, NMFS proposed that a weak buoy line, when developed, might substantially reduce the risk of entanglements. NMFS is committed to research and development in this field and intends to modify the gear "menus" when new take reduction technology is demonstrated to be operational on the water. For the time being, however, the lists reflect current general good fishing practices. Some fishermen will have to change their gear to meet the gear requirements in this interim rule, but many are already in compliance. Vessels fishing in low risk areas will be required to ensure that their gear has at least one of the listed characteristics. Those fishing in areas where the risk of entanglement is high (i.e., Stellwagen and Jeffreys Ledge and in critical habitats during periods of relatively low right whale use) are required to ensure that their gear has at least two of the listed characteristics. Because fishing conditions require heavier gear offshore, for the time being there are different breaking strengths for offshore and inshore lobster gear.

4.2.9 Gear Review and Modification

The Gear Advisory Group, the Take Reduction Team and comments received from the public have identified several gear modifications that might be effective in reducing entanglements after further development. Because continued progress toward ZMRG may depend on developing gear that poses less of an entanglement risk to large whales, further research is needed.

Proposed action: NMFS will support research and development of gear modifications that may reduce the risk of entangling large whales. NMFS has committed funds to study several of these this year and plans to continue to provide funding for this kind of research in the future. NMFS expects to reconvene the Gear Advisory Group to review progress on gear research and development and to continue to suggest future research directions.

4.2.10 Contingencies

There are some risks in allowing gear to be used in areas of known high use by large whales. In order to minimize the consequences if the risks are unjustified, it would be useful to be able to respond quickly to prevent future entanglements should one take place in critical habitat during high right whale use times. Therefore, NMFS proposes that, in addition to existing emergency authorities under the MMPA, the Endangered Species Act, the Magnuson-Stevens Fishery Conservation and Management Act, or other appropriate authority, this plan allow for closing critical habitat quickly if an entanglement is known to occur there.

Proposed action: If a right whale becomes entangled in lobster gear in Cape Cod Bay critical habitat from January 1 to May 15 or becomes entangled in anchored gillnet gear in the Great South Channel sliver area from April 1 through June 30, NMFS will close that area to that type of fishing.

5.0 ALTERNATIVES TO THE PROPOSED ACTION

The Environmental Assessments prepared for the Magnuson-Stevens Fishery Conservation and Management Act Framework 23 regulations (NMFS 1997a) and MMPA Lobster Emergency Rule (NMFS 1997b) restricting gillnetting and lobster fishing in the Great South Channel and federal water portion of the Cape Cod Bay right whale Critical Habitat areas contain a discussion of alternatives to those proposed activities, and have assessed the environmental impact for those measures. Those assessments are incorporated by reference.

5.1 Cape Cod Bay

5.1.1 Description of Physical Environment

Cape Cod Bay is a large embayment bounded on three sides by Cape Cod and the Massachusetts coastline from Plymouth, Massachusetts, south. Cape Cod Bay has an average depth of about 25 meters and a maximum depth of about 65 meters. The deepest area of Cape Cod Bay is in the northern section, bordering Massachusetts Bay. The federal portion of Cape Cod Bay critical habitat, in this northern section, consists of approximately 60 square nautical miles bounded by a line beginning at 42°12'N/70°30'W, then due east to 42°12'N/70°15'W, then southeast to 42°08'N/70°12.4'W, then along the 3 NM state water boundary west, southwest and west again to 42°08.3'N/70°30'W, and then back to the first point given. This

federal waters area falls within the Studds-Stellwagen Bank National Marine Sanctuary and is a noted high use area for marine mammals and other marine organisms.

The general water flow in Cape Cod Bay is counter-clockwise, running from the Gulf of Maine south into the western half of the bay, over to the eastern bay, and back into the Gulf through a channel formed by the northern part of Cape Cod and the southeastern end of Stellwagen Bank. Salinity is fairly stable at around 31-32 parts per thousand. Much of the bottom is comprised of unconsolidated sediments with finer sediments occurring in the deeper waters (Davis 1984). In shallow areas where there is sufficient current, sediments tend to be coarser.

Northern right whales are sighted in Cape Cod Bay with greatest frequency between February and May, with peak abundance in late March. The Commonwealth of Massachusetts Endangered Whale Working Group has also identified January as a month of concern. The late-winter/early spring zooplankton fauna of Cape Cod Bay consists primarily of copepods, represented predominantly by two species, *Arcartia clausi* and *A. tonsa*. The copepod *C. finmarchicus* is found throughout inshore Cape Cod Bay waters. Species composition of zooplankton in the Bay varies year-to-year. Mayo and Marx (1990) found feeding right whales were associated with patches of zooplankton that were dominated by *C. finmarchicus*, *P. minutus*, *C. spp.*, and cirripede (barnacle) larvae.

Cape Cod Bay may serve as a calving area for right whales and is recognized as nursery habitat for the calves born in the winter off the Georgia and Florida coasts (Mead 1986). The upper portion of CCB also is resident to humpback whales during the summer and fall months.

Like Great South Channel, Cape Cod Bay is subjected to extensive vessel traffic including cargo vessel traffic through Cape Cod Canal and the Boston Harbor approaches, dredging and disposal traffic, recreational boating, commercial fishing, whale-watch vessels, and other boating activities. Commercial fishing vessels and gear in the area are dominated by the lobster industry, which, typically, begins its season in the middle of June. Recreational boating, whale-watching, ferries, and other vessels increase activity in the area with the onset of warmer weather and the tourist season, which typically begins in May or June and ends no later than November. Discharges from municipal, industrial and non-point sources, dredging activities, dredge spoil disposal and sewage disposal may also contribute to the degradation of essential habitat in Massachusetts Bay/northern Cape Cod Bay.

5.1.2 Description of the Problem

The ALWTRT discussed state and federal waters of right whale critical habitat in Cape Cod Bay separately and did not reach consensus on measures for the federal water portion. This plan treats the state and federal waters as one critical habitat unit to provide equivalent protection in both sectors. The Cape Cod Bay critical habitat restricted area (equivalent to the right whale critical habitat area) is the area bounded by the following points:

<u>North Latitude</u>	<u>West Longitude</u>
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42°04.8'N	70°10.0'W
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42°12.0'N	70°15.0'W
-----------	-----------

42°12.0'N	70°30.0'W
-----------	-----------

41°46.8'N	70°30.0'W
-----------	-----------

and, on the south and east, by the interior shoreline of Cape Cod, Massachusetts.

Cape Cod Bay is a known high use habitat for the northern right whale during the winter (January 1 through May 15) and is used less frequently by right whales during all other months of the year. Lobster and sink gillnet gear are more often deployed in the Bay in the summer and fall months. The ALWTRP calls for the strongest restrictions on these gear types in the Bay during the peak period of right whale abundance, while relaxing certain restrictions or allowing modified gear in the Bay during the remainder of the year. This will eliminate the possibility for entanglement in sink gillnet gear and reduce the likelihood of entanglement in lobster pot gear during high use periods and provide protection during the remainder of the year as well.

5.1.3 Discussion of Alternatives

5.1.3.1 Area Closures

The Cape Cod Bay is known to be an area of high use by right whales during the winter and early spring. The area is utilized by lobster and gillnet fisheries primarily in the summer and early fall. The existing Massachusetts and federal closures during the high use period of January 1 to May 15 appear to adequately minimize the potential for large whale entanglement in gillnet gear. A federal harbor porpoise closure in the Massachusetts Bay area in March provides further coverage. Maintaining the closure throughout the summer months could provide some additional reduction in potential entanglements, but the benefits would be unpredictable because right whale presence is unpredictable. Also, a summer closure would entail much higher costs to the industry. See section 4.1 for a general discussion of area closure and gear removal alternatives.

NMFS, in cooperation with the USCG and Commonwealth of Massachusetts, currently operate a New England Early Warning System (NEEWS) for right whales that involves regular aerial or ship surveys of both the GSC and CCB. The NEEWS will be extending coverage through the summer beginning in 1997. The NMFS currently has the authority to implement emergency closures of an area under both the MMPA and the ESA. The NEEWS and other opportunistic sighting from the extensive use of this area by commercial and recreational vessels will alert the agency to any right whale concentrations that may develop during the summer or fall. Other less restrictive measures such as implementing the gear modifications or best available fishing practices discussed below may provide sufficient protection.

5.1.3.2 Other Gear Modifications

NMFS proposed a complex suite of gear modifications that had been discussed at the ALWTRT meetings for various areas including the CCB. Lobster gear requirements for the CCB were implemented by Massachusetts and the NMFS emergency regulations in 1997. Through public comments and a subsequent meeting of gear specialists, it was determined that many of the gear modifications were untested and, if implemented as broadly as proposed, may result in greater chances of gear entanglements. The gear modifications that were placed into effect under the Massachusetts and federal emergency regulations were in 1997 provided some insight as to their operational effectiveness. For more information on specific problems with the proposed gear modifications, see section 4.2.8.

Although several gear requirements were found to cause operational problems, there were some that were found to be potentially beneficial if used in combination with what has been determined over the years to be the best available fishing practice for specific areas. Therefore, the NMFS has developed a menu of gear modifications that are either already in use, or could easily be put in to use in most fisheries. For the high use right whale period (Jan 1 to May 15) lobster gear will be required to use the current suite of gear modifications placed into effect in 1997. For the non-high use period (May 16 to December 31) all gillnet and lobster gear must use two items from the gear menu. See section 4.2 for a general discussion of gear modification alternatives. See section 4.1 for a general discussion of area closure and gear removal alternatives.

5.2 Great South Channel

5.2.1 Description of Physical Environment

The Great South Channel right whale critical habitat is the area bounded by the following points: 41°40' N, 69°45' W; 41°00' N, 69°05' W; 41°38' N, 68°13' W; 42°10' N, 68°31' W. This area is one of five (3 U.S., 2 Canadian) that together comprise the minimal space required to support a viable northern right whale population. (Figure 1)

The Great South Channel is a large funnel-shaped bathymetric feature at the southern extreme of the Gulf of Maine between Georges Bank and Cape Cod, Massachusetts. The channel is bordered on the west by Cape Cod and Nantucket Shoals and on the east by Georges Bank. To the south the channel narrows and rises to the continental shelf edge and deep sea canyons beyond. To the north the channel opens into Murray and Wilkinson Basins. The average depth is about 175 meters with a maximum depth of about 200 meters to the north near Wilkinson Basin. The channel becomes thermally stratified during the spring and summer months. Surface waters typically range from 3 to 17 °C between winter and summer.

Salinity is stable throughout the year at approximately 32-33 parts per thousand (Hopkins and Garfield 1979). Much of the bottom is comprised of silty, sandy sediments, with finer sediments occurring in the deeper waters.

Mixing of warmer shelf waters with the cold Gulf of Maine water funneled through the channel in the late winter and early spring causes a drastic increase in primary productivity in the area. The zooplankton fauna found in these waters are typically dominated by copepods, specifically, *Calanus finmarchicus*, *Pseudocalanus minutus*, *Centropages typicus*, *Centropages hamatus*, and *Metridia lucens*. From the middle of winter to early summer, *C. finmarchicus* and *P. minutus* are the dominant species, which together make up 60-90% of copepod abundance (Sherman *et al.* 1987). In late spring *C. finmarchicus* alone makes up 60-70% of all copepods in the area. In the second half of the year the two species of *Centropages* dominate the waters. Other abundant taxa include euphausiids, cirripede larvae, coelenterates, chaetognaths, appendicularians, and pteropods (Sherman *et al.* 1987).

The primary prey of the northern right whale is the copepod *Calanus finmarchicus* (Kraus and Kenney 1991) although other similar sized zooplankton or other prey organisms may be utilized. In order to receive sufficient sustenance and maintain their energy requirements, northern right whales must feed on dense patches of these copepods or other organisms. Humpback, fin and minke whales also utilize this rich concentration of zooplankton in the spring and early summer months.

The Great South Channel has historically been heavily utilized by fishing vessels and other commercial vessels. A shipping traffic separation scheme runs north-south along the western edge of the area. Coastwise traffic and vessels bound to and from New England ports use the lanes year round. To reach the commercially important fishing grounds on Georges Bank, many vessels transit the critical habitat. The dominant fishing gear-type used in the area is the bottom trawl. The impact of mobile gear to the area is unknown. Although patches of plankton which consists of concentrations necessary for right whale feeding may be disrupted by the passage of fishing vessels or the use of mobile gear, the mesh sizes used in the area do not pose an immediate threat to the whales's planktonic food supply by impingement and subsequent depletion from the environment. Groundfish trawling has been excluded from the southern portion of the area year-round since December 1994 in Area Closure 1 under the Northeast Multispecies FMP.

Current regulations (50CFR648.87) promulgated under the Magnuson-Stevens Fishery Conservation and Management Act Multispecies FMP prohibit the deployment and use of sink and other gillnet gear capable of catching multispecies in the Great South Channel Right Whale Critical Habitat east of the Loran C 13710 line from April 1 to June 30 of each year unless gear or alternative fishing practices are developed that reduce the likelihood of entanglement and/or reduce the chances that an entanglement will result in serious injury or mortality of a right whale. Similar regulations restricting the use of lobster pot gear throughout the entire

critical habitat area were established through an emergency rule (50CFR229.30) on April 1, 1997.

5.2.2 Description of the Problem

The Great South Channel is a known high use habitat for the northern right whale during the spring (April 1 through June 30), during which period it is also used by humpback, fin, and minke whales. In addition to the April through June period, the Great South Channel is an important area for large whales during the summer and fall seasons. Lobster fishing effort has historically been at low levels in this area during the spring, while sink gillnet effort is largely concentrated along the western border. A large segment of the area is currently closed to all groundfish fishing (mainly otter trawl and gillnet gear) for the entire year. Despite the low effort levels during the April through June period, the area is considered a high risk area during that time due to significant use by whales. The ALWTRP calls for restricting these gear types in the Great South Channel during the peak period of right whale abundance, while allowing modified gear in the area during the remainder of the year. This action is expected to eliminate the possibility of whale entanglement in sink gillnet and lobster pot gear throughout most of the Great South Channel critical habitat area during the peak period of right whale abundance. The restrictions are expected to provide significant protection to humpback, fin, and minke whales as well during the April through June period and will reduce the potential for interactions resulting in serious injury or mortality during periods of migratory and/or foraging passage of all whales throughout the remainder of the year.

With regard to lobster gear restrictions, the Great South Channel restricted area consists of the entire critical habitat area. For gillnet restrictions, the area is divided into two areas, west and east of the Loran C 13710 line; the area west of this line is referred to as the "sliver area".

The critical habitat area is the area bounded by the following points:

<u>North Latitude</u>	<u>West Longitude</u>
41°40' N	69°45' W
41°00' N	69°05' W
41°38' N	68°13' W
42°10' N	68°31' W

For gillnet restrictions, the area is broken down into areas described by the following two sets of points:

Area east of the Loran C 13710 line

<u>North Latitude</u>	<u>West Longitude</u>
41°02.2'N	69°02'W,
41°43.5'N	69°36.3'W,

42°10'N	68°31'W, and
41°38'N	68°13'W.

Area west of the Loran C 13710 line ("sliver area")

<u>North Latitude</u>	<u>West Longitude</u>
41°02.2'N	69°02'W,
41°43.5'N	69°36.3'W,
41°40'N	69°45'W, and
41°00'N	69°05'W

5.2.3 Discussion of Alternatives

5.2.3.1 Area Closures

The Great South Channel is known to be an area of high use by large whales during the spring and early summer. The area is utilized by lobster and gillnet fisheries primarily in the summer and early fall. Therefore, closure during the high use period will provide maximum protection against the possibility of entanglement. There have been occasional summers in which whales remain resident beyond July 1, but virtually no records exist of large whales remaining in the GSC after November. Therefore, there is no need for year round closures in the GSC. The existing closures during the high use period of April 1 to June 30 appear to adequately minimize the potential for large whale entanglement in lobster and gillnet gear. Maintaining the closure throughout the summer months would provide very little additional reduction in potential entanglements. See section 4.1 for a general discussion of area closure and gear removal alternatives. Other less restrictive measures such as implementing the gear modifications or best available fishing practices discussed below may provide sufficient protection.

The current regulations do not close the entire Great South Channel critical habitat to gillnet gear. A sliver area on the west side of the critical habitat area remains open. However, the closure does essentially eliminate any potential interaction between gillnetters and right whales in the area during the period of peak right whale abundance, as ninety-seven percent of the right whale sightings in the area occur east of the Loran C 13710 line in waters greater than 50 fathoms in depth. This is due, in large part, to the concentrations of copepods that aggregate in the deeper basin occurring north of the 50 fathom contour. The Loran C 13710 line runs near parallel to, and just inside of, the western boundary of the critical habitat in waters depths of approximately 35 fathoms or less. The only area where the Loran C 13710 line intercepts the 50 fathom contour (Groundfish Area I) has already been closed to all gear capable of catching groundfish as an action under the Multispecies FMP.

The NMFS, in cooperation with the USCG and Commonwealth of Massachusetts, currently operate a New England Early Warning System (NEEWS) for right whales that involves

regular aerial or ship surveys of both the GSC and CCB. The NEEWS will be extending coverage through the summer beginning in 1997. The NMFS currently has the authority to implement emergency closures of an area under both the MMPA and the ESA. The NEEWS and other opportunistic sighting effort will alert the agency to any large whale concentrations that may develop during non-traditional high use periods.

5.2.3.2 Other Gear Modifications

NMFS proposed a complex suite of gear modifications that were discussed at the ALWTRT meetings for various areas including the GSC. Through public comments and a subsequent meeting of gear specialists, it was determined that many of the gear modifications were untested and, if implemented as broadly as proposed, may result in greater chances of gear entanglements. See section 4.2.8 for more information about problems with specific proposals. However, several gear modifications were believed to be beneficial overall if used in combination with what has been determined over the years to be the best available fishing practice for specific areas. Therefore, the NMFS has developed a menu of gear modifications that are either already in use by some fishermen, or could be put in to use in most fisheries. For the GSC in the non-high use period (July 1 to March 31) all gillnet and lobster gear must use two items from the gear menu. This requirement applies to all gillnets in the GSC sliver area for the entire year. See section 4.2 for a general discussion of gear modification alternatives.

5.3 Stellwagen Bank/Jeffreys Ledge Restricted Area

5.3.1 Description of Physical Environment

The Stellwagen Bank/Jeffreys Ledge (SB/JL) area is defined as all Federal waters in the Gulf of Maine that lie to the south of the 43°15'N latitude line and west of the 70° W longitude line, except the Cape Cod Bay right whale critical habitat area. This boundary has been changed from what NMFS proposed in April to more accurately reflect the area where the risk of whale/fishery interactions is high. See Volume I, Final Supplemental Environmental Impact Statement for Amendment 5 to the Northeast Multispecies FMP, and the FEIS and Management Plan for the Studds-Stellwagen Bank National Marine Sanctuary for a description of the physical environment.

5.3.2 Description of the Problem

The SB/JL restricted area lies to the north and west of the two critical habitats mentioned above, and encompasses NOAA's Studds-Stellwagen National Marine Sanctuary. The SB/JL habitat is used as a migratory pathway for right whales to and from the high use right whale habitat in the lower Bay of Fundy, which is in Canadian waters. The area is a high use habitat for humpback, fin, and minke whales during the spring, summer, and fall months. On rare occasions, right whales have remained in this area throughout the summer. The designation of

Stellwagen Bank as a National Marine Sanctuary in 1992 acknowledges the area's rich marine resource diversity. The NMFS plan calls for restricting lobster pot and sink gillnet gear in the Stellwagen Bank/Jeffreys Ledge area year round to modified gear. The intent of this measure is to reduce the potential for interactions resulting in serious injury or mortality during periods of migratory and/or foraging passage of right whales as well as for foraging resident and migrant humpback, fin, and minke whales, while allowing resource users continued access to the area.

5.3.3 Discussion of Alternatives

5.3.3.1 Area Closures

This area is a high use area for humpback and fin whales in the summer and fall. Right whales are occasionally seen in this area in the summer and fall either foraging migrating between their known high use areas to the north (Lower Bay of Fundy and Browns/Baccarro Banks) and south (CCB and GSC). Lobster and gillnet gear is deployed in the area from spring through fall. Current gillnet closures in the Mid-Coast and Massachusetts Bay harbor porpoise closure areas restrict the use of gillnets in the SB/JL area during March in Massachusetts Bay, and the Mid-Coast area from September 15 to December 31 (known fall whale congregation period) and again in the spring from March 25 to April 25. All groundfish gear (including gillnet) is prohibited in much of this area during May for effort reduction under the Multispecies FMP.

The low use of this area by right whales, combined with the extensive gillnet closures currently in effect will go a long way toward minimizing the potential for large whale entanglement in gillnet gear. Therefore, further closures throughout the summer months would provide very little additional reduction in potential entanglements. See section 4.1 for a general discussion of area closure and gear removal alternatives. Other less restrictive measures such as implementing the gear modifications or best available fishing practices discussed below may provide sufficient protection. The NMFS has enhanced the disentanglement effort and early warning monitoring system through out the region. These efforts, in coordination with State and other federal agency actions, will provide the information network that will allow us to determine when an unusual right whale distribution pattern is developing that may require either emergency rulemaking or some other form of proactive action.

5.3.3.2 Other Gear Modifications

NMFS proposed a complex suite of gear modifications that were discussed at the ALWTRT meetings for various areas including the SB/JL area. Through public comments and a subsequent meeting of gear specialists, it was determined that many of the gear modifications were untested and, if implemented as broadly as proposed, may result in greater chances of gear entanglements. See section 4.2.8 for further information about problems with specific

proposed gear requirements. However, several gear modifications were believed to be beneficial overall if used in combination with what has been determined over the years to be the best available fishing practice for specific areas. Therefore, the NMFS has developed a menu of gear modifications that are either already in use, or could easily be put in to use in most fisheries. For the SB/JL area, in all gillnet and lobster gear must use two items from the gear menu. See section 4.2 for a general discussion of gear modification alternatives.

5.4 Inshore Lobster

5.4.1 Description of Physical Environment

Inshore lobster waters means all State and Federal waters from the Virginia/North Carolina border to the U.S./Canada border that is shoreward of the area designated below as "offshore lobster waters", and seaward of the exempted waters described in Section 3.6 above. The regulations further divide the inshore waters at 41° 30'N Latitude into a "northern" and "southern" area.

5.4.2 Description of the Problem

Although some right whales can generally found in critical habitat areas at predictable times, the location of most right whales is not known most of the time. Right whales have been seen in coastal and offshore waters in all the months of the year. The "northern" inshore area is used by humpback, fin and minke whales either foraging or moving between the higher use areas (CCB, GSC and SB/JL). Right whales are also seen in this northern area migrating between the high use areas to the north (Lower Bay of Fundy and Browns/Baccarro Banks) and south (CCB and GSC).

The "southern" inshore area is used by foraging fin whales in the summer and fall, and by humpback whales in the winter. Right whales are occasionally seen in this area in the winter moving between their known high use areas to the north (CCB and GSC) and south (SEUS).

Because the movements of large whales are still not predictable, there remains a risk of entanglement in most inshore and offshore waters. Juvenile whales appear to be less predictable in their movements than adults and are also the ones most prone to entanglements. Therefore, some measures to reduce entanglements of large whales are warranted in most coastal and all offshore waters.

5.4.3 Discussion of Alternatives

5.4.3.1 Area Closures

The low use of both the northern and southern areas by right whales suggest that closures would provide very little additional reduction in potential entanglements. See section 4.1 for a general discussion of area closure and gear removal alternatives. Other less restrictive

measures such as implementing the gear modifications or best available fishing practices discussed below may provide sufficient protection. The NMFS plans to enhance the disentanglement effort and early warning monitoring system through out the region. These efforts, in coordination with State and other federal agency actions, will provide the information network that will allow us to determine when an unusual right whale distribution pattern is developing that may require either emergency rulemaking or some other form of proactive action.

5.4.3.2 Other Gear Modifications

NMFS proposed a complex suite of gear modifications that were discussed at the ALWTRT meetings for various areas including the Inshore Lobster area. Through public comments and a subsequent meeting of gear specialists, it was determined that many of the gear modifications were untested and, if implemented as broadly as proposed, may result in greater chances of gear entanglements. See section 4.2.8 for more information on problems with specific proposed gear requirements. However, several gear modifications were believed to be beneficial overall if used in combination with what has been determined over the years to be the best available fishing practice for specific areas. Therefore, the NMFS has developed a menu of gear modifications that are either already in use, or could easily be put in to use in most fisheries. For the Inshore Lobster area, all lobster gear must use one item from the gear menu. This requirement is effect year round in the northern area and during the right whale migration period in the southern area (December 1 to March 31). See section 4.2 for a general discussion of gear modification alternatives.

5.5 Offshore Lobster - Gulf of Maine

5.5.1 Description of Physical Environment

Offshore lobster waters means the area sometimes referred to as "Lobster Management Area 3", and includes all U.S. waters seaward of the following lines except for waters in the Great South Channel critical right whale habitat: Beginning at the international boundary between the U.S. and Canada; thence southerly along the boundary to the LORAN C 9960-Y-44400 line; thence southwesterly along the 44400 line to 70°W longitude; thence south along the 70° meridian to the LORAN C 9960-W-13700 line; thence southeasterly to the intersection with the LORAN C 9960-Y-43700 line; thence westerly to the intersection with the LORAN C 9960-W-14610 line; thence southerly along the 14610 line to the intersection with the LORAN C 9960-Y-43700 line; thence southwesterly to the intersection of the LORAN C lines 9960-Y-43500 and 9960-X-26400; thence southerly to the intersection of the LORAN C lines 9960-Y-42600 and 9960-X-26550; thence southerly to the intersection of the LORAN C lines 9960-Y-42300 and 9960-X-26700; thence southerly to the intersection of the LORAN C lines 9960-Y-41600 and 9960-X-26875; thence southerly in a line toward the intersection of LORAN C lines 9960-Y-40600 and 9960-X-26800 but stopping at the latitude of the North

Carolina/Virginia border; thence due west to the shore. The regulations further divide the offshore waters at 41° 30'N Latitude into a “northern” and “southern” area.

5.5.2 Description of the Problem

The same issues discussed in 5.4.2 are applicable to this region. Most sightings of entangled whales involve free-swimming animals carrying gear. Therefore, the initial point of entanglement is usually not known. In some cases, however, whales are found anchored (dead or alive), or identification is recovered from the gear which can be traced to an individual fisher, who can provide information on when and where the gear was set. In many cases where the original point of entanglement is known, that location is outside the right whale critical habitat areas, mid-Atlantic coastal waters area, and/or Stellwagen Bank/Jeffreys Ledge area. Entanglements of one or more of the four whale species have been recorded from as far north as Lubec and Beal’s Island, Maine and at various inshore and offshore locations along the East Coast down through North Carolina. Therefore, some level of protection is necessary to address this overlap between fishing effort and whale distribution.

5.5.3 Discussion of Alternatives

5.5.3.1 Area Closures

The “northern” offshore area is used by humpback, fin and minke whales either foraging or moving between the higher use areas (CCB, GSC and SB/JL). Right whales are also seen in this northern area migrating between the high use areas to the north (Lower Bay of Fundy and Browns/Baccarro Banks) and south (CCB and GSC). Lobster and gillnet gear is deployed in the area from spring through fall.

The “southern” offshore area is occasionally used by foraging fin whales in the summer and fall. Right whales are infrequently seen in this area in the winter migrating between their known high use areas to the north (CCB and GSC) and south (SEUS).

The low use of both the northern and southern areas by right whales, and the infrequent use by other large whales suggests that closures would provide very little additional reduction in potential entanglements. See section 4.1 for a general discussion of area closure and gear removal alternatives. Other less restrictive measures such as implementing the gear modifications or best available fishing practices discussed below may provide sufficient protection.

5.5.3.2 Other Gear Modifications

NMFS proposed a complex suite of gear modifications that were discussed at the ALWTRT meetings for various areas including the Offshore Lobster area. Through public comments and a subsequent meeting of gear specialists, it was determined that many of the gear modifications

were untested and, if implemented as broadly as proposed, may result in greater chances of gear entanglements. See section 4.2.8 for a more detailed discussion of some of the problems with specific proposed gear modifications. However, several gear modifications were believed to be beneficial overall if used in combination with what has been determined over the years to be the best available fishing practice for specific areas. Therefore, the NMFS has developed a menu of gear modifications that are either already in use, or could easily be put in to use in most fisheries. For the Offshore Lobster area, all lobster gear must use one item from the gear menu. This requirement is effect year round in the northern area and during the right whale migration period in the southern area (December 1 to March 31). See section 4.2 for a general discussion of gear modification alternatives.

5.6 Northeast Gillnet

5.6.1 Description of Physical Environment

Northeast gillnet waters means those U.S. waters east of 72°30'W and north of a line running due east from the Virginia-North Carolina border, and consist of all waters except for the Cape Cod Bay restricted area, the Great South Channel Restricted Gillnet Area and Great South Channel sliver restricted areas and the Stellwagen Bank/Jeffreys Ledge Restricted Area described above.

5.6.2 Description of the Problem

The same issues discussed in 5.4.2 are applicable to this region. The Northeast Gillnet area is used by humpback, fin and minke whales either foraging or moving between the higher use areas (CCB, GSC and SB/JL). Right whales are also seen in this northern area migrating between the high use areas to the north (Lower Bay of Fundy and Browns/Baccarro Banks), the CCB and GSC areas, and the SEUS area to the south. Gillnet gear is deployed in the area year round, though mainly spring through fall.

5.6.3 Discussion of Alternatives

5.6.3.1 Area Closures

Current gillnet closures in the Mid-Coast and Massachusetts Bay harbor porpoise closure areas restrict the use of gillnets in the SB/JL area during March in Massachusetts Bay, and the Mid-Coast area from September 15 to December 31 (known fall whale congregation period) and again in the spring from March 25 to April 25. There is also a sink gillnet closure in eastern Maine from August 15 through September 13. All groundfish gear (including gillnet) is prohibited in this area during May for effort reduction under the Multispecies FMP.

The low use of this area by right whales, combined with the extensive gillnet closures currently in effect will go a long way toward minimizing the potential for large whale

entanglement in gillnet gear. Therefore, further closures throughout the summer months would provide very little additional reduction in potential entanglements. See section 4.1 for a general discussion of area closure and gear removal alternatives. Other less restrictive measures such as implementing the gear modifications or best available fishing practices discussed below may provide sufficient protection. The NMFS has enhanced the disentanglement effort and early warning monitoring system through out the region. These efforts, in coordination with State and other federal agency actions, will provide the information network that will allow us to determine when an unusual right whale distribution pattern is developing that may require either emergency rulemaking or some other form of proactive action.

5.6.3.2 Other Gear Modifications

NMFS proposed a complex suite of gear modifications that were discussed at the ALWTRT meetings for various areas including the Northeast Gillnet area. Through public comments and a subsequent meeting of gear specialists, it was determined that many of the gear modifications were untested and, if implemented as broadly as proposed, may result in greater chances of gear entanglements. See section 4.2.8 for more information about problems with specific proposed gear modifications. However, several gear modifications were believed to be beneficial overall if used in combination with what has been determined over the years to be the best available fishing practice for specific areas. Therefore, the NMFS has developed a menu of gear modifications that are either already in use, or could easily be put in to use in most fisheries. For the Northeast Gillnet area, all gillnet gear must use one item from the gear menu. See section 4.2 for a general discussion of gear modification alternatives.

5.7 Mid-Atlantic Coastal Gillnet Fishery

5.7.1 Description of Physical Environment

The mid-Atlantic coastal waters restricted area applies only to mid-Atlantic coastal gillnet gear, which is grouped into three basic types: (1) sink gillnet gear, *i.e.*, anchored gillnet gear that is fished in the lower third of the water column, (2) other anchored gillnet gear, *i.e.*, anchored gillnet gear that is fished in the upper two thirds of the water column, and (3) driftnet gear. (Restrictions on lobster pot gear fished in this area are addressed under “other northeast waters” above.) This area is defined as the area west of a line running due south from the southern Long Island, New York shoreline at 72°30'W and north of a line running due east from the North Carolina-South Carolina border, and seaward of the exempted waters identified in Section 3.6 above.

5.7.2 Description of the Problem

The same issues discussed in 5.4.2 are applicable to this region. The Mid-Atlantic Gillnet area is used by foraging fin whales in the summer and fall, and by humpback whales in the

winter. Right whales are occasionally seen in this area in the winter migrating between their known high use areas to the north (CCB and GSC) and south (SEUS).

5.7.3 Discussion of Alternatives

5.7.3.1 Area Closures

This information suggest that closures would provide very little additional reduction in potential entanglements. See section 4.1 for a general discussion of area closure and gear removal alternatives. Other less restrictive measures such as implementing the gear modifications or best available fishing practices discussed below may provide sufficient protection. The NMFS has enhanced the disentanglement effort and early warning monitoring system through out the region. These efforts, in coordination with State and other federal agency actions, will provide the information network that will allow us to determine when an unusual right whale distribution pattern is developing that may require either emergency rulemaking or some other form of proactive action.

5.7.3.2 Other Gear Modifications

NMFS proposed a complex suite of gear modifications that were discussed at the ALWTRT meetings for various areas including the Mid-Atlantic Gillnet area. Through public comments and a subsequent meeting of gear specialists, it was determined that many of the gear modifications were untested and, if implemented as broadly as proposed, may result in greater chances of gear entanglements. See section 4.2.8 for more information about problems with specific proposed gear modifications. However, several gear modifications were believed to be beneficial overall if used in combination with what has been determined over the years to be the best available fishing practice for specific areas. Therefore, the NMFS has developed a menu of gear modifications that are either already in use, or could easily be put in to use in most fisheries. For the Mid-Atlantic Gillnet area, all gillnet gear must use one item from the gear menu for the period when large whales are likely to be in the area, i.e., from December 1 through March 31.. See section 4.2 for a general discussion of gear modification alternatives. In addition, from December 1 to March 31, all vessels using driftnets in the mid-Atlantic gillnet area are required to haul all such gear and stow it on the vessel before returning to port. If driftnets are set at night they must be tended i.e., remain attached to the vessel.

5.8 Southeastern U.S. Critical Habitat Restricted Area

5.8.1 Description of the Physical Environment

The designated right whale critical habitat off Georgia and northern Florida (the area described as the SEUS) consists of waters that average about thirty meters in depth with a maximum depth of about sixty meters. The deepest waters occur along the coast of Florida, just south of Cape Canaveral. Seasonal water temperatures and salinity for the area are higher than in

northern waters. This is a transition area separating subtropical from the temperate southeastern marine communities. Large, cyclic changes in abundance and dominance of plankton species occur seasonally and annually. The preferred prey species of right whales, *C. finmarchicus*, does not occur in SEUS waters and the area is not considered a foraging area for northern right whales. The area does, however, provide important calving and nursing habitat for a significant portion of the right whale population.

The calving season extends from late November through early March with an observed peak of activity in January. Between 1980 and 1994, 153 individuals were identified in the area, and nearly all the adult whales that were sighted were female. The relatively warm, shallow waters seem to be preferred by the females with new calves.

Significant vessel traffic and fisheries occur in the SEUS calving grounds. The area is adjacent to major shipping and military ports, and hosts significant recreational boating activity. The fishing activity includes coastal shrimp trawlers and a shark driftnet fishery.

5.8.2 Description of the Problem

The shark driftnet fishery operates primarily off the east coast of Georgia and Florida from May through November when sharks are in relatively shallow water. Some fishing effort occurs year-round. The fishery consists of ten to twelve small boats that take primarily single day trips. Some of the vessels set large-mesh gillnets for the sharks; others target sharks by "strike-netting", a method in which the boat uses the shoreline and a raised or shallow area in the ocean to corral the sharks with the net, similar to a purse seine.

Historically, the greatest density of effort in this fishery is south of the SEUS from January through March, however, for the rest of the year the entire critical habitat is within the range of the densest fishing effort. This includes three months (November, December, and April) of the period in which right whales are likely to be present in the critical habitat area. All gillnetting is currently prohibited in both Florida and Georgia state waters.

5.8.3 Discussion of Alternatives

5.8.3.1 Area Closures

Because the SEUS critical habitat area hosts a significant portion of the right whale population from November through March of each year and because successful calving is crucial to the species continued existence, the ALWTRP includes provisions which provide the greatest measure of entanglement risk reduction. Beginning in 1997, from November 1 through March 31, 1998, and for each year thereafter, the area from Sebastian Inlet, Florida (27°51'N latitude) to Savannah, Georgia (32°00'N latitude) would be closed to all shark net fishing, except for strikenet fishing. In addition, all vessels operating in the shark net fishery from West Palm Beach, Florida (26°46.05'N Latitude) north to Sebastian Inlet, Florida (27°51'N latitude) must call NMFS Regional Office not less than 48 hours prior to departing on any trip

in order to arrange for observer coverage and must take an observer if requested by NMFS. Vessels using strikenets in the entire area from West Palm Beach to Savannah, GA, must also call NMFS prior to departure to arrange observer coverage. This observer requirement is for the November 1 through March 31 period. Observations of right whales in the areas outside this period, that is April 1 through October 31 of each year, are rare, and a broader closure period is, therefore, unneeded. See section 4.1 for a general discussion of area closure and gear removal alternatives.

5.8.3.2 Other Gear Modifications

Because fishing with a shark gillnet is prohibited during the period when the whales are present and because the whales are so rarely sighted in the area during the rest of year, the ALWTRP requires relatively little of the shark gillnet fishery in terms of gear and fishing practice modifications. Because these lighter gillnets are not anchored, the mechanism that would cause the gear to breakaway is unavailable. See section 4.2 for a general discussion of gear modification alternatives. Gear will be required to be marked (see section 4.2.5) and the requirements for the use of observers in the fishery will be broadened.

Strikenetting in southeast waters will only be permitted during the high risk period if: (1) no nets are set at night or when visibility is less than 500 yards (460 m), (2) each set is made under the observation of a spotter plane, (3) no net is set within 3 miles of a right, humpback or fin whale, and (4) if a whale comes within 3 miles of set gear, the gear is removed from the water immediately. NMFS believes these measures will minimize the risk of entangling any large whale.

6.0 Affected Environment

6.1 Description of the Physical Environment

See 5.0 above for a description of the physical environment in the areas affected by this plan.

6.2 Description of Biological Environment

See Volume I, Final Supplemental Environmental Impact Statement for Amendment 5 to the Northeast Multispecies FMP for a listing of affected species. Information on marine mammals and endangered species can be found in Section E.6.3, Pages 167-168 and the associated National Marine Fisheries Service Biological Opinion issued on November 30, 1993. See Volume I, Supplemental Environmental Impact Statement for Amendment 7 to the Multispecies FMP, Section E.6.3.4, Pages 116-118, the associated NMFS Biological Opinion issued on February 16, 1996 (NMFS 1996a), and the Biological Opinion issued on December 13, 1996 (NMFS 1996b) as part of the reinitiated Endangered Species Act Section 7 consultation.

Pursuant to Section 114 of the MMPA, NMFS has published a Stock Assessment Report (SAR) for all Atlantic and Gulf of Mexico marine mammal stocks under NMFS jurisdiction. The most current stock assessment report for marine mammals is Waring (1996). The SARs contain a summary of current knowledge on stock definition and geographic range, population size, current and maximum net productivity rates, PBR levels, annual anthropogenic serious injury/mortality, and status of the stocks. Those assessments are incorporated by reference. Updated entanglement and ship strike impact information is presented below, some of which is excerpted from Waring (1996).

6.2.1 Take of Northern Right Whales Incidental to Human Activities

The size of this stock is considered to be low relative to OSP, and this species is listed as endangered under the ESA. A Recovery Plan has been published (NMFS 1991) and its implementation is being overseen by two teams, a New England and a Southeastern Implementation Team. Waring (1996) lists the PBR for the Western North Atlantic stock as 0.4 per year, or 2 whales every 5 years. Under the MMPA, the northern right whale is classified as a strategic stock because the minimum annual average fishery-related mortality and serious injury exceeds PBR and because the northern right whale is an endangered species.

For the period 1991 through 1995, the rate of fishery related mortality based on observer records alone is 0.4 per year (extrapolation of one observed take in the driftnet fishery). The SAR (Waring, 1996) reports four additional records of entanglements where fishery interactions were considered the primary cause of death. This results in an additional 0.7 mortalities or serious injury to right whales per year due to fishing interactions. In addition, the SAR (Waring, 1996) estimates the average annual mortality related to ship strikes as 1.6 right whales per year. Adding all human induced mortality and serious injuries together yields a total annual mortality and serious injury estimate of 2.7 per year. With the exception of the observed take in the swordfish driftnet fishery, these mortality and serious injury rates are minimum estimates, since they are based only on known entanglements. Other entanglements may have occurred but not been seen.

Approximately one-third of all right whale mortality can be definitively attributed to human activities (Kraus, 1990; Kenney and Kraus, 1993). Further, the small population size and low annual reproductive rate suggest that human sources of mortality may have a greater effect relative to population growth rates than for other whales. Marks or scars from entanglement were reported from 57% of living right whales, and 7% had major wounds probably due to collisions with ship propellers (Kraus, 1990). This scarification analysis suggests that most encounters with fishing gear do not result in serious injury or mortality. In many cases, whales may break free of gear immediately with either no injury or only minor lacerations. In some cases, however, whales can sustain deeper wounds by thrashing to shake the gear, or thrashing may result in gear becoming wrapped or cinched around the animal. Such cases are

more likely to result in serious injury or mortality. Young animals, ages 0-4 years, are apparently the most affected segment of the population (Kraus 1990).

6.2.2 Take of Humpback Whales Incidental to Human Activities

The size of this stock is considered to be low relative to OSP, and this species is listed as endangered under the ESA. To fulfill responsibilities under the ESA, NMFS established a team of regulatory agencies and technical advisors in New England to implement the humpback whale recovery plan published by NMFS in 1991. There are insufficient data to determine population trends for humpback whales. Waring (1996) lists the PBR for humpback whales, Western North Atlantic stock, as 9.7 per year. Under the MMPA, the Western North Atlantic stock of humpback whales is considered a strategic stock because of its status as an endangered species.

The 1996 Stock Assessment Reports estimate that the rate of serious Injury and mortality of humpback whales due to fishery interactions is 4.1 animals per year. Of this value, 0.7 animals per year were observed by NMFS observers. The remaining 3.4 animals per year are from known entanglements not directly observed by NMFS. Other sources of serious injury and mortality are estimated at 1.4 (including ship-strikes), making the total human-induced serious injury and mortality estimate at 5.5 humpback whales per year. The PBR level for this stock is 9.7 whales per year.

A preliminary scarification analysis of photographically identified humpback whales in the Gulf of Maine suggests a 30-40% scarring rate from possible gear interactions (Carlson, pers. comm.). Of twenty dead humpback whales, principally in the mid-Atlantic, where decomposition state did not preclude examination for human impacts, Wiley *et al.* (1995) reported that six (30%) had major injuries possibly attributable to ship strikes, and five (25%) had injuries consistent with possible entanglement in fishing gear. One whale displayed scars that may have been caused by both ship strike and entanglement. Thus, 60% of the whale carcasses which were suitable for examination showed signs that anthropogenic factors may have contributed to, or been responsible for, their mortality. Wiley *et al.* (1995) further reported that all stranded animals were sexually immature, suggesting a winter or migratory segregation and/or that juvenile animals are more susceptible to human impacts. Although ship strikes have primarily been attributed to large vessels, on 7 October 1993 off Atlantic City, NJ, there was a collision between a 33 foot sport-fishing vessel and a humpback whale, causing subsequent injury.

Canadian serious injury/mortality is not included in the above calculation of bycatch rates from opportunistic (non-observer data) reports. During the 1991 through 1995 period, 1 entanglement in unspecified Canadian gillnet gear was reported for the Bay of Fundy. Additional entanglements may have occurred further north in Canada, since humpback entanglements have been documented in the Canadian Maritimes, particularly off Newfoundland. Numbers of entanglements have been reduced since the Canadian limitations

on fishing for cod went into effect. Reports of collisions with fixed fishing gear set for groundfish around Newfoundland averaged 365 annually from 1979 to 1987 (range 174-813). An average of 50 humpback whale entanglements (range 26-66) were reported annually between 1979 and 1988 and 12 of 66 humpback whales that were entangled in 1988 died (Lien et al. 1988). Volgenau *et al.* (1995) also summarized existing data and concluded that in Newfoundland and Labrador, cod traps caused the most entanglements and entanglement mortalities (21%) of humpbacks between 1979 and 1992. They also reported that gillnets are the gear that was the primary cause of entanglements and entanglement mortalities (20%) of humpbacks in the Gulf of Maine between 1975 and 1990.

6.2.3 Take of Fin Whales Incidental to Human Activities

The status of this stock relative to OSP is unknown, but the species is listed as endangered under the ESA and is therefore considered strategic under the MMPA. There are insufficient data to determine the population trends for fin whales. Waring (1996) lists the PBR for the Western North Atlantic stock of fin whales as 3.4 per year.

There was no reported fishery-related mortality or serious injury to fin whales in US fisheries observed by the NMFS Sea Sampling program during 1991-95. However, several reports of entangled fin whales were received from sources outside the observer program. A review of 15 records of stranded or floating (dead or injured) fin whales on file at NEFSC/NMFS showed that three had fishery interactions: two had net or rope marks, and one had line through the mouth and around the tail. The data are insufficient to assign a specific number per year. The Stock Assessment Reports estimate the total known mortality and serious injury of fin whales due to entanglements is less than 10 percent of PBR.

An estimate of scarification rates for fin whales is not available at this time, although photo-identification catalogues maintained at the College of the Atlantic in Bar Harbor, Maine and the Mingan Island Cetacean Study in Quebec may be useful for scarification analysis. Scars are often used to identify individuals (Stevick, pers. comm.). Potential for under-reporting of mortality of fin whales could be significant because they sink when dead and therefore may never be observed. In addition, because of their size, speed, and power, fin whales are likely to break through and/or carry off entangling gear and would therefore be less likely to be observed.

6.2.4 Take of Minke Whales Incidental to Human Activities

The status of minke whales relative to OSP in the US Atlantic EEZ is unknown. The total level of human-caused mortality and serious injury is unknown, but an analysis of the above data results in a minimum annual average of 2.5 events per year due to entanglement in U.S. fishing gear. Waring (1996) sets the PBR for the Canadian/East Coast stock of minke whales at 21. This is not a strategic stock because estimated fishery-related mortality and serious injury is not known to exceed PBR, and the minke whale is not listed as a threatened or

endangered species under the ESA. The total fishery-related mortality and serious injury for this stock is greater than 10% of the calculated PBR and, therefore, cannot be considered to be insignificant and approaching zero mortality and serious injury rate.

Accurate estimates of human-caused serious injury and mortality of minke whales are not available because it is likely that many entanglements, injuries, and mortalities go unobserved and/or unrecorded partly due to minke whales becoming trapped, drowning, and sinking without being observed. The majority of entanglement reports where whales are found dead in gear involve minke whales. During the 1991-1995 period, the NMFS Sea Sampling program recorded observed takes of minke whales in sink gillnet and swordfish drift gillnet gear. In addition to observer data, several entanglement and ship strike reports were received from other data sources.

Minke whales inhabit coastal waters during much of the year and are subject to collision with vessels. In one record in the NMFS marine mammal stranding database, on 7 July 1974, the necropsy suggested a vessel collision. On 15 March 1992, a juvenile female minke whale with propeller scars was found floating east of the St. Johns channel entrance. Although ship strikes of minke whales have occurred historically, records maintained by NMFS and the Smithsonian Institute do not list any minke whale ship strike mortalities for the 1991-1995 period.

6.3 Description of the Human Environment

Gillnet Fishery: See Volume I, FSEIS for Amendment 5 to the Northeast Multispecies FMP, Section E.6.4, Pages 176-177 for a description of the New England fleet; and Volume I, SEIS for Amendment 7 to the FMP, E.6.4.1, Pages 119-121. Although these EIS's are somewhat dated, they represent the most current assessment of the status of the fisheries that are involved in marine mammal interactions. Changes in these fisheries from the extensive effort reduction and harbor porpoise protection regulations have not yet been analyzed.

A gillnet is an upright barrier of monofilament netting in which fish are caught. Fish, of a size for which the net is designed, swimming into the net can pass only part way through a single mesh of the net and thereby become "gilled". Various mesh sizes are used depending upon the species and size of the fish to be caught. Gillnets can be suspended at the surface, in mid-water, or close to the bottom by controlling the number of buoy lines, the size and number of floats on the top or cork line, and the size of the weights on the lead line. The northeast groundfish gillnet fishery sets nets on or near the bottom, where they are fixed by anchors or weights of various types; thus it is referred to as the "sink gillnet" fishery. Target species include groundfish (cod, haddock, hake, pollack, and flounders), monkfish, and dogfish.

Social and Cultural Aspects: See Volume I, FSEIS for Amendment 5 to the Northeast Multispecies FMP, Section E.6.4.3; and Volume I, SEIS for Amendment 7 to the FMP, E.6.4.3, Pages 169-179.

7.0 Environmental Consequences of Proposed Actions and Alternatives

7.1 Biological Impacts

See the Biological Opinions on Amendment 5 to the American lobster FMP (NMFS 1994) and the 1996 reinitiated Biological Opinion on the lobster FMP (NMFS 1996c) for descriptions of known impacts of the lobster fishery on endangered and threatened species under NMFS jurisdiction. See also the Biological Opinions on Amendment 7 to the Multispecies FMP (NMFS 1996a) and the 1996 reinitiated Biological Opinions on the Multispecies FMP (NMFS 1996b) for descriptions of known impacts of the sink gillnet fishery on endangered and threatened species under NMFS jurisdiction. Specific impacts of the proposed emergency action and alternatives are described below.

7.1.1 Marine mammals

Further information about the population biology and human-caused sources of mortalities and serious injuries is available from NMFS in the 1996 stock assessment reports. Some entanglements of large whales were observed by the NMFS sea sampling program; however, most records come from reports from various sources such as small vessel operators. Limitations on the use of the available entanglement data include: 1) not all observed events are reported; 2) most reports are opportunistic rather than from systematic data collection; consequently, conclusions cannot be made regarding actual entanglement levels; 3) identifying gear type or the fishery involved is often problematic; and 4) identifying the location where the entanglement first occurred is often difficult since the first observation usually occurs after the animal has left the original location.

Right Whales - Most of the measures in this interim plan focus on ways to reduce the risk of serious injury and mortality to right whales, both because the right whale's population status is more critical than that of any other large whale, and because right whales are the only endangered large whale in U.S. Atlantic waters for which PBR is known to be exceeded. The North Atlantic right whale is one of the most endangered species in the world, numbering only around 300 animals. The most recent (1996) stock assessment compiled by NMFS estimates that a minimum of 1.1 right whales from the western North Atlantic stock are seriously injured or killed annually by entanglement in U.S. fishing gear each year from 1991 through 1996. The reports available to NMFS often do not contain the detail necessary to attribute an entanglement to a particular fishery or location. However, lobster gear and pelagic drift gillnet gear are known to have contributed to these entanglements. Longer-term records held by NMFS include entanglements of right whales in other gillnets, including in Canada and in the southeastern United States. Unobserved entanglements are also known to occur, based on observed scarred animals. (More than half of all right whales bear scars that appear to be from entanglements.) NMFS is unable to estimate the rate of these unobserved events.

NMFS has determined that to meet the 6-month goal set by the MMPA to reduce takes by commercial fisheries to below the PBR level of 0.4 for this stock, the overall probability of entanglement of right whales by all U.S. Atlantic fisheries must be reduced by approximately two-thirds (from 1.1 to less than 0.4 per year). For the purposes of this plan, the ZMRG for this stock is considered to be 0.04 animals per year, or four cases of serious injury or mortality per century.

Humpback Whales - The 1996 Stock Assessment Reports estimate that rate of serious injury and mortality of humpback whales due to fishery interactions is 4.1 animals per year. Of this value, 0.7 animals per year were observed by NMFS observers. The remaining 3.4 animals per year are from known entanglements not directly observed by NMFS. The PBR level for this stock is 9.7 whales per year. Therefore, NMFS has determined that a reduction in take for the western North Atlantic stock of humpback whales is not required to meet the 6-month goal. For the purposes of this plan, the ZMRG for this stock is considered to be 1 case of serious injury or mortality per year. This level is exceeded by the current entanglement rates.

Fin Whales - Although serious injury and mortality due to entanglement has been documented for this stock of fin whales over the 1991-1995 period, none of those events can be conclusively attributed to any of the four fisheries groups covered in this plan. The total known fishery-related mortality and serious injury rate for this stock is less than 10% of PBR, which is calculated to be 3.4 fin whales per year. Therefore, NMFS has determined that a reduction in take for the western North Atlantic stock of this species is not required for these fisheries to meet the 6-month goal. For the purposes of this plan the ZMRG is considered to be 0.3 cases of serious injury or mortality per year or three fin whales per decade. The 1996 Stock Assessment Report concludes that the known fishery-related mortality and serious injury for this stock is less than 10 percent of PBR and can be considered to be approaching the ZMRG. This assessment may change in the future. NMFS has records of fin whale entanglements that have not been analyzed, however, and intends to complete the analysis of these records soon. It should be noted that known entanglements of fin whales are rare. The number of entangled fin whale sightings is likely to be negatively biased because carcasses usually sink and are therefore less likely to be observed.

Minke Whales - The 1996 NMFS stock assessment report estimates that 2.5 minke whales are seriously injured or die from fishery-related encounters. This level does not exceed the PBR level of 21 for this stock. This species is not listed as threatened or endangered under the ESA or as depleted under the MMPA. Measures implemented to reduce the entanglement rate of right and humpback whales may reduce the entanglement rate for minke whales, facilitating progress of that stock toward ZMRG. For the purposes of this plan, the ZMRG for this stock of minke whales is considered to be 2.1 animals per year. The current entanglement rate exceeds that figure by a small margin.

Other Marine Mammals - The area closure measures of the ALWTRP may reduce interactions of other marine mammal species such as white-sided dolphins and harbor porpoise that may

frequent either the CCB or GSC in the winter or spring. The gear modification measures are general designed to release when a large mammal hits the gear. Smaller marine mammals would not benefit from these measures. The other ALWTRP measures may increase awareness among fishers as to the need to avoid interactions with all marine mammals.

7.1.2 Other Bycatch Reduction Measures

Other measures that are expected to decrease the risk of entanglement of whales in sink gillnets are either currently in effect or under consideration. Reductions in allowable days at sea and seasonal or year-round area closures to protect groundfish will also reduce the risk of entangling right whales. Additionally, area closures for harbor porpoise conservation are in effect for Massachusetts Bay, the Gulf of Maine "mid-coast" and "northeast" areas, and southern New England. With the exception of the harbor porpoise closure in southern New England, all of these closures coincide with times that right whales are also present in the area, further decreasing the likelihood of entanglement. Effort reduction measures under Framework Adjustment 20 to the Northeast Multispecies Fishery Management Plan are expected to reduce total sink gillnet effort by 50 to 80 percent. This measure is expected to also reduce the risk of large whale entanglement associated with this gear.

New England sink gillnetters that fish "day trips" are now limited in the number of nets they can set. This limit may further reduce the risk of entanglement of right whales in sink gillnet gear.

Some level of lobster pot gear effort reduction may occur under gear conflict management measures such as those implemented by the NEFMC in Southern New England. Gear conflict reduction measures are also expected to decrease the amount of lost gear, which should reduce the risk that whales would become entangled in "ghost" gear. Further, the Atlantic States Marine Fisheries Commission is currently considering reducing effort in the lobster fishery. Any effort reduction measures implemented for the lobster fishery are likely to reduce the risk of entanglement of whales in that gear.

7.1.3 Cape Cod Bay Critical Habitat Restricted Area

The ALWTRP incorporates the Framework 23 and MMPA emergency regulations. See the Environmental Assessments prepared for the Lobster MMPA Emergency Interim Final Rule (NMFS 1997b) and Framework 23 to the Multispecies FMP (NMFS 1997a) that implemented a closure in the federal water portion of the Cape Cod Bay critical habitat for sink gillnets and implemented gear restrictions for lobster pot gear during the high use period for right whales (January 1 to May 15) to be consistent with similar Massachusetts regulations in state waters. Those assessments of alternatives for the January 1 through May 15 period are incorporated by reference.

Lobster and sink gillnet gear are more often deployed in the Bay in the summer and fall months. Although this is a period of less frequent use by right whales, right whales are known to use the Bay during all months of the year, and it is important habitat for other large whales as well. Therefore, the NMFS plan calls for maintaining the current restrictions for sink gillnet and lobster gear implemented by Massachusetts in the Bay during the peak right whale abundance months, and then requiring fishers to use two modifications from a menu of best available fishing practices for the remainder of the year. These measures are expected to minimize the possibility for entanglement during right whale high use periods while reducing the potential for gear interactions resulting in serious injury or mortality during periods of less frequent right whale use. NMFS believes these actions will achieve the necessary risk reduction for this area for all four large whale species .

7.1.4 Great South Channel Critical Habitat Restricted Area

See the Environmental Assessments prepared for the Lobster Emergency Rule (NMFS 1997b) and Framework 23 to the Multispecies FMP (NMFS 1997a) that implemented a closure in the Great South Channel critical habitat for sink gillnet and lobster pot gear during the high use period for right whales (April 1 to June 30). The final rule incorporates these regulations under the MMPA. This Environmental Assessment (EA) incorporates the EAS prepared for those actions for the April 1 through June 30 period.

Lobster and sink gillnet gear are rarely used in this area during the spring, and a large segment of the area is currently closed to all groundfish fishing (mainly otter trawl and gillnet gear) for the entire year. The NMFS plan calls for restricting these gear types in the Great South Channel during the high use months, while allowing fishers to use two modifications from a menu of best available fishing practices during the remainder of the year. This action would eliminate the possibility for entanglement of large whales in sink gillnets in this area during the peak period of right whale abundance as implemented under Framework 23 and reduce the potential for entanglement in lobster pot gear as implemented under the MMPA emergency regulations during the same period and would reduce the potential for interactions resulting in serious injury or mortality during periods of migratory and/or foraging passage of all large whales.

The ALWTRP will allow sink gillnet gear to occur in a small section of the western edge of the critical habitat area described as the area west of LORAN C 13710 (sliver area), during the April 1 to June 30 closure period. Lobster pot gear is prohibited from that area until minimal risk gear has been developed, as recommended in the Reasonable and Prudent Alternatives for the reinitiated Lobster FMP Biological Opinion issued on December 13, 1996 (NMFS 1996c). Gillnet gear in this area is usually tended by vessels in the vicinity who can observe any entanglement problem and either disentangle the animal or call nearby disentanglement teams to respond. Lobster gear is rarely set in this area during the spring, and is typically tended less frequently than gillnet gear. Therefore, the final rule remains consistent with the Reasonable and Prudent Alternatives set out in the respective Biological Opinions. The

ALWTRP will allow modified sink gillnet and lobster pot gear to be set in this area during the off-peak right whale period of July 1 to March 31, provided that the gear has at least two characteristics from the menu of best available fishing practices.

7.1.5 Stellwagen Bank/Jeffreys Ledge Restricted Area

The Stellwagen Bank/Jeffreys Ledge restricted area encompasses NOAA's Studds-Stellwagen National Marine Sanctuary and nearby waters, and is used as a migratory pathway for right whales to and from the high use right whale habitat in the lower Bay of Fundy, which is in Canadian waters. The area is also known as a high use habitat for the humpback, fin, and minke whales during the spring and summer (May 1 through September 30), as well as an area of rich marine resource diversity as recognized by its designation as a National Marine Sanctuary. The NMFS plan calls for restricting sink gillnet and lobster gear types in the Stellwagen Bank/Jeffreys Ledge restricted area year-round to using two gear modifications from the menus developed for specific gear categories. This will reduce the potential for interactions resulting in serious injury or mortality during periods of migratory and/or foraging passage of right whales as well as for foraging resident humpback, fin, and minke whales while allowing resource users continued access to the area.

7.1.6 Southeastern U.S. Critical Habitat Restricted Area

Right whales are found in the Southeastern U.S. critical habitat during the winter months (November through March), usually engaged in mating and calving activities. The shark net fishery operates in same general waters off Georgia and Florida during the late fall and early winter (October through December), although all gillnetting is currently prohibited in both Florida and Georgia state waters. The NMFS plan will prohibit shark gillnetting from Sebastian Inlet, Florida to Savannah, Georgia, and require observers aboard shark gillnet vessels from West Palm Beach to Sebastian Inlet, Florida. Strikenetting, a form of encircling fish with a gillnet, will be allowed with certain operational restrictions.

7.1.7 Other Restricted Areas

Large whales are known to migrate and engage in far ranging foraging throughout the Gulf of Maine and along the Mid-Atlantic coast. Although the location of most whale entanglement events is unknown, some fraction of the records do contain enough information to pinpoint the area. Many of these entanglement events for which location is known occurred in areas of gillnet and/or lobster pot fishing effort, but outside the Cape Cod Bay, Great South Channel, and Stellwagen Bank/Jeffreys Ledge areas. The NMFS plan will require gear marking throughout the range of the four fisheries regulated by this plan. The plan also calls for one gear modification for all lobster pot gear and anchored gillnet gear from the menu of modifications developed for each gear type. This is expected to reduce the potential for gear interactions resulting in serious injury or mortality. Because whales are extremely mobile, widespread gear modifications are believed to be the most effective means of reducing the rate

of serious injury and mortality of large whales due to entanglement. In particular, juvenile whales, which appear to be the age classes most vulnerable to entanglement, often stray outside the usual concentration areas and high-use habitats of the population as a whole.

Measures restricting gillnets in the mid-Atlantic coastal waters area are expected to have the greatest benefit for humpback whales. Restrictions are required for the December 1 through March 31 period, when humpback whales, particularly juveniles, are most likely to be present.

7.1.8 Impacts on Other Marine Organisms

The time/area closures are likely to result in some relief of fishing pressure on the sink gillnet and lobster target species as well as other marine mammals in the affected areas. The final actions are fully consistent with groundfish and lobster conservation goals detailed in the Multispecies and American Lobster Fishery Management Plans.

The time/area closure may result in a shift of lobster and/or gillnet fishing effort rather than a net reduction. The shift itself and the effects it may have on other marine organisms cannot be predicted in a meaningful manner.

The possibility of gear becoming lost and turning into “ghost gear” due to the use of weak links and breakaway gear required under the final action may become a problem to benthic resources such as lobster, crabs, flounders and other bottom dwelling finfish. However, there is no way to determine the degree to which gear will become lost due to these gear modifications. Derelict lobster gear is likely to be less of a problem for other marine organisms, as it is already outfitted with degradable panels to address this problem. Sink gillnet gear may remain in a vertical fishing mode for some period of time, but eventually becomes balled up on the bottom and represents less of a problem to other marine resources.

If widespread closures were imposed, there would be some benefit to other marine species. For example, target species would be expected to increase. This is particularly true for lobster, because a wide-spread closure would entail a large decrease in effort. Groundfish stocks would improve under wide-spread gillnet closures. Non-target species taken incidentally in these fisheries might also increase, to the degree that bycatch of these species affects their reproductive rate. The populations of other species linked to target species through predator/prey or competitive relationships would also be affected. Widespread closures would also result in less lost gear, since there would be less gear in the water. Non-target and target species would benefit from such an effect.

7.2 Economic Impacts

The Economic Analyses contained in the Environmental Assessments prepared for the Lobster Emergency Rule (NMFS 1997b) and in Framework 23 to the Multispecies FMP (NMFS 1997a) addressing sink gillnet and lobster pot gear are incorporated in the following analyses

so that a consistent picture of the costs of large whale take mitigation on individual entities is presented.

The foregone gross revenue from landings from an area by a particular gear in question is used as a measure of the cost of a closure. No attempt is made to estimate the revenue regained by redeployment of gear. Additionally, there is assumed to be no loss in consumer benefits due to reduced availability of seafood.

The analysis called for in this setting is more appropriately a cost effectiveness comparison than a benefits/cost comparison. While the "benefit" of, say, an avoided large whale mortality is not infinite, the legislation implies that reasonable costs will be incurred to contain the number of "takes" over time to some predetermined level. Furthermore, as discussed earlier in this report, there is little empirical evidence with which to gauge the expected benefit of reduced injury/mortality and compare it to the incremental cost required to achieve that benefit. Of course, at some level of cost, such as that represented by closure, there is an expectation that the risks will have been reduced. Therefore, given the determination of appropriate measures for mitigating interactions, a comparison of cost among alternatives is appropriate. For closures, the gross revenue foregone is a useful basis.

The proposed closures and gear modification exemptions constitute the preferred alternative. A "No Action" alternative consists of continuing the fisheries in question (no cost of adjustment) and continuing to accept the risk. A "Non-Preferred" alternative is presented as well, one which evaluates the cost of increased likelihood of reduced risk by substituting closure for the area and period over which gear modifications are to apply in the preferred alternative - a full year in almost all cases. More extensive closures could be postulated, of course, including those which would preclude any risk of injury or mortality from fishery interactions. These are not yet indicated. In fact, the costs of the year round closures were so huge that it did not seem necessary to calculate a net present value over a ten year horizon as we did for the gear conversion and replacement costs. Therefore, the non-preferred alternative costs should be recognized as **per-year** costs of closure.

7.2.1 Cape Cod Bay Critical Habitat

See the Economic Analysis contained in the Environmental Assessments prepared for the Lobster Emergency Rule (NMFS 1997b) and Framework 23 to the Multispecies FMP (NMFS 1997a) that implemented a closure in the federal water portion of the Cape Cod Bay critical habitat for sink gillnet and implemented gear restrictions for lobster pot gear during the high use period for right whales (January 1 to May 15) to be consistent with similar Massachusetts regulations in state waters. The proposed rule incorporates these regulations under the MMPA.

7.2.1.1 No Action

This alternative calls for no changes in fishing practices and accepts the current level of risk.

7.2.1.2 Preferred Alternative

7.2.1.2.1 Lobster Fisheries

The PA would prohibit the setting of lobster gear in the Cape Cod Bay Critical Habitat Area (CCBHA) from January to May 15 unless modified as prescribed. Further, the PA would require modification of all gear set in Cape Cod Bay from May 16 to December 31. The modified gear was assumed to have no impact on lobster landings; hence, the gear modifications are assumed to have no impact on fishery revenues. However, the regulations would effectively require modification of every trap fished in the area. The present value of the cost to retrofit gear was estimated to be \$1.4 million. This estimate was based on the assumption that the regulations would be in place for at least 10 years beginning in 1998. The estimated costs are also based on the total number of traps fished in both state and Federal waters of Cape Cod Bay. This was necessary due to the inability to assign traps to only the Federal portion of the CCBCHA. The cost estimates are, therefore, overestimates of the economic costs associated with the Federal portion of the Bay. The estimated cost was calculated as follows.

Since the regulations would affect every piece of lobster gear fished in the CCBHA the maximum number of traps fished in the area during any given month was assumed to be affected. Selecting 1993 as the baseline year, the maximum number of traps fished in the area was 57,878 during September (Endangered Whale Working Group, 1996). Because the water depth in the Bay varies, it was assumed that 25% of these traps were fished in depths up to 200 feet. The remaining traps were assumed to be fished at depths averaging 100 feet. Assuming an average number of 10 pots per lobster pot trawl fishermen will be required to replace approximately 2,730 and 1365 feet of line respectively at depths of 200 and 100 feet per 10-pot trawl. Replacement sinking line was estimated to cost \$0.0875/ft. The cost of installing break-away buoy lines was assumed to be \$4.96 per 10-pot trawl and the cost of markers was assumed to be a total of \$17.71. The implementation schedule would require replacement of all lines, the use of break-away buoys, and markers on each buoy by January 1998. Thus, the 1998 cost of the measure was estimated to be \$0.98 million for replacement of 5,788 ten-trap trawls. This estimate does include labor costs associated with the conversion.

Labor costs were computed assuming an average wage rate of \$13.28 per hour (Bureau of Labor Statistics average manufacturing wage in New England). Labor time to refit gear was assumed to be 14 minutes per trawl for replacement of sinking groundlines and installation of weak links on buoy lines. Gear marking was assumed to be done by whipping appropriate colored twine. Each whip was assumed to take ten minutes. Of the gear marking practices that could be adopted, whipping line is probably the most expensive due to the time it takes to

apply each whip. Painting line would be considerably less time consuming. Thus, the labor costs are quite conservative and likely substantially overstate the gear marking costs.

Subsequent year's (1999-2007) costs were estimated to be \$0.1 million based on an assumed 20% replacement rate for lost or damaged gear. Note that the replacement cost was estimated as the difference in cost of replacing sinking line as compared to floating line. Thus these estimates are the increased replacement costs associated with the large whale protection measures. The time stream of costs and their discounted values are presented in Table 6.2.1.2.1.A.

Assuming an average of 800 traps per fishing firm, the whale protection measures in the CCBCHA will affect 72 small businesses. The conversion cost of complying with the whale protection measure will be \$13,689 per firm inclusive of labor costs. The majority of this cost is associated with replacement of floating line and labor cost associated with gear marking.

Table 6.2.1.2.1.A. Time Stream of Costs for Gear Modification in the CCBCHA			
Year	Cost (\$)	Discount Factor (7%)	Present Value (\$)
1998	985591	0.87	860853
1999	101857	0.82	83146
2000	101857	0.76	77706
2001	101857	0.71	72623
2002	101857	0.67	67871
2003	101857	0.62	63431
2004	101857	0.58	59281
2005	101857	0.54	55403
2006	101857	0.51	51779
2007	101857	0.48	48392
Total			1440487

The average annual additional costs will be \$1,400 per firm. This is due to the marginal gear maintenance costs associated with replacing floating line with sinking line.

7.2.1.2.2 Gillnet Fisheries

The proposed regulations would prohibit gillnet fishing in Cape Cod Bay from January 1 through May 15. Additionally, from May 16 to December 31, gillnet vessels would have to pick two gear modifications if they wish to fish in this area. Based on Sea Sampling data, it's assumed that vessels are fishing with 50 pound anchors. This leaves the vessels with a choice of one additional option and it's assumed that it will be the one which is the least costly to the vessel.

A 1994 report (Walden, 1996) showed that gillnet vessels which are likely to operate in these areas fish on average 7.2 strings of gear with each string on average comprised of 11.2 nets. Based on an average water depth of 100 feet, the least cost alternative will be for the vessels to replace their buoy lines with sinking buoy line at a cost of \$128 . The cost of sinking buoy line is estimated to be \$.0875 per foot (this is also consistent with estimates made by two University of Maine Economists and submitted by the State of Maine in their public comments). We also assume that it will take 5 minutes to re-rig each buoy line and that the opportunity cost of labor \$13.28 per hour. This is the average manufacturing wage rate in New England reported by the Bureau of Labor Statistics. It's also estimated that vessels will need to replace 20% of their sinking line annually, regardless of whether these regulations were in place. Because sinking line is more expensive than regular polypropylene line, the difference in price of approximately \$.0475 per foot between the two types of line, is what needs to be included in the gear replacement cost calculation. This adds another \$13 per vessel per year for gear replacement. Labor costs are not included in the replacement cost of the lines because vessels would still need to replace lines in the absence of this regulation.

Vessels will also have to mark their buoy lines with a two-color code scheme at the top of the line and mid-way down the line. Based on comments received from the State of Maine, we assume that the vessels will use whipping to mark their lines. We also use the same assumptions as the State of Maine, specifically that it will take 10 minutes of labor per whip and that each whip costs \$0.05. Based on these assumptions the initial marking costs for the buoy lines is estimated to be \$68 per vessel ($7.3 \text{ strings per vessel} \times 4 \text{ whips per buoy line} \times 2 \text{ buoy lines} \times 0.05 + 7.3 \times 4 \times 2 \times 13.28 \times 10/60$). We also assume that 33% of the marks will need to be replaced annually, at a cost of \$22.40 per vessel in years 2 through 10. This includes labor costs because gear marking costs are incurred as a direct result of the regulation.

It was estimated that 3 vessels fished in Cape Cod Bay during 1996 based on logbook data. This was calculated by multiplying the percentage of gillnet vessels fishing in Cape Cod Bay during 1993 by the total number of gillnet vessels fishing in 1996. The reason the numbers were calculated in this manner was because the 1996 logbook data had spatial data which was not audited, and therefore was not considered reliable. Based on 3 vessels, the total present value cost (7% discount rate) of implementing these regulations over a ten-year horizon was \$69,362, or \$23,121 per vessel (Table 7.2.1.2.2.A). Included in this calculation was foregone revenue of \$3,438 per vessel per year.

Table 7.2.1.2.2.A. Time Stream of Conversion Costs and Foregone Revenue for Vessels in the Cape Cod Bay			
Critical Habitat Area			
Year	Cost	Discount	Present Value
	(\$)	Factor (7%)	(\$)
1998	11,142	0.87	9,694
1999	10,486	0.82	8,599
2000	10,486	0.76	7,970
2001	10,486	0.71	7,445
2002	10,486	0.67	7,026
2003	10,486	0.62	6,502
2004	10,486	0.58	6,082
2005	10,486	0.54	5,663
2006	10,486	0.51	5,348
2007	10,486	0.48	5,034
Total			69,362

7.2.1.3 Non-Preferred Alternative

The alternative which would close the areas described above to the two gears for the period during which the modifications are in place would reduce further the likelihood of interaction of a large whale with the fishing gear. The cost of such an expanded closure is measured here by the foregone revenue from those fisheries for that period (in this case a full year closure) is estimated as \$11,848,602 for lobster gear and \$654,396 for Gillnet gear.

7.2.2 Great South Channel Critical Habitat

See the Economic Analysis contained in the Environmental Assessments prepared for the Lobster Emergency Rule (NMFS 1997b) and Framework 23 to the Multispecies FMP (NMFS 1997a) that implemented a closure in the Great South Channel critical habitat for sink gillnet and lobster pot gear during the high use period for right whales (April 1 to June 30). The proposed ALWTRP incorporates these regulations under the MMPA.

7.2.2.1 No Action

This alternative seeks to continue the fisheries involved unmodified. The risks are thereby not reduced as well.

7.2.2.2 Preferred Alternative

7.2.2.2.1 Lobster Fisheries

The PA includes a closure in the Great South Channel Critical Habitat Area (GSCCHA) from April 1 through June 30 of each fishing year. Further, beginning in 1998 the PA would require that all gear set in the GSCCHA conform to at least two characteristics from the take reduction technology list (TRTL) for the rest of the fishing year. During the prohibition period, all lobster revenues during that time would be lost. The modified gear was assumed to have no impact on lobster landings; hence, the gear modifications are assumed to have no impact on fishery revenues. However, the regulations could require modification of every trap fished in the area. The present value of the cost to retrofit gear and the foregone lobster revenues was estimated to be \$0.15 million. This estimate was based on the assumption that the regulations would be in place for at least 10 years beginning in 1998. The estimated cost was calculated as follows.

Foregone annual revenues were estimated as being \$20,053 from approximately 22 Massachusetts licensees that fished in the area. Since the regulations could affect every piece of lobster gear fished in the GSCCHA the maximum number of traps fished in the area was assumed to be affected. The total number of affected traps was estimated to be 8,414. Assuming an average trawl consisting of 40 traps per trawl, a total of 210 trawls could require some manner of gear modification. Since the items on the TRTL represent commonly accepted "good fishing practices" it was assumed that all gear fished in the area would conform to at least one characteristic on the TRTL. However, gear fished in the GSCCHA would be required to meet two of the TRTL characteristics. It was assumed that vessels would choose to adopt the least costly characteristic in terms of material and labor costs. Installation of weak links was assumed to be the most likely of the gear characteristics that would be selected.

The cost of installing break-away buoy lines was assumed to be \$4.96 and the cost of cost of gear marking was estimated to be a total of \$18.15 including labor costs per 40-pot trawl. Note that the labor costs were estimated in a manner similar to that described for the CCBCHA and, for the same reasons, are likely to be overestimated. The 1998 cost of the measure was estimated to be \$4.9 thousand for gear marking and installation of weak links for 210 trawls. The 1999 cost was estimated to be \$989 based on an assumed 20% replacement rate for lost or damaged gear. Note that the replacement cost was estimated as the difference in cost of replacing weak links and gear marking as gear is lost or damaged. Thus these estimates are the increased replacement costs associated with the large whale protection measures. The time stream of costs and their discounted values are presented in Table 7.2.2.2.1.A.

Table 7.2.2.2.1.A Time Stream of Costs for Gear Modification in the GSCCH Area			
Year	Cost (\$)	Discount Factor (7%)	Present Value (\$)
1998	24998	0.87	21834
1999	21042	0.82	17176
2000	21042	0.76	16053
2001	21042	0.71	15003
2002	21042	0.67	14021
2003	21042	0.62	13104
2004	21042	0.58	12247
2005	21042	0.54	11445
2006	21042	0.51	10697
2007	21042	0.48	9997
Total			141577

Given the estimated number of 22 fishing firms and the trap totals fished, the average conversion cost per firm of complying with the whale protection measure (including foregone lobster revenues) will be approximately \$1,136 per firm inclusive of labor costs. The majority of this cost is associated with labor costs associated with gear marking costs. The average annual additional costs will be \$956 per firm including foregone revenues.

7.2.2.2.2 Gillnet Fisheries

The analysis of impacts on the gillnet fleet includes both the Great south Channel Area and the so called “sliver area”. The proposed regulations for this area would ban gillnet gear in the Great South Channel restricted area between April 1 and June 30 until such time as minimal risk gear is approved by the Assistant Administrator. Vessels fishing in this area, and the sliver area, at any other time of the year would need to pick two gear modifications. We assume, as in the case of Cape Cod Bay, that most vessels are meeting the anchoring requirements and therefore need only pick one further modification.

Because vessels operating in these areas fish at much greater depths, the choice of which option to choose was not the same as for those vessels operating in the Cape Cod Bay critical habitat area. Assuming that vessels fished at the same average depth as the lobster fleet, replacement of buoy lines with sinking line was estimated to cost \$858 per vessel (the assumptions concerning costs of material and labor are the same as in the Cape Cod Bay critical habitat). Alternatively, installation of weak links was estimated to cost \$288 per vessel, including labor costs. This was based on a vessel fishing on average 72 nets, using two weak links per net, each weak link costing approximately \$2 and requiring 5 minutes of labor to install. Assuming a 20% replacement rate, the annual replacement cost in years two through ten would be approximately \$90 per vessel. This includes labor costs because replacement of the gear is a direct result of the regulations.

The gear marking requirements were the same as for vessels in Cape Cod Bay. We assume that vessels will use whipping, that it will take 10 minutes per whip, each whip will cost \$0.05 and that the opportunity cost of labor is \$13.28 per hour. On average, vessels in this area fish 7 strings of gear and it's estimated that the initial gear marking will cost be \$65 per vessel ($7 \times 2 \times 4 \times (.05 + 13.28 \times 10/60)$). We assume the gear marks need to be replaced at a 33% annual rate, for a cost of roughly \$21.

Table 7.2.2.2.A shows the costs over a 10 year horizon discounted to 1997, including foregone revenue from not fishing in the Great South Channel restricted area between April and June. Total costs over the ten-year horizon were estimated to be \$183,379 (7% discount rate, Table 7.2.2.2(A)). It was estimated that 8 vessels fish in this area, and that the total discounted per vessel cost would be \$22,922.

Year	Cost (\$)	Discount Factor (7%)	Present Value (\$)
1998	30,742	0.87	26,746
1999	27,528	0.82	22,573
2000	27,528	0.76	20,921
2001	27,528	0.71	19,545
2002	27,528	0.67	18,444
2003	27,528	0.62	17,067
2004	27,528	0.58	15,966
2005	27,528	0.54	14,865
2006	27,528	0.51	14,039
2007	27,528	0.48	13,213
Total			183,379

7.2.2.3 Non Preferred Alternative

This alternative seeks closure instead of mere gear modification where applicable for the period that the modified gear would be required. Again an entire year applies. The costs involved are \$284,449 for lobster gear for the year and \$89,321 for gillnet gear.

7.2.3 Stellwagen Bank/Jeffreys Ledge Restricted Area

7.2.3.1 No Action

No change in fisheries' prosecution will be required and no reduction in interaction risk achieved. All the costs are borne by the mammals in this alternative.

7.2.3.2 Preferred Alternative

7.2.3.2.1 Lobster Fishery

Beginning in 1998 the PA could require modification of all gear set in the Stellwagen Bank/Jeffreys Ledge (SB/JL) area from January 1 to December 31. The modified gear was assumed to have no impact on lobster landings hence, the gear modifications are assumed to have no impact on fishery revenues. The total present value of gear marking and gear modification costs was \$2.6 million for the ten year time period.

The regulations could affect every piece of lobster gear fished in the SB/JL so the maximum number of traps that could potentially be fished in the area was assumed to be affected. The total number of affected traps was estimated to be 433,172 (University of Rhode Island 1995). This includes approximately 381,922 traps fished by 733 Massachusetts lobster businesses and 51,250 traps fished by 275 New Hampshire lobster businesses. Note that the SB/JL area excludes Maine waters. Further, it seems likely that the trap numbers and number of fishing firms (hence economic costs) are lower than that reported here. This is due to the fact that the number of traps and fishing firms that fish exclusively in exempted near-shore waters could not be determined.

Potential gear modifications would require adoption of at least two characteristics from the lobster TRTL. Since the items on the TRTL represent commonly accepted "good fishing practices" it was assumed that all gear fished in the area would conform to at least one characteristic on the TRTL. However, gear fished in the SB/JL would be required to meet two of the TRTL characteristics. It was assumed that vessels would choose to adopt the least costly characteristic in terms of material and labor costs. Installation of weak links was assumed to be the most likely of the gear characteristics that would be selected.

The cost of installing break-away buoy lines was assumed to be \$4.96 and the cost of cost of gear marking was estimated to be a total of \$18.15 including labor costs per 10-pot trawl. Note that the labor costs were estimated in a manner similar to that described for the CCBCHA and, for the same reasons, are likely to be overestimated. The 1998 cost of the measure was estimated to be \$1.3 million for gear marking and installation of weak links for 43,317 trawls. For subsequent years, the cost was estimated to be \$0.3 million based on an assumed 20% replacement rate for lost or damaged gear. Note that the replacement cost was estimated as the difference in cost of replacing weak links and gear marking as gear is lost or damaged. Thus, these estimates are the increased replacement costs associated with the large whale protection measures. The time stream of costs and their discounted values are presented in Table 7.2.3.2.A.

Table 7.2.3.2..A Time Stream of Costs for Gear Modification in SB/JL Area			
Year	Cost (\$)	Discount Factor (7%)	Present Value (\$)
1998	1273420	0.87	1112254
1999	254684	0.82	207898
2000	254684	0.76	194297
2001	254684	0.71	181586
2002	254684	0.67	169707
2003	254684	0.62	158604
2004	254684	0.58	148228
2005	254684	0.54	138531
2006	254684	0.51	129468
2007	254684	0.48	120999
		Total	2561573

Given the estimated number of fishing firms and the trap totals fished by those firms, the whale protection measures in the SB/JL area could affect 1,008 small businesses. The conversion cost of complying with the whale protection measure will be approximately \$1,263 per firm inclusive of labor costs. The majority of this cost is associated with labor costs for marking gear. The average annual additional costs were estimated to be \$253 per firm.

7.2.3.2.2 Gillnet Fishery

Vessels which fish in the Stellwagen Bank/Jeffreys Ledge area will need to choose two gear modifications. It's assumed that the requirements for using a 50 pound anchor are already being met, and that one additional modification will be needed.

It's assumed that the average depth fished is 100 feet, to be consistent with assumptions made about the lobster fleet. Based on an average vessel fishing 5.3 string of nets (Walden, 1994), it appears that replacing buoy lines with sinking line would be the least cost alternative for the vessels, with an estimated cost of \$98 per vessel. It's estimated that based on an opportunity cost of labor of \$13.28 per hour, there will be an additional cost of \$12 per vessel, assuming it takes 5 minutes per line to switch lines. It's assumed that there is a 20% replacement rate per year for sinking line, and this will add \$19 in cost during years 2 through 10.

The gear marking requirements will also affect vessels operating in this area. We assume that vessels will use whipping, that it takes 10 minutes of labor to whip the line, that each whip costs \$0.05 and that there will be 4 marks per line. Based on these assumptions, the marking requirements will cost each vessel \$96, which includes the labor costs. Assuming a 33% replacement rate, the annual cost in years 2 through 10 will be \$32, inclusive of labor costs.

It's assumed that there are 119 vessels which operate in the Jeffreys Ledge/Stellwagen Bank Critical Habitat Area. Over a 10 year horizon, the discounted cost (7%) of these regulations was \$39,078 (Table 7.2.3.2.2.A). This translates into a per vessel cost of \$329.

Year	Cost (\$)	Discount Factor (7%)	Present Value (\$)
1998	12,433.00	0.87	10,817
1999	4,967.00	0.82	4,073
2000	4,967	0.76	3,775
2001	4,967	0.71	3,526
2002	4,967	0.67	3,328
2003	4,967	0.62	3,079
2004	4,967	0.58	2,881
2005	4,967	0.54	2,682
2006	4,967	0.51	2,533
2007	4,967	0.48	2,384
Total			39,078

7.2.3.3 Non Preferred Alternative:

The annual cost to the fishing industry of year round closures as opposed to gear modifications for this area is estimated at: \$24,966,836 for lobster gear and \$8,331,641 for gillnet gear.

7.2.4 All Other Northeast Restricted Areas

7.2.4.1 No Action

All of the costs are borne by the mammals and none by fishers nor consumers.

7.2.4.2 Preferred Alternative

7.2.4.2.1 Lobster Fisheries.

Unless otherwise specified, beginning in January 1998, the PA would require that all gear set in all Atlantic waters South of 41 degrees N from December 1 to March 31 of every fishing year be fished with at least one characteristic from the TRTL. Similarly, all lobster gear set North of 41 degrees N would also have to conform to at least one TRTL characteristic on a year-round basis.

The use of the modified gear was assumed to have no impact on lobster landings hence, the gear modifications are assumed to have no impact on fishery revenues. However, the regulations could require modification of every trap fished in affected areas. For vessels fishing Southward of 41 degrees N, the timing of the modification requirements will have greatest impact on offshore lobster vessels. By contrast, except for those that fish exclusively in exempted near-shore waters, the PA will affect all vessels in the Gulf of Maine. The economic impacts of the PA for vessels fishing out of the States of Massachusetts and New Hampshire were assumed to be affected by the SB/JL measures. Therefore, the majority of the PA impact in the Gulf of Maine will affect lobster vessels fishing in the EEZ and affected state waters in Maine.

For regulatory purposes, the Northern and Southern areas are further separated into inshore and offshore areas. The estimated number of traps fished in each of these areas are shown in Table 7.2.4.2.1.A. Trap estimates for the Southern inshore and offshore areas were based on Kraus (1993) adjusted upwards by 20% to account for recent year's increases in trap numbers. Trap estimates for the Northern inshore and offshore areas were based on comments received on the proposed ALWTRT plan. Based on these comments it was assumed that approximately 50% of total traps fished (2.6 million) in Maine were fished in exempted near-shore waters, 1% were fished in offshore (Area 3) waters and the remainder were fished in the affected inshore lobster area.

Table 7.2.4.2.1.A. Estimated Trap Numbers by Area (1,000's of traps)				
	Northern Inshore	Northern Offshore	Southern Inshore	Southern Offshore
Traps	1,309.6	25.9	659.0	186.2

Since the items on the TRTL represent commonly accepted "good fishing practices" it was assumed that all gear fished in these areas would already conform to at least one characteristic on the TRTL. However, all gear fished in these areas will be required to mark all buoy lines. The estimated number of buoy lines by area are reported in Table 7.2.4.2.1.B

Table 7.2.4.2.1.B. Estimated Number of Buoy Lines by Area (1,000's of lines)				
	Northern Inshore	Northern Offshore	Southern Inshore	Southern Offshore
Buoy Lines	537	3.5	329.5	12.4

Each buoy line requires a total of 4 marks. Assuming whipping colored line is used, the total 1998 cost of the gear marking requirement was estimated to be \$8.0 million. This estimate is based on an assumed wage rate of \$13.28 per hour, an estimate of ten minutes per mark, and four marks per buoy line (i.e., \$9.05 per buoy line). This estimate is quite conservative since other less costly gear marking techniques (painting for example) are more likely to be adopted. The time stream of costs and their discounted values are presented in Table 7.2.4.2.1.C.

Table 7.2.4..2.1.C. Time Stream of Costs for Gear Modification in Other Atlantic Area			
Year	Cost (\$)	Discount Factor (7%)	Present Value (\$)
1998	7988544	0.87	6977503
1999	1597709	0.82	1304206
2000	1597709	0.76	1218884
2001	1597709	0.71	1139144
2002	1597709	0.67	1064621
2003	1597709	0.62	994973
2004	1597709	0.58	929881
2005	1597709	0.54	869048
2006	1597709	0.51	812194
2007	1597709	0.48	759060
		Total	16069515

Assuming an average firm size of 2,000 traps in offshore waters and 600 traps in inshore areas, a total of 93 offshore lobster businesses and 3,281 inshore lobster businesses would be affected by the gear marking requirements. The cost per firm for complying with the gear marking requirements was estimated to be \$2,391 and \$1,565 for inshore and offshore firms respectively. The per firm costs are lower for offshore vessels due to the fact that they typically fish more traps per trawl and, therefore, would have fewer buoy lines as compared to firms that fish in inshore areas.

7.2.4.2.2 Gillnet Fisheries

Northeast waters

Gillnet vessels fishing in northeast waters outside of critical habitat areas will need to pick one gear modification. Since it's assumed that gillnet vessels can easily meet the 50 pound anchoring requirement, effectively vessels will not need to modify their gear at all in these areas. However, they are still subject to gear marking requirements.

Vessels are assumed to fish on average 5.9 strings of gear. It's assumed that vessels will whip their lines in order to comply with the marking requirements. Each whip costs \$0.05, it takes 10 minutes to install the whip, and the opportunity cost of labor is \$13.28 per hour. Based on these assumptions, the initial cost of gear marking is estimated to be \$107 per vessel ($5.9 \times 2 \times 4 \times (0.05 + 13.28 \times (10/60))$). Additionally, in years 2 through 10 there will be a per vessel cost of \$35.24 per vessel to replace the marks assuming a 33% replacement rate. It's estimated that there were 131 vessels fishing in the northeast areas during 1996, and that the total discounted cost (7%) to the fleet over the ten-year horizon was \$38,453 (Table 7.2.4.2.2.A). This translates into a per vessel cost of \$293.53.

Table 7.2.4.2.2.A. Time Stream of Conversion Costs for Gillnet Gear Modification for all Gillnet Vessels in Northeast Waters.

Year	Cost (\$)	Discount Factor (7%)	Present Value (\$)
1998	13,995	0.87	12,175
1999	4,618	0.82	3,787
2000	4,618	0.76	3,510
2001	4,618	0.71	3,279
2002	4,618	0.67	3,094
2003	4,618	0.62	2,863
2004	4,618	0.58	2,679
2005	4,618	0.54	2,494
2006	4,618	0.51	2,355
2007	4,618	0.48	2,217
Total			38,453

7.2.4.3 Non-Preferred Alternative.

A year-round closure of this area would cost the Gillnet fleet approximately \$16.1 million dollars in foregone revenue per year, and the lobster fleet \$106 million in foregone revenue per year.

7.2.5 Mid-Atlantic Waters

7.2.5.1 Gillnet Vessels

Gillnet vessels fishing in Mid-Atlantic waters will need to pick one gear modification. Since it's assumed that gillnet vessels can easily meet the 50 pound anchoring requirement, effectively vessels will not need to modify their gear at all in these areas. However, they are still subject to gear marking requirements.

Vessels are assumed to fish on average 5.9 strings of gear. It's assumed that vessels will whip their lines in order to comply with the marking requirements. Each whip costs \$0.05, it takes 10 minutes to install the whip, and the opportunity cost of labor is \$13.28 per hour. Based on these assumptions, the initial cost of gear marking is estimated to be \$107 per vessel ($5.9 \times 2 \times 4 \times (0.05 + 13.28 \times (10/60))$). Additional, in years 2 through 10 there will be a per vessel cost of \$35.24 to replace the marks assuming a 33% replacement rate. It's estimated that there were 43 vessels fishing in the northeast areas during 1996, and that the total discounted cost

(7%) to the fleet over the ten-year horizon was \$12,622 (Table 7.2.5.1(A)). This translates into a per vessel cost of \$293.54.

Table 7.2.5.1(A). Time Stream of Conversion Costs for Gillnet Gear Modification for Vessels in the Mid-Atlantic Area.

Year	Cost (\$)	Discount Factor (7%)	Present Value (\$)
1998	4,594	0.87	3,996
1999	1,516	0.82	1,243
2000	1,516	0.76	1,152
2001	1,516	0.71	1,076
2002	1,516	0.67	1,016
2003	1,516	0.62	940
2004	1,516	0.58	879
2005	1,516	0.54	819
2006	1,516	0.51	773
2007	1,516	0.48	728
Total			12,622

7.2.5.2 Non-Preferred Alternative

A year round closure of this area would result in a revenue loss of approximately \$1.2 million dollars per year for the gillnet fleet. This figure is roughly 100 times in magnitude the cost estimated for the preferred alternative.

7.2.6 Southeastern U.S. Critical Habitat

7.2.6.1 No Action

Under the no action alternative, there is no anticipated change in benefits (additional protection for right whales). There is also not anticipated to be any changes in revenue earned by the fleet, or costs of fishing.

7.2.6.2 Preferred Alternative.

The preferred alternative provides for a closure of the gillnet shark fishery for the period November 15 to April 1 in the area from Sebastian Inlet, Florida to Savannah Georgia. There

is a provision in the alternative to allow the fishery to continue fishing using strikenets if all sets are made in daylight hours, if a spotter plane is present, if there is observer coverage and if there are no right whales within 3 nm of the gear. Since the fishery is strictly a night fishery and probably is characterized by low rates of return, the effect of the alternative is to close the fishery for the period indicated. In other words, the fishermen will not be able to take advantage of the special conditions under which they would be allowed to use strikenets during the November 15 to April 1 period because the compliance costs would be too high and the catch levels too low. Hence, no fishing will occur during the period and there will be no associated costs of observers, spotter planes or any other costs associated with meeting the other requirements. It is expected that this alternative will reduce the risk of Right Whale bycatch to zero.

In addition to the closure outlined above, all nets, ropes and buoys will have to be marked every 100 yards with color codes denoting the gear type and location (i.e. southeastern United States). The cost of materials required to meet these regulations has been estimated to be one dollar for each "mark" that has to be made on the gear. For the southeastern Shark gillnet fishery, it is estimated that the fleet will need a total of 1,200 "marks", and the total initial cost of marking is estimated to be \$1,200, or \$120 per vessel. It is further assumed that the "marks" have a life of three years, so the annual cost of marking after the first year is estimated to be \$400.

Foregone revenues during this closure period are estimated from landings obtained from the Florida Trip Ticket System, as provided by the Florida Dept. of Environmental Protection. Additional data and information was extracted from a draft manuscript by Dr. Lee Trent that provides detailed results of a 1993-95 observer program for the Southeastern shark gillnet fishery.

Table 7.2.5.A shows the annual catch of sharks by gill net for the fishing years 94/95 and 95/96 in the EEZ off Florida and also indicates the amount taken in the affected area and other shark fishing areas where gillnet gear is used. It should be noted that some catches are made off Georgia, but these landings are small, are not identified as to gear and likely involve only one or two gillnet fishing operations. Accordingly, the discussion will concentrate on Florida data, but the effects apply to shark gillnet fishermen operating off Georgia. Also, while data for 93/94 and earlier years is available, it is not used because a ban on nets in the State waters of Florida was instituted in mid-1994 and there was a likely shift in effort from State to Federal waters following the net ban.

Table 7.2.5.A. Annual Shark Gillnet Catches in Florida That Would be Affected by Total or Partial Closures of Historical Fishing Grounds.

	<u>Time of Year</u>	<u>Affected Area</u>	<u>Other Areas</u>
94/95	Oct. - March	30,724	177,382
	All Year	411,624	203,459
	% Oct. - March	7.5	Not Applicable
	% All Year	100.0	Not Applicable
95/96	Oct. - March	43,206	239,898
	All Year	273,577	322,405
	% Oct. - March	15.8	Not Applicable
	% All Year	100.0	Not Applicable

NOTE: Minor amounts of confidential data are excluded from the Oct. - March and All Year totals.

The data are available quarterly (confidentiality problems preclude the use of less aggregated data) and the period covering October through March is used to approximate the closure period of November 15 to April 1. Hence, the estimated effects on revenue changes will be overstated by an unknown, but probably small, degree. The landings data indicate that about 7.5 and 15.8 percent of the annual catch in the affected area for the fishing seasons of 94/95 and 95/96 was taken during the period of time for the proposed closure. The data also indicate that the other portions of the fishing area, those not in the closure zone, are more active at that time of the year, i.e., winter catches are relatively large in the other areas. This very scanty data indicates the possibility that fishermen historically operating in the affected area during the winter could fish further to the south if it were economically possible. In any event, if none of the catch can be made up by a switch in effort to other areas, then the data indicate that foregone catches would amount to 30,724 pounds for the 94/95 fishing year and 43,206 pounds for the 95/96 fishing year. Price and revenue implications depend on the level of ex-vessel prices and while the catch includes mostly small coastal sharks, about a third of the catch is large coastal sharks. Since the price of small coastal sharks is well below the price of large coastal sharks, the result is an average price of roughly \$.50 per pound (prices ranged from \$.40 to \$.65 for the 94/95 season and from \$.20 to \$.50 for the 95/96 season, but true weighted average prices are not available). Hence, in terms of gross revenue, the effect would be an estimated shark revenue loss of \$15,362 for 94/95 and \$21,603 for 95/96. These two figures are combined to arrive at a mean estimated shark revenue loss of \$18,483. The fishery also takes and sells some of the bycatch and king mackerel is the most important bycatch in terms of pounds and ex-vessel value. Given the data in the observer study, there are roughly 25 pounds of king mackerel taken for each 1,000 pounds of the three major shark species caught in the fishery. Expanding this to the historical take during the proposed closed season, there would also be a loss of about \$1,000 in king mackerel sales during the closed season.

As mentioned previously, the fishermen could either forgo the catches altogether or attempt to overcome the revenue losses by switching their effort to other shark areas or by switching to other species. At the present time, there are no models available upon which to make a determination as to which outcome is more likely. Fishermen will also realize cost savings if they are not able to switch grounds or fisheries, because they would not be spending money on such things as fuel, food and ice. Because cost data have not been regularly collected in the southeast region, there are no data available upon which to project potential cost savings. Therefore, the projected revenue losses are an upper bound estimate on losses because cost savings are not included and because switching behavior cannot be modeled at this time. Table 7.2.5.B shows the discounted estimated cost (including foregone revenue) of imposing these regulation on the southeast Shark gillnet fishery over a ten year horizon. The ten year cost was estimated to be \$131,128, or \$13,113 per firm.

Year	Cost	Discount	Present Value
	(\$)	Factor (7%)	(\$)
1998	20,683	0.87	17,994.00
1999	19,883	0.82	16,304.00
2000	19,883	0.76	15,111.00
2001	19,883	0.71	14,117.00
2002	19,883	0.67	13,322.00
2003	19,883	0.62	12,327.00
2004	19,883	0.58	11,532.00
2005	19,883	0.54	10,737.00
2006	19,883	0.51	10,140.00
2007	19,883	0.48	9,544.00
Total			131,128

It should also be noted that to the extent fishermen are able to switch to other fishing areas or other fisheries, there will be a cost (of unknown magnitude) imposed on other fishermen. The reason for this is that most fisheries are either currently overfished or fully exploited. Economists would say that the amount of total effort in most fisheries exceeds the effort required to be fishing at maximum economic yield. Hence, the statement that the losses can be offset is not correct if the negative effects (externalities from an economics point of view) are not accounted for or are assumed to be zero.

7.2.6.3 Year-round Closure of the Southeastern U.S. Right Whale Critical Habitat

Under this alternative, the expected annual take of right whales by the affected gear will drop

to zero. Assuming vessels are not able to switch fisheries or areas, all revenue from the affected portion of the fishery will be foregone. In terms of observed catches during the 94/95 and 95/96 fishing seasons the losses are estimated at about \$221,000 and \$137,000 respectively. There would also be additional losses of about \$10,000 and \$7,000 in revenue derived from king mackerel sales and an additional small loss in revenue from other landed bycatch. It is repeated that these figures are a maximum amount, even if the small but unknown losses off Georgia were to be included, and that cost savings are not included in the analysis. This translates into an average loss of \$187,500, or 18,750 per firm. Compared to the preferred alternative, this option is much more costly. Additionally, the estimated losses under the preferred alternative were for a ten-year horizon, while the losses under this alternative were a one-year estimate.

8.0 REGULATORY IMPACT REVIEW

8.1 Introduction

The purpose of the Regulatory Flexibility Act (RFA) is to reduce the impacts of burdensome regulations and record keeping on small businesses. To achieve this goal, the RFA requires government agencies to describe and analyze the effects of the regulations and possible alternatives on small business entities. On the basis of this information, the Regulatory Impact Review determines whether the proposed action would have a "significant economic impact on a substantial number of small entities."

The main elements of the RFA are discussed fully in several sections of this document and the relevant sections are identified by reference. The following discussion summarizes the consequences for small businesses of the proposed action and non-preferred management options in the protection of large whales under the MMPA.

8.2 Problem Statement

The purpose and need for reduction of large whale interactions in lobster pot, Northeast sink and Mid-Atlantic gillnet and Southeast shark net fisheries is described in Section 2.0 of this document.

8.3 Objectives

The mammal protection objectives of the ALWTRP are described in Section 3.0 of this document.

8.4 Alternatives

A discussion of the alternatives to the proposed ALWTRP are found in Section 4.0 of this document.

8.5 Steps taken to minimize the economic impact

In this interim final rule, NMFS has taken the following steps to minimize the significant economic impact on small entities: 1) It has exempted waters where the risk of entangling right whales is low. This action eliminates any economic cost for a large portion of the coastal lobster industry. 2) It will not require any untested gear to be deployed. This will eliminate costs for lost gear beyond usual wear and tear. 3) It will not require any expensive gear modifications at this time. NMFS will allow fishermen to choose from a menu of gear characteristics that have been tested in the field and which are thought to be helpful in reducing entanglements. Most of the items currently on the menus represent current best fishing practices, which many fishermen already use. 4) Some possible closures have been eliminated, such as the closure contingent upon the unusual presence of four or more right whales in an area. This will allow fishermen to plan better and will eliminate to potential cost of lost revenue should such a closure have been instituted. 5) It has devised a simpler, quicker and less expensive system for marking gear. Painting line is now allowed, which should minimize the time and cost required to mark gear. A discussion of the reasons for selecting these alternatives and a review of other significant regulatory alternatives can be found in the EA prepared for this action.

8.6 Determination of Significant Economic Impact on a Substantial Number of Small Entities

The RFA recognizes three kinds of small entities: small business, small organization and small government jurisdictions. It defines a small business in any fish-harvesting or hatchery business as a firm with receipts of up to \$2 million annually. The American lobster pot, Northeast sink gillnet, Southeast shark net, and Mid-Atlantic coastal gillnet fisheries directly affected by the proposed action are composed of primarily small business entities.

According to the RFA, if more than 20 percent of the small businesses in a particular industry are affected by the regulations, the regulations are considered to have an impact on a "substantial number" of these entities. Since the proposed ALWTRP will affect all vessels participating in the Northeast sink gillnet, Southeast shark net and Mid-Atlantic gillnet fisheries, the "substantial number" criterion will be met. The plan will also affect greater than 20 percent of the vessels in the Lobster fleet.

NMFS considers economic impacts on small business entities to be "significant" if the proposed regulations are likely to cause any of the following: a) a reduction in annual gross revenues of more than 5% for 20% of the participants; b) an increase in total costs of production by more than 10% for 20% of the participants; and 2 percent of the participants cease operations.

The RFA analysis included in the May 1, 1997 Environmental Assessment Document for the proposed rule stated that the economic impact on small businesses was likely to be significant.

This was due to the gear modifications which were required at the time, particularly the replacement of all ground lines in the Lobster sector with sinking lines. For the Gulf of Maine Lobster fleet alone, the per vessel conversion costs were estimated to be between 1.4 and 4.5 thousand. This was considered to be greater than a 10 percent increase in operating costs for Gulf of Maine Lobster participants.

The plan presented as the preferred alternative in this document is markedly different from the prior plan. Below is a table that summarizes the per firm cost of the preferred alternative.

<u>Fishery Area</u>		<u>Firms</u>	<u>Cost per Firm</u>	
			<u>Losses</u>	<u>Modification Cost</u>
Lobster	CCB	72		\$13.6K
	GSC	22	\$0.9K	\$0.2K
	SB/JL	1008		\$1.3K
	Gulf of Maine			
	Inshore	2,183		\$2.4K
	Offshore	13		\$1.6K
	South			
	Inshore	1,098		\$2.4K
	Offshore	80		\$1.6K
	Gillnet	CCB		\$3.4K
GSC		8	\$26.6K	\$0.5K
SB/JL		119		\$0.1K
Northeast		131		\$0.1K
Mid-Atlantic		43		\$0.1K
SEUS		10	\$1.95K	\$0.12K

As the table above shows, there will be a reduction in gross revenues for 11 gillnet vessels, or 6.9% of the participants. Based on 1996 logbook data, gillnet vessels earned on average \$102,000, which means that only vessels operating in the Great South Channel will have their revenue reduced by more than 5%. This is clearly less than 20% of the participants. If the total costs for vessels are on average 50 percent of gross revenues, then there would have to be an increase in costs per vessel of \$5,100 to exceed the threshold for an increase in production costs. For the Gillnet fleet, none of the modification costs cross this threshold. For the Lobster fleet, only vessels operating in the Cape Cod Bay critical habitat area would likely see their costs increase more than 10%. This is based on a University of Rhode Island study which showed a per firm cost for the lobster fleet between \$36,000 and \$57,000 depending on the area in which the vessel operated. The 72 firms which are estimated to operate in this area do not exceed 20% of the firms in the lobster fleet. The analysis of costs also assumes that vessels use the costliest alternative for marking gear, based on comments received from the State of Maine. Any reduction in gear marking costs through adoption of lower cost methods will reduce overall modification costs. It should also be noted that the majority of the increased costs are due to the gear marking requirements. Most of the gear marking cost is a non-cash cost composed of the opportunity cost of labor. Because these vessels are for the

most part owner-operated, the opportunity cost of labor is a per hour wage rate assigned to the owners to properly account for the value of their time. It's unlikely that the vessels will actually have to spend this amount out-of-pocket. Finally, with such low modification costs it's unlikely that 2% of the participants will cease operations as a result of this action. Vessels have the option to switch times and areas in which they operate in order to lower their costs of compliance with these regulations.

As a result of this analysis, NMFS has determined that no Regulatory Flexibility Analysis was required. The costs of the measures required by this interim final rule have been determined to be relatively low on a per firm basis, and none of the NMFS standards for Regulatory Flexibility Analysis determinations are anticipated to be met. Therefore, NMFS believes that this interim final rule will not have a significant impact on a substantial number of small entities.

8.7 Determination of Significant Regulatory Action

Executive Order 12866 defines a "significant regulatory action" as one that is likely to result in: a) an annual effect on the economy of \$100M or more or one which adversely affects in a material way the economy, a sector of the economy, productivity, jobs, the environment, public health or safety, or state, local, or tribal governments or communities; b) a serious inconsistency or interference with an action taken or planned by another agency; c) novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in this Executive Order.

The preceding analysis shows that the proposed ALWTRP would not constitute a "significant regulatory action". The proposed regulations will not have, an annual impact on the economy of \$100M or more, and will not adversely affect the productivity, environment, public health or safety, or state, local, or tribal governments or communities in the long run. The proposed action also does not interfere with an action planned by another agency. It does not raise any novel legal and policy issues because it is implementing the provisions of the 1994 Amendments to the MMPA and the regulations already set in place to promulgate that statute.

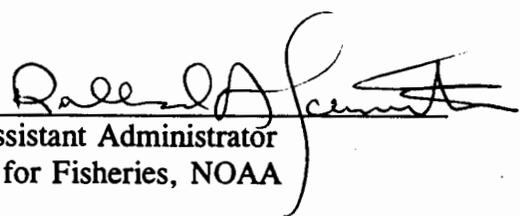
9.0 FINDING OF NO SIGNIFICANT IMPACT

I find that the regulations which will implement the Atlantic Large Whale Take Reduction Plan are not likely to have a significant impact on the human environment.

The ALWTRP sets into interim final rule the measures initially taken under Framework #23 to the Multispecies FMP and emergency regulations under the MMPA for lobster pot gear. These actions were concluded to be of no significant impact at that time and are believed to constitute no significant impact in this interim final rule. The remaining suite of gear modifications and ALWTRP measures to mitigate future interactions with large whales through disentanglement efforts, early warning monitoring systems, gear research, and outreach efforts is not likely to have a significant impact on the human environment as it essentially is designed to implement the best available fishing practices that will accomplish the ALWTRP goal while setting in place the infrastructure to identify and mitigate the causes for entanglements while actively searching for better gear answers to the issue. The ALWTRP contains adequate contingencies to protect the severely endangered species involved while allowing the affected fisheries to seek to improve their entanglement performance.

This finding of no significant impact (FONSI) could not have been made with regard to the set of ALWTRP regulations which were originally proposed (62 FR 16519, April 7, 1997). The proposed regulations were controversial, had uncertain effects, and would possibly have had significant economic impacts on the affected fisheries. In response to the public comment that accompanied the proposed rule, the final regulations have been prepared to achieve fully the goals of the ALWTRP while minimizing the uncertainty and the economic impacts on the fisheries and coastal communities.

Some part of the controversy that was stirred by the proposed regulations is likely to surround the interim final regulations. The specific provisions that provoked the controversy have, to a great extent, been removed from the final or amended to soften the effect on fishers. Much of the controversy that will resound with the issuance of the final regulations is likely to have its roots in this very difficult rulemaking process rather than in the substance of the rule itself.


Assistant Administrator
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0111 15 1997

Date

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