UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Silver Spring, Maryland 20910

96-67

DEC 13 1996

MEMORANDUM TO: F/SF - Gary C. Matlock

FROM: F/PR - Patricia A. Montanio

SUBJECT: Reinitiation of Section 7 Consultation Regarding Current and Proposed Management Activities Conducted under the American Lobster Fishery Management Plan

**GARFO-1996-00001**

Attached are the National Marine Fisheries Service (NMFS) Biological Opinion (BO) and Conferences issued pursuant to Section 7(a)(2) of the Endangered Species Act of 1973, as amended (ESA), regarding the American Lobster Fishery Management Plan (FMP), including current and anticipated (over the next 6 months) actions under this FMP.

This BO concludes that continued fishing under the current FMP, including anticipated management actions, is likely to jeopardize the continued existence of the northern right whale. The BO also concludes that these activities are not likely to jeopardize the continued existence of other endangered or threatened species or result in the adverse modification of critical habitat. This conclusion, with respect to right whales, is based on the environmental baseline that measures adverse effects and reflects the precarious level of the most recent right whale population estimate, the mortality that occurred during January and February of 1996 and the potential sources of future mortality.

A Reasonable and Prudent Alternative has been provided which, if implemented fully and in a timely manner, will reduce the potential for entanglement of right whales in lobster gear, and, therefore, avoid the likelihood of jeopardizing the continued existence of right whales. In accordance with 50 CFR § 402.15(b), please notify the Office of Protected Resources of a final decision to implement the Alternative.

Under the MMPA, NMFS has established the Atlantic Large Whale Take Reduction Team, which is considering the impact of several fisheries (including the lobster trap/pot fishery) on large whales and will be providing a Take Reduction Plan to NMFS by February, 1997. When received, NMFS will review the plan and initiate consultation under section 7 of the ESA on the proposed implementation of the plan. If this plan is found to be sufficient to avoid jeopardy to the right whale, then NMFS may use the implementation of the plan as an alternative to the reasonable and prudent alternative outlined in this opinion.
Attachment

ENDANGERED SPECIES ACT

SECTION 7 CONSULTATION

BIOLOGICAL OPINION
and
CONFERENCES

**AGENCY:** National Marine Fisheries Service

**ACTIVITY:** Reinitiation of Consultation Regarding Current and Proposed Management Activities Conducted Under the American Lobster Fishery Management Plan

**CONDUCTED BY:** National Marine Fisheries Service
Northeast Regional Office

**DATE ISSUED:** December 13, 1996

**BACKGROUND**

Consultation History

Consultation history on the American Lobster Fishery Management Plan (FMP) up through and including the consultation on Amendment 5 to the FMP is included in the Biological Opinion (BO) on Amendment 5, issued on March 23, 1994 (NMFS 1994) and is incorporated by reference. That opinion and previous opinions concluded that the fishing activities resulting from the American Lobster (hereafter referred to as "Lobster") FMP may adversely affect but were not likely to jeopardize, the continued existence of endangered and threatened species under jurisdiction of the National Marine Fisheries Service (NMFS).

During January and February of 1996, an unprecedented number of right whale deaths (6-7) were reported from the Southeast right whale critical habitat/calving grounds off Georgia and Florida. A report on these mortalities was presented by the Right Whale Research Group of the New England Aquarium to the New England and Southeast Right and Humpback Whale Recovery Plan Implementation Teams along with information on other events which occurred during that time. At that time the new information suggested that the right whale population may be declining rather than increasing at a rate of 2.5% per year as had previously been reported (Knowlton et. al. 1994). This information reflected a possible change in the status of the species, as measured by the environmental baseline upon which all previous Section 7 consultations had been conducted. Based on this new information

and the fact that entanglement of right whales in lobster gear has been documented, NMFS reinitiated consultation on the Lobster FMP on December 9, 1996.

**PROJECT ACTIVITIES**

All activities currently conducted under the Lobster FMP that were considered in previous formal consultations are incorporated herein by reference.

This fishery included approximately 2,000 federal and 12,000 state permit holders in 1995. It is not likely that effort in this fishery in federal waters will increase significantly in the next three years, as Amendment 5 included a 5-year moratorium on new federal permits. Amendment 5 contained several additional effort reduction measures; however, these measures have not been implemented. A new plan being developed by the Atlantic States Marine Fisheries Commission (ASMFC) is expected to replace the Lobster FMP and will include several effort reduction measures in state waters. The Maine and Massachusetts state regulators are considering or have already implemented effort reduction measures in state waters.

List of Lobster FMP actions implemented and/or reviewed informally by NMFS since conclusion of Amendment 5 formal consultation (March 23, 1994):

Framework 1: Final rule requiring all permit applicants to own a fishing vessel at the time they apply for or renew a lobster limited access permit. The intent of this action was to allow certain applicants who have owned vessels that meet the various lobster limited access permit qualification criteria, but who did not currently own a vessel, to preserve their eligibility to apply for a lobster limited access permit for a replacement vessel in subsequent years by obtaining a Confirmation of Permit History.

Frameworks 2 and 3: Final rule requiring all permit applicants to own a fishing vessel at the time they apply for or renew a lobster limited access permit. The intent of this action was to allow certain applicants who have owned vessels that meet the various lobster limited access permit qualification criteria, but who did not currently own a vessel, to preserve their eligibility to apply for a lobster limited access permit for a replacement vessel in subsequent years by obtaining a Confirmation of Permit History.

March 27, 1996: A proposed rule to withdraw approval of the American Lobster FMP and remove its implementing regulations. Final action would be contingent upon appropriate action by the Atlantic States Marine Fisheries Commission (ASMFC) that would

allow NMFS to issue effective Federal regulations under Atlantic Coastal Fisheries Cooperative Management Act, as necessary.

April 1996: An Emergency Action to resolve gear conflict between fixed and mobile gear in Southern New England (SNE). Two areas closed to fixed gear from April 1 - June 25, 1996, and to one area closed to mobile gear from April 1 - April 30, 1996.

October 9, 1996: A proposed rule for the Gear Conflict Amendment (Amendment 8 to NE Multispecies, Amendment 6 to the Atlantic Sea Scallop, and Amendment 6 to the Lobster FMPs), which would provide a framework abbreviated rulemaking process to address gear conflicts in the New England and Mid-Atlantic regions. This rule is expected to be implemented in January 1997 simultaneously with the first framework action under the amendment.

List of proposed actions (expected over the next 6 months):

It is impossible to know at this time exactly how this action will be implemented by the New England Fishery Management Council (NEFMC) and NMFS, but the impacts of action as now described is evaluated in this consultation. If this framework changes considerably from the following discussion, it will be reviewed for potential impacts as soon as the changes, if any, are identified and consultation will be initiated, if necessary.

Gear Conflict Amendment, first framework action: This framework, which would be Framework 4 under the Lobster FMP, would address gear conflict in SNE for vessels fishing in the multispecies, lobster and sea scallop fisheries. The framework actions under these three FMPs would extend the three area closures (two mobile gear and one fixed gear) implemented under the April 1996 Gear Conflict Emergency action, add a newly defined mobile gear closed area, and implement less restrictive transiting provisions.

Gear Types

Gear types used in the American lobster (Homerus americanus) fishery include single traps, pair traps (two traps in a series), multiple trap trawls, and otter trawls. Gear descriptions were provided in the Amendment 5 BO (NMFS 1994).

In addition to these primary gear types, an unknown proportion of the trap/pot vessels use small gillnets to catch bait for the traps. These nets are typically smaller mesh than the groundfish sink gillnet fishery and the strings of nets are typically shorter. Bait species are primarily small pelagic fishes such as herring (Clupea harengus), Atlantic mackerel (Scomber scombrus), Atlantic menhaden (Brevoortia tyrannus), or whiting (Merluccius bilinearis).

Walden (1996), presenting results from a 1990-1991 survey of

ports from Maine through Virginia, states that 182 vessels reported fishing with gillnet gear for bait or for personal use. The majority of these vessels operated from Maine ports. Information received from the Maine Department of Marine Resources suggests that the number of vessels using bait gillnets varies significantly with the price of herring available commercially through other sources such as the coastal trawl fishery. It is likely that some of the bait gillnet vessels are fishing for bait for the bluefin tuna hook-and-line fishery rather than or in addition to lobster bait.

Walden (1996) gives several reasons why the number of bait gillnet vessels derived from the survey may be an underestimate. The lobster bait gillnet fishery is poorly known and is not tracked directly by NMFS. Some information may be available from the fishing vessel logs of multispecies, scallop, or summer flounder permit holders who also fish for lobsters and from dealer logbooks. Dealers which buy only from state lobster permit holders are not required to hold a federal dealer permit and are not required to report landings to NMFS. Since the majority of lobster vessels do not hold federal permits, the number of vessels and dealers which do not report could be substantial. Some state dealers, however, do provide monthly voluntary summaries. Some states require fishers to be licensed for commercial use of any gillnet. In many areas, fishers who set gillnets only for their own bait may not be tracked by any system.

The New England Fishery Management Council has developed a framework measure (Framework 16 under the Multispecies FMP) which limits the use of bait gillnets in harbor porpoise, Phocoena phocoena, closure areas. Framework 16 is expected to significantly reduce the potential for marine mammal entanglement in bait gillnets in the porpoise closure areas but does not limit the use of bait gillnets in any other times or areas.

**LISTED AND PROPOSED SPECIES THAT MAY OCCUR IN THE PROJECT AREA AND DESIGNATED CRITICAL HABITAT**

The list of endangered and threatened species in waters where the lobster fishery operates has not changed from that described in the BO for Amendment 5 and is hereby incorporated by reference. Since the BO for Amendment 5 was issued, right whale critical habitat has been designated and two species have been proposed for listing.

Right Whale Critical Habitat

There are five well-known habitats used annually by northern right whales, including: 1) coastal Florida and Georgia, 2) the Great South Channel, east of Cape Cod, 3) Cape Cod Bay 4) the Bay of Fundy, and 5) Browns and Baccaro Banks, south of Nova Scotia.

The first three areas occur in U.S. waters and were designated by NMFS as critical habitat [50 CFR 59(106): 28793-28808, June 3, 1994].

Kraus and Kenney (1991) provide an overview of data regarding right whale use of these areas; this is further discussed in the listing notice. Habitat in Cape Cod Bay and the Great South Channel is used for foraging, breeding and nursing. Important habitat components in Cape Cod Bay include seasonal availability of dense zooplankton patches and protection from weather afforded by the land masses surrounding the bay. The spring current regime and bottom topography of the Great South Channel result in nutrient rich upwelling conditions. These conditions support the dense plankton and zooplankton blooms utilized by right whales. However, the combination of highly oxygenated water and dense zooplankton concentrations are optimal conditions for the small schooling fishes (sand lance, herring, and mackerel) that are preferred prey of several piscivorous marine mammal species such as humpback and fin whales, Atlantic whitesided dolphins, pilot whales, and harbor porpoise. Concentrations of these species were observed in this region during the same spring period (CeTAP 1982).

Actions that impact habitat elements identified as essential to critical habitat designation must come under the ESA Section 7 consultation procedures, regardless of the presence of right whales at the time of impacts. In addition, these actions may adversely effect the species itself regardless of presence at the time of impacts. For these reasons, any impacts to the Great South Channel and Cape Cod Bay that may effect prey availability and quality, or nursery protection must be considered under Section 7 consultation.

It is unlikely that zooplankton densities that occur seasonally in Cape Cod Bay or the Great South Channel could be expected to increase significantly. However, increased predation by groundfish on small schooling fish in certain areas and at specific critical periods may allow the necessary high zooplankton densities to be maintained in these areas for longer periods, or accumulate in other areas at levels acceptable to right whales.

Scientists at the Center for Coastal Studies in Provincetown, Massachusetts, are beginning to find evidence of dense concentrations of plankton in layers very close to the water-sediment interface in eastern Cape Cod Bay. These layers appear to be the target of active feeding by right whales, and may represent a more important source of plankton than surface swarms (Mayo, pers. comm.). The abundance and distribution of plankton in the lower portion of the water column is poorly known because of mechanical hazards of towing oceanographic sampling equipment near the bottom. Oceanographers are hopeful that alternative

sampling methods such as video recording can be utilized to overcome the sampling difficulties (Goldman, pers. comm.).

Harbor Porpoise

The harbor porpoise, Phocoena phocoena, was proposed for listing as threatened on Jan. 7, 1993. A Conference on harbor porpoise is appended to this Biological Opinion.

Atlantic Salmon

A Distinct Population Segment (DPS) of Atlantic salmon, Salmo salar, was proposed for listing as threatened in seven Maine rivers on September 25, 1995. A Conference on Atlantic salmon is appended to this Biological Opinion.

**STATUS OF AFFECTED SPECIES**

Complete species accounts and references can be found in the Biological Opinion for the U.S. Coast Guard Vessel and Aircraft Operations (NMFS 1995), and in the Biological Opinion for Amendment 5 to the Lobster FMP (NMFS 1994) and is incorporated herein by reference. New information that has become available in 1996 that has bearing on this consultation is described below.

Northern right whale

Since the issuance of the Biological Opinion on Amendment 5 on March 23, 1994, new information has been reported on the status of the right whale population. The 1995 Stock Assessment Report prepared by NMFS pursuant to the 1994 MMPA amendments (Blaylock, et al. 1995) references the estimate of 295 (Knowlton et al. 1994) as the current minimum population estimate for the northern right whale.

The Potential Biological Removal (PBR) level is a value developed under the MMPA which represents the maximum annual removal level due to human-induced serious injury or mortality which could occur without hindering the species from recovering to and/or sustaining its optimum sustainable population level. The PBR level for right whales is currently set at 0.4 individuals per year, or 2 human-induced whale mortalities or serious injuries every 5 years (Blaylock et. al. 1995). Based on a minimum estimate of known serious injuries or mortalities, the current PBR level has been exceeded in 20 of the past 27 years. This level of interaction is based on actual reported numbers rather than an estimate based on presumed dead numbers or extrapolations to total shipping and fishing effort. Due to the limited size of the population, the lengthy calving interval, and other factors that may be affecting population growth (at Blaylock et al. 1995), it is expected that each mortality will further inhibit recovery of this species to some extent.

The northern right whale population has not made significant steps toward obvious recovery in the 50 years since a whaling moratorium was placed on 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, most of these known deaths are related to human activity, specifically ship strikes. A more extensive discussion of these factors can be found in the September 15, 1995, and July 22, 1996, BOs on operations of the U.S. Coast Guard in the Atlantic Ocean (NMFS 1995, 1996). Incidences of these whale-human interactions are becoming more evident as increased efforts are made to retrieve carcasses so that in-depth necropsies can be conducted to determine the cause of death. Recent necropsies have shown that external observations of whale carcasses are not sufficient to determine whether a ship strike has occurred. For example, both humpback and right whale carcasses have been recovered which showed no external signs of skull damage. When the skull was flensed, however, extensive shattering of the cranial bones was uncovered. More information on internal damage resulting from entanglement and other anthropogenic impacts is needed before conclusions can be drawn based on external observations.

Knowlton et. al. (1994) presented data (through 1992) which suggests an annual population growth rate of 2.5% and an annual mortality rate of 2.1%. The mortality rate was calculated using the number of animals known to be dead (from both anthropogenic and natural causes) added to the number presumed to be dead based on the fact that they were not observed in over five years (sighting rate based on a photo-identification sighting database). A whale not observed in 5 years is considered dead in Year 6.

In early 1996, an estimate of total mortality (anthropogenic and natural mortality combined) was derived using this method through the end of 1995. This resulted in an apparent mortality increase in 1994 to 19 whales and 18 whales in 1995. This preliminary estimate of number of animals presumed dead in 1994 and 1995, coupled with an increase in known deaths in early 1996, strongly suggested that the population may be declining and was used in the US Coast Guard Biological Opinions (NMFS 1995, 1996). However, a further analysis of the sighting database and the method for estimating the presumed dead whales has shown that this calculation has been biased by the cessation of sighting effort in offshore areas since 1989 relative to the known movements of individual whales based on their previous sighting record (i.e., the reduction in offshore effort approximately 5-6 years ago resulted in an increase in the number of animals not observed in 5-6 years because many of the whales presumed to be dead in 1996 have an offshore sighting distribution. Therefore it is not known whether they are really dead, or have not been

observed because of reduced effort in the past 6 years in offshore habitats). Correcting for the effort bias resulted in an estimated mortality of 6 whales presumed dead in both 1994 and 1995 rather than 19 and 18, respectively, as the preliminary analysis had indicated. Adding the corrected presumed dead numbers to known dead numbers yields an estimated total mortality of 7 whales in 1994 and 8 in 1995, within the range of estimated annual right whale mortality in recent years. The presumed dead number for 1996 is not yet available, but the known dead number alone totals 6. In addition, 2 right whales have been observed with serious injuries from entanglement thus far in 1996.

Therefore, the re-analysis of the sighting database concluded that the presumed dead component of the mortality rate calculation has likely not increased in recent years. Population parameters must be further analyzed to quantify the various biases and validate the vital rate estimates before known or presumed numbers of mortalities can be used to indicate trends with scientific certainty. Since effort bias has been determined in this database, and in consideration of the possible effects of this bias as it relates to the methods used by Kraus (1990), Knowlton et al. (1994), and Kenney et al. (1995) to estimate mortality and calf production, a review and re-assessment of these biological parameters for the northern right whale population is now being conducted. Until that information is available, it is not possible to determine population trends.

Regardless of whether the growth rate has changed since 1992, this rate is still lower than that calculated for four populations of the southern right whale, Eubalaena australis, a similar species. This difference in growth rates may indicate greater impediments to the recovery of the northern right whale and justifies a highly conservative stance in managing the northern right whale population. The difference in population parameters between populations also suggests that the northern right whale may be more susceptible to human perturbations than other whale species (Blaylock et al. 1995).

Since 1970, 41 northern right whale mortalities from anthropogenic (ship strike or entanglement), natural, or unknown sources (Appendix A) have been reported. Mortalities include 14 ship strikes, 2 entanglements, and 25 mortalities of unknown or natural causes. Twelve mortalities in the latter category were adults, juveniles, or calves which had survived their first 6 months. Although the actual cause of death for these whales remains uncertain, it is likely that a significant fraction of these animals died from anthropogenic impacts.

Right whales which have been struck by vessels usually strand or are found floating in the vicinity of critical habitats in the north and south or near the shipping lanes in the Mid-Atlantic. In addition to the 14 ship strikes which resulted in mortality,

the prevalence of injuries (not immediately lethal) from ship strikes was estimated from scarification analysis to be 7% (Kraus 1990). One animal was seen on a NMFS research cruise in 1995 with a deep gash in its head. This animal was not included in the above mortality estimate; however, experts believed that the whale would not survive the injury (Knowlton, pers.comm.).

Gear entanglements are the second major known anthropogenic source of right whale mortality and injury. An analysis of entanglement data since 1970 reveals approximately 31 records of entanglement of right whales in commercial fishing gear which did not result in immediate mortality. Although entanglements are not always immediately lethal, evidence suggests that many entanglements result in injuries leading to mortality by causing substantial wounds or reducing the animal's ability to swim and/or feed, thereby reducing the likelihood of survival and possibly compromising reproductive fitness. NMFS recognizes that the total level of take is an unknown, but considers the known level a minimum.

**Summary:**

In combination, the following factors form the environmental baseline upon which the impacts of management activities regulating the lobster fishery must be evaluated.

* The known serious injury and/or mortality of 5 right whales in 1995 (3 involving entanglement, 2 involving ship strikes) and 8 right whales in 1996 (2 involving entanglement, 4 involving unknown or natural causes, 1 ship strike, and 1 mortality due to ship strike of a whale injured by an entanglement in 1995), is the primary change in knowledge concerning the status of the population and describes significant anthropogenic mortality or serious injury from ship strikes or entanglements.

* The unknown status of this species is indicated by the lack of any measurable recovery progress over the past 15 years but balanced by the possibility that the population may have made a slow recovery from as low as 50 animals at the turn of the century (Reeves et al. 1992; Kenney 1992) to the Knowlton et al. (1994) estimate of 295.

* Based on historic calving interval data (Knowlton 1994), 46 females in the population were considered available to calve in 1995-96. However, only ten were observed with new calves in 1996. The fact that the other 36 did not calve when expected suggests a significant increase in the calving interval for the population. However, NMFS is unable to determine at

this time if an increasing calving interval can be interpreted as a change in fitness of the non-calving females or a natural phenomenon of aging females.

* The small estimated population size (295) and low reproductive rate suggest that any anthropogenic impacts may have a greater effect on this population relative to population growth rates than for other whales. These population parameters are critically low in view of the unknown variability in the rates of anthropogenic (such as ship strikes, entanglements, acoustic trauma, and habitat degradation) and natural mortality.

* Documented anthropogenic impacts have exceeded the current PBR threshold of 0.4 for 20 of the past 27 years.

* Additional data to consider (data from the New England Aquarium Right Whale Research Group):

  (1) A high number (21) of births was recorded during the 1995-96 calving season;
  (2) At least 15 of these calves survived the seasonal migration to the Bay of Fundy; and
  (3) Eleven of the calves were born to females never before observed to bear young,

* Uncertainties still remain because a preliminary re-analysis of photo-identification data suggests that impact of the recent births and deaths on the previously reported annual population growth rate of 2.5% (7 animals per year) cannot currently be estimated.

Humpback Whale

The 1995 Stock Assessment Report (Blaylock et al. 1995) lists the minimum population estimate for the Western North Atlantic humpback stock as 4,848. An update of humpback entanglement records received by NMFS is presented in Appendix C. Ship strikes have continued to contribute significantly to the known mortality rate for humpback whales on the U.S. East Coast. An update of ship strike impacts is not available at this time.

Fin Whale

The 1995 Stock Assessment Report (Blaylock et al. 1995) lists the minimum population estimate for the Western North Atlantic fin stock as 1,704. Ship strikes continue to contribute to the total known mortality rate for fin whales on the U.S. East Coast. An update of ship strike impacts is not available at this time. It

is possible that known fin mortality is under-represented relative to humpback and right whale estimates due to the fact that finback 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.

**ASSESSMENT OF IMPACTS**

An assessment of impacts of the lobster fishery on endangered and threatened species is contained in the BO for Amendment 5 (NMFS 1994). That discussion is hereby incorporated by reference. The following updated information is provided.

**Endangered Whales**

Endangered whale interactions with fishing gear has been summarized from the NMFS entanglement database updated to include new information since the BO on Amendment 5. The database includes entanglements of right and humpback whale entanglements in lobster trap/pot gear as well as other gear types and unidentified gear. Entanglement of other endangered whale species (finback whale, Balaenoptera physalus, blue whale, Balaenoptera musculus, and sperm whale, Physeter catodon) in lobster trap/pot gear has also been documented.

Guidelines Used to Determine "Serious Injury"

NMFS published a definition of "injury" and "serious injury" in the regulations implementing section 118 of the Marine Mammal Protection Act (60 FR 45086). While the definition of injury is very specific and includes descriptions of many types of potential injuries, the definition of serious injury was defined only as an injury likely to result in mortality. National guidelines for determining what constitutes a serious injury have not been formally established. The Atlantic Scientific Review Group (SRG), which advises the agency on the science used by NMFS to manage marine mammals in the Atlantic Ocean, recommended that all instances where marine mammals are released alive from fishing gear be considered serious injuries until documentation to the contrary has been produced. In the absence of national guidelines and because a working definition of serious injury was urgently needed to address the impact of the lobster pot fishery to right and humpback whales, the Northeast Region developed criteria for determining what constitutes a serious injury to large whales. The guidelines developed by the NER were initially used in the classification of the lobster fishery, and were also used to determine what constitutes a serious injury for the purpose of this Biological Opinion.

According to the definition of injury, animals entangled in

fishing gear, or released with gear trailing, are considered injured. Injuries described in large whale entanglement records were considered serious if they met any of the following criteria: a) entanglement did or could interfere with feeding, e.g., cinching loop around snout or gear through baleen; b) entanglement did or could interfere with mobility, e.g., whale anchored, flippers pinned, flukes weighed down, gear apparently preventing whale from getting to the surface to breathe; or c) entanglement resulted in substantial wounds, e.g., deep cuts, tendon/ligament or bone damage, which may result in loss of appendages or debilitating infection. A secondary consideration used in the analysis was whether the growth of a juvenile animal could cause further injury by a cinching entanglement on any part of its body as it increased in size. If necessary, these guidelines will be changed to ensure consistency with national guidelines once national guidelines are developed.

Right Whales

Entanglement of right whales from 1987-1996 in lobster gear is summarized in Table 1. The number of entanglement related serious injuries which eventually result in mortality is unknown.

**Table 1 . Right whale serious injury and mortality from lobster trap/pot gear, 1987-1996**

| Date | Lat./Lon. | Gear Type | Gear Description | Outcome |
|---|---|---|---|---|
| 11/17/88 | 44.87/66.65 | lobster | Canadian lobster trawl | dead |
| 07/09/93 | 40.38/67.63 (Georges Bank) | lobster | bullet dob, swivel, line | serious injury |
| 12/21/93 | 30.74/81.36 (Georgia) | lobster | trawl rig; mostly sinking line; toggle | serious injury |
| 12/95 | 44.86/66.69 | lobster | Canadian lobster trawl | serious injury |
| 01/06/96 | 30.53/81.29 | lobster | bullet buoys and line | serious injury |

Evidence suggests that both buoy lines and groundlines (line on bottom connecting lobster pots) represent an entanglement threat to right whales. Table 1 lists 5 records of serious injury or

mortality of right whales due to entanglement in lobster trap/pot gear from 1987 through 1996. One whale was found dead in a trap trawl in the Bay of Fundy. The other entanglements resulted in serious injury rather than immediate mortality. In addition to the threat of injury or mortality from entanglement, the entanglement problem is compounded by cases such as that recorded in December 1995. In that case, the whale was entangled in a multiple-trap trawl in the Bay of Fundy in mid-December 1995. The whale swam off trailing gear around its tail and through the baleen and was killed by a ship in the vicinity of Cape Cod, Massachusetts in March of 1996. Thus the entanglement was not the ultimate cause of mortality, but probably interfered with the animal's ability to feed, swim, and maneuver and may, therefore, have made the whale more vulnerable to a ship strike. Such an entanglement might also limit the animal's ability to reproduce.

The true level of interaction is likely higher than that mentioned above but cannot be estimated. An analysis of scars (Kraus 1990) indicated that approximately 57% of the photo-identified right whales exhibit scars consistent with entanglement. However, these scars are likely due not only to the lobster fishery, but to several other fisheries as well.

In addition to the unidentified line entanglements, NMFS has several records of unidentified net entanglements (NMFS, unpub). It is possible that some fraction of these events could have been due to entanglement in lobster bait gillnets. Since these nets are smaller than groundfish sink gillnets, it is unlikely that entanglement in a lobster bait gillnet would result in immediate mortality. However, a right whale could incur serious injury from entanglement in a bait gillnet, particularly if the whale was a juvenile or if the entanglement prevented the whale from opening its mouth to nurse or feed.

Humpback Whales

Entanglements of humpback whales from 1987-1996 in lobster gear are summarized in Table 2. The number of entanglement related serious injuries which eventually result in mortality is unknown.

**Table 2. Humpback whale serious injury and mortality from lobster trap/pot gear, 1987-1996**

| Date | Area | Gear Type | Description | Outcome |
|---|---|---|---|---|
| 11/29/88 | MA | lobster | line + hiflyer of 9-pot trawl | serious injury |
| 04/10/90 | MA | lobster | 100s of yds of lobster gear | serious injury |
| 06/18/90 | MA | lobster | lobster warp and float | serious injury |
| 07/04/90 | NH | lobster | lobster line & orange buoy | serious injury |
| 08/01/91 | MA | lobster | gillnet, lobster, & tuna | serious injury |
| 08/24/91 | NY | lobster | offshore rig & hiflyers | serious injury |
| 10/03/91 | MA | lobster | pot trawl with two buoys | serious injury |
| 04/22/93 | MA | lobster | lobster line | serious injury |
| 06/13/93 | NH | lobster | pot warp | serious injury |
| 08/11/93 | ME | gillnet & lobster | gillnet & lobster line | serious injury |
| 08/19/93 | ME | lobster | lobster gear | serious injury |
| 08/11/94 | ME | lobster | probably single trap | serious injury |
| 01/30/96 | MA | lobster | offshore 40-trap trawl surface gear | serious injury |
| 10/07/96 | MA | lobster | lobster line and buoy | serious injury |

The above table (covering a ten-year period from 1987 to 1996) lists 14 records of humpback whale entanglements in lobster gear which resulted in serious injury. This represents a minimum

average entanglement rate of 1.4 per year based on reported incidents which cannot be extrapolated to total fishing effort. The true level of interaction is likely higher but cannot be estimated. The number of reports of serious injury incidents range from 0 in 1987 to 4 in 1993. A preliminary analysis of scars has indicated that more than 30% of the photo-identified humpback whales in the Gulf of Maine exhibit scars consistent with entanglement (Carlson, pers. comm.). However, these scars are likely attributable not only to the lobster fishery, but to several other fisheries as well.

NMFS has also received 20 reports for the 1987-1996 period where the gear type was reported as "line" or unknown gear. Some fraction of these entanglements may be attributable to lobster gear. In some cases, the line is a fragment of gear. In other cases, however, line is all that is visible at the surface, and it is not possible to determine whether other gear is trailing at depth. In some records, gear descriptions could fit more than one gear type, e.g., surface gear described as "highflyer, line, and poly ball" could be part of a lobster trap trawl, a hagfish (Myxine glutinosa) pot trawl or other fish trap, or a groundfish sink gillnet. Prior to 1986, there are 3 more lobster gear and 6 line or unknown gear entanglement records, but these have not yet been verified and classified according to the degree of injury/mortality.

In addition to the unidentified line or unknown gear entanglements, NMFS also has records of entanglement of humpbacks in unidentified net gear (NMFS unpub.) It is possible that some fraction of these events could have been due to entanglement in lobster bait gillnets. Since these nets are smaller than groundfish sink gillnets, it is unlikely that entanglement in a lobster bait gillnet would result in immediate mortality. However, a humpback whale could incur serious injury from entanglement in a bait gillnet, particularly if the whale was a juvenile or if the entanglement prevented the whale from opening its mouth to nurse or feed. It is likely that the periods during which bait gillnet effort is high overlap the periods of peak piscivorous endangered whale abundance.

Fin Whale

No records of fin entanglement in lobster gear have been received for the 1987-1996 period. One record for July 1996 in Canadian waters may have been lobster gear, but this has not been confirmed. During the 1987-1996 period, 4 fin entanglement records involving unidentified line and one of unidentified net have been received. It is possible that some fraction of these records could be attributable to entanglement in lobster pot gear or lobster bait gillnet gear. In some cases, the line is a fragment of gear. In other cases, however, line is all that is

visible at the surface, and it is not possible to determine whether other gear is trailing at depth.

**Right Whale Critical Habitat**

The effect of the prosecution of the fishery on the habitat itself cannot be measured at the present time. The amount of gear lost due to gear conflicts and storms is considerable at certain times and in certain areas. It is possible that the lost gear mentioned above and the deployment and retrieval of active gear could disrupt patches of right whale prey and make these plankton swarms inaccessible or unacceptable to right whales. In addition to impacts from lobster vessels, these impacts would be introduced by other vessels using the critical habitat areas.

**CUMULATIVE EFFECTS**

"Cumulative Effects", as defined in the ESA, are "those effects of future state or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation." Therefore, this section does not discuss the cumulative effects of federal actions since these actions undergo Section 7 consultations. The Biological Opinion for Amendments 5 identified other cumulative impacts; that discussion is hereby incorporated by reference. New information that has been received since that consultation includes an action by the Commonwealth of Massachusetts to develop a conservation plan for right whales in state waters that addresses state fishery interactions. This is expected to reduce the impacts of state fixed gear fisheries on right whales in Massachusetts waters.

**CONCLUSIONS**

Based on the environmental baseline which includes adverse effects and reflects the precarious level of the most recent right whale population estimate, the mortality that occurred during January and February of 1996 and the cumulative effects of all remaining potential sources of mortality, NMFS concludes that the current and proposed fishing activities carried out under the Lobster FMP are likely to jeopardize the continued existence of the North Atlantic right whale. This opinion is also based on that fact that the lobster fishery uses a gear type which is known to cause serious injury to right whales and, therefore, the current and proposed activities conducted pursuant to the Lobster FMP, without amendment, are likely to be present, are also likely to jeopardize the continued existence of the population.

A Reasonable and Prudent Alternative has been provided, which if implemented fully and in a timely manner, will directly and indirectly reduce the likelihood of large whale entanglement in Lobster fishing gear to a level that is not likely to jeopardize

the continued existence of right whales. Reasons why the Reasonable and Prudent Alternative will reduce the likelihood of jeopardy are discussed below.

The primary element of the Reasonable and Prudent Alternative includes the prohibition of all lobster trap/pot gear in right whale critical habitat, unless gear or alternative fishing practices are developed that eliminate the likelihood of entanglement. This element in combination with disentanglement efforts will reduce the frequency of interactions, increase the probability that those interactions that do occur will be observed, or ensure that adequate response efforts can be deployed in time to avoid serious injury or mortality.

Monitoring of lobster effort information and whale distribution data will enable NMFS to avoid clumping fixed gear effort in high-risk/overlap areas and/or sensitive whale areas such as right whale critical habitat. This information is essential for measuring impacts to protected species. Once this data is available, it will be possible to avoid concentrating gear in sensitive areas.

There is no new information to change the basis for the conclusions of the 1994 BO that the fishing activities carried out under the Lobster FMP are not likely to jeopardize the continued existence of the other endangered and threatened whale and sea turtle species under NMFS jurisdiction.

NMFS concludes that the prosecution of the lobster fishery will not adversely modify right whale critical habitat because although the deployment and retrieval of lobster gear might disrupt plankton patches, it is unlikely that there will be significant overlap because the percentage of the bottom which harbors acceptable right whale feeding patches is small, and because the impact of lobster gear on critical habitat is expected to be minimal because times of peak fishing effort do not coincide with peak whale abundance.

**REINITIATION OF CONSULTATION**

Reinitiation of formal consultation is required if: (1) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered (specifically, should results of monitoring and reporting effort included as part of the Reasonable and Prudent Alternatives provide new information that the levels of take are higher than anticipated, or new fishing methods or gear are developed that will eliminate existing threats to endangered whales, consultation should be reinitiated); (2) the identified action is subsequently modified in a manner that causes an effect to listed species or critical habitat that was not considered in the Biological Opinion; (3) a new species is listed or critical

habitat designated that may be affected by the identified action; or (4) the Incidental Take Statement is exceeded.

Because of the nature of this action, it is anticipated that consultation will be reinitiated regularly as new management measures are developed. Each reinitiation will consider all aspects of the FMP. In addition to regulations resulting from Lobster FMP actions, additional protection for endangered marine mammals is anticipated as take reduction plans are implemented pursuant to the Marine Mammal Protection Act.

NMFS expects that the take reduction plan, assessment of lobster effort patterns, and right whale population trend analysis will be completed by April 1997.

Although the following activities are ongoing, if, for any reason there is a change in these activities, consultation must be reinitiated.

1. Continue support for inshore disentanglement effort, and work with the U.S. Coast Guard and the Center for Coastal Studies (CCS) to implement the expanded offshore effort protocol by June 1997, and

    a. instruct all federal fishery permit holders to contact the large whale disentanglement team if an entanglement of a large whale occurs.

    b. work with states to disseminate similar information to state permit holders

2. Continue coordination with the U.S. Coast Guard to implement current inshore disentanglement protocol, early warning system for shipping and fishing operations, spring survey flights in Critical Habitat areas, and others measures specified under the Memorandum of Understanding with that agency. These actions are expected to prevent takes by providing fishermen with real-time whale distribution information to evaluate whether or not gear should be set in that area.

**REASONABLE AND PRUDENT ALTERNATIVE**

The regulations implementing Section 7 of the Endangered Species Act (50 CFR 402.14) specify that a jeopardy biological opinion shall include reasonable and prudent alternatives, if any. The following Reasonable and Prudent Alternative must be taken to avoid the likelihood of jeopardizing the continue existence of the northern right whale. It can be implemented in a manner consistent with the scope of NMFS's legal authority and

jurisdiction, and is economically and technologically feasible. NMFS concludes that all components of the Reasonable and Prudent Alternative must be implemented to ensure that continued fishing under the Lobster FMP is not likely to jeopardize the continued existence of the northern right whale. The following schedule for implementing the Reasonable and Prudent Alternative will reduce the likelihood of jeopardy to right whales.

**Reasonable and Prudent Alternative: NMFS, in conjunction with the New England Fishery Management Council and/or Atlantic States Marine Fisheries Commission, must reduce significantly the possibility of entanglement of northern right whales in lobster trap/pot gear and bait gillnets.**

The 1994 Amendments to the Marine Mammal Protection Act (MMPA) mandate that a Take Reduction Team (TRT) be convened to recommend measures to reduce commercial fishery-related impacts on marine mammals, including endangered whales. The Atlantic Large Whale TRT has met 4 times and will provide to NMFS a Take Reduction Plan (TRP) by early February 1997. When received, NMFS will review the plan and initiate consultation under section 7 of the ESA on the proposed implementation of the plan. If this plan is found to be sufficient to avoid jeopardy to the right whale, then NMFS may use the implementation of the plan as an alternative to the reasonable and prudent alternative outlined in this opinion.

NMFS has received recommendations from the New England Whale Recovery Plan Implementation Team (NEWRPIT) concerning actions that could be taken to reduce entanglements within the operating area of the Lobster FMP. The NEWRPIT recommended, in a letter dated July 26, 1996, that NMFS prohibit fixed gear in the right whale Critical Habitat areas during the periods of high use by whales. Although the NEWRPIT recognized that the specific location of known gear entanglements is often not known and that the events do not occur solely within Critical Habitat, they reasoned that prohibiting gear in these areas and times would serve to protect known concentration areas while other alternatives to reducing interactions were explored by the Atlantic Large Whale TRT. The Team also recommended that NMFS consider measures to reduce the number of vertical lines associated with fixed fishing gear.

**The following components represent the Reasonable and Prudent Alternative necessary to reduce significantly the possibility of entanglements and ensure that fishing conducted under the Lobster FMP is not likely to jeopardize the continued existence of the northern right whale. NMFS must take the following actions:**

1. Prohibit the deployment of lobster trap/pot gear and lobster bait gillnet gear in the Great South Channel right whale Critical Habitat area from April 1 to June 30 of each year, unless gear or alternative fishing practices are developed

that eliminate the likelihood of entanglement. NMFS must request the NEFMC to initiate Framework action immediately to implement Great South Channel closure by April 1, 1997, unless gear or alternative fishing practices are developed that eliminate the likelihood of entanglement.

2. Analyze fishing effort and whale distribution in order to avoid clumping fixed gear effort in high-risk/overlap areas and/or sensitive whale areas such as right whale critical habitat. To achieve this NMFS must:

   a. develop and implement a coordinated program for analysis of lobster fishing effort data to provide information on distribution and quantity of effort and continue this analysis on an annual basis.

   b. coordinate with the states to obtain effort information for state water trap/pot and bait gillnet fisheries.

   c. Use existing effort analysis models to predict similar shifts that may result from the proposed activities described in this BO.

   d. Modify existing permit and data collection systems to track lobster bait gillnet effort to the fullest extent possible

It is believed that implementation of this Reasonable and Prudent Alternative under the schedule delineated above will directly or indirectly reduce the likelihood of entanglement in lobster fishing gear to a level that is not likely to jeopardize the continued existence of the northern right whale. However, the analysis required in Item 2 above will be critical in determining whether additional long-term measures are necessary to reduce significantly the possibility of entanglements, and thus avoid jeopardy to right whales.

Although NMFS recognizes that random interactions with gear may still occur, this alternative in combination with disentanglement efforts will increase the probability that those interactions that do occur will be observed and reported, and ensure that adequate response efforts can be deployed in time to avoid serious injury or mortality. Furthermore, the proposed framework anticipated under the Lobster FMP will either reduce fishing effort or not change it in a way that further threatens right whales. Thus, the framework measure may be implemented while the schedule of measures under the Reasonable and Prudent Alternative outlined above are implemented.

Because this Biological Opinion has found jeopardy, the Office of

Sustainable Fisheries is required to notify the Office of Protected Resources of its final decision on the implementation of the Reasonable and Prudent Alternatives.

## CONSERVATION RECOMMENDATIONS

In addition to Section 7(a)(2), which requires agencies to ensure that proposed projects will not jeopardize the continued existence of listed species, Section 7(a)(1) of the ESA places an additional responsibility on all Federal agencies to:

> ". . . utilize their authorities in furtherance of the purposes of this Act by carrying out programs for the conservation of endangered species . . . ."

The Recovery Plans for the Northern Right Whale and Humpback Whale describe actions the Council and NMFS can take to assist in the recovery of these species in the associated implementation schedules.

In the Amendment 5 BO, NMFS recommended that the following conservation measures be implemented to further reduce adverse effects of fishing activities on listed species:

1. NMFS should continue to pursue efforts to work with states to develop Section 10 permits and associated conservation plans that improve data collection regarding the incidental take of sea turtles, and reduction of takes.

2. The NEFMC and NMFS should encourage the states to require fishermen to report sea turtle takes as bycatch in the states' mandatory logbooks. Reports should include a description of the animal's condition at the time of release.

3. NMFS and the NEFMC should assemble fishermen, gear experts and sea turtle biologists in a workshop or special working group to consider mechanisms to reduce the take of sea turtles in lobster gear. Discovery of the attractive features of the gear and modification of those features should be attempted.

The Conservation Recommendations provided below are additional to those provided in the Biological Opinion for Amendment 5. In order for NMFS to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitat, appropriate divisions notify the Office of Protected Resources of the implementation of any recommendations, and a summary of what has been implemented from the previous consultation.

1. NMFS should conduct a thorough scientific analysis on the right whale catalogue database to determine the population status, to the extent practicable, (decline, status quo, increase). This assessment should include analysis of the

effects of changes in sighting effort to locate whales and should consider the use of population parameters in predicting the impact of a given number of births or deaths on the population.

2. NMFS should examine all pot fisheries to consider whether there are other fisheries which use gear types similar to lobster pot gear that operate in areas used by endangered and threatened species. For example, the hagfish fishery uses gear which is rigged similarly to lobster pot trawls, i.e., same surface gear, although the hagfish pots are more like drums or barrels (D. McKiernan, pers. comm.). Effort has increased substantially in recent years in areas of high whale abundance such as Stellwagen Bank and Jeffreys Ledge in the Gulf of Maine (M. Weinrich, pers. comm.).

3. If a potential impact is identified, NMFS should implement conservation measures consistent with those recommended for the lobster fishery.

4. NMFS should promulgate regulations under the ESA and MMPA to allow fishermen to close-approach and attempt to disentangle whales caught in gear when permitted disentanglement parties (CCS) are not able to respond within a period of time specified by NMFS. This is expected to reduce the probability of serious injury or mortality by encouraging fishermen to report and participate in disentanglement efforts as necessary without legal repercussions.

5. NMFS should coordinate with the Commonwealth of Massachusetts to restrict or modify the lobster fishery to reduce threat of entanglement in the Cape Cod Bay right whale Critical Habitat, which lies totally in state waters, from February through May of each year.

6. NMFS should Work with the fishing industry to develop modifications to lobster gear or alternative fishing practices that will eliminate the likelihood of entanglement in lobster trap/pot and bait gillnet gear, whereupon fishery exemptions would be provided.

7. NMFS should work with the NOAA/Sanctuaries and Reserves Division to eliminate any possibility that lobstering within the Stellwagen Bank National Marine Sanctuary poses a threat to endangered large whales.

## INCIDENTAL TAKE STATEMENT

Section 7(b)(4) of the Endangered Species Act (ESA) requires that when a proposed agency action is found to be consistent with Section 7(a)(2) of the ESA, and the proposed action may incidentally take individuals of a listed species, NMFS will issue a statement that specifies the impact of any incidental taking of endangered or threatened species. It also states that reasonable and prudent measures, and terms and conditions to implement the measures, be provided that are necessary to minimize such impacts. Only incidental taking resulting from the agency action, including incidental takings cause by activities approved by the agency, that are identified in this statement and that comply with the specified reasonable and prudent alternatives, and terms and conditions, are exempt from the takings prohibition of section 9(a), pursuant to section 7(o) of the ESA.

Because no authorization pursuant to Section 101(a)(5)(E) of the Marine Mammal Protection Act has been made, the take of endangered marine mammals cannot be authorized at this time.

NMFS anticipates that the continued operation of the lobster fishery under current and anticipated management measures may result in the injury or mortality of loggerhead and leatherback sea turtles. NMFS identifies a reported annual level of take (by injury or mortality) for the lobster fishery of ten (10) loggerhead or four (4) leatherback turtles.

The reasonable and prudent measures contained in the Incidental Take Statement provided in the March 23, 1994, BO for Amendment 5 remains effective and is incorporated herein by reference.

CONFERENCE
on

Proposed Listing of Harbor Porpoise
and
Atlantic Salmon

During conferences, NMFS makes advisory recommendations on ways to minimize or avoid adverse impacts to the populations proposed for listing. If the harbor porpoise or DPS of Atlantic salmon is listed, the NMFS and Council must then review this FMP to determine whether formal consultation under Section 7 of the ESA is required.

**HARBOR PORPOISE**

**Abundance, Distribution, and Life History**

This consultation, conducted under 50 CFR § 402.10, represents the Conference regarding the impacts of the Lobster FMP on harbor porpoise. If harbor porpoise is subsequently listed NMFS must review the FMP to determine whether formal consultation is required.

Harbor porpoise that occur in waters where the lobster fishery operates are considered part of the Gulf of Maine/Bay of Fundy population. NMFS has proposed listing the Gulf of Maine population of harbor porpoise as a threatened species under the ESA (58 FR 3108; Jan. 7, 1993). Harbor porpoise have been proposed for listing as threatened due to a combination of: (a) significant on-going bycatch in sink gill net fisheries, primarily in New England waters; and (b) the present lack of adequate control on the fisheries-related mortality.

The current minimum population estimate for the Gulf of Maine/Bay of Fundy harbor porpoise stock is 40,297 animals (Blaylock et al. 1995). The population appears to be highly mobile, with strong seasonal north/south movements throughout shelf waters of the Bay of Fundy and the northeastern United States (CeTAP 1982; Payne et al. 1990). Porpoise are found in southern New England waters in the winter, and in Massachusetts and Cape Cod Bays in the spring beginning in March, and again in the fall. They appear to summer in the northern Gulf of Maine from Nova Scotia, through the lower Bay of Fundy, and extending west to the Penobscot Bay in Maine. The winter distribution of the Gulf of Maine population of harbor porpoise is poorly known. There are records of winter strandings from New England to Cape Hatteras, and rarely to Florida (Polacheck and Wenzel 1990). Recent surveys demonstrate the scattered presence of harbor porpoise in the Georges Bank area in the winter. Stranding data from February to May 1993 (Haley and Read 1993) indicate harbor porpoise extend over the continental shelf region from North Carolina to New Jersey during that time.

Studies of harbor porpoise in the Bay of Fundy indicate some site fidelity within a season and between years (Gaskin and Watson, 1985), suggesting home-ranges for harbor porpoise. Similar studies are being conducted in Maine and may involve Massachusetts waters. Harbor porpoise reach sexual maturity at age four and females reproduce annually, resulting in concurrent weaning and gestation. Although they can live to be over 10 years of age, studies conducted in the Bay of Fundy indicate few animals live beyond seven years (Read and Gaskin, 1988).

Numerous factors may contribute to the health and status of the Gulf of Maine harbor porpoise population. Harbor porpoise in the Gulf of Maine are known to carry high levels of heavy metals and organochlorines in their tissues (Gaskin et al. 1982). Of particular concern are the polychlorinated biphenyls (PCBs) and other lipophilic organochlorines found in harbor porpoise (Gaskin et al. 1982, 1983). These organochlorine residues are known to be mobilized and transferred from adult females to their calves during lactation (Gaskin et al. 1982). However, at the present time, the presence of these contaminants in harbor porpoise tissues is not manifested in any pathological observations. Further analyses are planned to better describe the fate and pathological effects of contaminants on harbor porpoise.

Atlantic herring appears to be the most important prey species for this population (Smith and Gaskin, 1974; Recchia and Read, 1989). Between 1967 and 1976, there was a 75 percent reduction in herring biomass on Georges Bank (Sissenwine et al. 1984), and in 1977, the commercial fishery for herring failed completely. There was virtually no evidence of a Georges Bank herring population between 1977-1983, despite considerable sampling by research vessels during that period.

Kenney et al. (1991) suggested that, in response to the complete collapse of a Georges Bank herring stock during the 1980's, harbor porpoise may have shifted their distribution nearshore, away from Georges Bank. Given the species' apparent preference for herring, it is reasonable to expect local increases in harbor porpoise abundance in areas of the Gulf of Maine where herring remain concentrated. Sinclair and Iles (1985) describe the seasonal distributional patterns of herring throughout the Gulf of Maine and specifically along the coastal regions of Nova Scotia, Maine and Massachusetts. It is clear that any shift in inshore shift of harbor porpoise to feed on herring would increase opportunities for fishery-harbor porpoise interactions in coastal fisheries. Recent observed increases in the offshore herring stock (NOAA, 1991(b)) may result in another change in harbor porpoise distribution.

Vessel traffic has also been documented to have a negative impact on harbor porpoise behavior. Flaherty and Stark (1982) suggested that harbor porpoise abandoned areas of the Washington State

coastline because of vessel traffic. Polacheck and Thorpe (1991) demonstrated ship avoidance by harbor porpoise from a research vessel in the Gulf of Maine. If ship avoidance were a widespread phenomenon, harbor porpoise might be expected to abandon areas of heavy vessel activity.

**Known Mortality Factors**

Harbor porpoise have been reported entangled and killed in the multispecies sink gillnet fishery since the early 1980's (Gilbert and Wynne 1988). Smith et al. (1993) provided the latest estimates of the best available population size and bycatch up to 1992. The estimated bycatch level exceeded 5.1 percent of the population in 1990, decreased to 3.6 percent in 1991, and then to 1.2 percent in 1992. Bycatch in the Gulf of Maine sink gillnet fishery was estimated at 2000 for 1995 (NMFS unpublished data). Bycatch also occurs in Canadian gillnet fisheries in the Bay of Fundy, although the level has decreased significantly in the past two years due to groundfish protection closures.

Haley and Read (1993) report findings of the Northeast Marine Mammal Stranding Network, which has documented strandings of harbor porpoise in the Mid-Atlantic. Many of these porpoise carcasses exhibited signs of gillnet entanglement or other human interaction. The entanglement could not be traced to specific fisheries.

**Assessment of Impacts**

No entanglements of harbor porpoise in lobster trap/pot gear have been reported. It is unlikely that entanglements in the traps or rigging lines would occur. However, an unknown proportion of this fishery uses small gillnets to catch bait for the traps. Because the small pelagic species used for bait are also primary prey species for harbor porpoise, there is a significant potential for interaction. The lobster bait gillnet fishery is poorly known and is not tracked directly by NMFS. Some information may be available from the fishing vessel logs of multispecies, scallop, or summer flounder permit holders who also fish for lobsters and from dealer logbooks. Some states require fishers to be licensed for commercial use of any gillnet. In many areas, fishers who set gillnets only for their own bait may not be tracked by any system. Walden (1996), presenting results from a 1990-1991 survey, states that 182 vessels reported that they fish with gillnet gear for bait or for personal use. The majority of these vessels operated from Maine ports. The author also gives several reasons why this figure may be an underestimate. It is likely that the periods during which bait gillnet effort is high overlap the periods of peak porpoise abundance, particularly in Maine.

Bycatch of porpoise in sink gillnets has been well documented.

Harbor porpoise have been reported entangled and killed in the multispecies sink gillnet fishery since the early 1980's (Gilbert and Wynne 1988). Initial data from the observer program and assessment surveys conducted in 1991 were available at a workshop held in May 1992 (Palka and Potter 1991). The data indicated that the harbor porpoise bycatch in the sink gillnet fishery in 1991 equaled approximately 4.5 percent of the best population estimate. Using reproductive rates from porpoise studies conducted in the Bay of Fundy (Woodley and Read, 1991), NMFS determined that the harbor porpoise population could not sustain long term annual losses from incidental take in excess of two percent of the population size. Therefore, NMFS proposed to list the species as threatened under the ESA on January 7, 1993 (58 FR 3108; Jan. 7, 1993).

Following a reanalysis of the 1991 observer and assessment data, and analysis of 1992 data, Smith et al. (1993) provided new estimates of the best available population size and bycatch up to 1992. Whereas the bycatch level among U.S. fishermen may have exceeded 5.1 percent of the population in 1990, it decreased to 3.6 percent in 1991, and then to 1.2 percent in 1992. It is unclear why the observed levels of mortality have declined when no significant change in fishing operations has occurred during that period.

The spatial and temporal distribution of harbor porpoise in the Gulf of Maine was different in 1992 than that observed in 1991 (Smith et al. 1993). It is possible that differences in harbor porpoise migrations during 1992 reduced their susceptibility to capture in the sink gillnet fishery. The implementation of the Interim Exemption, and it's focus on the porpoise bycatch issue may have changed the fishing strategy of gillnetters. Smith et al. (1993) discuss the sensitivity of the mortality estimates to small changes in observed bycatch rates on sampled trips (10 percent of all effort), and attribute the reduction in mortality between 1991 and 1992 to the lower bycatch rate in the southern Gulf of Maine from January to May, 1992 (1991 - 0.28 per trip compared to 1992 - 0.06 per trip). The reduced bycatch level in the U.S. sink gillnet fishery since 1989 is likely real. However, further variability in bycatch levels may occur in any year due to natural fluctuations in harbor porpoise movements.

The New England Fishery Management Council (NEFMC) has developed several frameworks to the Multispecies FMP to reduce the threat to harbor porpoise from Multispecies gear. In addition, NMFS established the Harbor Porpoise Take Reduction Team pursuant to the MMPA. This team has developed a plan which recommends measures to reduce the bycatch of harbor porpoise in the Gulf of Maine sink gillnet fishery. The plan will be implemented in early 1997. A take reduction team is being formed to deal with entanglement of porpoise in the Mid-Atlantic; that team will begin meeting in early 1997.

Several groundfish conservation measures implemented under Amendment 7 to the Multispecies FMP and subsequent framework adjustments may also reduce harbor porpoise bycatch in the sink gillnet fishery. One of these framework actions (Framework 16) also limits the use of bait gillnets in harbor porpoise closure areas. Framework 16 is expected to significantly reduce the potential for interaction with bait gillnets in the porpoise closure areas (See map in Appendix D to Biological Opinion) but does not limit the use of bait gillnets in any other times or areas.

**ATLANTIC SALMON**

**Proposed Listing of Distinct Population Segment**

On September 29, 1995, the National Marine Fisheries Service and the U.S. Fish and Wildlife Service (the Services) published a proposed rule to list a distinct population segment (DPS) of Atlantic salmon in seven downeast Maine rivers as threatened pursuant to the Endangered Species Act (ESA). The seven rivers included in this DPS are the Dennys, Machias, East Machias, Pleasant, Narraguagus, Ducktrap, and Sheepscot Rivers. Federal agencies are required, during the proposed rule stage, to confer with the Services on actions likely to jeopardize the continued existence of a proposed species (50 CFR §402.10).

**Abundance, Distribution, and Life History**

A brief summary of the life history of Atlantic salmon is provided below. For more information see the Status Review for Anadromous Atlantic Salmon in the United States, published in draft form in January 1995 by NMFS and the U.S. Fish and Wildlife Service.

Anadromous Atlantic salmon have a relatively complex life history that extends from spawning and juvenile rearing in freshwater rivers to extensive feeding migration in the high seas. As a result, Atlantic salmon have several distinct phases in their life history that are identified by specific behavioral and physiological changes. Adult Atlantic salmon ascend the rivers of New England beginning in spring, a migration that peaks in June and continues into fall. Spawning occurs in late October through November. Good spawning habitat has a gravel substrate and adequate water circulation to keep the eggs well oxygenated. Female anadromous Atlantic salmon produce between 1,500 and 1,800 eggs per kilogram (2.2 pounds) of body weight; on average each female Maine Atlantic salmon produces 7,200 eggs. Eggs hatch in late March or April and the resulting alevins remain in the redd for about six weeks and are nourished by their yolk sac. When the alevins emerge from the gravel about mid-May and begin feeding, they are referred to as fry. Fry become parr as vertical bars become visible on the sides of their bodies. In

spring, when the parr are two or three years of age and 12.5 centimeters (cm) to 15 cm (5 to 6 inches) long, they undergo smoltification, a process where morphological and physiological changes prepare the smolt for the transition from fresh to salt water. Most smolts in New England rivers migrate to sea in May and begin their ocean feeding migration.

The marine life history of Atlantic salmon of U.S. origin is not as well understood as the freshwater phase. Scientists have discovered correlations between natural mortality in the marine environment and abiotic factors, particularly sea surface temperature. Atlantic salmon of U.S. origin are highly migratory, undertaking long marine migrations from the mouths of U.S. rivers to the northwest Atlantic Ocean where they are distributed seasonally over much of the region. Upon entry into the nearshore waters of Canada, the U.S. post-smolts become part of a mixture of stocks of Atlantic salmon from various North American streams. Data from commercial harvest indicate that post-smolts overwinter in the southern Labrador Sea and in the Bay of Fundy. Direct sampling during the winter months is needed to better understand post-smolt Atlantic salmon distribution in the North Atlantic. Most Atlantic salmon of U.S. origin spend two winters in the ocean before returning to fresh water for spawning. Those that return after only one year at sea are called grilse.

The Atlantic salmon populations in the Sheepscot, Ducktrap, Narraguagus, Pleasant, Machias, East Machias, and Dennys Rivers are reproductively isolated and evolutionarily significant and therefore qualify as a distinct population segment for consideration under the ESA. Management will continue on a watershed basis. Since the persistence of Atlantic salmon in the Kennebec River, Penobscot River, Tunk Stream, and St. Croix River and their link to native populations warrant further study, these populations were designated as a species of concern by USFWS and as a candidate species by NMFS (60 FR 50530, September 29, 1995).

Throughout the past 24 years, the Dennys and Narraguagus rivers have had the best returns relative to available habitat, averaging 20 percent of escapement goal. The Pleasant, Sheepscot, and Machias rivers have had returns that averaged between 10 and 12 percent of escapement goal. However, recent downward trends in abundance have put most rivers at less than 10 percent of their respective escapement goals. Only the Narraguagus River has exceeded 10 percent in the past seven years.

**Known Impacts**

In addition to habitat destruction, Atlantic salmon have historically been intercepted by commercial fishermen in Canada and Greenland. In U.S. waters, salmon are occasionally taken in

groundfish gear but cannot be landed commercially. A recreational fishery still exists in certain areas of the North Atlantic, although restrictions such as seasonal and/or size limits and catch-and-release only landings exist in some areas.

**Assessment of Impacts**

No information is available which suggests that Atlantic salmon have been taken in lobster gear, nor does NMFS believe there is significant potential for catch in lobster traps or otter trawls targeting lobster. Since much of the bait gillnet fishery occurs during summer in Maine in inshore waters, there is potential for that fishery to take Atlantic salmon.

**Conclusions**

The NMFS concludes that the current fishing practices allowed under the Lobster FMP, including proposed measures, may affect but are not likely to jeopardize the continued existence of the harbor porpoise and the DPS of Atlantic salmon stocks found in certain Maine rivers that are both currently proposed to be listed as threatened. The following factors form the basis for these determinations:

1. There is significant potential that harbor porpoise and Atlantic salmon may be taken in lobster bait gillnets, particularly in Maine.

2. The use of these bait gillnets is substantially restricted in the harbor porpoise area closures implemented under the Multispecies FMP. One of these closures is in the Downeast Maine area from August 15 - September 13 of each year.

3. The above restriction applies only to federal waters or federal permit holders fishing in state waters.

4. It is prohibited to land Atlantic salmon in any commercial fishery. Recreational fisheries are similarly limited to catch-and-release in certain rivers and prohibited elsewhere within State of Maine waters. Observer data and logbook bycatch reports contain no records of salmon taken in commercial fisheries.

**Conference Advisory Recommendations**

NMFS makes the following advisory recommendations to minimize or avoid adverse effects on the harbor porpoise population and Atlantic salmon DPS:

- NMFS should work with the states to revise permitting and data collection procedures to insure that bait gillnet use is tracked to the fullest extent possible.

- if a significant overlap is identified between the lobster bait gillnet fishery and porpoise or salmon high-use areas, conservation measures should be implemented.

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