Endangered Species Act - Section 7 Consultation

Biological Opinion

Agency: National Marine Fisheries Service

Activity: Consultation on the Atlantic Bluefish Fishery

Consultation Conducted By: National Marine Fisheries Service, Northeast Region

Date issued: July 2, 1999

This document represents the National Marine Fisheries Service (NMFS) Biological Opinion (Opinion) based on our review of the Atlantic bluefish *(Pomatomus saltatrix)* fishery, the Atlantic Bluefish Fishery Management Plan (FMP), including the proposed Amendment 1[1] for the Atlantic bluefish fishery and its potential for effects on threatened and endangered marine mammals and sea turtles under NMFS jurisdiction, in accordance with section 7 of the Endangered Species Act of 1973, as amended (16U.S.C. 1531 *et seq.*)(ESA).

This Opinion is based on information provided in the Atlantic Bluefish FMP and Amendment 1 (as referenced above) , including the Final Environmental Impact Statement (FEIS) and other information on the fishery contained in NMFS sea sampling database. Formal consultation of this action was initiated on May 10, 1999. A complete administrative record is on file at the Northeast Regional Office, NMFS, Gloucester, Massachusetts.

The Atlantic Bluefish FMP was originally approved in 1990 and since it contains a major inshore element was managed jointly between the Mid-Atlantic Fishery Management Council (MAFMC) and the Atlantic States Marine Fisheries Commission (ASMFC). Amendment 1 was prepared under the Magnuson-Stevens Fishery Conservation and Management Act (M-S Act) as amended under the Sustainable Fisheries Act (SFA) and the Atlantic Coastal Fisheries Cooperative Management Act (ACFCMA).

In the Atlantic, the bluefish fishery has historically been primarily a marine recreational fishery. As overseas markets developed for bluefish in the eighties, fishery managers were asked to develop an FMP to protect the important recreational fishery from over harvest by commercial ventures. During those years, 80% of the bluefish catch was reserved for recreational fishermen with the remaining 20% further subdivided among commercial fisheries in the north, mid, and south Atlantic regions (10%, 50%, and 40% respectively). The current FMP includes a license requirement to sell bluefish, possession limits for anglers, including charter boat limitations, and permits for commercial fishermen who can take more than the possession limit. In the current FMP, the commercial fishery is still limited to approximately 20% of the total catch.

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[1]Both plan and amendment received final Mid-Atlantic Fishery Management Council (MAFMC) approval October 7, 1998

Commercial controls limit highly efficient gear that can be identified as responsible for any increases in commercial landings and these limitations on specific gear types in the EEZ include trip limits, area closures, and other measures as appropriate, including gear prohibitions. Development of Amendment 1 began in response to the limited number of management options to control fishing mortality in the existing FMP and also to bring the plan into compliance with the SFA.

A. Consultation History

- December 4, 1989. Informal consultation was concluded on the development of the original bluefish FMP which determined that the fishery would have no effect on endangered or threatened species under NMFS jurisdiction.
- March 8, 1996. Informal consultation was concluded on the proposed rule for withdrawal of Secretarial approval of the FMP for the Atlantic Bluefish FMP and removal of implementing regulations which determined that no new information was available to change the previous conclusion on the fishery and that the withdrawal of the plan itself was not likely to adversely affect any listed species under NMFS jurisdiction.

Since new information on listed species and developments under the Marine Mammal Protection Act of 1972, as amended (MMPA), Sustainable Fisheries Act (SFA) and other ESA related recovery actions have become available since 1996, in addition to new actions under M-S Act (Amendment 1) relative to this fishery, consultation is now being reinitiated. Specifically, this information includes data from the sea sampling program documenting takes of sea turtles during trips where the catch composition show greater than 50% bluefish and development of take reduction plans under the MMPA that address all gillnets regardless of target species, requiring a change in the effect determination and leading to initiation of formal consultation.

B. Description of Proposed Action

Action Area: The management unit for the Bluefish FMP covers United States waters in the western Atlantic Ocean from Maine through Key West, Florida and consequently represents the action area for this consultation.

For a detailed description of this fishery and the management actions refer to *Amendment 1 to the Bluefish Fishery Management Plan, including the Environmental Impact Statement and Regulatory Impact Review* (MAFMC 1998). This document was used in preparation of the following summary:

Pertinent bluefish life history elements: Bluefish are a migratory species found in continental shelf waters in temperate and semi-tropical oceans and range from Nova Scotia to Florida in the northwestern Atlantic. Conflicting hypotheses suggest that spawning either occurs as a protracted season beginning in late winter in slope waters off the southeastern U.S., progressing northward with time, or in two principal areas (South Atlantic Bight and Mid-Atlantic Bight). In general, adult bluefish travel north in spring and summer and south in fall and winter, with the southern migration closer to shore. Some inshore-offshore movement occurs in both migrations.

Temperature and photoperiod are the principle environmental factors directing movements. During summer, stocks are centered between Cape Cod and Chesapeake Bay and in northern North Carolina. Generally, abundance and occurrence varies annually but bluefish are abundant in New England from June through October (peak August-September). In the Mid-Atlantic States abundance peaks between July and October. In the South Atlantic bluefish occur year round, but peak landings are in January. Bluefish, like piscivorous marine mammals, are carnivorous and feed on a variety of pelagic and demersal fish and invertebrates.

Description of the Commercial Fishery. As noted, the management unit for the Bluefish FMP covers United States waters in the western Atlantic Ocean from Maine through Key West, Florida. Based on data from 1987-1996, bluefish are commercially harvested in state and Exclusive Economic Zone (EEZ) waters by many commercial gears with the most bluefish landed by gillnets (48%), otter trawls (19%), fish pound nets (7%), hand and troll lines (6%), and haul seines (3%). The state fisheries vary and add considerable effort with beach haul seines and commercial hand lines. Gillnets including run-around gillnets caught significant amounts of bluefish in most states except Connecticut , South Carolina, Georgia and Florida.

Geographically, most bluefish caught commercially were in state waters except in the New England sub-region where EEZ landings predominate (see attachment 1). For the most part Mid-Atlantic landings predominate over the other two regions with respect to total commercial landings. Average monthly landings from 1987-1996 showed the largest peak in October.

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Since US commercial fisheries are expected to harvest the entire Optimum Yield (OY) established for this fishery, no foreign components of this fishery will be authorized. In addition to specifying the OY for the U.S. fishery, the FMP establishes a rebuilding schedule not to exceed 10 years, a requirement for commercial and party/charter vessel permits, dealer permits, and operator permits. A framework adjustment process is also included and the following measures can be frame-worked:

- minimum fish size
- maximum fish size
- gear restrictions
- gear requirements
- permitting restrictions
- recreational possession limits
- recreational season
- closed areas
- commercial season
- description and identification of Essential Fish Habitat and other habitat areas of concern
- any other management measures currently included in the FMP.

For the commercial fishery the plan establishes a commercial quota and 17% (14,262 K pounds) of the Total Allowable Landings are allocated to the commercial fishery based on the average 1981-1989 landings (85,875 K pounds). The fishing mortality target is 0.36 and the current fishing mortality rate is 0.51. The fishing mortality rate producing MSY (target) is 78% of the current fishing mortality.

Description of the Recreational Fishery. The recreational fishery is also largest in the Mid-Atlantic of the three regions (55.7% as compared to 33.1% and 11.2% in the north and south, respectively). It has historically been and currently is one of the most sought after recreational marine fishes in both state and federal waters.

Description of Take Reduction Plans which are part of the scope of this action (the bluefish fishery and associated regulations). Given that gillnets are the primary type of commercial gear that lands bluefish (48% of commercial landings), two take reduction plans (TRP) with regulations promulgated under the Marine Mammal Protection Act of 1972, as amended (MMPA), would affect operation of the commercial bluefish fishery in both state and federal waters. These are the Atlantic Large Whale Take Reduction Plan (ALWTRP)(February 16, 1999) and the Harbor Porpoise Take Reduction Plan (HPTRP) (December 2, 1998).

The ALWTRP. The fisheries affected by the ALWTRP include: Anchored gillnet fisheries including the New England sink gillnet fishery, the Gulf of Maine/U.S. Mid-Atlantic lobster trap/pot fishery, the U.S. mid-Atlantic coastal gillnet fisheries, and the Southeastern U.S. Atlantic shark gillnet fishery. The New England Multispecies sink gillnet fishery has an historical incidental bycatch of humpback, minke, and possibly fin whales. This gear type has been documented to entangle right whales in Canadian waters. Additionally, entanglements of right whales in unspecified gillnets have been recorded for U.S. waters, although U.S. sink gillnets have not been conclusively identified as having entangled right whales. The Gulf of Maine/U.S. mid-Atlantic lobster trap/pot fishery has an historical bycatch of right, humpback, fin and minke whales. The mid-Atlantic coastal gillnet fisheries have an historical incidental bycatch of humpback whales. The Southeastern U.S. Atlantic shark gillnet fishery may have been responsible for bycatch of at least one right whale (NMFS 1997i). Since all anchored gillnets are included in the ALWTRP and bluefish gillnets are included in the Mid-Atlantic coastal gillnet fishery, the bluefish fishery would also be subjected to the requirements of these plans.

As stated above and as required by the MMPA, the plan has two goals. The short-term goal was to reduce serious injuries and mortalities of right whales in U.S. commercial fisheries to below 0.4 animals per year within six months of plan implementation. The long-term goal is to reduce 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 within five years of plan implementation, taking into account the economics of the fisheries, the availability of existing technology, and existing State and regional fishery management plans.

To reach the short-term goal, the ALWTRP implemented the following measures to achieve the necessary take reductions within 6 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. gillnet fishery to minimize the risk of entanglement and requiring observers on shark gillnet vessels operating adjacent the southeast U.S. critical habitat; 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 additional

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 to assist in disentangling right whales; and 7) prohibiting storage of inactive gear in the ocean.

The steps in the implementation of the ALWTRP designed to achieve the long-term goal include: 1) A commitment to improve public involvement in take reduction efforts, including 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 research and development of fishing gear that will reduce the risk of entanglement; 4) continuing to improve the disentanglement effort, including encouraging more cooperation from fishermen; 5) implementing a gear marking program, 6) developing contingency plans in cooperation with states for when right whales are present at unexpected times and places; 7) working with Canada to decrease entanglements in its waters; 8) improving monitoring of the right whale population distribution and biology; 9) conducting aerial surveys to monitor whale distribution, fishing effort and shipping traffic, 10) maintaining a network to alert maritime users about right whale distribution; and 11) establishing the framework of 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 will continue to use the ALWTRT, an advisory group that includes fishermen, scientists, and representatives of environmental groups and state governments, to review progress on reaching the goals of the ALWTRP and to make recommendations on how to continue to decrease serious injuries and mortalities due to entanglements. NMFS also intends to continue to seek technical advice on matters pertaining to gear development through its Gear Advisory Group (GAG), which is composed of persons with direct knowledge of fishing gear or disentangling large whales. NMFS convened the GAG in October 1998, and the TRT met in February 1999 to review this plan and its associated final rule. NMFS modified the plan in a final rule (February 16, 1999) based on TRT recommendations as follows:

(1) Definition of lobster trap was changed to be : "any trap, structure or other enclosure that is placed on the ocean bottom and is designed or is capable of catching lobsters. This change was to prevent the confusion found in the interim rule definition where it was not clear that applied only to traps and not gillnets or bottom trawls that could catch lobster. This new definition does, however, explicitly include traps for other species such as black sea bass and scup.

(2) Definition of gillnet was broadened so that minor alterations in design, verticality, tie-downs etc did not exclude nest intended to be included from plan requirements.

(3) Exempted waters in the Gulf of Maine were eliminated which will ensure consistency in gear, particularly in Maine waters.

(4) Exempted waters were added in Rhode Island to eliminate certain coastal ponds and rivers where right whales have never been seen.

(5) Gear marking requirements were restricted to apply only to critical habitats, Stellwagen Bank and Jeffrey's Ledge and were stayed until the GAG and ALWTRT can define an appropriate scheme.

(6) Lobster gear requirements in Cape Cod Bay were made consistent with the regulations set by the Commonwealth of Massachusetts.

(7) The interim final rule allowed gillnetters to place extra weights onto the leadline to increase holding power of their nets. The concept was to anchor the nets to make it easier for a whale to break free. However, this only works in conjunction with weak links elsewhere, not as an alternative to weak links, which is what was allowed under the IFR. Therefore, the anchoring option was eliminated in the final rule.

To date, entanglements of right whales have occurred since plan implementation. Some of these entanglements resulted in successful disentanglements, some did not. At this time we have no evidence as to whether the whales that were not disentangled suffered serious injury. The ALWTRP has been successful in that entangled whales are being sighted more often and disentanglement teams have been responding more efficiently and effectively as a result of outreach and education efforts and expansion of disentanglement capabilities. Given the relative rarity of events, there are not yet enough data to say how much the rate of entanglement has been reduced. The Team did not recommend any major changes at the last meeting and it is still expected that the whale plan will meet its goals. The gillnet portion of the bluefish fishery takes place in the areas and times that are affected by the ALWTRP and consequently the regulatory components are an integral part of scope of activities that constitute the bluefish fishery and the scope of action considered in this consultation that are expected to reduce the potential for impact from the fishery.

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The HPTRP. The HPTRP requires one set of management measures in New England and one set of measures in the Mid-Atlantic. In New England the plan consists of a series of time/area closures where no fishing with gillnets is allowed, and also a series of much larger closures in both time and area where fishing with gillnets is allowed as long as acoustic deterrent devices, "pingers", are on the nets.

Gulf of Maine time/area closures to gillnet fishing and periods during which pinger use are required under the Final Rule/HPTRP

Northeast Area:	
August 15 - September 13	Closed
Mid-Coast Area:	
September 15 - May 31	Closed, gillnet with pingers allowed
Massachusetts Bay Area:	
December 1 - February 28/29	Closed, gillnet with pingers allowed
March 1 - 31	Closed
April 1 - May 31	Closed, gillnet with pingers allowed
Cape Cod South Area:	
December 1 - February 28/29	Closed, gillnet with pingers allowed
March 1 - 31	Closed
April 1 - May 31	Closed, gillnet with pingers allowed
Offshore Area:	
November 1 - May 31	Closed, gillnet with pingers allowed

Cashes Ledge Area:	
February 1 - 28/29	Closed

In the Mid-Atlantic, the plan consists of three time/area 20-30 day closures in addition to gear modification requirements from January through May. These modifications consist of a minimum twine size requirement, limits on the length of net panels, limits on the total length of float line, and tie-down restrictions. Commercial gillnets in the bluefish fishery would have to comply with these regulations.

Management measures for the large mesh gillnet (includes gillnet with mesh size greater than 7 inches (17.78cm) to 18 inches (45.72cm)) fishery in the Mid-Atlantic under the final rule/HPTRP.

Floatline Length:	
New Jersey Mudhole	Less than or equal to 3,900 ft (1188.7 m)
New Jersey Waters (excluding the Mudhole)	Less than or equal to 4,800 ft (1463.0 m)
Southern Mid-Atlantic	Less than or equal to 3,900 feet(1188.7 m)
Twine Size:	
All Mid-Atlantic Waters	Greater than or equal to .90 mm (.035 inches)
Tie Downs:	
All Mid-Atlantic Waters	Required
Net Cap:	
All Mid-Atlantic Waters	80 nets
Net Size:	A net must be no longer than 300 feet (91.4m) long
Net Tagging:	Requires all nets to be tagged by January 01, 2000
Time/Area Closures:	
New Jersey waters out to 72°30' W. longitude (including the Mudhole)	Closed from April 1 -April 20
New Jersey Mudhole	Closed from February 15 - March 15
Southern Mid-Atlantic waters (MD, DE, VA, NC) out to 72°30' W. longitude	Closed from February 15 - March 15

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Management measures for the small mesh gillnet fishery (includes gillnet with mesh size of greater than 5 inches (12.7 cm) to less than 7 inches (17.78cm)) in the Mid-Atlantic under the final rule/HPTRP.

Floatline Length:	
New Jersey waters	less than or equal to 3,000 feet (914.4 m)
Southern Mid-Atlantic waters	less than or equal to 2,118 feet (645.6 m)
Twine Size:	greater than or equal to .81 mm (.031 inches) in all Mid-Atlantic waters
Net Cap:	45 nets in all Mid-Atlantic waters
Net Size:	A net must be no longer than 300 feet (91.4m) long.
Net Tagging:	Requires all nets to be tagged by January 01, 2000
Time/Area Closures:	
New Jersey Mudhole	Closed from February 15 - March 15

The closures and gear modifications under the HPTRP would apply to anchored gillnets for bluefish.

C. Status of Listed Species and Critical Habitat

The following listed species under the jurisdiction of the NMFS are known to occur in the action area (Atlantic Ocean, Maine through Key West, Florida) and may be affected by fishing activity for bluefish:

Loggerhead sea turtle	*Caretta caretta*	Threatened
Kemp's ridley sea turtle	*Lepidochelys kempi*	Endangered
Leatherback sea turtle	*Dermochelys coriacea*	Endangered
Green sea turtle[2]	*Chelonia mydas*	Endangered
Shortnose sturgeon	*Acipenser brevirostrum*	Endangered
North Atlantic right whale	*Eubalaena glacialis*	Endangered
Humpback whale	*Megaptera novaeangliae*	Endangered
Fin whale	*Balaenoptera physalus*	Endangered
Johnson's seagrass	*Halophila johnsonii*	Threatened

While sperm whales (*Physeter macrocephalus),* blue whales (*Baleanoptera musculus*) and sei whales *(Balaenoptera borealis*) are endangered, occur in the action area, and could become entangled in fishing gear, given the primarily coastal nature of this fishery and the more pelagic distribution of these species, NMFS has determined that fishing gear targeting bluefish is not likely to adversely affect sperm whales, blue whales and sei whales. In addition, due to the primary location and habitats for hawksbill sea turtles and Johnson's seagrass in the southeastern US, NMFS has also determined that fishing gear targeting bluefish is not likely to adversely affect hawksbill sea turtles or Johnson sea grass that may be present in the action area. Therefore, these species will not be discussed further in this Biological Opinion.

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<u>Critical Habitat Designations</u>

North Atlantic right whale	Cape Cod Bay and Great South Channel off Massachusetts and the FL/GA breeding/calving grounds

Background information on the range-wide status of these species and a description of critical habitat can be found in a number of published documents. General information on the potential for entanglement in the gear types used in the bluefish fisheries is likely to be similar to that summarized in previous consultations on the Multispecies FMP, including the June 12, 1986, November 30, 1993, February 18, 1996, and December 13, 1996 (NMFS 1996a, 1996c) Biological Opinions and the December 21, 1998 Monkfish Opinion. Additional sources include recent sea turtle status documents (NMFS and USFWS 1995, USFWS 1997), Recovery Plans for the humpback whale (NMFS 1991a), right whale (NMFS 1991b), loggerhead sea turtle (NMFS & USFWS 1991) and leatherback sea turtle (NMFS & USFWS 1992), the status reports on Kemp's ridley and loggerhead sea turtles provided by the Marine Turtle Expert Working Group

[2]Green turtles in US waters are listed as threatened except for the Florida breeding population which is listed as endangered. Due to inability to distinguish between the populations away from the nesting beach, green turtles are considered endangered wherever they occur in U.S. waters.

(TEWG 1998) and the 1998 marine mammal stock assessment report (Waring *et al.* 1999). Summary information on the biology of these species is provided below. Information in the human impacts sections on "takes" refers to entanglements in gillnet or trawl mesh or capture in trawl gear.

a. Loggerhead Sea Turtle

Distribution: The threatened loggerhead is the most abundant species of sea turtle in U.S. waters, commonly occurring throughout the inner continental shelf from Florida through Cape Cod, Massachusetts. The loggerhead's winter and early spring range is south of 37°00' N in estuarine rivers, coastal bays, and shelf waters of the southeastern United States. Loggerheads move northward and enter northeast coastal embayments as water temperatures approach 20°C (Burke *et al.* 1989; Musick *et al.* 1984) to feed on benthic invertebrates, leaving the northern embayments in the fall when water temperatures drop.

The activity of the loggerhead is limited by temperature. Keinath *et al.* (1987) observed sea turtle emigration from the Chesapeake Bay when water temperatures cooled to below 18°C, generally in November. Work in North Carolina showed a significant movement of sea turtles into more northern waters at 11°C (Chester *et al.* 1994) and Morreale (NMFS and USFWS 1995) has seen sea turtles persist in New York waters for extended periods at temperatures as low as 8°C. Surveys conducted offshore and sea turtle strandings during November and December off North Carolina suggest that sea turtles emigrating from northern waters in fall and winter months may concentrate in nearshore and southerly areas influenced by warmer Gulf stream waters (Epperly *et al.* 1995). This is supported by the collected work of Morreale and Standora (see Morreale and Standora, 1998) who tracked 12 loggerheads and 3 kemp's ridleys by satellite. All of the turtles tracked similar spatial and temporal corridors, migrating south from Long Island Sound, NY, in a time period of October through December. The turtles traveled within a narrow band along the continental shelf and became sedentary for one to two months south of Cape Hatteras. Some of the turtles lingered between Cape Lookout Shoals and Frying Pan Shoals offshore of Wilmington, North Carolina prior to moving south or into the Gulf Stream.

Aerial surveys of loggerhead turtles at sea north of Cape Hatteras indicate that they are most common in waters from 22 to 49m deep, although they range from the beach to waters beyond the continental shelf (Shoop and Kenney 1992). There is no information regarding the activity of these offshore turtles.

Population status: During 1996, a Turtle Expert Working Group (TEWG) met on several occasions and produced a report assessing the status of the loggerhead sea turtle population in the Western North Atlantic (WNA). Of significance is the conclusion that in the WNA, there are at least 4 loggerhead subpopulations separated at the nesting beach (TEWG 1998). This finding was based on analysis of mitochondrial DNA, which the turtle inherits from its mother. It is theorized that nesting assemblages represent distinct genetic entities, but further research is necessary to address the stock definition question. These nesting subpopulations include the following areas: northern North Carolina to northeast Florida, south Florida, the Florida Panhandle, and the Yucatan Peninsula. Genetic evidence has shown that loggerheads from

Chesapeake Bay southward to Georgia are nearly equally divided in origin between South Florida and northern subpopulations. Work is currently ongoing in the Northwestern North Atlantic to collect samples which will provide information relative to turtles north of the Chesapeake, which is most of the action area for this consultation.

The loggerhead turtle was listed as "threatened" under the ESA on July 28, 1978, but is considered endangered by the World Conservation Union (IUCN) and under the Convention on International Trade in Endangered Species of Flora and Fauna (CITES). The significance of the results of the TEWG analysis is that the northern sub-population may be experiencing a significant decline (2.5% - 3.2% for various beaches). A recovery goal of 12,800 nests has been assumed for the Northern sub-population, but current nests number around 6,200 (TEWG 1998). Since the number of nests have declined in the 1980's, the TEWG concluded that it is unlikely that this sub-population will reach this goal. Considering this apparent decline as well as the lack of information on the sub-population from which loggerheads in the WNA are derived, progress must continue to reduce the adversely affect of fishing and other human-induced mortality on this population.

The most recent 5-year ESA sea turtle status review (NMFS & USFWS 1995) reiterates the difficulty of obtaining detailed information on sea turtle population sizes and trends. Most long-term data is from the nesting beaches, and this is often complicated by the fact that they occupy extensive areas outside U.S. waters. This status review supports the conclusion of the TEWG that the northern sub-population may be experiencing a decline and that inadequate information is available to assess whether its status has changed since the initial listing as threatened in 1978. The current recommendation from the 5-year review is to retain the threatened designation but note that further study is needed before the next status review is conducted.

Recent mortality and human impacts: Human-caused mortality and serious injury to loggerheads in the action area of this consultation are varied and many are difficult to quantify. The largest impacts are from nest disturbances and predations, fishing interactions (particularly the shrimp fishery and other trawl and gillnet fisheries, and the longline fishery for tuna, swordfish, and sharks (for 1995 this was an estimate in excess of 1500 turtles, many of which ingested the hook). The level of mortality in the longline fishery was estimated at 30% in the biological opinion on the fishery, based on a limited study, but true mortality estimates are not available at this time. Trawlers in the southeastern U.S. are required to use turtle excluder devices (TEDs) in the shrimp fishery which have been reported as having reduced lethal takes by 54% and declines have also been observed in the summer flounder fishery that is equipped with TEDs (TEWG, 1998). NMFS (1998d) estimated that 4100 turtles may be captured annually by shrimp trawling (650 leatherbacks that cannot be released through TEDs, 1700 turtles taken in try nets, and 1750 turtles that fail to escape through the TED). Henwood and Stuntz (1987) reported that the mortality rate for trawl caught turtles range between 21% and 38 %, but others (Magnuson et al 1990) suggested that those rates were conservative and likely underestimate the true mortality rate.

Work is ongoing to continue to evaluate this question in addition to a review of all fisheries in the western Atlantic for which observer data is available. Bycatch estimates for loggerheads will

be made for all fisheries with sufficient sample sizes to produce reasonable CVs on the estimates. This will be compiled in an assessment report which is expected by the end of 1999. At that time, estimates will be used to re-evaluate the fisheries to which they pertain through reinitiation of appropriate consultations.

Until that work is completed the only information on magnitude of take available for fisheries, other than the estimated take levels available for the shrimp and pelagic fishery are observed takes from the sea sampling. A preliminary data pull (1994-1998) from the NEFSC sea sampling database shows the following total loggerhead entanglements, hooking or entrainment: 209 (longline), 23 (otter trawl), 18 (coastal trawl), 15 (anchored gillnet), 82 (pelagic driftnet), 1 (scallop dredge). Considering that barely 5% coverage is achieved in the anchored gillnet fishery, one of the higher rates of observer coverage, the actual number of takes in fisheries combined is likely significant.

b. Leatherback Sea Turtle

Distribution: The leatherback is the largest living turtle and ranges farther than any other sea turtle species, exhibiting broad thermal tolerances (NMFS & USFWS 1995). Leatherback turtles feed primarily on cnidarians (medusae, siphonophores) and tunicates (salps, pyrosomas) and are often found in association with jellyfish. These turtles are found throughout the action area of this consultation and, while predominantly pelagic over the entire action area, they occur annually in more coastal areas like Cape Cod Bay and Narragansett Bay, and inshore waters of North Carolina during certain times of the year, fall in the north and spring in the south. Of the turtle species common to the action area, leatherback turtles seem to be the most susceptible to entanglement in lobster gear and longline gear. This susceptibility may be the result of attraction to gelatinous organisms and algae that collect on buoys and buoy lines at or near the surface.

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Population status: Nest counts are the only reliable population information available for leatherback turtles. Recent declines have been seen in the number of leatherbacks nesting worldwide (NMFS & USFWS 1995). The status review notes that it is unclear whether this observation is due to natural fluctuations or whether the population is at serious risk With regard to repercussions of these observations for U.S. leatherback populations in general, it is unknown whether they are stable, increasing, or declining, but it is certain that some nesting populations (*e.g.*, St. John and St. Thomas, U.S. Virgin Islands) have been extirpated.

Recent mortality and human impacts: Information on human-caused mortality and serious injury for leatherbacks is even more scarce than it is for loggerheads. A working group meeting was held in the northeast in 1998 to develop a management plan for leatherbacks and experts expressed the opinion that incidental takes in fisheries were likely higher than is being reported. Two to three leatherbacks are reported entangled in lobster gear every year. Anecdotal accounts by fishermen support the idea that they have many more encounters than are reported. Prescott (1988) reviewed stranding data for Cape Cod Bay and concluded that for those turtles where cause of death could be determined (the minority), entanglement is the leading cause of death followed by capture by dragger, cold stunning, or collision with boats. Many leatherback-fishery interactions seem to be indicative of entanglement in buoy lines and longline gear as

compared to gillnets and trawl gear. Annual estimates of take of leatherbacks in the longline fishery reported in the latest biological opinion was 690 (average 1994-1995) and it is expected that the level of take has not decreased in recent years. Entanglements have been reported in all gear types used in the bluefish fishery. Leatherback bycatch estimates will be included in the analysis discussed above, expected later this year, which will provide a better assessment of overall fishery mortality than is currently available.

Preliminary sea sampling data summaries as mentioned above for loggerheads (1994-1998) shows the following observed takes of leatherbacks: 1 (longline), 4 (anchored gillnet), 1 (pelagic gillnet).

c. Kemp's Ridley Sea Turtle

Distribution: Juvenile Kemp's ridleys use northeastern and mid-Atlantic coastal waters of the U.S. Atlantic coastline as primary developmental habitat during summer months, with shallow coastal embayments serving as important foraging grounds. Post-pelagic ridleys feed primarily on crabs, consuming a variety of species including: *Callinectes* sp., *Ovalipes* sp., *Libinia* sp., and *Cancer* sp. Mollusks, shrimp, and fish are consumed less frequently (Bjorndal 1997). Juvenile ridleys migrate south as water temperatures cool in the fall, and are predominantly found in shallow coastal embayments along the Gulf Coast during fall and winter months.

Ridleys found in mid-Atlantic waters are primarily post-pelagic juveniles averaging 40 centimeters in carapace length, and weighing less than 20 kilograms (Terwilliger and Musick 1995). Next to loggerheads, they are the second most abundant sea turtle in Virginia and Maryland waters, arriving in these areas during May and June and emigrating to more southerly waters from September to November (Keinath *et al.* 1987; Musick and Limpus 1997). In the Chesapeake Bay, ridleys frequently forage in shallow embayments, particularly in areas supporting submerged aquatic vegetation (Lutcavage and Musick 1985; Bellmund *et al.* 1987; Keinath *et al.* 1987; Musick and Limpus 1997). The juvenile population in Chesapeake Bay is estimated to be 211 to 1,083 turtles (Musick and Limpus 1997). They are predominantly found in shallow coastal embayments along the Gulf Coast during fall and winter months.

Juvenile ridleys follow regular coastal routes during spring and fall migrations to and from developmental foraging grounds along the mid-Atlantic and northeastern coastlines. Consequently, many ridleys occurring in coastal waters off Virginia and Maryland are transients involved in seasonal migrations. However, Maryland's and Virginia's coastal embayments, which contain an abundance of crabs, shrimp, and other prey as well as preferred foraging habitat such as shallow subtidal flats and submerged aquatic vegetation beds, are likely used as a foraging ground by Kemp's ridley sea turtles (John Musick, Virginia Institute of Marine Science, 1998, pers. comm.; Sherry Epperly, NMFS Beaufort Laboratory, Beaufort North Carolina, 1998, pers. comm.; Molly Lutcavage, New England Aquarium, 1998 pers. comm.). Nesting is undocumented for Virginia or Maryland beaches and rarely occurs outside the Gulf of Mexico.

Population status: The Kemp's ridley is one of the most endangered of the world's sea turtle species. The only major nesting site for ridleys is a single stretch of beach near Rancho Nuevo,

Tamaulipas, Mexico (Carr 1963). Estimates of the adult population reached a low of 1,050 in 1985, and have increased to 3,000 individuals in 1997. First-time nesting adults have increased from 6% to 28% from 1981 to 1989, and from 23% to 41% from 1990 to 1994, indicating that the ridley population may be in the early stages of exponential growth (TEWG 1998).

Recent mortality and human impacts: Mortality in the large juvenile and adult life stage would have the greatest impact to the Kemp's ridley population (TEWG, 1998). The vast majority of ridleys identified along the Atlantic Coast have been juveniles and subadults. Sources of mortality in this area include incidental takes in fishing gear, pollution and marine habitat degradation, and other man-induced and natural causes. Loss of individuals, particularly large juveniles, in the Atlantic may therefore impede recovery of the Kemp's ridley sea turtle population. As with loggerheads, a large number of Kemp's ridleys are taken in the shrimp fishery each year and in trawl and gillnet fisheries up and down the Atlantic coast. As for the other species, estimates of total fishery mortality, other than work done on the shrimp fishery, are not available at this time. The TEWG (1998) concluded, as they did for loggerheads, that given the state of existing data, the total number of Kemp's ridley turtles that could be incidentally taken during commercial fishing above current levels without slowing recovery of this species cannot be estimated at this time.

d. Green sea turtle

Distribution: Green turtles are distributed circumglobally, mainly in waters between the northern and southern 20°C isotherms (Hirth, 1971). In the western Atlantic, several major nesting assemblages have been identified and studied (Peters, 1954; Carr and Ogren, 1960; Parsons, 1962; Pritchard, 1969; Carr *et al.*, 1978). However, most green turtle nesting in the continental United States occurs on the Atlantic Coast of Florida (Ehrhart, 1979). Several nests are reported each year for the Florida panhandle (FLDEP, unpublished data). Most green turtle nesting activity occurs on Florida index beaches. These index beaches were established to standardize data collection methods and effort on key nesting beaches. The pattern of green turtle nesting shows biennial peaks in abundance, with a generally positive trend during the six years of regular monitoring since establishment of the index beaches in 1989.

While nesting activity is obviously important in determining population distributions, the remaining portion of the green turtle's life is spent on the foraging grounds. Some of the principal feeding pastures in the western Atlantic Ocean include the upper west coast of Florida, the northwestern coast of the Yucatan Peninsula, the south coast of Cuba, the Mosquito Coast of Nicaragua, the Caribbean Coast of Panama, and scattered areas along Colombia and Brazil (Hirth, 1971). The preferred food sources in these areas are *Cymodocea, Thalassia, Zostera, Sagittaria, and Vallisneria* (Carr, 1952; 1954; Mexico, 1966).

Although no green turtle foraging areas or major nesting beaches have been identified on the Atlantic Coast, evidence provided by Mendonca and Ehrhart (1982) indicates that immature green turtles may utilize lagoonal systems for foraging. These authors identified a population of young green turtles (carapace length 29.5-75.4 cm) believed to be resident in Mosquito Lagoon, Florida. The Indian River system, of which Mosquito Lagoon is a part, supported a green turtle fishery during the late 1800s (Ehrhart, 1983), and these turtles may be remnants of this historical

colony. Additional juvenile green turtles occur north to Long Island Sound, presumably foraging in coastal embayments. In North Carolina, green turtles are known from estuarine and oceanic waters. Recently, green turtle nesting occurred on Bald Head Island, just east of the mouth of the Cape Fear River, on Onslow Island, and on Cape Hatteras National Seashore. No information is available regarding the occurrence of green turtles in the Chesapeake Bay, although they are presumably present in very low numbers.

Recent mortality and human impacts: The shrimp fishery has been estimated as taking as many as 300 turtles a year. In addition, stranding reports indicate that between 200-300 green turtles stand annually (STSSN data) from a variety of causes. As with the other turtle species fishery mortality accounts for a large proportion of annual human-caused mortality outside the nesting beaches, while other activities like dredging, pollution, and habitat destruction account for an unknown level of other mortality. Green turtle takes have been documented in gillnet, trawl and longline gear. Preliminary sea sampling data summary (1994-1998) shows the following takes of green turtles: 1 (anchored gillnet), 2 (pelagic driftnet), 2 (pelagic longline).

e. Shortnose sturgeon

Distribution: Shortnose sturgeon occur in large rivers along the western Atlantic coast from the St. Johns River, Florida (possibly extirpated from this system), to the Saint John River in New Brunswick, Canada. The species is anadromous in the southern portion of its range (*i.e.*, south of Chesapeake Bay), while northern populations are amphidromous (NMFS 1998f). Popuation sizes vary across the species' range.

Shortnose sturgeon are benthic fish that mainly occupy the deep channel sections of large rivers. They feed on a variety of benthic and epibenthic invertebrates including molluscs, crustaceans (amphipods, chironomids, isopods), and oligochaete worms (Vladykov and Greeley 1963; Dadswell 1979). Shortnose sturgeon are long-lived (30 years) and, particularly in the northern extent of their range, mature at late ages. In the north, males reach maturity at 5-10 years, while females mature between 7 and 13 years.

In the northern extent of their range, shortnose sturgeon exhibit three distinct movement patterns that are associated with spawning, feeding, and overwintering periods. In spring, as water temperatures rise above 8° C, pre-spawning shortnose sturgeon move from overwintering grounds to spawning areas. Spawning occurs from mid/late April to mid/late May. Post-spawned sturgeon migrate downstream to feed throughout the summer. As water temperatures drop below 8° C again in the fall, shortnose sturgeon move to overwintering concentration areas and exhibit little movement until water temperatures rise again in spring (Dadswell *et al.* 1984; NMFS 1998). Young-of-the-year shortnose sturgeon are believed to move downstream after hatching (Dovel 1981) but remain within freshwater habitats. Older juveniles tend to move downstream in fall and winter as water temperatures decline and the salt wedge recedes. Juveniles move upstream in spring and feed mostly in freshwater reaches during summer.

Shortnose sturgeon spawn in freshwater sections of rivers, typically below the first impassable barrier on the river (*e.g.*, dam). Spawning occurs over channel habitats containing gravel, rubble,

or rock-cobble substrates (Dadswell *et al.* 1984; NMFS 1998). Additional environmental conditions associated with spawning activity include decreasing river discharge following the peak spring freshet, water temperatures ranging from 9 -12° C, and bottom water velocities of 0.4 - 0.7 m/sec (Dadswell *et al.* 1984; NMFS 1998).

Population status: From available estimates, smallest populations occur in the Cape Fear (~ 8 adults) (Moser and Ross 1995) and Merrimack Rivers (~ 100 adults) (M. Kieffer, United States Geological Survey, personal communication), and the largest populations are found in the Saint John (~ 100,000) (Dadswell 1979) and Hudson Rivers (~ 35,000) (Bain et al. 1995). Total instantaneous mortality rates (Z) are available for the Saint John River (0.12 - 0.15; ages 14-55) (Dadswell 1979), Upper Connecticut River (0.12) (Taubert 1980), and Pee Dee-Winyah River (0.08-0.12) (Dadswell *et al.* 1984). Total instantaneous natural mortality (M) for shortnose sturgeon in the lower Connecticut River was estimated to be 0.13 (T. Savoy, Connecticut Department of Environmental Protection, personal communication). There is no recruitment information available for shortnose sturgeon because there are no commercial fisheries for the species. Estimates of annual egg production for this species are difficult to calculate because females do not spawn every year (Dadswell *et al.* 1984). Further, females may abort spawning attempts, possibly due to interrupted migrations or unsuitable environmental conditions (NMFS 1998). Thus, annual egg production is likely to vary greatly in this species.

Recent mortality and human impacts: Gillnet fisheries and trawl fisheries are known to occur in both the northern and southern portion of the shortnose sturgeon's range. Although no entanglement or interaction have been observed on trips targeting bluefish, the more inshore nature of this fishery, the difficulty in distinguishing shortnose from Atlantic sturgeon, and the growth in populations of some rivers, makes it likely that more interactions with gillnet or trawl gear may occur than has been observed or reported. Documented human impacts to sturgeon also include power plant and dredge interactions, although the magnitude of any of these factors is not known.

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g. North Atlantic Right Whale

Distribution: With the exception of time spent in Canadian waters, most of the species' geographic range is within the action area for this consultation. In the action area as a whole, right whales are present throughout the year, but occur in different parts of the action area at different times of the year.

NMFS designated right whale critical habitat on June 3, 1994 (59 FR 28793). These waters, which lie within the action area, include the waters of Cape Cod Bay and the Great South Channel off the coast of Massachusetts, and off the coasts of southern Georgia and northern Florida, where the species aggregates at different times of the year.

In the northern critical habitats, whales are most abundant in Cape Cod Bay between February and April (Hamilton and Mayo 1990; Schevill *et al.* 1986; Watkins and Schevill 1982) and in the Great South Channel in May and June (Kenney *et al.* 1986, Payne *et al.* 1990). Right whales also frequent the Bay of Fundy, Browns and Baccaro Banks (in Canadian waters), Stellwagen

Bank and Jeffrey's Ledge in spring and summer, and use mid-Atlantic waters as a migratory pathway between winter (mid-November through March) calving grounds and their spring and summer nursery/feeding areas in the Gulf of Maine. Recent satellite tracking efforts have identified individual animals embarking on far-ranging foraging episodes not previously known (Knowlton, pers. comm.). Right whales in the Gulf of Maine feed on zooplankton, primarily copepods, by skimming at or below the water's surface with open mouths (see NMFS 1991b, Kenney *et al.* 1986, Murison and Gaskin 1989, Mayo and Marx 1990).

Population trends: Attempts have been made to determine the current status and trends of this very small population and to make valid recommendations on recovery requirements. Through 1998, biological opinions cited Knowlton *et al.* (1994) which concluded, based on data from 1987 through 1992, that the northern right whale population was growing at a net annual rate of 2.5% (CV = 0.12). This rate is also used in NMFS' marine mammal Stock Assessment Report (e.g. Blaylock *et al.* 1995, Waring *et al.* 1997). Since then, data used by Knowlton *et al.* (1994) have been re-evaluated, and new attempts to model the trends of the northern right whale population have been published (e.g., Kraus 1997; Caswell *et al.* 1999) and additional works are in progress (Caswell *et al.*, 1999.; Wade and Clapham, in prep). These analyses suggest that the western North Atlantic stock has been in decline in the 1990's.

Recognizing the precarious status of the right whale globally, the International Whaling Commission (IWC) held a special meeting of its Scientific Committee from March 19-25, 1998, in Cape Town, South Africa, to conduct a comprehensive assessment of right whales worldwide. Workshop participants reviewed available information on the northern right whale, including Knowlton *et al.* (1994), Kraus (1997), and Caswell *et al.* (1999). After considering this information, the workshop attendees concluded that it is unclear whether the Western North Atlantic stock of the northern right whale population is "declining, stationary or increasing, and [that] the best estimate of current population size is only 300 animals." Maintaining a conservative stance due to these uncertainties, participants concluded that the growth rate of this population "is both low and substantially less than that of the southern right whale populations" (IWC in press).

Workshop participants expressed "considerable concern" in general for the status of the Western North Atlantic population. Based on recent (1993-1995) observations of inconsistent calf production, the relatively large number of human-induced mortalities, and an observed increase in the calving interval, it has been suggested that the slow but steady recovery rate published in Knowlton *et al.* (1994) may not be continuing. The Caswell *et al.* (1999) work was reviewed at the Cape Town workshop, received considerable peer review since that time, and was revised accordingly prior to publication. Reviewers concurred with Caswell *et al.*'s (1999) conclusion that the population trajectory has declined from an approximately 2.5% annual increase to one which is declining at a rate of approximately 2.4% annually. This re-analysis incorporated previous concerns regarding possible bias in sampling effort after surveys in the Great South Channel ceased. Other works in progress are likely not to be inconsistent with this conclusion (Wade and Clapham, in prep., Caswell *et al.*, 1999). Nonetheless, the Caswell et al. model suggests that the northern right whale will be extinct in 100-200 years; at the current rate of decline "functional" extinction will likely occur in 50 years.

Therefore, it is essential to remain diligent in efforts to control human-induced adverse effects to this population in order to avoid jeopardy from such activities. For the purposes of this Biological Opinion, NMFS will assume, until published estimates become available, that the northern right whale population is declining. This approach is more protective of the northern right whale than alternative assumptions. IWC Workshop participants urgently recommended increased efforts to determine the trajectory of the northern right whale population, and NMFS' Northeast Fisheries Science Center has already begun to implement that recommendation.

Recent mortality and human impacts: Six right whale mortalities resulting from various causes were recorded in 1996 (see NMFS Biological Opinion, May 29, 1997 for detailed information on these mortalities). In addition to these mortalities, 2 reports of right whale entanglement in fishing gear were received during 1996. One, classified as a serious injury, was not relocated; the other was disentangled and was seen the following year with a calf. Data from 1997 indicate that one mortality occurred from unknown causes, another mortality occurred due to a ship strike in the Bay of Fundy, and 8 entanglements were reported. Six of the entanglements were reported in Canadian waters and 2 in U.S. waters (one of the reports may represent a re-sighting of an earlier entanglement). In 1998, two known mortalities occurred, as evidenced by stranded carcasses. The first was the mortality of a calf due to natural causes and the second was an adult (probable) male, for which cause of death has not yet been determined. Two adult female right whales were discovered in a weir off Grand Manan Island in the Bay of Fundy on July 12, 1998, and were released two days later; no residual injuries were reported. On July 24, 1998, the Disentanglement Team removed line from around the tail stock of a right whale which was originally seen entangled in the Bay of Fundy on August 26, 1997. This same whale, apparently debilitated from the earlier entanglement, became entangled in lobster pot gear twice in one week in Cape Cod Bay in September 1998. The gear from the latter two entanglements was completely removed, but line remained in the animal's mouth. On August 15, 1998, a right whale was observed entangled in the Gulf of St. Lawrence; the animal apparently freed itself of most of the gear, but it is unknown whether gear remains on the animal. Thus far in 1999, one whale stranded with evidence of ship strike and 2 likely entanglements were reported. Neither of these whales were successfully disentangled and the affects on the animal remain unknown

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The IWC workshop recommended that the following activities be undertaken to reduce the adverse effects of entanglement in fishing gear:

- research into methods to reduce right whale entanglements in fishing gear,
- determination and monitoring of entanglement rates and the success of steps to reduce entanglement,
- modification of protective measures, if shown to be insufficient,
- establishment of disentanglement programs, and
- consideration of prohibition of any gear that might entangle right whales in high-use habitats, especially in calving, breeding or feeding areas, and sanctuaries.

All of these recommendations are presently being implemented via similar recommendations of the ALWTRP as part of implementation of the TRP.

h. Humpback Whale

Distribution: As with right whales, a large portion of the species' geographic range is within the action area for this consultation. Humpback whales feed in the northwestern Atlantic during summer and migrate to calving and mating areas in the Caribbean. Five separate feeding areas are utilized in northern waters; one, the Gulf of Maine feeding area, lies within U.S. waters and is in the action area of this consultation. Most of the humpback whales that forage in the Gulf of Maine visit Stellwagen Bank and the waters of Massachusetts and Cape Cod bays. Sightings are most frequent from mid-March through November between 41°N and 43°N, from the Great South Channel north along the outside of Cape Cod to Stellwagen Bank and Jeffreys Ledge (CeTAP, 1982), and peak in May and August. Small numbers of individuals may be present in this area year-round, including the waters of Stellwagen Bank.

Katona and Beard (1990) summarized information gathered from a catalogue of photographs of 643 individuals from the western North Atlantic population of humpback whales. These photographs indicated reproductively mature western North Atlantic humpback whales winter in tropical breeding grounds in the Antilles, primarily on Silver and Navidad Banks, north of the Dominican Republic. The primary winter range also includes the Virgin Islands and Puerto Rico (see NMFS, 1991). In general, it is believed that calving and mating take place in winter range. Calves are born from December through March and are about 4 meters at birth. Sexually mature females give birth approximately every 2 to 3 years. Sexual maturity is reached between 4 and 6 years of age for females and between 7 and 15 years for males. Size at maturity is about 12 meters.

Swingle *et al.* (1993) identified an increase of juvenile humpback whales in the nearshore waters of Virginia, primarily in winter. Those photo-identified were known members of the Gulf of Maine feeding group, suggesting a shift in distribution that may be related to winter prey availability. Studies conducted by the Virginia Marine Science Museum (VMSM) indicate that these whales are feeding on, among other things, bay anchovies and menhaden. Researchers theorize that juvenile humpback whales, that do not participate in the migration to Caribbean waters, may be establishing a winter foraging area in the mid-Atlantic (Mayo, pers. comm.). In concert with the increase in mid-Atlantic whale sightings, strandings of humpback whales have increased between New Jersey and Florida since 1985. Strandings were most frequent during September through April in North Carolina and Virginia waters, and were composed primarily of juvenile humpback whales of no longer than 11 meters (Wiley *et al.*, 1995). Six of 18 humpbacks (33 percent) for which the cause of mortality was determined were killed by vessel strikes. An additional humpback whale had scars and bone fractures indicative of a previous vessel strike that may have contributed to the whale's death. Sixty percent of those mortalities that were closely investigated showed signs of entanglement or vessel collision (Wiley *et al.*, 1995).

Population Status: Recent information has become available on the status and trends of the humpback whale population, although there are still insufficient data to determine population trends for the Western North Atlantic stock (Waring *et al.* 1997). The current rate of increase of the North Atlantic humpback whale population has been estimated at 9.0% (CV=0.25) by Katona and Beard (1990) and at 6.5% by Barlow and Clapham (1997). Palsboll *et al.* (1997) studied humpback whales through genetic markers to identify individual humpback whales in the

northern Atlantic Ocean. Using breeding ground samples from 1992–1993, Palsboll *et al.* (1997) estimated the North Atlantic humpback whale population at 4,894 (95% confidence interval 3,374 - 7,123) males and 2,804 females (95% confidence interval 1,776 -4,463), for a total of 7,698 whales. However, since the sex ratio in this population is known to be 1:1 (Palsboll et al., 1997), the lower figure for females is presumed to be a result of sampling bias or some other cause for partitioning of the sampling. Photographic mark-recapture analyses from the YONAH (Years of the North Atlantic Humpback) project gave an ocean-basin-wide estimate of 10,600 (95% c.i. = 9,300 - 12,100) and an additional genotype-based analysis yielded a similar but less precise estimate of 10,400 (95% c.i. = 8,000 - 13,600) (Smith *et al.* 1999). The estimate of 10,600 is regarded as the best available estimate for this population. The minimum population estimate for the North Atlantic humpback whale population is 10,019 animals (CV=0.067) (Waring *et al.* 1999).

Recent mortality and human impacts: In 1996, three humpback whales were killed in collisions with vessels and at least five were seriously injured by entanglement in the same year. At least three humpback whale entanglements were reported in 1997. Stranding records for 1997 for the U.S. Atlantic coast include seven stranded/dead floating humpback whales. Two of these deaths were attributed to ship strikes. For 1998, 14 humpback whale entanglements resulting in injury (n = 13) or mortality (n = 1) were reported. Two of the whales with entanglement injuries stranded dead, but the role of the entanglement in the whales' death has not been determined. Three of the injured animals were completely disentangled, one partially disentangled, one partially disentangled and which later shed the remaining gear, and one shed the gear without assistance from the Disentanglement Team. An additional death (recorded off North Carolina) was attributed to vessel strike. One injury from a vessel interaction involving a known whale was reported in 1998; the whale, which was seen several times after the injury, exhibited some healing. At least three incidents of dead floating humpback whales were also reported as of December 1998; however, cause of death has not been determined for any of these animals. One entanglement of a humpback whale has been reported so far in 1999, the whale was successfully disentangled by a disentanglement team offshore of Cape Lookout, North Carolina.

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i. Fin Whale

Distribution: The fin whale is ubiquitous in the North Atlantic and occurs from the Gulf of Mexico and Mediterranean Sea northward to the edges of the arctic ice pack (Waring *et al.* 1999). The overall pattern of fin whale movement is complex, consisting of a less obvious north-south pattern of migration than that of right and humpback whales. Based on acoustic recordings from hydrophone arrays, however, Clark (1995) reported a general southward "flow pattern" of fin whales in the fall from the Labrador/Newfoundland region, south past Bermuda, and into the West Indies. The overall distribution may be based on prey availability, and fin whales are found throughout the action area for this consultation in most months of the year. This species preys opportunistically on both invertebrates and fish (Watkins *et al.* 1984). As with humpback whales, they feed by filtering large volumes of water for prey. Fin whales are larger and faster than humpback and right whales and are less concentrated in nearshore environments. Due to these traits, fin whales are less prone to entanglements than are right and

humpback whales, however because their distribution overlaps that of commercial fishing activities, the potential exists for entanglement in fishing gear used in the bluefish fishery.

Population status: Hain *et al.* (1992) estimated that about 5,000 fin whales inhabit the northeastern United States continental shelf waters. Shipboard surveys of the northern Gulf of Maine and lower Bay of Fundy targeting harbor porpoise for abundance estimation provided an imprecise estimate of 2,700 (CV=0.59) fin whales (Waring *et al.* 1997).

Recent mortality and human impacts: Of 18 fin whale mortality records collected between 1991 and 1995, four were associated with vessel interactions, although the proximal cause of mortality was not known. In 1996, three reports of ship strikes were received, although this was only confirmed as cause of death for one of the incidents. One entanglement report was received in 1996. At least five reports of entangled fin whales were received by NMFS in 1997. Four fin whales were reported as having stranded in the period from January 1, 1997, to January 1, 1998, in the Northeast Region; the cause of death was not determined for these animals. One ship strike mortality was documented in 1998 in the Virginia-North Carolina border area. One entanglement mortality was reported in September 1998.

j. Right Whale Critical Habitat

It is likely that not all areas of right whale occurrence have been identified. For example, about 80% of the population is unaccounted for in the winter. Genetics work performed by Schaeff *et al.* (1993) suggested the existence of at least one unknown nursery area. Within the known distribution of the species, however, the following five areas have been identified as critical to the continued existence of the species: (1) coastal Florida and Georgia; (2) the Great South Channel, east of Cape Cod; (3) Cape Cod and Massachusetts Bays; (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 have been designated by NMFS as critical habitat (59 FR, 28793, June 3, 1994).

The availability of dense concentrations of zooplankton in the winter (Cape Cod Bay) and spring (Great South Channel) is described as the key factor for right whale utilization of the areas. Kraus and Kenney (1991) provide an overview of data regarding right whale use of these areas. Important habitat components in Cape Cod Bay include seasonal availability of dense zooplankton patches and protection from weather 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).

In 1993/1994, NMFS, the U.S. Coast Guard (USCG), the U.S. Navy (USN), and the U. S. Army Corps of Engineers (ACOE) began a program to monitor the presence of right whales in and

adjacent to the U.S. southeast right whale critical habitat, in order to reduce the potential for ship-whale collisions. A number of collaborative efforts have resulted in coverage of not only the coastal, high-use area where whales frequently traverse major shipping lanes, but also less densely concentrated areas (both in terms of whale and vessel traffic) to the north, south, and east of this high-use area. Public sightings are also investigated and verified to ensure mariner notification of all confirmed right whale sightings in the area.

In 1997, NMFS, the USCG, and the Commonwealth of Massachusetts began a similar program to monitor the presence of right whales in and adjacent to the Cape Cod Bay and Great South Channel habitats in order to reduce the potential for ship-whale collisions in these waters. Sightings in other parts of the Northeast are also investigated. One such investigation revealed the presence of 23 individual whales in one day off Rhode Island in an area of heavy shipping traffic. These monitoring programs, known as the Early Warning System (EWS), also known as the Whale Alert Program, are described in more detail in the Environmental Baseline Section. Important information has been collected through the EWS which may enable NMFS to identify additional critical habitat areas as well as to refine the time and area boundaries of the known existing critical habitat areas and peak usage periods.

D. Environmental Baseline

Environmental baselines for Biological Opinions include the past and present impacts of all state, Federal or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of state or private actions that are contemporaneous with the consultation in process (50 CFR § 402.02). The environmental baseline for this Biological Opinion includes the effects of several activities that affect the survival and recovery of threatened and endangered species in the action area. The activities that shape the environmental baseline in the action area of this consultation generally fall into the following three categories: vessel operations, fisheries, and recovery activities associated with reducing those impacts. Other environmental impacts include effects of discharges, dredging, ocean dumping, sonic activity, and aquaculture.

1. Status of the species within the action area

The listed species occurring in the action area are all highly migratory, and the scope of the action area includes the western Atlantic from Maine to Florida. Therefore, the range-wide status of the species given in the previous section most appropriately reflects the species' status within the action area.

2. Factors affecting the species within the action area

a. Federal actions that have undergone Formal or Early section 7 consultation.

In the past four years, NMFS has undertaken several ESA section 7 consultations to analyze the effects of vessel operations and gear associated with Federally-permitted fisheries on threatened

and endangered species in the action area. Each of those consultations sought to develop ways of reducing the probability of adverse effects of the action on large whales and sea turtles. Similarly, recovery actions NMFS has undertaken under both the MMPA and the ESA are addressing the problem of take of whales in the fishing and shipping industries.

(1) *Vessel Operations*
Potential adverse effects from Federal vessel operations in the action area of this consultation include operations of the U.S. Navy (USN) and U.S. Coast Guard (USCG), which maintain the largest Federal vessel fleets, the Environmental Protection Agency, the National Oceanic and Atmospheric Administration (NOAA), and the ACOE. NMFS has conducted formal consultations with the USCG, the USN (described below) and is currently in early phases of consultation with the other Federal agencies on their vessel operations (ACOE, USGS). NMFS has consulted with the ACOE to provide recommended permit restrictions for operations of contract or private vessels around whales. Through the section 7 process, where applicable, NMFS has and will continue to establish conservation measures for all these agency vessel operations to avoid adverse effects to listed species. At the present time, however, they represent potential for some level of interaction. Refer to the Biological Opinions for the USCG (NMFS 1995, 1996b, and 1998) and the USN (NMFS 1997a) for detail on the scope of vessel operations for these agencies and conservation measures being implemented as standard operating procedures.

Since the USN consultation only covered operations out of Mayport, Florida, potential for USN vessels to adversely affect large whales when they are operating in other areas within the range of these species has not been assessed. Similarly, operations of vessels by other Federal agencies within the action area (NOAA, EPA, ACOE) may adversely affect whales. However, the in-water activities of those agencies are limited in scope, as they operate a limited number of vessels or are engaged in research/operational activities that are unlikely to contribute a large amount of risk for large whales. Through the consultation process, conservation recommendations will be provided to reduce that potential even further.

(2) *Additional military activities*, including vessel operations and ordnance detonation, also affect listed species of sea turtles. USN aerial bombing training in the ocean off the southeast U.S. coast, involving drops of live ordnance (500 and 1,000-lb bombs) is estimated to have the potential to injure or kill, annually, 84 loggerheads, 12 leatherbacks, and 12 greens or Kemp's ridley, in combination (NMFS, 1997b). The USN will also conduct ship-shock testing for the new SEAWOLF submarine off the Atlantic coast of Florida, using 5 submerged detonations of 10,000 lb explosive charges. This testing is estimated to injure or kill 50 loggerheads, 6 leatherbacks, and 4 hawksbills, greens, or Kemp's ridleys, in combination (NMFS, 1996b). Operation of the USCG's boats and cutters in the U.S. Atlantic, meanwhile, is estimated to take no more than one individual turtle—of any species—per year (NMFS, 1995). Formal consultation on USCG or USN activities in the Gulf of Mexico has not been conducted.

The construction and maintenance of Federal navigation channels has also been identified as a source of sea turtle and shortnose sturgeon mortality. Hopper dredges, which are frequently used in ocean bar channels and sometimes in harbor channels and offshore borrow areas, move

relatively rapidly (compared to sea turtle swimming speeds) and can entrain and kill sea turtles, presumably as the drag arm of the moving dredge overtakes the slower moving turtle. Along the Atlantic coast of the southeastern United States, NMFS estimates that annual, observed injury or mortality of sea turtles from hopper dredging may reach 35 loggerheads, 7 greens, 7 Kemp's ridleys, and 2 hawksbills (NMFS, 1997c). Along the north and west coasts of the Gulf of Mexico, channel maintenance dredging using a hopper dredge may injure or kill 30 loggerhead, 8 green, 14 Kemp's ridley, and 2 hawksbill sea turtles annually (NMFS, 1997d). Additional incidental take statements for dredging of Charlotte Harbor and Tampa Bay, FL anticipate the incidental take, by injury or mortality, of two (2) loggerheads or one (1) Kemp's ridley or one (1) green or one (1) hawksbill sea turtle for Charlotte Harbor and eight (8) sea turtles, including no more than five (7) documented Kemp's ridley, hawksbill, leatherback, or green turtles, in any combination, for Tampa Bay. Three to five shortnose sturgeon have been taken annually in hydraulic pipeline dredging in the Delaware River and they have been documented entrained in a hopper dredge in the Savannah River, Georgia.

3) Federal Fishery Operations

Adverse effects on threatened and endangered species from several types of fishing gear occur in the action area. Efforts to reduce the adverse effects of commercial fisheries are addressed through both the MMPA take reduction planning process discussed earlier and the ESA section 7 process. Gillnet, longline, trawl gear, and pot fisheries have all been documented as interacting with either whales or sea turtles or both. For all fisheries for which there is a Federal fishery management plan (FMP) or for which any Federal action is taken to manage that fishery, impacts will be evaluated under section 7.

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Several formal consultations have been conducted on the following fisheries that NMFS has determined are likely to adversely affect threatened and endangered species: American Lobster, Monkfish, Northeast Multispecies, Atlantic Pelagic Swordfish/Tuna/Shark, and Summer Flounder/Scup/ Black Sea Bass fisheries. These consultations are summarized below; for more detailed information, refer to the respective Biological Opinions.

The *Northeast Multispecies Sink Gillnet Fishery* is one of the other major fisheries in the action area of this consultation that is known to entangle whales and sea turtles. This fishery has historically occurred from the periphery of the Gulf of Maine to Rhode Island in water to 60 fathoms. In recent years, more of the effort in this fishery has occurred in offshore waters and into the Mid-Atlantic. Participation in this fishery declined from 399 to 341 permit holders in 1993 and is expected to continue to decline as further groundfish conservation measures are implemented. The fishery operates throughout the year with peaks in the spring and from October through February. Data indicate that gear used in this fishery has seriously injured northern right whales, humpback whales, fin whales, and loggerhead and leatherback sea turtles. Waring *et al.* (1997) reports that 17 serious injuries or mortalities of humpback whales from 1991 to 1996 were fishery interactions (not necessarily multispecies gear), the majority of which indicated some kind of monofilament like that used in the multispecies fishery. It is often difficult to assess gear found on stranded animals or observed at sea and assign it to a specific fishery. Only a fraction of the takes are observed, and the catch rate represented by the majority of takes, which are reported opportunistically, *i.e.*, not as part of a random sampling program, is

unknown. Consequently, the total level of interaction cannot be determined through extrapolation.

NMFS recently concluded formal consultation on the *Federally regulated American Lobster Fishery* to consider potential effects of the transfer of management authority from the MSFCMA to the Atlantic Coastal Fisheries Cooperative Management Act (ACFCMA), the implementation of new lobster management actions under the ACFCMA, and recent takes of endangered whales in the fishery. The transfer of authority is being carried out in step-wise fashion, and is currently in an interim phase. The previous formal consultation on the fishery under the MSFCMA had reached a jeopardy conclusion for the northern right whale with the Biological Opinion issued December 13, 1996. As a result of the Reasonable and Prudent Alternative included with the 1996 Biological Opinion, an emergency regulation under the Marine Mammal Protection Act (MMPA) (Emergency Interim Final Rule, 62 FR 16108) was published when implementing restrictions on the use of lobster pot gear in the Federal portion of the Cape Cod Bay right whale critical habitat and in the Great South Channel right whale critical habitat during periods of expected peak right whale abundance. This is still in effect but under the regulations for the ALWTRP.

The proposed ACFCMA plan contains measures to limit the number of lobster traps that can be deployed during the first two years of the plan, and further trap reduction measures may be chosen as default effort reduction measures during subsequent plan years. The reduction in the number of traps fished is expected to result in a reduction of entanglement risk. The interaction between the lobster trap fishery and endangered whales is addressed in the Atlantic Large Whale Take Reduction Plan (ALWTRP) implemented via an interim final rule November 15, 1997, followed by a final rule issued February 16,1999. The ALWTRP incorporated the RPA issued with the 1996 Biological Opinion and implemented additional restrictions. Because of the greater protection provided by the ALWTRP, NMFS substituted the ALWTRP for the RPA issued with the 1996 Biological Opinion and has concluded that the lobster fishery in the context of the ALWTRP is likely to adversely affect but is not likely to jeopardize the northern right whale. Additional description of the ALWTRP is provided in the proposed action section of this BO.

The monkfish fishery is prosecuted with northeast multispecies-type gear, and therefore has potential to interact with large whales and is also known to interact with sea turtles. NMFS (1998g) concluded in a Biological Opinion issued December 21, 1998, that conduct of the monkfish fishery, with modification to reduce impacts of entanglement through the ALWTRP and the HBTRPs, may adversely affect but is not likely to jeopardize the continued existence of endangered and threatened species under NMFS jurisdiction and is not likely to destroy or adversely modify right whale critical habitat.

The conversion of the monkfish fishery into a regulated fishery has the potential to benefit protected species management by the overall monitoring of effort patterns in the fishery. It will also be beneficial to begin identification and tracking of monkfish-only gillnet permit holders to include them in outreach efforts regarding the MMPA Marine Mammal Authorization Program (MMAP) and take reduction plans. These vessel operators may not be aware that they are

considered to be part of the Northeast sink gillnet or Mid-Atlantic coastal gillnet fisheries, which are required to register in the MMAP and are regulated by the whale and porpoise TRPs, respectively. The identification of these vessels will also facilitate effective placement of observers. The ITS provided under the monkfish Opinion anticipates an incidental take by entanglement or capture of 6 loggerhead sea turtles (no more than 3 lethal), 1 lethal or non-lethal entanglement or capture of a green sea turtle, 1 lethal or non-lethal entanglement or capture of a Kemp's ridley, and 1 lethal or non-lethal entanglement or capture of a leatherback. The dogfish fishery has not previously been consulted on, but it is expected that the Mid-Atlantic Fisheries Management Council will be submitting an FMP for this fishery in the near future, on which NMFS will conduct an ESA section 7 consultation.

The *Summer Flounder, Scup and Black Sea Bass fisheries* are known to interact with sea turtles. While not documented, the gear-types used in this fishery could entangle endangered whales, particularly humpback whales. Significant measures have been developed to reduce the take of sea turtles in summer flounder trawls and trawls that meet the definition of a summer flounder trawl (which would include fisheries for other species like scup and black sea bass) by requiring Turtle Excluder Devices (TED) in nets in the area of greatest bycatch off the North Carolina coast. NMFS is considering a more geographically inclusive regulation to require TEDs in trawl fisheries that overlap with sea turtle distribution to reduce the impact from this fishery. Developmental work is also ongoing for a TED that will work in the flynets used in the weakfish portion of this fishery. These fisheries are subject to the requirements of the ALWTRP for gillnets and lobster pots in the Mid-Atlantic. The anticipated observed annual take rates for turtles in this multispecies fishery is 15 loggerheads and 3 leatherbacks, hawksbills, greens, or Kemp's ridley, in combination (NMFS, 1997g).

Similarly, the *squid, mackerel, butterfish fishery* (SMB) is known to interact with sea turtles. While entanglements have not documented, the gear-types used in this fishery could entangle endangered whales. After reviewing the best available information on the status of endangered and threatened species under NMFS jurisdiction, the environmental baseline for the action area, the effects of the action, and the cumulative effects, NMFS concluded in a Biological Opinion issued in April 1999, that operation of the SMB fishery may adversely affect but is not likely to jeopardize the continued existence of endangered and threatened species under NMFS jurisdiction and is not likely to destroy or adversely modify any critical habitat. Limited observer information on this fishery provided a level of anticipated take of less than 10 turtles, for which an incidental take statement was issued.

The *Southeast U.S. Shrimp Fishery* is known to interact with sea turtles. Shrimp trawlers in the southeastern U.S. are required to use TEDs, which reduce a trawler's capture rate by 97%. Even so, NMFS estimated that 4,100 turtles may be captured annually by shrimp trawling, including 650 leatherbacks that cannot be released through TEDs, 1,700 turtles taken in try nets, and 1,750 turtles that fail to escape through the TED (NMFS, 1998d). Henwood and Stuntz (1987) reported that the mortality rate for trawl-caught turtles ranged between 21% and 38%, although Magnuson *et al.* (1990) suggested Henwood and Stuntz's estimates were very conservative and likely an underestimate of the true mortality rate. Work continues on new TED technology and

on bycatch and population assessment techniques to continue to improve the evaluation of this fishery and minimize the impacts.

On November 15, 1997, NMFS implemented the interim final rule for the *Atlantic Large Whale Take Reduction Plan* and issued the final rule February 16, 1999. This plan is designed to reduce the rate of serious injury and mortality of right, humpback, fin, and minke whales incidental to the Northeast sink gillnet, lobster pot, Southeast shark gillnet, and Mid-Atlantic gillnet fisheries to acceptable removal levels as defined in the MMPA. A section 7 consultation was conducted on this Plan, including the operation of the four fisheries regulated by the Plan, which concluded, with a no jeopardy Biological Opinion on the interim final rule issued on July 15, 1997 (NMFS 1997e) (and with an informal consultation on the final rule concluded February 16, 1999 (NMFS 1999), which determined that the basis upon which the previous consultation was concluded was unchanged) that the implementation of the ALWTRP and continued operation of these fisheries may adversely affect, but is not likely to jeopardize the continued existence of any listed species of large whales or sea turtles under NMFS jurisdiction. The primary take reduction measures of the plan include closures and modification of fishing gear and practices to reduce the adverse impacts of entanglement. Since no changes were anticipated from the existing operations of these fisheries, no additional incidental take was anticipated or authorized in this Opinion.

(4) Other – Sea turtles entering coastal or inshore areas have been affected by entrainment in the cooling-water systems of electrical generating plants. At the St. Lucie nuclear power plant at Hutchinson Island, Florida, large numbers of green and loggerhead turtles have been captured in the seawater intake canal in the past several years. Annual capture levels from 1994-1997 have ranged from almost 200 to almost 700 green turtles and from about 150 to over 350 loggerheads. Almost all of the turtles are caught and released alive; NMFS estimates the survival rate at 98.5% or greater (see NMFS 1997e). Other power plants in New Jersey, south Florida, west Florida, and North Carolina have also reported low levels of sea turtle entrainment, but formal consultation on these plants' operations has only been completed for two plants in New Jersey (Public Service Gas and Electric, Salem/Hope Creek Nuclear Generating Station and Oyster Creek NGS). Takes of turtles at these NJ plants reached a high in the early 1990s, but the problem was resolved by removing ice barriers around the intakes when turtles were present in Delaware Bay. One or two shortnose sturgeon become impinged annually, although in most cases the fish have already been in advanced states of decomposition and likely were not killed by the plant structure itself.

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b. State or private actions

(1) *Private and commercial vessels*
Private and commercial vessels operate in the action area of this consultation and also have the potential to interact with whales and sea turtles. For example, shipping traffic in Massachusetts Bay is estimated at 1,200 ship crossings per year with an average of three per day. More than 280 commercial fishing vessels fish on Stellwagen Bank in the Gulf of Maine, and sportfishing contributes more than 20 vessels per day from May to September. Similar traffic may exist in many other areas within the scope of this consultation which overlap with whale high-use areas. The invention and popularization of new technology resulting in high speed catamarans for ferry services and whale watch vessels operating in congested coastal areas contributes to the potential for impacts from privately-operated vessels in the environmental baseline.

In addition to commercial traffic and recreational pursuits, private vessels participate in high speed marine events concentrated in the southeastern United States that are a particular threat to sea turtles. The magnitude of these marine events is not currently known. NMFS and the USCG are in early consultation on these events, but a thorough analysis has not been completed. The Sea Turtle Stranding and Salvage Network (STSSN) also reports many records of vessel interaction (propeller injury) with sea turtles off coastal states such as New Jersey and Florida, where there are high levels of vessel traffic.

(2) *State fishery operations*
Very little is known about the level of entanglement for sea turtles and shortnose sturgeon, serious injury or mortality of ESA-listed species in fisheries that operate strictly in state waters. However, depending on the fishery in question, many state permit holders also hold Federal licenses; therefore, section 7 consultations on Federal action in those fisheries address some state-water activity. Impacts of state fisheries on endangered whales are addressed as appropriate through the MMPA take reduction planning process. NMFS is actively participating in a cooperative effort with ASMFC to standardize and/or implement programs to collect information on level of effort and bycatch in state fisheries. When this information becomes available, it can be used to refine take reduction plan measures in state waters. With regard to whale entanglements, vessel identification is occasionally recovered from gear removed from entangled animals. With this information, it is possible to determine whether the gear was deployed by a Federal or state permit holder and whether the vessel was fishing in Federal or state waters. In 1998, 3 entanglements of humpback whales in state-water fisheries were documented.

In 1998, East Coast states from Maine through North Carolina began implementing regulations pursuant to the Year 1 requirements of *Amendment 3 to the Atlantic States Marine Fisheries Commission's Coastal Fishery Management Plan for American Lobster* (ASMFC 1997). The Federal ACFCMA plan is designed to be complementary to the ASMFC plan, and the two plans are largely similar in structure. Regulations will be geared toward reducing lobster fishing effort by 2005 to reverse the overfished status of the resource. States in the 6 coastal areas must implement regulations according to a compliance schedule established in Amendment 3. Effort reduction measures will be similar to those in the Federal ACFCMA plan. Several states have implemented trap caps for 1998. Further trap limits, which the compliance schedule requires for

Area 1 and the Outer Cape Lobster Management Area in 1999, will generate some localized risk reduction for protected species in those areas. If all states elect to implement a significant trap reduction program, the overall entanglement risk would be substantially reduced. As the Gulf of Maine and Mid-Atlantic lobster pot fisheries in the MMPA List of Fisheries (Section 118) includes state water effort, vessels fishing in state waters will be required to comply with MMPA take reduction plan regulations designed to reduce entanglement risk to whales.

Early in 1997, the *Commonwealth of Massachusetts* implemented restrictions on lobster pot gear in the state water portion of the Cape Cod Bay critical habitat during the January 1 - May 15 period to reduce the impact of the fishery on northern right whales. The regulations were revised prior to the 1998 season. State regulations impact state permit holders who also hold Federal permits, although effects would be similar to those resulting from Federal regulations during the January 1 - May 15 period. Massachusetts has also implemented winter/spring gillnet restrictions similar to those in the ALWTRP and the MSFCMA for the purpose of right whale and/or harbor porpoise conservation. Lobster pots are fished in areas outside of Massachusetts where sea turtles and the depleted stock of bottlenose dolphin are present. Entanglement has been documented for both species.

A Biological Opinion on the *NMFS/ASMFC interjurisdictional FMP for weakfish* was conducted in June 1997. Weakfish are caught in the summer flounder fishery and are also fished with flynets. Analyses of the NMFS' observer data showed 36 incidental captures of sea turtles for trawl and gillnet vessels operating south of Cape May, New Jersey from April 1994 through December 1996. Of those turtles taken, 28 loggerheads were taken in trawls that also caught weakfish and resulted in two deaths. Most of the sea turtle takes occurred in late fall. In all cases, weakfish landings were second in poundage behind Atlantic croaker and summer flounder (NEFSC, unpub. data).

The North Carolina Observer program documented 33 flynet trips from November through April of 1991 – 1994 and recorded no turtles caught in 218 hours of trawl effort. However, a NMFS observed vessel fished for summer flounder for 27 tows with an otter trawl equipped with a TED and then fished for weakfish and Atlantic croaker with a fly net that was not equipped with a TED. They caught one loggerhead in 27 TED equipped tows and seven loggerheads in nine fly net tows without TEDs. In addition, the same vessel using the fly net in a previous trip took 12 loggerheads in 11 out of 13 observed tows targeting Atlantic croaker. Weakfish was a secondary species from these fly net tows (NEFSC, unpub.data). A slight potential does exist for interaction between the bluefish fishery and humpback whales, particularly in the mid-Atlantic, but no documentation of such interactions is available.

Other Southeast Fisheries

Georgia and South Carolina prohibit gillnets for all but the shad fishery. This fishery was observed in South Carolina for one season by the NMFS Southeast Fisheries Science Center (McFee et al. 1996). No takes of protected species were observed. Florida has banned all but very small nets in state waters, as has the state of Texas. Louisiana, Mississippi and Alabama have also placed restrictions on gillnet fisheries within state waters such that very little commercial gillnetting takes place in southeast waters, with the exception of North Carolina.

Most pot fisheries in the southeast are prosecuted only in areas not likely to be frequented by whales.

c. Conservation and recovery actions shaping the environmental baseline

A number of activities are in progress that ameliorate some of the potential threat from the aforementioned activities. Education and outreach are considered one of the primary tools to reduce the threat of impact from private and commercial vessels. The USCG has provided education to mariners on whale protection measures and uses their programs such as radio broadcasts and notice to mariner publications to alert the public to potential whale concentration areas. The USCG is also participating in international activities (discussed below) to decrease the potential for commercial ships to strike a whale. In addition, outreach efforts for fishermen under the ALWTRP are increasing awareness and fostering a conservation ethic among fishermen that is expected in the long run to help reduce overall probability of adverse impacts in the environmental baseline from these commercial fishing activities.

In addition to the ESA measures for Federal actions mentioned in the previous section, numerous recovery activities are being implemented to decrease the level of impacts from private and commercial vessels in the action area. These include the early warning system (EWS), other activities recommended by the Northeast Recovery Plan Implementation Team for the Right and Humpback Whale Recovery Plans (NEIT) and Southeast Recovery Plan Implementation Team for the Right Whale Recovery Plan (SEIT), and NMFS regulations.

(1) The Northeast and Southeast Early Warning Systems

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Due to concern over potential collisions between right whales and hopper dredges operating in what is now designated critical habitat for right whales in southeast waters, monitoring requirements placed on the ACOE under a Biological Opinion resulted, in the 1980's, in the first regular aerial survey flights for right whales in waters off the Southeast United States. These surveys evolved over the years and, since late 1993/early 1994, have been officially sponsored by NMFS, the USCG, USN, and ACOE, and became known as the "Early Warning System" or EWS, also known as Whale Alert Program. The surveys were designed as daily reconnaissance flights to detect the presence of whales in and around a number of busy southeast shipping ports, USN vessel and submarine bases, and ACOE dredging sites, in order to alert vessels of the whales' presence and prevent potential whale/vessel collisions. The EWS, with the assistance of the USN and USCG, has evolved a sophisticated communication network which alerts not only dredges and military vessels in the area, but provides broadcasts to mariners via NAVTEX, NOAA Weather Radio, and other means, and even contacts vessels directly via radio when urgently necessary to prevent imminent collision.

Using the SEUS aircraft survey program as a model, efforts were initiated in 1997 to develop a similar program in the Cape Cod Bay (CCB) and the Great South Channel in late winter and early spring. The program is a cooperative effort by NMFS, the USCG, Massachusetts Division of Fisheries, the Massachusetts Environmental Trust, the Center for Coastal Studies, the USN and MASSPORT (the Boston port authority). As a result of recommendations by the ALWTRT,

a similar EWS was established in the northeast in late 1996. NMFS has the ability under the ESA to impose emergency regulations which may be used to protect unusual congregations of right whales. Through a fax-on-demand system, fishermen can obtain EWS sighting reports and, in some cases, can make necessary adjustments in fishing practices to decrease the potential for entanglements. The Commonwealth of Massachusetts was a key collaborator in the 1996-1997 EWS effort and expanded the effort during the 1997-1998 seasons. Effort remained strong in 1999. The USCG has played a key role in this effort all along, providing both air and sea support, and their continued cooperation is expected throughout. The State of Maine and Canada Department of Fisheries and Oceans have expressed interest in conducting this type of EWS along their coastal waters. It is expected that other potential sources of sightings such as the U.S. Navy may contribute to this effort following NMFS' commitment to support the EWS over the long-term. The NMFS Maine ALWTRP Coordinator is also working with local aquaria to collect whale sightings from fishing vessels in the Gulf of Maine. All this cooperation will increase the chance of success of this program in diverting potential impacts in the environmental baseline.

(2) The Northeast and Southeast Whale Recovery Implementation Teams

In order to address the known impacts to right and humpback whales described in the Recovery Plans, NMFS established the Northeast and Southeast Recovery Plan Implementation Teams (NEIT and SEIT). The Recovery Plans describe steps to reduce the impacts to levels that will allow the two species to recover and rank the various recovery actions in order of importance. The Implementation Teams provide advice to the various Federal and state agencies or private entities on achieving these national goals within their respective regions. The teams both agreed to focus primarily on habitat and vessel- related issues and rely on the take reduction plan process under the MMPA for reducing takes in commercial fisheries.

As part of NEIT activities, a Ship Strike Workshop was held in April 1997 to inform the shipping community of their need to participate in efforts to reduce the impacts of commercial vessel traffic on northern right whales. The workshop summarized current research efforts using new shipboard and moored technologies as deterrents, and a report was given on ship design studies currently being conducted by the New England Aquarium and Massachusetts Institute of Technology. This workshop increased awareness among the shipping community and has likely further contributed to reducing the threat of ship strikes of right whales by advising mariners of information on location of whales so that they can be avoided (SAS) and by giving them guidance on operations when whales are encountered.. In addition, a Cape Cod Canal Tide Chart that included information on critical habitat areas and the need for close watch during peak right whale activity was distributed widely to professional mariners and ships passing through the canal. Annually, radio warning transmissions are transmitted by Canal traffic managers to vessels transiting the Canal during peak Northern right whale activity periods. Follow-up meetings were held with New England Port Authority and pilots to notify commercial ship traffic to keep a close watch during peak right whale movement periods. In response to current needs, the NEIT is reconfiguring its ship strike subcommittee to address these impacts on a more formal basis.

As part of addressing shipping issues on a more formal basis, the NEIT ship strike subcommittee developed a 1998-1999 strategy plan based on recommendations of a New England Aquarium shipping and right whale workshop in April of 1997. Language was developed for the U.S. Coast Pilot and NOAA nautical charts, a right whale brochure, and an International Maritime Organization (IMO) ship strike information paper, including language that eventually was used in development of the IMO initiative (see below). Even a recreational vessel initiative was put forward and a sticker warning operators of the potential for collision was developed. A right whale avoidance/training/education video targeting merchant mariners is in development. All these activities are aimed at educating all sectors of vessel operators from commercial merchants to recreational vessel owners. This NEIT ship strike subcommittee is also called on to address and suggest solutions to new issues as they arise, including the increase in high speed ferry services, so that they do not add impacts to the environmental baseline beyond what is already being considered.

Both the SEIT and NEIT's are involved in exploring a predictive GIS modeling system that will link environmental variables in key habitat areas to use as a management tool related to ship traffic in major shipping lanes near critical habitats. A workshop was held at the NEFSC in the fall of 1998 to begin the process of studying the linkage between environmental variables and right whale distribution. The SEIT has established a GIS subcommittee and is progressing with work to analyze right whale sightings, vessel traffic information, and pertinent environmental data in order to better understand right whale distribution patterns in southeast waters and ultimately prevent human interactions with these whales.

As of May 1999, a joint effort has begun to develop a cooperative program between shipping companies operating in the east coast coastal waters of Canada and the US. This will entail development of cooperative agreements between individual shipping companies.

(3) Reducing Potential for Vessel Related Impacts

As part of recovery actions aimed at reducing vessel related impacts, NMFS published a proposed rule in August 1996 restricting vessel approach to right whales (61 FR 41116) to distances outside of 500 yards in order to minimize human-induced disturbance. The Recovery Plan for the Northern Right Whale identified disturbance as one of the principal human-related factors impeding right whale recovery (NMFS 1991b). Following public comment, NMFS published an interim final rule in February 1997 codifying the regulations. With certain exceptions, the rules prohibit both boats and aircraft from approaching any right whale closer than 500 yds. The regulations are consistent with the Commonwealth of Massachusetts' approach regulations for right whales. These are expected to reduce the potential for vessel collisions inherent in the environmental baseline.

In April 1998, the USCG submitted, on behalf of the United States, a proposal to the International Maritime Organization (IMO) requesting approval of a mandatory ship reporting system in two areas off the east coast of the United States. The USCG worked closely with NMFS and other agencies on technical aspects of the proposal. The proposal was submitted to the IMO's Subcommittee on Safety and Navigation for consideration and submission to the

Marine Safety Committee at IMO and approved in December 1998. The system will require all vessels over 300 tons to report to a shore-based station, thereby prompting a return message which provides precautionary measures to be taken to reduce the likelihood of a ship strike and locations of recent right whale sightings. The reporting system will be implemented by July 1999. The USCG and NOAA will play important roles in helping implement the system.

(4) Measures to Reduce Incidental Takes of Sea Turtles in Commercial Fisheries

NMFS has implemented a series of regulations aimed at reducing potential for incidental mortality of sea turtles in commercial fisheries. In particular, NMFS has required the use of TEDs in southeast U.S. shrimp trawls since 1989 and in summer flounder trawls in the mid-Atlantic area (south of Cape Henry, Virginia) since 1992. It has been estimated that TEDs exclude 97% of the turtles caught in such trawls. These regulations have been refined over the years to ensure that TED effectiveness is maximized through proper placement and installation, configuration (e.g., width of bar spacing), flotation, and more widespread use. However, with the expansion of fisheries to previously underutilized species of fish, trawl effort directed at other than summer flounder and that does not meet the definition of a summer flounder trawl as specified in the TED regulations, may be an undocumented source of mortality for which TEDs should be considered.

In 1993 (with a final rule implemented 1995), NMFS established a Leatherback Conservation Zone to restrict shrimp trawl activities from off the coast of Cape Canaveral, Florida, to the North Carolina/Virginia border. This provides for short-term closures when high concentrations of normally pelagically distributed leatherbacks are recorded in more coastal waters where the shrimp fleet operates. This measure is necessary because, due to their size, adult leatherbacks are larger than the escape openings of most NMFS-approved TEDs.

In addition, NMFS has been active in public outreach efforts to educate fishermen regarding sea turtle handling and resuscitation techniques. As well as making this information widely available to all fishermen, over the past year NMFS has conducted workshops with longline fishermen to discuss bycatch issues including protected species, and to educate them regarding handling and release guidelines. NMFS intends to continue these outreach efforts and hopes to reach all fishermen participating in the pelagic longline fishery over the next one to two years.

(5) Sea Turtle Stranding and Salvage Network Activities

There is an extensive network of sea turtle stranding and salvage network (STSSN) participants along the Atlantic and Gulf of Mexico coasts which not only collects data on dead sea turtles, but also rescues and rehabilitates any live stranded turtles. In most states, the STSSN is coordinated by state wildlife agency staff, although some state stranding coordinators are associated with academic institutions. Data collected by the STSSN are used to monitor stranding levels and compare them with fishing activity in order to determine whether additional restrictions on fishing activities are needed. These data are also used to monitor incidence of disease, study toxicology and contaminants, and conduct genetic studies to determine population structure. All of the states that participate in the STSSN are collecting tissue for and/or conducting genetic

studies to better understand the population dynamics of the small subpopulation of northern nesting loggerheads. These states also tag turtles as live ones are encountered (either via the stranding network through incidental takes or in-water studies). Tagging studies help provide an understanding of sea turtle movements, longevity, reproductive patterns, etc.

d. Other potential sources of impacts in the environmental baseline

A number of activities that may indirectly affect listed species in the action area of this consultation include discharges from wastewater systems, dredging, ocean dumping and disposal, and aquaculture. The impacts from these activities are difficult to measure. Where possible, however, conservation actions are being implemented to monitor or study impacts from these sources. For example, extensive monitoring is being required for a major discharge in Massachusetts Bay (Massachusetts Water Resources Authority) in order to detect any changes in habitat parameters associated with this discharge. MWRA participates in the NEIT and they are now developing a scope of work that will result in creation of a food web model for Massachusetts Bay as a requirement of their EPA permit. Close coordination is occurring through the section 7 process on both dredging and disposal sites to develop monitoring programs and ensure that vessel operators do not contribute to vessel-related impacts and that dredging is planned to reduce the potential for take of sea turtles.

NMFS and the U.S. Navy have been working cooperatively to establish a policy for monitoring and managing *Acoustic Impacts from Anthropogenic Sound Sources* in the marine environment. Acoustic impacts can include temporary or permanent injury, habitat exclusion, habituation, and disruption of other normal behavior patterns. It is expected that the policy on managing anthropogenic sound in the oceans will provide guidance for programs such as the use of acoustic deterrent devices in reducing marine mammal-fishery interactions and review of Federal activities and permits for research involving acoustic activities. The Office of Naval Research hosted a meeting in March 1997 to develop scientific and technical background for use in policy preparation. NMFS hosted a workshop in September 1998 to gather technical information which will support development of new acoustic criteria.

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Aquaculture is currently not concentrated in whale, sturgeon, or sea turtle high-use areas, but some projects have begun in Cape Cod Bay Critical Habitat and in other inshore areas off the Massachusetts and New Hampshire coast. Acknowledging that the potential for impacts is currently unknown, NMFS is coordinating research to measure habitat related changes in Cape Cod Bay and is ensuring through the section 7 process that these facilities do not contribute to the entanglement potential in the baseline. Many applicants have agreed to alter the design of their facilities to minimize or eliminate the use of lines to the surface that may entangle whales and/or sea turtles.

The *Massachusetts Environmental Trust and Massachusetts Division of Marine Fisheries* have funded several projects to investigate fixed fishing gear and potential modifications to reduce the risk of entanglement to whales. These projects are an important complement to the NMFS research effort and have yielded valuable information on the entanglement problem. The Trust has also funded research on right whales in the Cape Cod Bay critical habitat area.

In summary, the potential for vessels and fisheries to adversely affect whales, sea turtles, and shortnose sturgeon remains throughout the action area of this consultation. However, recovery actions have been undertaken as described and continue to evolve. Although those actions have not been in place long enough for a detectable change in the northern right whale population (or other listed species populations) to have occurred, those actions are expected to benefit the northern right whale and other listed species in the foreseeable future. These actions should not only improve conditions for listed whale and sea turtles, they are expected to reduce sources of human-induced mortality as well.

E. Effects of the Action

This section of a BO assesses the direct and indirect effects of the proposed action on threatened and endangered species or critical habitat, together with the effects of other activities that are interrelated or interdependent (50 CFR 402.02). Indirect effects are those that are caused later in time, but are still reasonably certain to occur. Interrelated actions are those that are part of a larger action and depend upon the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration (50 CFR 402.02).

Compared to other Atlantic trawl and gillnet fisheries the commercial bluefish fishery is relatively low in total landings; bluefish and is more often bycatch associated with other target fisheries in the EEZ than a target species of a directed fishery. As mentioned earlier, the directed commercial bluefish fishery is primarily in state waters, with the exception of New England where the majority of landings come from the EEZ. In general, mid-Atlantic landings predominate over northern and southern Atlantic regions. Therefore, **spatially**, the greatest interactions with this fishery and ESA-listed species would be expected to involve entanglement, capture, or hooking of sea turtles in state waters, primarily in the mid-Atlantic. In New England, gear that lands bluefish in the EEZ may also entangle large whales. The time of year that would be expected to result in the greatest number of interactions would be in the Mid-Atlantic from spring through fall. However, some interactions could occur in some regions as landings occur in every month though often associated with catches of other finfish fisheries. These interactions would also likely have already been considered in assessing impacts of other directed fisheries through consultations on species such as weakfish and summer flounder.

For the more southern states (SC, GA, FL), interactions are less likely in both gillnet and trawl gear. These states have banned most gillnetting in state waters. In addition, Turtle Excluder Device (TED) regulations are in place for summer flounder trawl vessels in parts of Virginia and North Carolina waters when trawlers are most capable of catching sea turtles. These TEDs have been shown to significantly reduce the mortality and serious injury of sea turtles taken in trawlers. Since the regulations require that any vessel capable of catching summer flounder or having 100 lbs or more of summer flounder on board are required to use TEDs, bluefish trawlers should fall under that definition.

Interactions with this fishery can take the form of entanglement, capture or hooking (internally or externally). Entanglement of marine mammals, sea turtles and shortnose sturgeon in gillnets is

probably the most severe interaction as it most often results in serious injury and death. Animals that do escape often retain pieces of gear that can inhibit their foraging or other survival activities. The disentanglement network for large whales often successfully disentangles whales, but if sea conditions are not favorable or the whale is too mobile, efforts can be hampered; gear left trailing on the animal can cause later harm. The use of TEDs in trawls and the length of the tows influence the level of injury to sea turtles. For all the gear types it is often difficult for an observer to tell if an animal released alive has been injured to the point of influencing its future survival potential. Consequently, since most data on interaction with gear cannot be refined to further detail with respect to level of effect as described above, the term "take" is sometimes used in this discussion to refer to these different types of potential interactions with bluefish gear.

Given all these considerations, the primary species likely to be adversely affected by the commercial bluefish fishery would be loggerhead and Kemp's ridley sea turtles. Sea sampling data indicate very little interaction of mid-Atlantic fisheries with shortnose sturgeon and green sea turtles. The primary area of impact of the directed commercial fishery for bluefish on sea turtles is likely to be trawl and gillnet gear in state waters in the mid-Atlantic from Virginia through New York, from late spring through fall (peak bluefish abundance July - Oct). In New England, interactions with trawl and gillnet gear may occur in summer through early fall (peak bluefish abundance Aug-Sept), although given the level of effort, the probability of interactions is much lower than in the Mid-Atlantic.

Analysis of the existing observer data indicates that there have been very few observed trips that were targeting bluefish. Bluefish trips represented only 5% of all the gillnet trips observed (which in turn is only 5% of total trips prosecuted). In 1995--15 bluefish trips out of 398 trips were observed, in 1996--23/360, and in 1997--21/346. There were no entanglements of endangered species observed in bluefish gillnets on any of these trips. Harbor seals were the only species documented by observers entangled in bluefish gillnet gear on two trips where greater than 50% of the catch was bluefish. The remaining catch composition was primarily spiny dogfish. No captures or entanglements have been observed in trawls targeting bluefish.

The "OBSCON" data base (most recent, not completely verified data) showed the following information for trips where the secondary species (in terms of pounds kept) was bluefish:

date	kept catch composition	target fish	area	turtle species	condition
3/98	monkfish 2500 bluefish 72 summer fldr 13 Little tunny 10	monkfish	NC	loggerhead	alive
4/98	Kingfish 210 Bluefish 45 butterfish 6 bonito 5	kingfish	NC	Kemp's ridley	dead

date	kept catch composition	target fish	area	turtle species	condition
12/98	speck. trout 26 bluefish 16 mullet 6 weakfish 4 black drum 5 striped bass 2	speckled trout	NC	Kemp's ridley	injured, brought in for rehab
3/99	monkfish 8220 bluefish 520 little tunny 48	monkfish	NC	loggerhead	4 dead 1 alive
3/99	monkfish 2540 bluefish 80 black drum 40 little tunny 12	monkfish	NC	loggerhead	2 dead 1 alive

Generally it appears that bluefish are caught with a variety of other species depending on the season. While in the mid-Atlantic bluefish is consistently one of the top 5 species landed, it is usually not the target species since the market price is consistently very low (Tork, pers comm). However, based on the information above, the commercial fishery which catches and sells bluefish is taking Kemp's ridley and loggerhead sea turtles. Some of these interactions with gillnet gear have been analyzed in other consultations on FMPs like summer flounder and monkfish, but others, such as incidental takes during kingfish or speckled trout trips, would be unaccounted for. This indicates that adequate observer coverage needs to be maintained in the mid-Atlantic coastal gillnet fishery to cover fisheries like the bluefish fishery that use gear capable of entangling or capturing sea turtles in order to verify the extent of incidental take. The mid-Atlantic gillnet fishery, regardless of target species, is known to take sea turtles.

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Very little data are available on the bluefish commercial fishery in the NMFS sea sampling database, but there is limited information on fisheries for similar species such as weakfish. As with weakfish, bluefish feed on small, schooling, pelagic fishes which also associates them in the water column with piscivorous whales. A consultation on the weakfish fishery (June 17, 1997), concluded that the weakfish fishery takes sea turtles. Flynet trawl gear indicated a particularly large take level. The biological opinion recommended a TED that would be workable in flynet trawls. In-water testing is scheduled for summer 1999. No information indicates that bluefish are targeted using this type of gear, although bluefish may be a portion of catch in many cases.

Adverse effects in the Mid Atlantic portion of the fishery.....

Comparing weakfish/Atlantic croaker information which is the most similar mid-Atlantic fishery to bluefish for which we have information, data in the NEFSC sea sampling data base from April 1994 - December 1996 showed no captures or entanglements of sea turtles in gillnets targeting weakfish or which contained weakfish in the catch (64 trips, 412 sets). Trawl trips that were targeting Atlantic croaker that also contained weakfish and summer flounder had incidental takes of turtles. This is the same type of gear used to target bluefish. During the times sea turtles are present in the area being fished, bluefish trawls are just as capable of taking turtles. The number of trips sampled for either bluefish or weakfish are inadequate to draw any statistical conclusions or estimate total expected take. In 1999, mid-Atlantic coastal trawl trips in January recorded 12 loggerhead turtles, 2 Kemp's ridleys, and one unidentified turtle; in February three loggerheads

were observed taken. In March 1999, nine loggerheads and one Kemp's ridley were taken in bottom coastal gillnets. While these were not bluefish-directed trips, this information illustrates how capable the gear is of taking turtles. Take patterns logically follow the seasonal nature of both the fisheries and the sea turtles. Takes are more prevalent in North Carolina in the late winter and in New England during summer.

For endangered whales, the most likely species that may interact with this portion of the fishery include humpback and fin whales in the fall/winter in the Mid-Atlantic. As mentioned in the status of listed species section above, juvenile humpbacks have shown an increased inshore presence in the mid-Atlantic waters in the fall and winter months in recent years.

Shortnose sturgeon are found in the Hudson, Delaware and Chesapeake River systems. It is possible that shortnose sturgeon could be taken in the estuaries of these systems, although observer information is considered inconclusive due to the difficulty in differentiating this species from the Atlantic sturgeon. However, sturgeon are usually found in the estuaries in winter and upstream during spring through fall, which is not when most of the bluefish fishing takes place.

Adverse effects in the New England component of the fishery:
In contrast to the mid-Atlantic discussed above, most New England landings of bluefish in the commercial fishery are from effort in the EEZ. In the Gulf of Maine EEZ, the fishery would not only be likely to adversely affect Kemp's ridley, loggerhead and leatherback sea turtles, but would also have more potential to come into contact with large whales: right whales, humpback whales and fin whales. Since the gillnets used in the bluefish fishery would need to comply with both the ALWTRP and the HPTRP, which are part of the scope of the action considered in this consultation, and since the ALWTRP is expected to reduce the serious injury and mortality of these species of large whales to below the potential biological removal level, the effects of the bluefish fishery on large whales should be minimal. This is particularly true, given low overall effort for bluefish in New England, which means there is a low probability that this fishery will actually interact with large whales.

As far as trawls are concerned, New England trawl gear does not use TEDs and sea turtles are taken in finfish trawls in New England as demonstrated above. However, the expected take in New England would be much lower than in the mid-Atlantic because overall effort is very low and the density of sea turtles is lower as well.

Since the New England portion of this fishery is primarily in the EEZ, it is unlikely that shortnose sturgeon would be taken in this fishery. While these fish are known to make occasional excursions into the saline environment, they primarily occupy the upper estuaries and rivers. However, due to the difficulty in differentiating this species from the Atlantic sturgeon, observer and logbook data are inconclusive. Some takes of shortnose sturgeon have been recorded and consequently cannot be ruled out entirely. As with the mid-Atlantic, the fish are found in the lower reaches of rivers and estuaries primarily during winter, and are further upstream, away form the EEZ area of operation for the bluefish fishery during summer on New England.

Adverse affects in the southeast component of the fishery:
As with the New England and mid-Atlantic portions of this fishery, bluefish is often a secondary target species in the southeast. Fishermen in the Spanish mackerel fishery are known to target bluefish when they cannot target Spanish mackerel. Pompano and spot fisheries, also subsets of the Spanish mackerel fishery also often target bluefish as a secondary species in southern Georgia and Florida (FDEP unpublished data). Gillnets are banned in state waters in the southeast, but gillnet effort could occur in the EEZ and trawlers can operate throughout the area. However, trawlers in North Carolina are required to use TEDs if they meet the definition of a summer flounder trawler (capable of catching summer flounder or having 100 pounds or more of summer flounder on board).

Shortnose sturgeon are found in rivers in North Carolina and Georgia (Cape Fear River, Savannah and Santee Rivers), but as in the northeast and mid-Atlantic rivers tend to occupy the estuarine environment during late fall and winter and move upriver to spawn in spring. While it is possible for the range of the species and the fishery to overlap in this region, the probability of an entanglement or capture occurring is very low.

The bluefish fishery would be expected to have the least impact on sea turtles and shortnose sturgeon in the southeast and will likely not interact with any endangered whales. This is because effort for bluefish is comparatively low overall in the southeast compared to the other two regions, turtles are protected from trawlers in this fishery by TEDs in North Carolina (based on their meeting the summer flounder definition), and gillnets are banned in South Carolina, Georgia and Florida state waters.

AO

Other commercial gear types: As noted earlier, fish pound nets (7%), hand and troll lines (6%), and haul seines (3%) are used in the commercial bluefish fishery. Sea turtles are found inside pound nets and can become entangled in the leaders. Smaller marine mammals are known to be taken in haul seines but no entanglements have been documented for sea turtles. Hand and troll lines have been implicated by anecdotal accounts as snagging endangered whales, but no injury was expected a a result. Since this fishery is so small to begin with and these gear types represent such a small proportion of total effort, it is unlikely that entanglement or capture in this type of gear would occur for any ESA-listed species.

Recreational Fishery

Since the recreational fishery gets 80% of the bluefish quota and charter/recreational boats are commonly found in the EEZ, a significant amount of hook and line fishing occurs for bluefish.

Sea turtles do ingest baited hooks or get snagged in their appendages by hooks, both of which have been recorded in the STSSN database. The probability of this occurring is difficult to ascertain and very little data are available to analyze impacts from this type of interaction on individual animals. In a study conducted by NMFS Galveston Laboratory between 1993 through 1995 (Cannon and Flanagan, 1996), interactions of 170 Kemp's ridleys were reported associated with recreational hook and line gear:

18 dead stranded turtles

51 rehabilitated turtles
5 that died during rehabilitation
96 released by fishermen

Cumulatively, fishery entanglement anomolies are noted in fewer than 4% of stranded sea turtle carcasses reported between 1990 and 1996 and some carcasses carry more than one hook (NMFS Biological Opinion on Brunswick Steam Electric Plant). In addition it is often impossible to tell if the entangling gear is recreational or commercial.

Summary: Based on the discussion above, including analysis of observer data and comparison to similar fisheries, the commercial bluefish fishery is likely to have its greatest effect on loggerhead and Kemp's ridley sea turtles in the mid-Atlantic area from spring through fall. This commercial fishery is somewhat unique in that, due to low market value, relatively few fishermen target this species, but they represent an important secondary species in fisheries targeting other species in kept catch for commercial sale. Consequently, some of the incidental take related to commercial bluefish catch has been addressed in several other FMP consultations on the target species. However, some previously unaddressed sea turtle take is expected from both the commercial and recreational fishery targeting bluefish. Given the relatively low effort overall in the gillnet portion of this fishery, particularly in New England, and restrictions of the ALWTRP, the probability of interactions with endangered whales is small. Turtles may also be taken in trawls for bluefish, but trawl effort is even lower than gillnet effort and the total number of takes in trawls would be small.

Adverse effects on right whale critical habitat:

There is no known direct trophic interaction between bluefish and right whales. However, recovery of commercially targeted finfish stocks from their current overfished condition may increase predation on the small schooling fish biomass (sand lance, herring, and mackerel) that do feed directly on zooplankton resources throughout the species' feeding range. In addition, 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 finfish 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 adequate levels for right whale feeding.

No direct adverse effects on right whale critical habitat are expected from commercial or recreational gear for bluefish.

F. 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 and are accounted for in the environmental baseline section of this opinion.

Cumulative impacts from unrelated, non-Federal actions occurring in the northwest Atlantic may affect sea turtles, marine mammals, and their habitats. Stranding data indicate that marine mammals and sea turtles in Atlantic waters die of various natural causes, including cold stunning (in the case of sea turtles), as well as human activities, such as incidental capture in state fisheries, ingestion of or entanglement in debris, vessel strikes, and degradation of nesting habitat. The cause of death of most marine mammals and turtles recovered by the stranding network is unknown. In waters of many Atlantic states, state-permitted coastal gillnetting may affect listed sea turtles and marine mammals. Recreational hook-and-line fisheries have been known to lethally take sea turtles, including Kemp's ridleys.

Fishing activities in state waters take several protected species. However, it is not clear to what extent state-water fisheries may affect listed species differently than the same fisheries operating in Federal waters. Further discussion on state water fisheries is contained in the Environmental Baseline section.

Wiley *et al.* (1995) showed that for stranded humpback whales where the cause of death was determinable, (mid-Atlantic area between Chesapeake Bay, Virginia, and Cape Hatteras, North Carolina) 30% of the mortalities were attributed to vessel strikes and 25% had injuries consistent with entanglement in fishing gear. This indicates that vessel interactions are having an impact upon whale populations along this portion of the coast, as well as in right whale concentration areas. Because most of the whales involved in these interactions are juveniles, areas of concentration for young or newborn animals are particularly important to protect. This also raises concerns that, with such mortality focused on one age-class of the population, that future recruitment to the breeding population may be affected.

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Ship strikes have been identified as a significant source of mortality to the northern right whale population (Kraus 1990) and are also known to impact all other endangered whales. Small vessel traffic is also known to take sea turtles. Commercial and private vessels may affect humpback, fin and right whales, and all species of sea turtles. As a point of reference, commercial shipping traffic in Massachusetts Bay is estimated at 1200 ship crossings per year with an average of three per day. About 20 whale watch companies representing 40–50 boats conduct several thousand trips from April to September, with the majority of effort in the summer season. More than 280 commercial vessels fish on Stellwagen Bank. Sportfishing contributes more than 20 vessels per day from May to September. In addition, an unknown number of private recreational boaters frequent Massachusetts and Cape Cod Bays. Massachusetts waters occupy only a small portion of the range of these species, so the potential traffic they are subjected to over their entire range along the western N. Atlantic is substantial. It is possible that the combination of these activities may cause sublethal effects to protected species that could prevent or slow a species' recovery. While the combination of these activities may cause sublethal effects to endangered and threatened species that could prevent or slow a species' recovery, such effects are currently unknown. Various initiatives have been planned or undertaken to expand or establish high-speed watercraft service in the northwest Atlantic, including one service between Bar Harbor, Maine, and Nova Scotia with a vessel operating at higher speeds than established watercraft service. The Bar Harbor–Nova Scotia high speed ferry conducted its first season of operations in 1998. The operations of these vessels and other high-speed craft may adversely affect threatened and

endangered whales and sea turtles, as discussed previously with private and commercial vessel traffic in the Action Area. NMFS and other member agencies of the NEIT will continue to monitor the development of the high speed vessel industry and its potential threats to listed species and critical habitat. Recent whale strikes resulting from interaction with whale watch boats and recreational vessels have also been recorded.

It is expected that states will continue to license/permit large vessel and thrill-craft operations which do not fall under the purview of a Federal agency and will issue regulations that will affect fishery activities. NMFS will continue to work with states to develop ESA Section 6 agreements and Section 10 permits to enhance programs to quantify and mitigate these takes. Increased recreational vessel activity in waters of the Atlantic and Gulf of Mexico will likely increase the number of whales and turtles taken by injury or mortality in vessel collisions.

Sources of pollutants in Atlantic and Gulf coastal regions include atmospheric loading of pollutants such as PCBs, storm water runoff from coastal towns, cities and villages, runoff into rivers emptying into the bays, groundwater discharges and river input and runoff. Nutrient loading from land based sources such as coastal community discharges is known to stimulate plankton blooms in closed or semi-closed estuarine systems. The effects to larger embayments is unknown. Although pathological effects of oil spills have been documented in laboratory studies of marine mammals and sea turtles (Vargo *et al.* 1986), the impacts of many other anthropogenic toxins have not been investigated.

Geraci *et al.* (1989) identified bioaccumulation of the neurotoxin responsible for paralytic shellfish poisoning (saxitoxin) in mackerel consumed by humpback whales as the possible cause of mortality of 14 humpbacks which stranded between November of 1987 and January of 1988. No saxitoxin was identified in plankton or shellfish sampled in Massachusetts waters at the time of the mortality. The authors suggest the neurotoxin could have been transported by mackerel obtaining the toxin from planktonic sources in the Gulf of St. Lawrence, the spawning ground for mackerel. While a similar multiple mortality of large whales has not been observed, the authors suggest individual mortalities caused by the biotoxin would go unnoticed. The reason for the multiple mortalities in the winter of 1987 and 1988 was never explained, although they may have been related to a shift in the normal diet of humpbacks due to the lack of sand lance in the bays the previous summer.

Other contributors of pollutants in the Massachusetts and Cape Cod Bays include atmospheric loading of pollutants such as PCBs, storm water runoff from Massachusetts coastal towns, cities and villages, runoff into rivers emptying into the bays, groundwater discharges and river input and runoff from Gulf of Maine waters.

Generally, right whales and humpback whales do not use southeastern waters for feeding. Therefore, most of the effects from pollution would be expected in the northern summer feeding areas for these species. However, sea turtles nest primarily in the southeastern United States, and early life stages and breeding individuals of these species are likely to be impacted by pollution in these areas, as well as in the northeast. Necropsies of hatchlings and juveniles show that young turtles commonly consume plastics and tar balls (STSSN stranding data base).

Humpback whale entanglements occur in relatively high numbers in Canadian waters. 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). Right whale entanglements also occur in Canadian waters, although not as frequently as for humpback whales. Many entanglements observed in U.S. waters may have originated in Canadian waters. Unless gear is specifically marked and such marks are documented, it is often impossible to determine the origin of the gear.

For sea turtles, substantial impacts of human activities are still evident on nesting populations of all species, particularly those areas outside of U.S. control. This includes poaching of eggs from nests and using the turtles themselves for food or shell products.

The combination of all these activities may cause effects to protected species that could prevent or slow a species' recovery. Designation of critical habitat, proactive approaches by other Federal agencies (i.e. the Army Corps of Engineers (ACOE) has limited dredging in southeastern channels to periods when turtles are not concentrated in the channels), participation by Federal agencies in recovery plan implementation activities and the section 7 process all contribute to mitigating these potential cumulative effects.

G. Conclusion

After reviewing the current status of listed species, the environmental baseline for the action area, the effects of the proposed action and the cumulative effects, it is the NMFS' biological opinion that the operation of the recreational and commercial bluefish fishery and associated management actions are not likely to jeopardize the continued existence of right, humpback and fin whales, or loggerhead, Kemp's ridley, or leatherback sea turtles, or shortnose sturgeon, and is not likely to adversely modify right whale critical habitat.

H. Incidental Take Statement

Section 9 of the Endangered Species Act and federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Incidental take is defined as take that is incidental to, and not the purpose of, the execution of an otherwise lawful activity. Under the terms of sections 7(b)(4) and 7(o)(2), taking that is incidental to and not intended as part of the action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement (ITS).

The measures described below are non-discretionary and must be undertaken by NMFS in a manner that they become binding conditions so that the exemption in section 7(o)(2) will apply. NMFS has a continuing duty to regulate the activity covered by this ITS. If NMFS fails to assume and implement the terms and conditions through enforceable terms, the protective

coverage of section 7(o)(2) may lapse. In addition, NMFS must report the progress of the action and monitor the impact of incidental take.

When a proposed NMFS action which may incidentally take individuals of a listed species is found to be consistent with section 7(a)(2) of the ESA, section 7(b)(4) of the ESA requires NMFS to issue a statement specifying the impact of any incidental taking. It also states that reasonable and prudent measures necessary to minimize such impacts be provided along with implementing terms and conditions. Only those incidental takes resulting from the agency action (including those caused by activities approved by the agency) that are identified in this statement and are in compliance 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.

NMFS is not including an incidental take authorization for endangered whales at this time because the incidental take of endangered whales currently cannot be authorized under the provisions of section 101(a)(5) of the Marine Mammal Protection Act or its 1994 Amendments.

Anticipated Amount or Extent of Incidental Take

NMFS anticipates that the operation of the bluefish fishery under the proposed Bluefish FMP may result in the injury or mortality of loggerhead or Kemp's ridley sea turtles and shortnose sturgeon by entanglement, capture or hooking. Based on observed takes from Sea Sampling data for gear types targeting or capable of catching bluefish, NMFS anticipates that the following numbers of incidental takes of sea turtles and shortnose sturgeon may be observed annually in the bluefish fishery:

- 6 takes (no more than 3 lethal) of loggerhead sea turtles,
- 6 lethal or non-lethal take of Kemp's ridley sea turtles,
- 1 shortnose sturgeon

Effect of the take

In the accompanying Biological Opinion, NMFS has determined that this level of anticipated take is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat.

Reasonable and Prudent Measures

Not more than 6 loggerhead sea turtles and 6 Kemp's ridley sea turtle are authorized to be incidentally taken in any given year as a result of the bluefish fishery. Below are the reasonable and prudent measures, with their implementing terms and conditions, that are designed to minimize the impact of the incidental take that might otherwise result from the proposed action. If, during the course of the bluefish fishery, this level of incidental take is exceeded, the additional level of take would represent new information requiring reinitiation of consultation and review of the reasonable and prudent measures that have been provided. If authorized levels

of incidental take are exceeded, the Office of Sustainable Fisheries must immediately provide an explanation of the causes of the taking and review, with the Office of Protected Resources, the need for possible modification of the reasonable and prudent measures.

NMFS has determined that the following reasonable and prudent measures are necessary and appropriate to minimize impacts of incidental take of sea turtles and shortnose sturgeon:

1. NMFS must provide for and evaluate observer information (and other information when available) annually to determine whether the incidental take level should be modified or if other management measures need to be implemented to reduce the take. Reports must be submitted to Northeast Region and Headquarters Protected Resources Divisions.

2. NMFS must incorporate planning for reporting of sea turtle takes into the Atlantic Coastal States Cooperative Statistics Program. Reporting information must provide adequate identification guidance for both sea turtles and shortnose sturgeon. Takes must be reported within 48 hours of returning from a trip in which an incidental take occurred. The reports shall include a description of the animal's condition at the time of release. NMFS shall incorporate this reporting requirement into the FMP.

3. Permit holders must be notified that when they are operating trawls in areas of North Carolina and Virginia when TEDs are required under 50 CFR §223.206(d)(2)(iii) that they are included in the definition of summer flounder trawls as vessels that are operating gear capable of catching summer flounder, and consequently cannot operate in those areas without properly installed TEDs.

4. NMFS must provide the guidance such that any sea turtle incidentally taken will be handled with due care to prevent injury to live specimens, observed for activity, and returned to the water.

Terms and Conditions:

1. NMFS will send a letter by January 1, 2000. to all bluefish permit holders detailing the following:

A. protocol for handling a turtle interaction. This letter must include the following measures, which are provided in 50 CFR 223.206(d)(1):

1. Live animals must be handled with care and released as soon as possible without further injury.

2. Animals are to be released when the vessel is in neutral and only in areas where they are unlikely to be recaptured or injured by vessels.

3. Comatose sea turtles should be resuscitated according to the procedures set forth in 50 CFR 223.206(d)(2)(iii).

4. Dead sea turtles may not be consumed, sold, landed, offloaded, transshipped or kept below deck, but must be released over the stern of the vessel.

B. information on the requirement and timing for TED use in Virginia and North Carolina trawl gear per 50 CFR § 227.72 (2)(iii)

C. Outreach information on the ALWTRP and HPTRP requirements

3. NMFS will ensure that observer coverage in the Mid-Atlantic coastal trawl and gillnet observer programs includes bluefish directed trips and trips where the secondary catch is bluefish. An annual summary of sea turtle takes in bluefish directed trips an in trips where the secondary catch is bluefish will be provided to the Northeast Region Protected Resources Division to monitor this incidental take statement.

4. NMFS will conduct a survey of bluefish recreational fishermen to fully evaluate the impact of the recreational component on sea turtles.

5. NMFS will incorporate specific training on identification of shortnose and Atlantic sturgeon into observer training, including the intra-orbital width measurement method.

NMFS believes that no more than 6 loggerhead sea turtles and 6 Kemp's ridley sea turtles per annum will be incidentally taken as a result of the proposed action. The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The Office of Sustainable Fisheries must immediately provide an explanation of the causes of the taking and review with the Office of Protected Resources the need for possible modification of the reasonable and prudent measures.

AQ

I. Conservation Recommendations

In addition to section 7(a)(2) of the ESA, 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....". Conservation Recommendations are discretionary activities designed to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. The conservation actions related to entanglement which were recommended in the Recovery Plans for the right and humpback whales are implemented in the Atlantic Large Whale Take Reduction Plan, which will also benefit other endangered whales. The following measures are recommended for sea turtles:

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. In this regard, NMFS should continue to pursue Section 6 Cooperative Agreements with states to better meet the conservation needs of sea turtles in state water fisheries, particularly in the mid-Atlantic.

2. NMFS, in conjunction with the ASMFC or other appropriate regulatory authority, should encourage states to require fishermen to report sea turtle takes as bycatch in any mandatory state logbooks and should provide instructions on release. Reports should include a description of the animal's condition at the time of release.

3. A significant amount of ghost gear is generated from fixed gear fisheries, occasionally due to conflict with mobile gear fisheries, other vessel traffic, storms, or oceanographic conditions. There is potential that this gear could adversely affect both sea turtles and their habitat. In order to minimize the risks associated with ghost gear, NMFS should assist the USCG in notifying all Atlantic fisheries permit holders of importance of bringing gear back to shore to be discarded properly. In conjunction with the USCG, fishery councils/commissions, and other appropriate parties, NMFS should review current regulations that concern fishing gear or fishing practices that may increase or decrease the amount of ghost gear to determine where action is necessary to minimize impacts of ghost gear. NMFS should assist the USCG in developing and implementing a program to encourage fishing industry and other marine operators to bring ghost gear in to port for re-use and recycling. In order to maximize effectiveness of gear marking programs, NMFS should work with the USCG and fishery councils/commissions to develop and implement a lost gear reporting system to tie in with ghost gear program and consider incorporating this system into future revisions of the appropriate management plans.

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In order for the Office of Protected Resources to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Office of Protected Resources requests notification of the implementation of any conservation recommendations.

J. Reinitiation of Consultation

This concludes formal consultation on the proposed Federal bluefish fishery. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) 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 ALWTRP provide new information that the levels of take are higher than expected or new fishing methods or gear are developed that will eliminate existing threats to endangered whales, consultation should be reinitiated); (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, NMFS' Office of Sustainable Fisheries must immediately request reinitiation of formal consultation.

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