UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
PROGRAM PLANNING AND INTEGRATION
Silver Spring, Maryland 20910

To All Interested Government Agencies and Public Groups:

Under the National Environmental Policy Act (NEPA), an environmental review has been performed on the following action.

TITLE: Environmental Assessment for Issuance of a Scientific Research Permit [File No. 15488] for Research on North Atlantic Right Whales in the Southeast United States

LOCATION: North Atlantic Ocean – off the Southeast United States

SUMMARY: The proposed action is issuance of a scientific research permit that would authorize aerial surveys and close approach by vessel to collect right whale photo-identification data, skin/blubber biopsies, and behavioral data. The purpose of the research is to monitor North Atlantic right whale population status, demographics, habitat and anthropogenic impacts. Bottlenose and Atlantic spotted dolphins would be harassed incidental to research. Impacts from these activities would be short-term and minimal to individual animals and negligible to the species. A biological opinion concluded that the proposed action would not likely jeopardize the continued existence of the species and would not likely destroy or adversely modify designated critical habitat. The permit would be valid for five years.

RESPONSIBLE OFFICIAL: James H. Lecky
Director, Office of Protected Resources
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
1315 East-West Highway, Room 13821
Silver Spring, MD 20910
(301) 713-2332

The environmental review process led us to conclude that this action will not have a significant effect on the human environment. Therefore, an environmental impact statement will not be prepared. A copy of the finding of no significant impact (FONSI) including the supporting environmental assessment (EA) is enclosed for your information.

Although NOAA is not soliciting comments on this completed EA/FONSI we will consider any comments submitted that would assist us in preparing future NEPA documents. Please submit any written comments to the responsible official named above.

Sincerely,

Paul N. Doremus, Ph.D.
NOAA NEPA Coordinator

Enclosure

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

JUN 23 2011

Environmental Assessment for Issuance of a Scientific Research Permit [File No. 15488] for Research on North Atlantic Right Whales in the Southeast United States

June 2011

Lead Agency: USDC National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Office of Protected Resources

Responsible Official: James H. Lecky, Director, Office of Protected Resources

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1315 East West Highway
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Location: North Atlantic Ocean – off the Southeast United States

Abstract: The National Marine Fisheries Service (NMFS) proposes to issue a five-year scientific research permit for takes of marine mammals in the wild, pursuant to the Marine Mammal Protection Act of 1972, as amended (MMPA; 16 U.S.C. 1361 *et seq.*) and the Endangered Species Act of 1973, as amended (ESA; 16 U.S.C. 1531 *et seq.*). Permit No. 15488 would authorize harassment of North Atlantic right whales (*Eubalaena glacialis*) off the coast of Georgia, Florida, and South Carolina. Activities would include aerial surveys and close approach by vessel to collect right whale photo-identification data, skin/blubber biopsies, and behavioral data. The purpose of the research is to monitor North Atlantic right whale population status, demographics, habitat and anthropogenic impacts. Bottlenose (*Tursiops truncatus*) and Atlantic spotted dolphins (*Stenella frontalis*) would be harassed incidental to research.

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CHAPTER 1 PURPOSE OF AND NEED FOR ACTION

1.1 Description of Action

In response to receipt of an application for a scientific research permit from the Georgia Department of Natural Resources, Wildlife Resources Division [GDNR; Responsible Party: Dan Forster], NMFS proposes to issue Permit No. 15488 authorizing "takes"[1] by Level A and B harassment[2] of marine mammals in the wild pursuant to:

- the Marine Mammal Protection Act of 1972, as amended (MMPA; 16 U.S.C. 1361 *et seq.*),
- the regulations governing the taking and importing of marine mammals (50 CFR Part 216),
- the Endangered Species Act of 1973 (ESA; 16 U.S.C. 1531 *et seq.*), and
- the regulations governing the taking, importing, and exporting of endangered and threatened species (50 CFR Parts 222-226).

1.1.1 Purpose and Need

The primary purpose of the permit is to provide an exemption from the take prohibitions under the MMPA and ESA to allow "takes" by level A and B harassment of marine mammals, including endangered species, for bona fide[3] scientific research. The need for issuance of the permit is related to NMFS' mandates under the MMPA and ESA. Specifically, NMFS has a responsibility to implement both the MMPA and the ESA to protect, conserve, and recover marine mammals and threatened and endangered species under its jurisdiction. The MMPA and ESA prohibit takes of marine mammals and threatened and endangered species, respectively, with only a few very specific exceptions, including for scientific research and enhancement purposes. Permit issuance criteria require that research activities are consistent with the purposes and policies of these federal laws and will not have a significant adverse impact on the species or stock.

1.1.2 Need for Proposed Research and Research Objectives

Under the ESA and MMPA, NMFS is responsible for the conservation and recovery of most endangered and threatened marine mammals. Scientific research is an important means of gathering valuable information about these species and is necessary to conserve them and promote their recovery. The purpose of the proposed research is to monitor North Atlantic right whale (*Eubalaena glacialis*) population status, demographics, habitat, and anthropogenic impacts in the Southeastern United States (SEUS). The research proposed in this project is critical to meet numerous research and management objectives outlined in the North Atlantic right whale Recovery Plan (NMFS 2005). The proposed research would contribute to ongoing research,

[1] Under the MMPA, "take" is defined as to "harass, hunt, capture, kill or collect, or attempt to harass, hunt, capture, kill or collect." [16 U.S.C. 1362(18)(A)] The ESA defines "take" as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." The term "harm" is further defined by regulations (50 CFR §222.102) as "an act which actually kills or injures fish or wildlife. Such an act may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns including breeding, spawning, rearing, migrating, feeding, or sheltering."

[2] "Harass" is defined by regulation (50 CFR §216.3) as "Any act of pursuit, torment, or annoyance which (i) has the potential to injure a marine mammal or marine mammal stock in the wild (Level A harassment); or (ii) has the potential to disturb a marine mammal or marine mammal stock in the wild by causing a disruption of behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering but does not have the potential to injure a marine mammal or marine mammal stock in the wild (Level B harassment)."

[3] The MMPA defines bona fide research as "scientific research on marine mammals, the results of which – (A) likely would be accepted for publication in a refereed scientific journal; (B) are likely to contribute to the basic knowledge of marine mammal biology or ecology; or (C) are likely to identify, evaluate, or resolve conservation problems."

including photo-identification, biopsy, health assessment, disentanglement and behavioral research (e.g. passive acoustic monitoring).

Biopsy Sampling, Including Calves

The proposed research includes a request to biopsy sample calves approximately one month of age and older. New England Aquarium (NEAQ) staff began biopsy sampling right whale calves opportunistically in the SEUS in the 1990s in conjunction with the Early Warning System (EWS) aerial survey project. During the early 2000s, researchers recognized the need for a concerted biopsy sampling effort in the SEUS targeting all right whale calves. The premise was simple:

- The SEUS calving grounds is the one place where almost every right whale is seen at least once during its life (Kraus et al. 1986).
- If every right whale calf on the SEUS calving grounds is sampled, genetic identities could be determined for the majority of the right whale population over time.
- Gaps in demographic data (e.g. age, matrilines) could be closed by re-sampling whales later in life and matching their genetic- and photo-identities.

In 2006, Florida Fish and Wildlife Conservation Commission (FWC), NEAQ and Trent University initiated a project to sample right whale calves in the SEUS. In 2007, GDNR and NMFS Northeast Fisheries Science Center (NEFSC) joined the effort. Each winter since, a concerted multi-agency biopsy effort has been conducted in the SEUS with the goal of sampling each right whale calf and other un-sampled right whales. While largely successful, the number of calves sampled has been limited by research permit restrictions. Moreover, many juvenile right whales remain un-sampled, so fewer demographic "holes" have been filled than initially hoped. The applicant requests a permit to:

1) biopsy-sample each right whale calf documented in the SEUS,
2) sample each juvenile right whale (an unknown proportion of which were likely sampled as calves), and
3) sample adult right whales that appear to be un-sampled based on photo-identification records.

This would significantly enhance right whale population monitoring efforts and fulfill numerous research and management objectives outlined in the North Atlantic right whale Recovery Plan (NMFS 2005).

Right whale calves do not develop identifying callosity patterns that can be used for photo-identification until 6-12 months of age (Hamilton et al. 1998). As such, the only way a calf's age and matriline can be determined using photo-ID methods is if:

- the calf is observed in summer foraging areas during its first summer post-calving,
- it is observed with its mother, and
- it has developed a uniquely-identifiable callosity pattern.

Approximately 40% of right whale calves are not observed in summer foraging areas, either because their mothers go to other locations (e.g. "non-Bay of Fundy" whales) or because the calves die during migration (Malik et al. 1999, Brown et al. 2001). If these calves survive and are photographed later in life, they can be assimilated into the photo-ID catalog, but their age and matriline are unknown. Of the 60% of calves that do travel to summer foraging areas with their mothers, some of those cannot be reliably distinguished by their callosity patterns. The age and

matriline of these whales may not be determined either, creating additional demographic uncertainty and data gaps. This uncertainty is compounded by the heterogeneity in habitat use among whales: it is often impossible to predict whether a given female will travel to a summer foraging ground with her calf (Malik et al. 1999, Brown et al. 2001). Hence, many valuable demographic data are lost, which increases uncertainty in demographic parameters and decreases precision of population monitoring.

Twenty years of right whale DNA research has provided the technology to fill in data gaps from photo-ID-derived demographics. If a right whale calf is sampled for DNA analysis in the SEUS during its first months of life, molecular techniques can be used to generate a genetic profile for that calf (Frasier 2005). If that whale is re-sampled for DNA analysis later in life, the genetic profiles can be matched, allowing genetic- and photo-ID data to be matched, and valuable demographic and matrilineal data can be recovered. Because survival is lower in early age classes (Fujiwara and Caswell 1999), the probability of matching calf and post-calf genetic identity is greatest when whales are re-sampled as juveniles. If sufficient juveniles are re-sampled across right whale habitats, these data will enhance efforts to estimate calf/juvenile survival, a key population parameter.

Molecular methods can also be used to improve estimates of right whale population size through genetic inference of individuals. For example, paternity analysis of cow/calf pairs from 1980 to 2001 revealed that only 45% of right whale fathers have been sampled genetically (Frasier et al. 2007). Given that most photo-identified males have been genetically sampled, these findings suggest additional male right whales may exist than those that are currently known from the photo-ID catalog. Research of this type would not be possible without a concerted calf biopsy effort in the SEUS.

The SEUS is the most appropriate location to conduct calf biopsy and juvenile re-sampling because:

- The SEUS is the only known North Atlantic right whale calving ground (Kraus et al. 1986). Collecting genetics samples from right whale calves in the SEUS maximizes the probability that each whale is sampled during its lifetime.
- Right whale calves are always found with their mothers in the SEUS, so matrilineal information can be conferred to calves by linking calves' genetic identities with their mothers' photo-identity.
- The SEUS is the only location where non-Bay of Fundy females are sighted reliably. Non-Bay of Fundy females and their calves are under-represented in population analyses because they are sighted less-frequently and many of their calves are of unknown age and matriline.
- The majority (55%-76%) of juvenile right whales return to the SEUS during their first few years post-calving (Table 1). Juvenile right whales have lower survival rates than adult right whales (Fujiwara and Caswell 2001). Therefore, sampling juvenile whales as soon as possible after their calving year reduces probability of missing demographic data before they are removed from the population. When combined with sampling of juveniles in other habitats, this effort will lead to fewer whales of unknown age, and more precise calf/juvenile survival estimates.
- The number of juvenile right whales seen in the SEUS has increased annually since 2006 (Table 1). In 2010, 99 juvenile whales were documented in the SEUS, 28% (n = 28) of

which were targets for biopsy sampling. Since 2006, 22%-37% of juvenile right whales documented in the SEUS per year have been of unknown age (Table 1).

- Sampling right whales in the SEUS is biologically and financially efficient. The SEUS calving season is long (~4 months) and individual whales are often sighted numerous times by aerial survey teams over multiple months. As such, there are usually multiple opportunities to locate and collect biopsy samples from individual whales. Right whales in the SEUS are also found within 30 nautical miles (nm) of shore, so biopsy samples are obtained during day-trips from small boats, keeping cost low. Lastly, permanent staff and infrastructure are already in place at GDNR and FWC. GDNR and FWC staff resources are augmented by seasonal staff from NMFS, NEAQ and Wildlife Trust.

Table 1. Right whale calves, yearlings, juveniles and juveniles of unknown age documented in the Southeast U.S. (SEUS), 2006-2010. Calf counts included calves counted inside and outside of the SEUS. Yearling counts include 4 and 13 season code whales from 2009 and 2010, respectively, that appeared 1 year old, but may have been up to 2 years old. Juveniles are defined as whales likely <5 years old, excluding calves. Data are preliminary from FWC, GDNR, NEAQ, NMFS and Wildlife Trust.

Year	n calves	n yearlings	n juveniles	n possible yearlings*	n possible juveniles**	% yearlings seen in SEUS	% juveniles seen in SEUS	n juveniles in SEUS of unknown age	% juveniles seen in SEUS of unknown age
2006	19	6	64	28	116	21	55	14	22
2007	23	7	67	19	104	37	64	25	37
2008	23	11	81	23	106	48	76	27	33
2009	39	18	79	23	110	78	72	19	24
2010	19	31	99	39	132	79	75	25	25

* possible yearlings = calves counted in previous year
** possible juveniles = calves counted in previous 5 yrs

1.2 Other EA/EIS that Influence Scope of this EA

NMFS has completed recent EAs demonstrating that the kind of research activities proposed do not have a potential for significant adverse impacts on the quality of the human environment and do not have adverse effects on ESA-listed North Atlantic right whales that are the subject of the research permit. Each of those EAs supported findings of no significant impact, and was accompanied by an ESA section 7 Biological Opinion concluding that the permitted research is not likely to jeopardize the continued existence of North Atlantic right whales or result in adverse modification of critical habitat. NEPA documents that influence the scope of this EA are:

- Environmental Assessment On the Issuance of Two Scientific Research Permits for Aerial and Vessel Surveys of North Atlantic Right Whales, FONSI signed September 2010 [File Nos. 14233 and 14603].
- Environmental Assessment On the Issuance of a Scientific Research Permit to the National Marine Fisheries Service Northeast Fisheries Science Center [Responsible Party: Dr.

Nancy Thompson] to Conduct Research on Marine Mammals in the North Atlantic Ocean, FONSI signed January 2008 [File No. 775-1875].

- Environmental Assessment On Issuance Of Permits For Aerial And Vessel Surveys Of Marine Mammals In The Western North Atlantic, FONSI signed April 2005 [multiple File Nos., including the applicant's current permit, No. 594-1759].
- On October 17, 2005, NMFS issued a notice of intent to voluntarily prepare an EIS (70 FR 60285) for issuance of permits for research on Northern right whales, in order to consider long-range planning needs and efficiencies in the permitting process. In accordance with NEPA and its implementing regulations at 40 CFR Section 1506.1, nothing precludes NMFS from issuing permits in the interim.

1.3 Scoping Summary

The purpose of scoping is to:

- identify the issues to be addressed,
- identify the significant issues related to the proposed action,
- identify and eliminate from detailed study the non-significant issues,
- identify and eliminate issues that have been covered by prior environmental review, and
- identify the concerns of the affected public and Federal agencies, states, and Indian tribes.

The Council on Environmental Quality's (CEQ) regulations implementing the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 *et seq*.) do not require that a draft EA be made available for public comment as part of the scoping process. However, this draft EA was available for review and comment concurrent with the requisite public comment period for the permit application.

The MMPA and its implementing regulations governing issuance of special exception permits for scientific research (50 C.F.R. §216.33) require that, upon receipt of a valid and complete application for a new permit, and the preparation of any NEPA documentation that has been determined initially to be required, NMFS publish a notice of receipt in the *Federal Register*. The notice summarizes the purpose of the requested permit, includes a statement about whether an EA or EIS was prepared, and invites interested parties to submit written comments concerning the application.

The application and draft EA were made available for public review and comment for 30 days and provided to the Marine Mammal Commission pursuant to 50 CFR §216.33 (d)(2). No comments were received that change the proposed action or the scope of this EA.

1.4 Applicable Laws and Necessary Federal Permits, Licenses, and Entitlements

This section summarizes federal, state, and local permits, licenses, approvals, and consultation requirements necessary to implement the proposed action, as well as who is responsible for obtaining them. Even when it is the applicant's responsibility to obtain such permissions, NMFS is obligated under NEPA to ascertain whether the applicant is seeking other federal, state, or local approvals for their action.

1.4.1 National Environmental Policy Act

The National Environmental Policy Act (NEPA) was enacted in 1969 and is applicable to all "major" federal actions significantly affecting the quality of the human environment. A major federal action is an activity that is fully or partially funded, regulated, conducted, or approved by a federal agency. NMFS issuance of permits for research represents approval and regulation of activities. While NEPA does not dictate substantive requirements for permits, licenses, etc., it requires consideration of environmental issues in federal agency planning and decision making. The procedural provisions outlining federal agency responsibilities under NEPA are provided in the CEQ's implementing regulations (40 CFR Parts 1500-1508).

Through NOAA Administrative Order (NAO) 216-6, NOAA established agency procedures for complying with NEPA and the implementing regulations issued by CEQ. NAO 216-6 specifies that issuance of scientific research permits under the MMPA and ESA are categorically excluded from further environmental review, except under extraordinary circumstances.
NMFS must prepare an EA or EIS when a proposed action:

- is the subject of public controversy based on potential environmental consequences,
- has uncertain environmental impacts or unknown risks,
- establishes a precedent or decision in principle about future proposals,
- may result in cumulatively significant impacts, or
- may have an adverse effect upon endangered or threatened species or their habitats.

While issuance of scientific research permits is typically subject to a categorical exclusion, as described in NAO 216-6, NMFS is preparing an EA for this action to provide a more detailed analysis of effects to ESA-listed species. This EA is prepared in accordance with NEPA, its implementing regulations, and NAO 216-6.

1.4.2 Endangered Species Act

Section 9 of the ESA, as amended, and Federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption such as by a permit. Permits to take ESA-listed species for scientific purposes, or for the purpose of enhancing the propagation or survival of the species, may be granted pursuant to section 10(a)(1)(A) of the ESA.

NMFS has promulgated regulations to implement the permit provisions of the ESA (50 CFR Part 222) and has produced OMB-approved application instructions that prescribe the procedures necessary to apply for permits. All applicants must comply with these regulations and application instructions in addition to the provisions of the ESA.

Section 10(d) of the ESA stipulates that, for NMFS to issue permits under section 10(a)(1)(A) of the ESA, the Agency must find that the permit: was applied for in good faith; if granted and exercised will not operate to the disadvantage of the species; and will be consistent with the purposes and policy set forth in section 2 of the ESA.

Section 2 of the ESA sets forth the purposes and policy of the Act. The purposes of the ESA are to provide a means whereby the ecosystems upon which endangered and threatened species depend may be conserved, to provide a program for the conservation of such endangered species and threatened species, and to take such steps as may be appropriate to achieve the purposes of the

treaties and conventions set forth in section 2(a) of the ESA. It is the policy of the ESA that all Federal departments and agencies shall seek to conserve endangered species and threatened species and shall utilize their authorities in furtherance of the purposes of the ESA. In consideration of the ESA's definition of conserve, which indicates an ultimate goal of bringing a species to the point where listing under the ESA is no longer necessary for its continued existence (i.e., the species is recovered), exemption permits issued pursuant to section 10 of the ESA are for activities that are likely to further the conservation of the affected species.

Section 7 of the ESA requires consultation with the appropriate federal agency (either NMFS or the U.S. Fish and Wildlife Service) for federal actions that "may affect" a listed species or adversely modify critical habitat. NMFS issuance of a permit affecting ESA-listed species or designated critical habitat, directly or indirectly, is a federal action subject to these section 7 consultation requirements. Section 7 requires federal agencies to use their authorities in furtherance of the purposes of the ESA by carrying out programs for the conservation of endangered and threatened species. NMFS is further required to ensure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any threatened or endangered species or result in destruction or adverse modification of habitat for such species. Regulations specify the procedural requirements for these consultations (50 Part CFR 402)

1.4.3 Marine Mammal Protection Act

The MMPA prohibits takes of all marine mammals in the U.S. (including territorial seas) with a few exceptions. Permits for bona fide scientific research on marine mammals, or to enhance the survival or recovery of a species or stock, issued pursuant to section 104 of the MMPA are one such exception. These permits must specify the number and species of animals that can be taken, and designate the manner (method, dates, locations, etc.) in which the takes may occur. NMFS has sole jurisdiction for issuance of such permits and authorizations for all species of cetacean, and for all pinnipeds except walrus[4].

NMFS may issue a permit or authorization pursuant to section 104 of the MMPA to an applicant who submits with their application information indicating that the taking is required to further a bona fide scientific purpose. An applicant must demonstrate to NMFS that the taking will be consistent with the purposes of the MMPA and applicable regulations. If lethal taking of a marine mammal is requested, the applicant must demonstrate that a non-lethal method of conducting research is not feasible. NMFS must find that the manner of taking is "humane"[5] as defined in the MMPA. In the case of proposed lethal taking of a marine mammal from a stock listed as "depleted" NMFS must also determine that the results of the research will directly benefit the species or stock, or otherwise fulfill a critically important research need.

NMFS has promulgated regulations to implement the permit provisions of the MMPA (50 CFR Part 216) and has produced OMB-approved application instructions that prescribe the procedures (including the form and manner) necessary to apply for permits. All applicants must comply with these regulations and application instructions in addition to the provisions of the MMPA.

[4] The U.S. Fish and Wildlife Service has jurisdiction for walrus, polar bears, sea otters, and manatees.
[5] The MMPA defines humane in the context of the taking of a marine mammal, as "that method of taking which involves the least possible degree of pain and suffering practicable to the mammal involved."

1.4.4 National Marine Sanctuaries Act

The National Marine Sanctuaries Act (NMSA; 32 U.S.C. 1431 *et seq*.) authorizes the Secretary of Commerce to designate and manage areas of the marine environment with special national significance. The National Marine Sanctuary Program (NMSP), operating under the NMSA and administered by NOAA's National Ocean Service (NOS) has the authority to issue special use permits for research activities that would occur within a National Marine Sanctuary. Obtaining special use permits is the responsibility of individual researchers. However, as a courtesy, the Office of Protected Resources consults with NOS when proposed research would occur in or near a National Marine Sanctuary.

1.4.5 Animal Welfare Act

The Animal Welfare Act (AWA; 7 U.S.C. 2131 – 2156) sets forth standards and certification requirements for the humane handling, care, treatment, and transportation of mammals. Enforcement of these requirements for non-federal facilities is under jurisdiction of the U.S. Department of Agriculture's Animal and Plant Health Inspection Service. Each research facility is required to establish an Institutional Animal Care and Use Committee (IACUC) which reviews study areas and animal facilities for compliance with the AWA standards. The IACUC also reviews research protocols and provides written approvals for those that comply with AWA requirements. It is the responsibility of the researcher to seek and secure IACUC reviews and approvals for their research.

CHAPTER 2 ALTERNATIVES INCLUDING THE PROPOSED ACTION

This chapter describes the range of potential actions (alternatives) determined reasonable with respect to achieving the stated objective, as well as alternatives eliminated from detailed study. This chapter also summarizes the expected outputs and related mitigation of each alternative. One alternative is the "No Action" alternative where the proposed permit would not be issued. The No Action alternative is the baseline for rest of the analyses. The Proposed Action alternative represents the research proposed in the submitted application for a permit with standard permit terms and conditions specified by NMFS.

2.1 Alternative 1 – No Action

Under the No Action alternative, Permit No. 15488 would not be issued. This alternative would not affect any existing NMFS research permits or future requests for permits or amendments. Current research permits would remain active and NMFS would continue to evaluate new permit requests as they are received, including requests from the applicant.

2.2 Alternative 2 – Proposed Action (Issuance of Permit with Standard Conditions)

Under the Proposed Action alternative, a five-year research permit would be issued for activities proposed by the applicant. The permit would include terms and conditions standard to such permits as issued by NMFS.

Proposed activities would include aerial surveys and close vessel approach for behavioral observations, photo-id, passive acoustic recordings, and biopsy sample collection and are summarized here. For additional information see the application. Proposed species and take numbers are listed in Table 2.

Proposed research would take place from November to April for five years beginning in November 2011.

Aerial Surveys

Aerial surveys would be flown at approximately 1,000 ft altitude and approximately 100 kt airspeed during good weather and visibility along predetermined transect lines. When one or more whales are sighted, the pilots would break from the transect line to circle over whales at approximately 1,000 ft altitude while biologists collect behavioral and photo-identification data.

Under MMPA regulations, cetacean surveys conducted at this altitude do not typically require a scientific research permit or a Letter of Confirmation under the General Authorization because the activity is not expected to result in harassment of animals. Consistent with these regulations and NMFS marine wildlife viewing guidelines, given the proposed altitude of surveys, NMFS does not expect that the aerial surveys would result in takes by harassment of right whales. However, ESA regulations at 50 CFR 224.103 prohibit approaches, by vessel or aircraft, within 500 yards of right whales without a scientific research permit. The approach regulations do not state at what distance a 'take' of a right whale would occur. In order to comply and be consistent with both MMPA and ESA regulations, Permit No. 15488 would authorize the survey aircraft to approach within 500 yards of right whales but no take numbers would be associated with the activity.

Vessel Surveys

Level B harassment of large whales would occur during vessel surveys from two 24-ft twin-outboard Zodiac rigid-hull-inflatable-boats (RHIBs). Other small outboard boats would be used when RHIBs are unavailable. Whales would be approached to approximately 30 ft for photo-identification and approximately 20 ft for biopsy sample collection. Approach durations would vary depending on circumstances, behaviors, social dynamics, and weather and water conditions, but would generally not last more than 30 min for cow/calf pairs, single whales or small groups. Approach durations might be longer for Surface Active Groups (SAGs; Parks et al. 2007) and other large whale aggregations, but in those cases whales are usually dispersed over a larger area, so the period of time that any individual whale would be harassed would be limited.

Focal follows would be conducted during some photo-identification approaches to collect behavioral data on right whales. Examples of data collected may include passive acoustic recordings or video recordings of whale. Duration of focal follows would likely be greater than photo-identification approaches (e.g. 1 to 2 hours vs. 30 minutes), but a greater distance would be maintained from whales to reduce behavioral response from whales. These observations would be made with the boat engine shut down for the majority of the approach, or with the aid of a quiet electric engine, in order to minimize response from whales.

Most individual whales would only be approached once per day and one to three times per season. However, some individuals would be taken by close approach a maximum of two times per day and up to ten times per season. Researchers would attempt to avoid approaching individual whales multiple times per day or season, but because whales must be approached before they can be identified, researchers would not necessarily be able to determine whether they are re-approaching a given whale until after the take has occurred.

Boat surveys would not usually be conducted along predetermined transect lines. Rather, boats would travel among right whale locations that are conveyed in real-time from aerial survey teams. Whales would also be sighted opportunistically from boats during transiting.

Disturbance to animals would be minimized during close vessel approaches for all activities by:

- Approaching at minimal speeds from behind or beside the group.
- Limiting approaches to the minimum time necessary to achieve objectives.
- Terminating activities if avoidance is occurring.
- Using caution when approaching females with calves.
- Conducting boat surveys in different geographic locations if multiple vessels are launched on the same day.
- Conducting boat surveys during periods of high visibility and low Beaufort sea state to maximize the probability of sighting whales and minimize the potential for boat/whale collisions.
- Actively searching for whales during transits. The boat operator and at least one other crewmember would be on-watch for any whales in the vicinity and ahead of the boat.
- Conducting boat surveys in close coordination with aerial survey teams to assist in locating whales and to avoid duplicate photo-ID and biopsy sampling of whales.

Level A harassment would occur during collection of biopsy samples, including adult females accompanied by calves and calves greater than approximately one month old (Table 1). NMFS OPR has worked with the applicant and the two other permit holders (NEFSC and Kraus) authorized to biopsy sample North Atlantic right whale calves to prevent duplicative sampling. Cumulatively, no more than 60 annual takes will be authorized to biopsy sample calves. If Permit No. 15488 is issued, the NEFSC's permit would be modified to decrease takes authorized by that permit from 30 to 20; each of the three permits would then authorize 20 annual takes of right whale calves for biopsy. Although a total of 60 annual takes would be authorized, the number of samples collected would be limited by the number of calves born in a given season; i.e., each calf would only be sampled once. Researchers would coordinate through the NEFSC daily during the calving season to ensure that calves are not sampled multiple times. The coordination letter describing requirements of permit holders is attached as Appendix 1.

Level B harassment from vessel-based activities, as described above, would occur concurrently.

Skin and blubber samples would be collected using stainless steel biopsy tips 0.7 mm in diameter and 2.5 cm deep. Crossbows would be used for sample collection. Biopsy tips would be threaded onto custom crossbow arrows fitted with floating stop-collars to prevent the dart from penetrating further into the whale or sinking. Samples would be collected from approximately 20-50 ft away.

In addition to the mitigation measures described above for close approach, mitigation measures used during biopsy sampling would include:

- Disinfecting biopsy tips and arrows prior to each use in a 30-second bath of 6% sodium hypochlorite, followed by a 30-second bath of 80% ethyl alcohol.
- Photo-identifying individuals prior to sampling to avoid duplication.
- Following each survey, photographs of biopsy-sampled whales would be uploaded to an FTP site within 12 hours of sampling and all other researchers working in the SEUS would be notified of the event via email. Researchers carry photographs of these and other

previously-sampled whales during boat surveys to minimize the potential of double-sampling whales.

Biopsy samples would be processed, stored, and shipped according to protocols established by researchers at Trent and St. Mary's Universities and NMFS Marine Mammal Health and Stranding Response Program (MMHSRP). Samples would be sent to Trent and St. Mary's Universities in Canada for genetics analysis. Precautions would be taken when collecting, handling and transporting samples (e.g. wearing gloves, disinfecting sampling equipment). Small amounts (<100 mL) of chemicals would be utilized to fix skin and blubber samples (e.g. 10% neutral buffered Formalin, ethanol, salt-saturated dimethyl sulfoxide). Chemicals would be handled, stored and disposed as outlined in their respective material safety data sheets.

Table 2. Proposed Annual Takes of Male and Female Right Whales from November through April During Vessel Surveys in the Atlantic Ocean and Gulf of Mexico off South Carolina, Georgia, and Florida out to the limit of the EEZ.

SPECIES	LIFE STAGE	PROPOSED TAKE	TAKES PER ANIMAL	TAKE ACTION	PROCEDURES	DETAILS
Whale, right, North Atlantic	All	350	10	Harass	Acoustic, passive recording; Count/survey; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photograph/Video	A max of 350 boat approaches will be made per season; number of takes per whale per season will range from 1 to 10; most whales will be taken only 1 to 3 times per season
Whale, right, North Atlantic	Adult/ Juvenile	50	1	Harass/ Sampling	Acoustic, passive recording; Count/survey; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photograph/Video; Sample, skin and blubber biopsy; Sample, skin biopsy	
Whale, right, North Atlantic	All	20	1	Harass/ Sampling	Acoustic, passive recording; Count/survey; Incidental harassment; Observation, monitoring; Observations, behavioral; Photo-id; Photograph/Video; Sample, skin and blubber biopsy; Sample, skin biopsy	Intended for calves >1 month old; can be used on older animals if not all used on calves. Calf biopsy takes will be coordinated daily with the NEFSC as agreed by researchers (see Appendix 1).
Whale, right, North Atlantic	All	100	1	Import/ export/ receive	Import/export/receive, parts	Biopsy samples will be exported to Canada for genetic analysis
Dolphin, bottlenose	All	350	1	Harass	Incidental harassment	
Dolphin, Atlantic spotted	All	200	1	Harass	Incidental harassment	
To comply with regulations (50 CFR 224.103) prohibiting approaches within 500 yards of North Atlantic right whales without a permit, the permit would authorize right whale aerial surveys flown at 1,000 feet (333 yds) with brief circling no lower than 900 ft. Take numbers are not required for this activity.						

Permit Duration

The proposed permit would be valid for five years from the date of issuance. NMFS would consider issuing a single one-year extension of the permit if the permit holder submits a request in writing before the expiration of the permit and in sufficient time for processing prior to expiration. The request to extend the permit would be considered a modification, pursuant to NMFS regulations at 50 CFR §222.306, and as such would have to be accompanied by full justification and supporting information, and formatted in accordance with NMFS permit application instructions. As with any modification to a permit, the extension of the permit duration would be subject to the same issuance criteria as the original application, including the requirements that the taking will not operate to the disadvantage of the species and will be consistent with the purposes and policies of the ESA.

If granted, a one-year extension of the permits would only allow "takes" of marine mammals that were not used in the last year of the permit; these remaining takes would be carried forward into a sixth permit year. The extension would not change any other terms or conditions of the permit. NMFS does not consider a one-year extension of this nature to represent a substantial change to the proposed action that involves changes in environmental impacts. As such, NMFS would not prepare a supplemental EA for the one-year extension unless there were significant new circumstances or information relating to environmental impacts (e.g., a change in the status of the target species, listing of new threatened or endangered species in the project area).

CHAPTER 3 AFFECTED ENVIRONMENT

This chapter presents baseline information necessary for consideration of the alternatives, and describes the resources that would be affected by the alternatives, as well as environmental components that would affect the alternatives if they were to be implemented. The effects of the alternatives on the environment are discussed in Chapter 4.

The proposed activities would occur in U.S. waters off South Carolina, Georgia, and Florida.

3.1 SOCIAL AND ECONOMIC ENVIRONMENT

Economic and social factors are listed in the definition of effects in the NEPA regulations. However, the definition of human environment states that "economic and social effects are not intended by themselves to require preparation of an EIS." An EA must include a discussion of a proposed action's economic and social effects when these effects are related to effects on the natural or physical environment. The social and economic effects of the proposed action mainly involve the effects on the people involved in the research, as well as any industries that support the research, such as charter vessels, and suppliers of equipment needed to accomplish the research. There are no significant social or economic impacts of the proposed action related to significant natural or physical environmental effects, so no further analyses were completed.

3.2 PHYSICAL ENVIRONMENT

3.2.1 National Marine Sanctuaries

All holders of NMFS' scientific research permits conducting work within a National Marine Sanctuary are required to obtain appropriate authorizations from and coordinate the timing and

location of their research with NOAA's NMSP to ensure that the research would not adversely impact marine mammals, birds or other animals within the sanctuaries. In addition, permit actions including those in the proposed action are sent to the NMSP for review if research is to occur in sanctuary waters.

Under the proposed action, activities might occur in the Gray's Reef National Marine Sanctuary.

Gray's Reef National Marine Sanctuary, located 17.5 nm (32 km) off the coast of Georgia, protects 17 square miles of open ocean that is home to a wide variety of marine life, as well as the "Bone yard," which has provided scientists with relics and fossils possibly dating back 20,000 years. Its sea floor is considered a "live bottom", where rocky ledges and limestone outcroppings are densely covered by sessile marine invertebrates, interspersed with sandy areas. In addition to being a known foraging and resting ground of loggerhead sea turtles and a right whale calving ground, Gray's Reef is important habitat for over 150 species of fish. Gray's Reef is a common recreational resource for fishing, boating, and diving; however, commercial industries are prohibited.

3.2.2 Designated Critical Habitat

The ESA provides for designation of "critical habitat" for listed species and includes physical or biological features essential to the conservation of the species. Critical habitats may require special management considerations or protection. Critical habitat designations affect only federal agency actions or federally funded or permitted activities. Research would be conducted in North Atlantic right whale critical habitat in the SEUS.

North Atlantic right whale critical habitat in the SEUS

The South Atlantic Bight (also referred to as the SEUS) extends roughly from Cape Hatteras, North Carolina, to West Palm Beach, Florida. These waters average about 30 m in depth with a maximum depth of about 60 m. The deepest waters occur along the coast of Florida, just south of Cape Canaveral. Right whales migrate through the northern portion of the South Atlantic Bight on their way to and from the calving grounds off the Georgia and northern Florida coast.

The South Atlantic Bight contains three large cape areas: Raleigh Bay, Onslow Bay, and Long Bay (Milliman and Imamura 1992). The dominant bathymetric features are the continental shelf, the continental slope, and the Blake Plateau. The continental shelf slopes gently from the coast to approximately the 50 m (164 ft) isobath; where it drops off to the 200 m (656 ft) isobath. The continental slope is steeply angled and extends approximately from the 200 m (656 ft) to the 700 m (2,297 ft) isobath. The slope is widest off Jacksonville, FL (30°N). The Gulf Stream flows along the Florida-Hatteras Slope over the Blake Plateau's western flank (DoN August 2002).

The substrate composition of the SEUS ranges from mixed fine sand and gravel near the coast to an increasingly higher percentage of calcium carbonate material at greater depths. There are also traces of gravelly sand, sand and clay, and fine-grained sand and silt found in deeper waters. Continental slope sediments in the SEUS area are primarily composed of silt and clay. The inner part of the Blake Plateau contains a minimal amount of sediments due to the sweeping action of the Gulf Stream. The Plateau is also covered by a thick layer of phosphoritic sediments and a thin layer of carbonate sands (DoN August 2002).

Seasonal water temperatures and salinity for this area are higher than in northern waters. The SEUS is considered a transition zone, where waters change from hosting subtropical marine communities to temperate marine communities. Large, cyclic changes in abundance and dominance of plankton species occur seasonally and annually. Annual variation may be so great that short-term monitoring studies may not be sensitive enough to assess the temporal variability of the plankton community. The recorded preferred food of the northern right whale, *C. finmarchicus,* does not occur in these waters, and the area is not considered a foraging area for northern right whales. The SEUS is believed to be the primary calving and nursery ground for the species.

The SEUS critical habitat area is bounded by the following coordinates: 31°15'N (approximately located at the mouth of the Altamaha River, GA) and 30°15'N (approximately Jacksonville, FL) from the shoreline out to 15 nm offshore; and the waters between 30°15'N and 28°00'N (approximately Sebastian Inlet, FL) from the shoreline out to five nm.

3.3 BIOLOGICAL ENVIRONMENT

3.3.1 Target Species

ESA-listed North Atlantic right whales would be targeted for study under the proposed action, and this species is considered part of the affected biological environment. NMFS publishes annual Stock Assessment Reports (SARs) for the marine mammals under its jurisdiction, which describe the distribution, abundance, productivity, and annual human-caused mortality for those species. The 2009 Atlantic SAR (Waring et al. 2009) contains the most recent information on North Atlantic right whales and is available in PDF format at www.nmfs.noaa.gov. A brief description of the species is summarized below; additional information on the status of these species can be found in the NMFS Recovery Plan (2005). All marine mammal stocks/species listed under the ESA are also considered depleted under the MMPA.

North Atlantic right whale:

The western North Atlantic stock of right whales range from their winter calving grounds in coastal waters of the southeastern United States to their spring feeding and nursery grounds in New England waters and northward to the Bay of Fundy and the Scotian shelf in summer. However, the location of a large segment of the population is unknown during winter, and data from a limited number of satellite-tagged whales suggests an extended range, at least for some individuals.

At least five major habitats or congregation areas are identified for this stock of right whales: the coastal waters of the southeastern United States, the Great South Channel, Cape Cod and Massachusetts Bays, the Bay of Fundy, and the Scotian Shelf. Like most mysticetes, right whales fast during the winter calving season and feed predominantly during spring, summer, and fall (Clapham 2004). They may also feed opportunistically while migrating. Right whales are large whales that grow to at least 10 m long, weigh at least 20 tons, and have baleen plates instead of teeth to trap and filter prey from the water column. They primarily feed on the copepod *Calanus finmarchicus* but also consume other zooplankton. Researchers estimate that right whales consume as much as 2,000 pounds of zooplankton per day (Kraus and Mallory 2003). Right whales are usually found alone or in small groups, although large aggregations may occur on the feeding grounds.

Right whale populations worldwide were brought to extremely low levels by hunting over the last five centuries (Brownell et al. 1986). Right whales in the North Atlantic were the first to be reduced (Reeves et al. 2007), and remain at low numbers and low growth rates (< 2 percent) despite international protection. The western North Atlantic population is estimated to include at least 345 individuals (Waring et al. 2009) but birth interval data and population models suggest that the population declined in the 1990s (Caswell et al. 1999; Fujiwara et al. 2001). Calving has increased since 2001 (Table 3), although North Atlantic right whale calving rates are still only two-thirds of comparable southern hemisphere right whale populations (Frasier et al. 2007b). The size of the stock relative to the Optimum Sustainable Population is extremely low and the stock is considered to be critically endangered.

Table 3: North Atlantic right whale calf production and mortality.

Year[6]	**Reported calf production**	**Reported calf mortalties**
1993	8	2
1994	9	0
1995	7	0
1996	22	3
1997	20	1
1998	6	1
1999	4	0
2000	1	0
2001	31	4
2002	21	2
2003	19	0
2004	17	1
2005	28	0
2006	19	2
2007	23	2
2008	23	2
2009	39	1

Continued low population growth has been attributed to human sources of mortality and impaired reproduction (Fujiwara and Caswell 2001; Kraus and Rolland 2007b). Human caused mortality, primarily from collisions with large ships and entanglements in fixed fishing gear, remained high through 2005 (Kraus et al. 2005; Kraus and Rolland 2007b; Moore et al. 2007). The passage of the NMFS right whale ship strike rule (NMFS 2008) should reduce ship kills of right whales, and progress on reducing entanglements may help. Impaired reproduction may be due to low genetic diversity (Frasier et al 2007a), loss of habitat (Reeves et al. 1978), food limitation (Greene and Pershing 2004; Baumgartner et al. 2007), disease, parasites, biotoxins, contaminants (Rolland et al. 2007a), and global warming (Kenney 2007).

6 includes December of the previous year

3.3.2 Non-Target Species

In addition to the target species, a wide variety of non-target species could be found within the action area, including marine mammals, invertebrates, fish, and sea birds. Merely being present within the action area does not necessarily mean a marine organism will be affected by the proposed action. Research is not directed at these species and mitigation measures would be employed to avoid harassing non-target species (e.g., not approaching and suspending activities that might disturb non-target species).

Small numbers of bottlenose (*Tursiops truncatus*) and Atlantic spotted dolphins (*Stenella frontalis*) would be harassed incidental to research activities (Table 2).

CHAPTER 4 ENVIRONMENTAL CONSEQUENCES

This chapter represents the scientific and analytic basis for comparison of the direct, indirect, and cumulative effects of the alternatives. Regulations for implementing the provisions of NEPA require consideration of both the context and intensity of a proposed action (40 CFR Parts 1500-1508).

4.1 EFFECTS OF ALTERNATIVE 1: No Action

No action, i.e., denial of the permit request, would eliminate potential risk to target species from the proposed research activities. This alternative would prevent the researchers from collecting valuable information on North Atlantic right whales that would directly address research needs identified in the NMFS recovery plan for right whales and provide important information to help conserve, manage, and recover the North Atlantic right whale as required by the ESA, MMPA, and implementing regulations.

Even if the requested permit is not issued, North Atlantic right whales within the action area would still be exposed to vessel traffic and anthropogenic effects, including existing and future permitted scientific research.

4.2 EFFECTS OF ALTERNATIVE 2: Issue permit with standard conditions

The proposed action would allow research involving level A and B harassment to be conducted on North Atlantic right whales. These activities may result in short-term behavioral responses by individuals, but would not be expected to result in stock- or species-level effects.

The issue most relevant to this analysis is the potential for negative impacts on the target species. It is important to recognize that an adverse effect on a single individual or a small group of animals does not translate into an adverse effect on the population or species unless it results in reduced reproduction or survival of the individual(s) that causes an appreciable reduction in the likelihood of survival or recovery for the species. In order for the proposed action to have an adverse effect on a species, the exposure of individual animals to the research activities would first have to result in:

- direct mortality,
- serious injury that would lead to mortality, or
- disruption of essential behaviors such as feeding, mating, or nursing, to a degree that an individual's likelihood of successful reproduction or survival was substantially reduced.

That mortality or reduction in the individual's likelihood of successful reproduction or survival would then have to result in a net reduction in the number of individuals of the species. In other words, the loss of the individual or its future offspring would not be offset by the addition, through birth or emigration, of other individuals into the population. That net loss to the species would have to be reasonably expected, directly or indirectly, to appreciably reduce the likelihood of both the survival and recovery of the listed species in the wild.

Effects of Directed Research on Cetaceans

Level B harassment, as defined by the MMPA, would occur during close vessel approach for behavioral observations, photo-identification activities, and collection of biopsy samples. The effects of these activities have been analyzed in past EAs for right whale research (see Chapter 1.2) and their associated Biological Opinions, and it has been repeatedly determined that this type of activity could lead to short-term behavioral disturbance of marine mammals, but that there would be no significant impact from issuance of scientific research permits authorizing these activities. The effects of close vessel approach for photo-identification, behavioral observation, and biopsy sampling conducted under the proposed action are not expected to differ from those previously analyzed. As noted in Ch. 2, aerial surveys are not expected to result in harassment and are not discussed further in this EA.

Behavioral responses would be expected to vary from no response to diving, tail slapping, or changing direction. With experienced vessel drivers, any potential effects of vessel approach should be short-lived and minimal. These short-term behavioral responses would not likely lead to mortality, serious injury, or disruption of essential behaviors such as feeding, mating, or nursing to a degree that the individual's likelihood of successful reproduction or survival would be substantially reduced. Annual reports submitted by current and past permit holders indicate that conduct of activities resulting in level B harassment has not led to mortality, serious injury, or disruption of essential behaviors such as feeding, mating, or nursing.

In addition to the mitigation measures identified by the applicants and described in Chapter 2.2, the permit, if issued, would contain conditions requiring the applicants to retreat from animals if behaviors indicate the approach may be interfering with reproduction, pair bonding, feeding, or other vital functions.

Level A harassment, as defined by the MMPA, would occur during biopsy sampling when physical contact is made that has the potential to injure animals. Actual injury would be minimized by measures identified by the applicant and described in Chapter 2.2 and conditions of the permit limiting how activities may occur, such as avoiding sensitive areas of the body during sampling.

Effects of biopsy sample collection on large whales

Biopsy sampling has been used extensively worldwide and is a common and widely accepted method for obtaining tissue samples, especially because the unequivocal value of molecular genetic tools and analyses has been recognized. The potential for serious injury and/or long-term effects on individuals from remote biopsy sampling is minimal. The biopsy darts would not

contain any hazardous materials, and the penetration depth of the dart relative to the blubber depth and mitigation measures employed to prevent deeper penetration make it highly unlikely that serious injury would occur to target individuals.

As with any instance where the dermis is penetrated, there is the possibility of infection associated with biopsy sampling. However, no evidence of infection has been seen at the point of penetration or elsewhere among the many whales re-sighted in days following the taking of a biopsy sample. No cases of infection or injury to large whales resulting from biopsies have been documented, including well-monitored populations with repeatedly observed identified individuals.

Wounds heal quickly in cetaceans (Weller et al. 1997, Krützen et al. 2002, Parsons et al. 2003). In addition to naturally occurring coloration patterns, the marks used to identify individuals include healed wounds from predation attempts (see Heithaus 2001*a* for a review of predator interactions), inter- and intra-species interactions, barnacles, remora, entanglement, and vessel interactions. In Shark Bay, Australia, approximately 74% of non-calf bottlenose dolphins had shark bite scars (Heithaus 2001*b*). A recent permit application for capture of bottlenose dolphins in the Indian River Lagoon, Florida, indicated that wounds from the collection of a full-thickness skin and blubber wedge biopsy approximately 5 cm x 3 cm typically heal in 14-30 days. No known morbidity or mortality has been associated with these procedures as described (G. Bossart, File No. 14352). The relatively small wounds created by biopsy sample collection in the proposed action would be expected to heal in a similar time frame.

Reeb and Best (2006) collected deeper biopsy samples from Southern right whales (*Eubalaena australis*) of all age classes using a hand-held pole system. The longest (deepest) samples collected in that study were from two early season calves (11.7 and 12.4 cm), a late season calf (13.2 cm), an early season adult (18.6 cm), and a late season adult (21.2 cm). Behavioral reactions to this system of biopsy collection were no greater than those observed during use of the more superficial Paxarms biopsy system (Best et al. 2005). The greatest component of the behavioral reaction to pole sampling was to the close approach of the vessel (Reeb and Best 2006). The biopsy site was hardly visible following biopsy, with one exception. In that instance, a thin spray of blood was seen from the biopsy site of a neonate, who reacted by lifting its head and fluke, slapping the water surface with its fluke, and swimming away. The bleeding ceased within minutes and the neonate's behavior appeared normal (Reeb and Best 2006).

Bearzi et al. (2000) reported the death of a common dolphin following penetration of a biopsy dart and subsequent handling. The authors concluded that the biopsy dart did not produce a lethal wound, but that the biopsy darting and subsequent handling, perhaps in combination with potential pre-existing health conditions of the animal, produced physical and/or physiological consequences that were fatal to the animal. There is no evidence that the biopsy procedure or associated boat approaches, if conducted responsibly and by experienced individuals, has any significant impact on cetacean populations. Studies to date indicate no long-term consequences on survival, return rates, or fecundity.

The effects of biopsy sampling on right whales were analyzed in previous EAs (see Chapter 1.2). These analyses found that there would be no significant impact from issuance of the permits. In

addition to the effects of the close approach of a vessel to whales associated with collecting biopsy samples (described above), those analyses determined:

- No evidence of infection has been seen at the point of penetration of a biopsy dart or elsewhere among whales re-sighted following biopsy sampling.
- The responses of whales are generally minimal to non-existent when approaches are slow and careful, and even when subjected to invasive biopsy and tagging procedures, a careful approach generally elicits at most a minimal and short-lived response from the whales.
- Biopsy sampling would not be expected to have long-term, adverse effects on the target species; therefore disturbances from the activities were considered not likely to have a significant cumulative effect.
- Re-sightings of sampled large whales suggest that animals would not significantly alter their range or habitat use and that any wounds at the biopsy site would heal over time, resulting in no long-term adverse effects to animal health or reproductive success.

Biopsy sampling has been conducted successfully with little or no behavioral reactions (*e.g.*, Weinrich et al. 1991, 1992; Clapham and Mattila 1993; Brown et al. 1994; Gauthier and Sears 1999; Cerchio 2003). Whales that have been inadvertently biopsied more than once have been documented displaying either no response or short-term behavioral responses (Gauthier and Sears 1999), although Southern right whale cows in cow-calf pairs may react more strongly to inadvertent repeat sampling (Best et al. 2005).

The NEFSC has noted that, during similar activities:

- Most right whales darted (80.6 percent; Brown et al. 1991) have shown no reaction. Those who did react either responded by "flinching" or through a tail flick or dive.
- The approach itself seems to have more of an effect; however, in those few cases where animals responded to the approach, they returned to normal behaviors quickly after the approach had been broken off.
- There have been no documented cases of infection or injury to large whales resulting from biopsies, including well-monitored populations with repeatedly observed identified individuals.
- Long-term impacts have been evaluated for humpback whale mothers and calves, and a similar analysis is underway for right whales. The humpback whale data indicates that survival of biopsied (n = 106) and unbiopsied (n = 112) calves is not significantly different. Similarly, the fecundity and return rates of biopsied adult females (n = 52) and unbiopsied mature females (n = 144) were not significantly different.

Ultrasound measurements of juvenile and adult right whale blubber thickness taken by Moore *et al.* (2001) from whales in the Cape Cod Bay varied between 12 cm and 23 cm. The blubber depths of necropsied right whale calves that died off the coast of Georgia and Florida ranged from 2.75 cm to 5 cm (Moore *et al.* 2004). Work by Best et al (2005) showed that biopsy activities on Southern right whales had no effect on reproduction or survivorship. The penetration depth of the dart relative to the blubber depth of large whales, and the mitigation measures employed to prevent deeper penetration, make it highly unlikely that any serious injury would occur. The smaller size and thinner blubber layer of young calves may make them somewhat more susceptible to the potential for serious injury from remote biopsy sampling. However, the intended penetration depth of the dart compared to the blubber depth, in addition to the dart's stop collar which prevents

deeper penetration, make it highly unlikely that any serious injury would occur. The proposed darts for calves would yield samples 2.5 cm in length, which is less than the blubber thickness of healthy right whale calves.

The main consideration for potential impacts from biopsy sampling young calves (one to six months old) and females with such calves is the potential for the close presence of the vessel to disrupt the important mother/calf pair bond or otherwise interfere with mother or calf fitness or survival. As noted above, the actual penetration of the dart would not be expected to have significant impact. There have been a number of studies that have collected biopsy samples from large whales, including young calves, with the following results:

- Clapham and Mattila (1993) conducted a detailed, directed study of the effects of biopsy sampling on humpback whales, including individual calves less than 6 months old (in wintering areas) and concluded "biopsies can be obtained from mothers and their calves with little effect on the animals." They analyzed behaviors before and after biopsy sampling, and the immediate reactions of 565 biopsied humpback whales (in addition to 427 misses). They found that most whales did not react (or did so minimally), and those behaviors, before and after, most often did not change. Additionally, mothers were the *least* likely to react to a biopsy hit, and calves reacted the same as other non-calf whales that were not anticipating contact (*e.g.*, noncompetitive and not mothers). Minimal reaction has been observed in studies of biopsy-sampled calves (Clapham and Mattila 1993, Cerchio 2003). Calves reacted more to biopsy hits than mothers, principal escorts, challengers and secondary escorts, but not significantly different than all the other classes of whales (Clapham and Mattila 1993). In no instance was a calf ever observed to separate from a mother, and many hundreds of mothers and calves have been observed and biopsied. The reactions were always short-term and the mothers and calves resumed normal behavior after the sampling ended (Clapham and Mattila 1993).

- Gauthier and Sears (1999) studied reactions of humpback, fin, and blue whales, revealing differences between the species. The majority of fin and blue whales exhibited no behavioral response to biopsy sampling, including two fin whale calves biopsied. No strong reactions were observed for these species (Gauthier and Sears 1999). The majority of humpback responses were moderate, consisting of hard tail flicks. Of the humpback whale calves biopsied, 4 out of 7 had a moderate to low reaction while the rest had no reaction (Gauthier and Sears 1999). They also noted that reactions of whales typically lasted at the most only a few minutes.

- Minimal reactions of biopsied adult females, including mothers, have been observed in many studies (Weinrich et al. 1992; Clapham and Mattila 1993; Brown et al. 1994). Reactions were always short in duration.

- A study of the long-term effects of biopsy sampling southern right whales found that the majority of cows that accompanied calves elicited a non-forceful fluke movement or lesser reaction (Best et al. 2005). Calves of cow/calf pairs on average showed a lesser response akin to a startle when biopsied (Best et al. 2005). Their data also suggested that cows may become more sensitive to repeated biopsy sampling within short time frames (less than 1

year) while this could not be detected in calves due to low sample sizes (Best et al. 2005). The authors also were unable to detect any difference in reproductive success or the proportion of normal calving intervals based on whether an animal was biopsy sampled in the prior two years, but this could be due to low sample sizes and statistical power. Despite this fact, no major effects to the population were detected and the authors cautiously approve of the biopsy sampling of southern right whale cow/calf pairs when done with care.

In addition, one researcher has data indicating that there are no long-term effects of biopsy sampling this age class. According to Knowlton (pers. comm. 2007), a female right whale calf that was biopsied off the coast of Georgia in 1997 was re-identified in 2006 with her first calf. This illustrates that 1) the calf was not seriously injured or killed as a result of the sampling in 1997 and 2) the reproductive fitness of the biopsied calf was not appreciably reduced.

Based on this information, NMFS expects that the effects of biopsy sampling right whale calves and females with calves would be similar to sampling adults. These procedures would be expected to result only in short-term stress and discomfort and no long-term effects would be anticipated. Any behavioral impacts to this age class and pairing would likely be short-term and considered minimal. In addition, conditions and mitigation measures would be placed in the permit to further limit the potential for negative effects from these activities.

There is no evidence that responses of individual whales of any age class to biopsy sampling would exceed short-term stress and discomfort and no long-term effects would be anticipated. Re-sightings of sampled animals suggest that animals would not significantly alter their range or habitat use and that any wounds at the biopsy site would heal over time, resulting in no long-term adverse effects to individual health. The proposed biopsy activities would not likely lead to serious injury, mortality, or disruption of essential behaviors such as feeding, mating, or nursing, to a degree that the individual's likelihood of successful reproduction or survival would be substantially reduced; therefore no stock- or species-level effects would be expected. In addition, conditions and mitigation measures would be placed in the permit to further limit the potential for negative effects from these activities.

Summary of effects

There is no evidence that responses of individual whales would exceed short-term stress and discomfort and no long-term effects would be anticipated. The activities would not be expected to have any additional effects that have not been previously analyzed. The short-term behavioral responses that might result from research activities would not likely lead to mortality, serious injury, or disruption of essential behaviors such as feeding, mating, or nursing, to a degree that the individual's likelihood of successful reproduction or survival would be substantially reduced. In addition, conditions and mitigation measures would be placed in the permit to further limit the potential for negative effects from these activities.

4.3 SUMMARY OF COMPLIANCE WITH APPLICABLE LAWS, NECESSARY FEDERAL PERMITS, LICENSES, AND ENTITLEMENTS

As summarized below, NMFS has determined that the proposed research is consistent with the purposes, policies, and applicable requirements of the MMPA, ESA, and NMFS regulations. NMFS issuance of the permit would be consistent with the MMPA and ESA.

4.3.1 Endangered Species Act

This section summarizes conclusions resulting from consultation as required under section 7 of the ESA. The consultation process was concluded after close of the comment period on the application to ensure that no relevant issues or information were overlooked during the initial scoping process summarized in Chapter 1. For the purpose of the consultation, the draft EA represented NMFS' assessment of the potential biological impacts. The consultation determined that the proposed action would not jeopardize any endangered species or destroy or modify any critical habitat (NMFS 2011).

4.3.2 Marine Mammal Protection Act

The applicant submitted an application which included responses to all applicable questions in the application instructions. The requested research is consistent with applicable issuance criteria in the MMPA and NMFS implementing regulations. The views and opinions of scientists or other persons or organizations knowledgeable of the marine mammals that are the subject of the application or of other matters germane to the application were considered following the close of the public comment period.

The permit would contain standard terms and conditions stipulated in the MMPA and NMFS's regulations. As required by the MMPA, the permit would specify: (1) the effective date of the permit; (2) the number and kinds (species and stock) of marine mammals that may be taken; (3) the location and manner in which they may be taken; and (4) other terms and conditions deemed appropriate. Other terms and conditions deemed appropriate relate to minimizing potential adverse impacts of specific activities, coordination among permit holders to reduce unnecessary duplication and harassment, monitoring of impacts of research, and reporting to ensure permit compliance.

4.3.3 National Marine Sanctuaries Act

If necessary, the applicant would obtain permits required to conduct research in the Sanctuaries within the action area.

4.4 COMPARISON OF ALTERNATIVES

The Proposed Action would authorize takes by level A and B harassment for North Atlantic right whales. The proposed action does not represent a substantial increase in the harassment of these species in the action area over that authorized by current scientific research permits. If Permit No. 15488 is issued, OPR requirements of all researchers biopsy sampling right whale calves would limit the total annual takes (including missed biopsy attempts) authorized annually to 60 – an increase of 10 biopsy takes annually from what is currently authorized - and would maintain the requirement that each calf would only be successfully sampled once annually. The potential for adverse impacts on the human environment is not greater under the proposed action than under the No Action alternative.

4.5 MITIGATION MEASURES

In addition to the measures identified by the applicant and otherwise considered "good practice or protocol", all NMFS marine mammal research permits contain conditions intended to minimize the potential adverse effects of the research activities on the animals. These conditions are based on the type of research authorized, the species involved, information in the literature and from the researchers about the effects of particular research techniques and the responses of animals to these activities.

A full list of conditions is available in the permit; conditions would include:

- Limitations on activities authorized for specific age classes.
- Requirements for Researchers to suspend permitted activities in the event serious injury or mortality of protected species occurs or authorized take is exceeded.
- Requirements for Researchers to exercise caution when approaching animals and retreating if behaviors indicate the approach may be interfering with reproduction, feeding, or other vital functions.
- Requirements for Researchers to take reasonable measures to avoid unintentional repeated biopsy sampling of any individual (e.g., compare photo-identifications).
- Limits on the number of attempts that would be made to biopsy sample an individual.
- Requirements that Researchers not attempt to biopsy a cetacean anywhere forward of the pectoral fin, avoiding sensitive areas of the body.
- Requirements to discontinue attempts to collect biopsy samples if an animal exhibits repetitive strong adverse reactions to the activity or the vessel.

The permit holder would also be required to notify the appropriate Assistant Regional Administrators for Protected Resources in the NMFS Regions where field work would be conducted, and to coordinate planned activities with other permitted researchers conducting similar activities in the area.

4.6 UNAVOIDABLE ADVERSE EFFECTS

The mitigation measures imposed by permit conditions are intended to reduce, to the maximum extent practical, the potential for adverse effects of the research on the targeted species as well as any other species that may be incidentally harassed.

4.7 CUMULATIVE EFFECTS

Cumulative effects are defined as those that result from incremental impacts of a proposed action when added to other past, present, and reasonably foreseeable future actions, regardless of which agency (federal or nonfederal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions that take place over a period of time.

North Atlantic right whales in the proposed study areas are regularly exposed to human activities. A summary of the identified anthropogenic activities that may impact right whales is presented here to assess the potential for cumulatively significant impacts resulting from the proposed action. Impacts may be chronic as well as sporadic effects like behavioral changes that can stress the animal and ultimately lead to increased vulnerability to parasites and disease. The net effect of disturbance is dependent on the size and percentage of the population affected, the ecological importance of the disturbed area to the animals, the parameters that influence an animal's

sensitivity to disturbance or the accommodation time in response to prolonged disturbance (Geraci and St. Aubin 1980).

Considering the nature of the proposed research activities, the minimal, temporary harassment that target animals would experience, the mitigation measures that would be employed, and that these types of research activities are not novel in the marine environment, the proposed research would contribute a negligible increment over and above the effects of the baseline activities currently occurring in the marine environment where the proposed research would occur. The following activities have been identified as factors that may impact North Atlantic right whales.

4.7.1 Shipping and Ship Strikes

Ship strikes are responsible for the majority of human-caused right whale mortalities (Knowlton and Kraus 2001; Jensen and Silber 2003; NMFS 2005b). As such, ship strikes are a primary factor in the lack of recovery of the species. In waters off the U.S. and Canadian East Coast, several major shipping corridors overlap with, or are adjacent to, right whale habitat and migratory routes and pose a grave threat to these animals. Presumably, right whales are either unable to detect approaching vessels or ignore them if they are involved in important activities such as feeding, nursing, or mating. On the other hand, given the density of ships and the distribution of right whales, overlap is nearly inevitable, thereby increasing the probability of a collision, even if one entity or the other is actively trying to avoid a collision. Additionally, right whales are very buoyant and slow swimmers, which may make it difficult for them to avoid oncoming vessels, even if they are aware of a vessel's approach. Similarly, it is difficult to detect a right whale from the bow of the ship because of its dark coloration, and it maintains a low profile while swimming (WWF 2005, as cited in USCG and Environmental Resources Management Inc. 2006).

NMFS published a database in 2003 of all known ship strikes to large whales worldwide. Although this database is perhaps the most comprehensive one available, it cannot be considered exhaustive and almost certainly underestimates the actual number of strikes, because not all ship strikes are documented. Based on a recent estimate of the mortality rate and records of ship strikes to large whales, scientists estimate that less than a quarter (17 percent) of ship strikes are actually detected (Kraus et al. 2005). Collisions occur off almost every U.S. coastal state, but strikes are most common along the East Coast. More than half (56 percent) of the recorded ship strikes from 1975 to 2002 occurred off the coasts of the Northeast U.S. and Canada, while the mid-Atlantic and SEUS areas each accounted for 22 percent (Jensen and Silber 2003). Records from Knowlton and Kraus' (2001) account of right whale deaths show similar results: of 15 confirmed ship strikes in the western North Atlantic (including Canada) from 1970 to 1999, nine (60 percent) occurred in the Northeast, and three (20 percent) occurred in both the mid-Atlantic and Southeast.

Records of deaths from 1970 to 1999 indicate that ship strikes were responsible for over one-third (16 out of 45, or 35.5 percent) of all confirmed right whale mortalities (Knowlton and Kraus 2001). The authors also noted two possibly fatal; and seven nonfatal ship strike injuries during this time period. Another study conducted over a similar period, 1970 to 2002, examined 30 (18 adults and juveniles and 12 calves) out of 54 reported right whale mortalities from Florida to Canada (Moore et al. 2004). Human interaction (ship strike or gear entanglement) was evident in 14 of the 18 adults examined, and trauma, presumably from vessel collision, was apparent in ten out of 14 cases. Trauma was also present in four out of 12 calves; although the cause of death was more

difficult to determine in these cases. In 14 cases, the assumed cause of death was vessel collision, and an additional four deaths were attributed to entanglement. The cause of death was undetermined in the other 12 cases (Moore et al. 2004).

A NMFS reference document on mortality and serious injury determinations for large whales contains 50 reports of right whale events from 1999 to 2003, including five right whale mortalities resulting from ship strike, which represent 27.8 percent of the 18 verified right whale mortalities from 1999-2003 (Cole et al. 2005). More recently, NMFS documented 58 reports of right whale events from 2003 to 2007, including nine mortalities and two serious injuries from confirmed ship strikes. These nine mortalities represent 45 percent of the 20 verified right whale mortalities from 2003-2007 (Glass et al. 2009).

Many types and sizes of vessels have been involved in ship strikes, including container/cargo ships/freighters, tankers, steamships, U.S. Coast Guard (USCG) vessels, U.S. Navy vessels, cruise ships, ferries, recreational vessels, fishing vessels, whale watching vessels, and other vessels (Jensen and Silber 2003). Vessel speed (when recorded) at the time of a large whale collision has ranged from two to 51 knots (Jensen and Silber 2003). Vessels can be damaged during ship strikes; of the 13 records that include vessel damage, all of these vessels were traveling at a speed of at least ten knots (Jensen and Silber 2003). Occasionally, collisions with large whales have even harmed or killed humans on board the vessel. A summary paper on ship collisions and whales by Laist et al. (2001), reported that of 28 recorded collisions causing lethal or severe injuries to whales, 89 percent involved vessels traveling at 14 knots or faster, and the remaining 11 percent involved vessels traveling at ten to 14 knots. None occurred at speeds below ten knots, although there is a predicted 45 percent chance of death or serious injury to the whale at ten knots (Pace and Silber 2005).

4.7.2 Conservation Efforts

Concern has been raised over the possible adverse effects of whale-watching activities on right whale aggregations, particularly in Cape Cod Bay and the lower Bay of Fundy. While adverse effects from this activity are possible, there are no data that conclusively establish adverse effects beyond the possibility of ship strikes. Furthermore, whale-watching in these regions is typically focused on other large whale species since a federal regulation (50 CFR 224.103) prohibits vessels from approaching right whales in U.S. Atlantic waters within 500 yards (460 m). There are a few exceptions to this regulation, such as permitted researchers, but whale-watching vessels must maintain the 500-yard distance. As a result, most effects from whale-watching activities are likely limited to behavioral changes or perhaps relatively small changes in distribution. Given the above-mentioned regulations on vessel approaches to right whales, the potential for temporary, perhaps relatively minor, effects has been reduced. However, relatively recent collisions between whale-watching boats and a humpback (2001) and a minke whale (1998) indicate that much more serious consequences (e.g., death or serious injury) are also possible. Each NMFS region issues guidelines for viewing whales.

In November 2006, NMFS established a set of recommended vessel routes in four locations to reduce the likelihood of collisions in key right whale habitats. More recently, in October 2008, NMFS issued new regulations to reduce the likelihood of vessel collisions with North Atlantic right whales. The regulations implement speed restrictions of 10 knots or less for vessels 65 ft

(19.8 m) and greater in certain areas and at certain times of the year along the U.S. Atlantic seaboard that correspond to right whale occurrence. Exempted from the rule are State enforcement vessels and U.S. government vessels that will be expected to adhere to guidance provided under ESA Section 7 consultations. The rule also contains a provision exempting vessels from speed restrictions in poor sea and weather conditions, thereby ensuring safe vessel maneuverability under those special conditions. The rule also provides for establishment of temporary, voluntary dynamic management areas (DMAs) in times and/or areas where the seasonal management measures are not in effect, and where whales occur. In these locations, mariners would have the option to cross through the DMA at a speed no greater than 10 knots or route around the area.

4.7.3 Fishing Gear Entanglement

Entanglement in fishing gear is another common anthropogenic cause of right whale mortality and serious injury. Because right whale occurrence can overlap with frequented fishing areas, gear entanglements are common and can cause death by drowning or serious injuries such as lacerations, which in turn can lead to severe infections. Most right whale entanglements appear to be with gillnets, lobster pots, crab pots, seines, fish weirs, and aquaculture equipment (NMFS 2005a). Because right whales are skimmers and feed by swimming with their mouth agape, it is quite common for gear to become entangled amongst the baleen plates in their mouths. Entanglements of juveniles are particularly dangerous because wrapped line can become imbedded in tissue as the whale grows, cause infections, and/or restrict growth.

From 2003 to 2007, 4 of 15 records of right whale mortalities or serious injuries resulted from entanglements or fishery interactions; during this time period there were also at least four documented cases of entanglements for which the intervention of disentanglement teams averted a likely serious-injury determination (Waring et al. 2009). In January 1997, NMFS changed the classification of two lobster pot fisheries (the Gulf of Maine and the U.S. mid-Atlantic) from Category III to Category I based on the number of large whales entangled by lobster pot gear during the time period of 1990 to 1994 (62 FR 33, January 2, 1997). A fishery qualifies as a Category I if the annual mortality and serious injury of a marine mammal stock in that fishery is greater than or equal to 50 percent of the PBR level, whereas a Category III fishery is a fishery where the annual mortality and serious injury is less than or equal to one percent of the PBR level (16 U.S.C. § 1387).

Although entanglements do not always result in death or serious injury, they pose a serious threat to North Atlantic right whales. Analysis of the North Atlantic Right Whale Catalog[7] indicates that 61.6 percent of the overall population shows physical evidence of entanglements, such as scars (Hamilton et al. 1998), and between 10 and 28 percent of whales experience entanglements each year (Knowlton et al. 2001). Injuries and entanglements that are not initially lethal may result in a gradual weakening of entangled individuals, making them more vulnerable to some other direct cause of mortality (Kenney and Kraus 1993). For example, entanglement may reduce a whale's ability to maneuver, making it more susceptible to ship strikes. Entanglement-related stress may decrease an individual's reproductive success or reduce its life span, which may in turn depress population growth.

[7] The Right Whale Catalog is a database of whale sightings and photographs maintained by the New England Aquarium.

Records of deaths from 1970 to 1999 indicate that three out of 45 (6.7 percent) were due to entanglement in fishing gear (Knowlton and Kraus 2001). The authors also noted eight possibly fatal and 20 nonfatal ship strike injuries during this time period. A NMFS reference document on mortality and serious injury determinations for large whales contains 50 reports of right whale events from 1999 to 2003, including three right whale mortalities and seven reports of serious injury resulting from entanglement. These three mortalities represent 16.7 percent of the 18 verified right whale mortalities from 1999-2003 (Cole et al. 2005). From 2003 to 2007, 20 right whale entanglement events were confirmed, three of which resulted in mortality and one serious injury (Glass et al. 2009).

The number of deaths attributed to fishing gear interactions may be grossly underestimated. In many cases, veterinarians and researchers are unable to determine a cause of death from a whale carcass. Another possibility is that some whales become entangled, drown, and fail to resurface, so their carcasses are never recovered and examined.

4.7.4 Habitat Degradation

A continued threat to the coastal habitat of the right whale in the western North Atlantic is the undersea exploration and development of mineral deposits, as well as the dredging of major shipping channels. Offshore oil and gas activities have been proposed off the coast of the mid- and south-Atlantic U.S. (NMFS 2005b), but NMFS is not aware of any current plans to explore or develop oil resources in this region. If these activities occur, there may be consequent adverse effects to the right whale population by vessel movements, noise, spills, or effluents. These activities may possibly result in disturbance of the whales or their prey and/or disruption of the habitat and should be subject to ESA Section 7 consultations.

Right whales also frequent coastal waters where dredging and its associated disposal operations occur on a regular basis, such as along the SEUS coast. The U.S. Army Corps of Engineers (USACE) has responsibility/oversight for many of these dredging and disposal operations and has consulted with NMFS under Section 7 of the ESA on these activities. As a result, engaging in dredging operations and related activities requires protective measures such as posting lookouts on dredge vessels and adherence to recommended precautionary guidelines for operations to reduce the risk of collision.

Discharge from municipal, industrial, and non-point sources, dredging activities, dredge spoil disposal, and sewage disposal may degrade essential habitat in Massachusetts Bay and northern CCB.

4.7.5 Noise

A review of impacts of noise of all types on marine mammals is provided by Richardson et al. (1995). Noise, as defined by Richardson et al. (1995), is a sound that impairs reception of signals of interest that affects the animal in a way that interrupts normal behavior. Although certain species of large whales have shown behavioral changes to anthropogenic noise sources in the marine environment, there have been few studies of the effects of anthropogenic noise on right whales specifically. In general, the impact of noise from shipping or industrial activities on the communication, behavior, and distribution of right whales remains unknown. Several of the

activities described in this section also have the possibility of creating a noise nuisance to right whales.

Noise from ships is one of the biggest problems facing right whales related to their hearing abilities. Even though research indicates that right whales should be able to hear vessels, they do not appear to avoid vessels. Several researchers have confirmed that right whales should be able to hear approaching vessels, which emit sounds in a range they can perceive. Parks (2003) established that whales have the ability to locate a sound and even remember where it originated from for around 20 minutes after the sound stops. Masking and habituation are two phenomena that may help to explain right whale behavior regarding vessels and other anthropogenic sounds.

Background ambient noise, or underwater noise, including that produced by human activities (e.g., dredging, shipping, seismic exploration, and drilling for oil), may interfere with or mask the ability of a marine mammal to detect sound signals, such as calls from other animals (Richardson et al. 1995). There are many sources of low frequency noises from human activities that overlap with the low frequency calls of mysticetes. To compensate and reduce masking, some mysticetes may alter the frequencies of their communication sounds (Richardson et al. 1995).

Masking may also prevent right whales from being able to detect and avoid approaching vessels because they might not be able to distinguish the sound of an approaching ship from the ambient noise in the ocean. This hypothesis has not been tested. Areas with continuous loud distant shipping may mask the sound of individual ships until they are too close to the whales (Terhune and Verboom 1999), which may make right whales more susceptible to ship strikes.

Research has been conducted on the effects of vessel noise on certain species of large whales yet there are still unknowns about right whale hearing capacities. Research suggests that right whale hearing is concentrated in the low frequency range, thus some high frequency noise such as propellers might not be detected (Terhune and Verboom 1999). Large vessels cause the most lethal and serious injury to whales and also produce low frequency sounds which may interfere with right whale hearing (Koschinski 2002).

The ability of a right whale to detect a vessel is related to a variety of factors including bottom reflections, frequency of sounds, location of the whale with respect to the vessel, and its depth in the water column. Multipath propagation of vessel noise may confuse the whale as to the direction the ship is going and generally is problematic with low frequency noise. Ships generate higher noise levels towards the stern of the boat than in front of the bow, and even louder noises directly under the ship, so there might be instances in which a whale would not actually hear a vessel until after it has passed. Ship noises are not as loud near the surface as they are five to ten meters beneath, due to the reflective nature of the surface (Terhune and Verboom 1999). This is known as the Lloyd-mirror effect, which is amplified in the low frequency range, in calm sea states, and when the source and/or receiver are near the surface (Richardson et al. 1995). Therefore, in certain conditions, a whale might be less likely to hear a vessel when the whale is at or near the surface, where it is at a high risk of being struck by a vessel.

Habituation is a phenomenon whereby whales may not respond to anthropogenic sources of noise, such as vessel noise, because they have become accustomed to continuous noise in certain areas.

For example, right whales may become habituated to vessel noise in areas of heavy vessel traffic and as a result, are less reactive to the approaching ships.

Attempts have been made to try to better understand the connection between the hearing abilities of right whales, vessel noise, and the incidence of ship strikes. One study utilized an archival DTAG to record whale behavioral reaction to an alert signal, vessel noise, other whale social sounds, and a silent control (Nowacek et al. 2004). The whales did not have a significant response to any of the signals other than an alert signal broadcast ranging from 500 to 4,500 Hz. In response to the alert signal, whales abandoned current foraging dives, began a high power ascent, remained at or near the surface for the duration of the exposure, and spent more time at subsurface depths of one to ten meters (Nowacek et al. 2004). This increased time just below the surface could substantially increase their risk of ship strike because whales are susceptible to being struck but are not visible at the surface. The consequences of the whales' altered behavior, aside from increased risk of ship strike, are reduced foraging time and an excess use of energy, a problem for an endangered species. The whale's lack of response to a vessel noise stimulus from a container ship and from passing vessels indicated that whales were unlikely to respond to the sounds of approaching vessels even when they could hear them (Nowacek et al. 2004).

A second study that utilized a DTAG had similar results. The scientists played a recording of a tanker using an underwater sound source and observed no response to a tagged whale 600 m away (Johnson and Tyack 2003). This non-avoidance behavior could be an indication that right whales have become habituated to the vessel noise in the ocean and therefore do not feel the need to respond to the noise or may not perceive it as a threat. These various hypotheses aside, it has not been established why the species is so susceptible to strikes. Also, caution should be used when extending study results from deep water environs to shallow water environs, for example, in the SEUS. (See section 4.7.1 for a more detailed discussion about the threat of ship strikes on right whale survival.)

It is unknown to what extent noise may disturb or otherwise affect right whales. It appears that whale behavior and the type of activity in which they are engaged influence right whale sensitivity to, and tendency to avoid, noise disturbance and vessel activity (Watkins 1986; NMFS 1991), but more studies are needed. Additional factors aside from masking and habituation may also interfere with a whales' ability to hear approaching vessels.

4.7.6 Contaminants

Two studies on contaminants in right whales, using samples obtained from remote biopsy sampling, indicate a range of total PCBs from 80 to 1,000 ng/g wet weight, i.e., in the parts per billion range (Moore et al. 1998; Woodley et al. 1991). These samples appear to be relevant to the whole animal given that lipid-normalized contaminant burden is comparable between different blubber depths and locations in large whales (Gauthier et al. 1997). No obvious geographic trends were evident in samples from South Africa, South Georgia, CCB, and Bay of Fundy, Canada (Moore et al. 1998). In contrast, most odontocete (i.e., toothed whales, porpoises, and dolphins) values were in the parts per million range (Aguilar and Borrell 1996). Organic chemical contaminants have been regarded as of less significance for mysticetes than odontocetes and are not considered primary factors in slowing the recovery of any stocks of large whale species (O'Shea and Brownell 1994). This is especially true for planktivorous baleen whales such as right

whales, given their lower accumulated contaminant burdens as compared to other marine mammals. However, assessment of contaminant body burden ignores toxic non-halogenated aromatic hydrocarbons (polynuclear aromatic hydrocarbons: PAH) from crude oil and combusted fossil fuels that do not bioaccumulate. Such compounds are metabolized, induce their effects, and are mostly excreted. Contaminant impact is therefore insufficiently assayed by blubber burden analysis of parent compounds alone.

Right whales may be exposed to a variety of anthropogenic chemical contaminants throughout their range, which can lead to reproductive dysfunction. Theoretically, a loss of genetic diversity can lead to "inbreeding depression," where inbreeding adversely affects a population's reproduction and recruitment rates. Genetic factors might be affected by external factors, including toxic chemicals and poor nutrition (Reeves et al. 2001).

Pollutants may also affect phytoplankton and zooplankton populations in a way that decreases the density and abundance of specific zooplankton patches on which northern right whales feed. In addition, pollution may affect the feeding patterns and habitat use of other components of the marine ecosystem, which in turn could impact food and habitat availability for the right whale. A study conducted by Doucette et al. (2006) suggests that the trophic transfer of marine algal toxins is a factor contributing to the recovery failure of the North Atlantic right whale.

4.7.7 Military Activities

Although no evidence conclusively links military activities in the North Atlantic to impacts on right whales, activities such as underwater explosions and military exercises in this ocean basin have the potential for disturbing, injuring, or killing these and other whales.

In early 1996, six right whale deaths were documented. Five (one attributed to a ship strike) occurred in waters adjacent to the SEUS critical habitat. Navy facilities adjacent to the critical habitat use offshore areas for gunnery exercises. Because several of the carcasses were found near a U.S. Navy gunnery range, it was suspected that some deaths were related to underwater explosions, and there was concern that Navy activities may have been involved in some deaths. However, no such link was established. Although a link to military activities was not established, the Navy entered into consultation with NMFS under Section 7 of the ESA on the potential effect of some of its operations on protected species, as described in Appendix A of the Recovery Plan (NMFS 2005b). In addition, Navy activities that introduce loud sounds into the marine environment are required to be reviewed to ensure compliance with those provisions of the MMPA regarding the incidental harassment of marine mammals. The Navy has made a number of significant modifications to its operations to facilitate protection of right whales in their critical habitat in the SEUS. NMFS and the Navy both understand the need to continue to keep an open dialogue and to evaluate ways to mitigate possible environmental impacts of naval operations throughout the eastern seaboard.

The Navy has also been issued Letters of Authorization (LOAs) to take North Atlantic right whales by Level B harassment of animals incidental to Navy training, maintenance, and research, development, testing, and evaluation activities to be conducted along the Atlantic and Gulf of Mexico coasts, over the course of 5 years. They are authorized takes for the harassment of right whales for training activities are classified as military readiness activities. These training activities

may incidentally take whales present within the AFAST Study Area by exposing them to sound from mid-frequency or high frequency active sonar or to underwater detonations at levels that NMFS associates with the take of marine mammals.

4.7.8 Climate and Ecosystem Change

There is a close linkage between right whale foraging and the physical forcing processes that concentrate prey in the oceanic environment (Kenney et al. 2001). Interannual, decadal, and longer time-scale variability in climate can alter the distribution and biomass of prey available to right whales. For example, decade-scale climatic regime shifts have been related to changes in zooplankton in the North Atlantic (Fromentin and Planque 1996). Decadal trends in the North Atlantic Oscillation (Hurrell 1995) can affect the position of the Gulf Stream (Taylor et al. 1998) and other circulation patterns in the North Atlantic that may be important to right whales. The effects of climate-induced shifts in productivity, biomass, and species composition of zooplankton on the foraging success of right whales have received little attention. Such shifts in community structure and productivity may alter the distribution and occurrence of foraging right whales in coastal habitats and affect their reproductive potential as well.

"The North Atlantic Oscillation is a complex climatic phenomenon in the North Atlantic Ocean (especially associated with fluctuations of climate between Iceland and the Azores). It is characterized predominantly by cyclical fluctuations of air pressure and changes in storm tracks across the North Atlantic."[8] The North Atlantic Oscillation index measures the difference in sea-level pressure between the subtropical high (Azores) and the subpolar (Iceland) low. The climactic change caused by the North Atlantic Oscillation can have an impact on right whale foraging. During a positive phase[9] in the 1980s, slope water temperatures were warmer than average in the Gulf of Maine, and *C. finmarchicus* abundance was relatively high. Modeling studies indicate that the stable calving rates of right whales in the 1980s were related to the high abundance of *C. finmarchicus* during this time (Greene et al. 2003). Then a decrease in the North Atlantic Oscillation index in the mid-1990s resulted in low *C. finmarchicus* abundance in the late 1990s, which coincided with declining calving rates from 1993 to 2001 (Greene et al. 2003).

Data from Gulf of Maine Ocean Observing System (GoMOOS) Buoy N (in the Northeast Channel) can provide forecasts of right whale births based on water temperature at the buoy. As mentioned above, the North Atlantic Oscillation affects water temperatures in the Atlantic Ocean and specifically, the Gulf of Maine. Water temperatures in turn, influence right whales' food supply, which affects reproduction and the number of calves born. After a positive [North Atlantic Oscillation] index, whale food becomes plentiful, and right whales produce many calves; after a negative index, food becomes scarce, resulting in few calves being born (GoMOOS 2006). Based on these data, 13 births were predicted for 2006 and 16 for 2007; 19 and 23 births were reported for these years, respectively (Table 3).

[8] http://www.cpc.ncep.noaa.gov/data/teledoc/nao.shtml

[9] A positive phase occurs when subtropical pressures are higher than normal and subpolar pressures are lower than normal, resulting in above average temperatures in the eastern US (http://www.cpc.ncep.noaa.gov/data/teledoc/nao.shtml).

4.7.9 Energy Development

Steady increases in oil prices and a desire to decrease U.S. dependence on foreign sources of oil have led to the development of alternative energy projects in U.S. waters. These include wind farms, tidal turbines, and liquefied natural gas installations. Another factor driving some of these projects is the desire to find cleaner, more environmentally-friendly sources from which to derive and maintain our energy needs.

Wind Farms

Currently, NMFS has issued one Incidental Harassment Authorization (IHA) for activities related to offshore wind energy. Bluewater Wind LLC plans to install two meteorological towers off the coast of Delaware and New Jersey in 2011 to collect wind resource data needed to support development of offshore wind parks. The current IHA allows for Level B harassment of marine mammals during the impact pile driving required for installation (75 CFR 61426, October 5, 2010), but does not authorize any take of right whales.

In 2001, Cape Wind Associates, LLC filed a permit application with the USACE, New England District, in anticipation of constructing a wind park located on Horseshoe Shoals in Nantucket Sound, Massachusetts. The proposed park would consist of 130 offshore wind turbine generators with a maximum potential electric output of approximately 454 megawatts (MW). The installation would require a 30 kilovolt submarine transmission cable to transmit the electricity to a centrally located electric service platform (71 CFR 30693, May 30, 2006).

According to a study conducted by ESS Group Inc. (2006), the construction and existence of the Cape Wind park will have a minimal impact on right whale feeding. The primary feeding grounds for many whales found in the study area, including right whales, are located further offshore from Nantucket Sound at locations such as Stellwagen Bank, CCB, and the Gulf of Maine. The bathymetric and oceanographic features that favor dense aggregations of whale prey species are not developed in Nantucket Sound to the same extent that they are farther north, around Stellwagen Bank, Jeffrey's Ledge, Browns and Baccaro Banks, and in the GSC (Kenney and Winn 1986). "Historically and at present, Nantucket Sound does not appear to be an important area for these species of whales" (ESS Group Inc. 2006). NMFS concluded Section 7 consultation in 2008 and the Biological Opinion did not anticipate any take of large whales. Consultation was reinitiated in 2010 and a final Biological Opinion was issued in December 2010, again not anticipating any take of large whales.

NMFS also anticipates applications for other wind energy projects to be submitted for the proposed Block Island Wind Farm (Deepwater Wind Block Island, LLC), the Atlantic City Offshore Wind Energy Project (Fishermen's Atlantic City Windfarm, LLC), and the University of Maine Deepwater Offshore Wind Test Site. The Deepwater and Fishermen's projects would have no more than eight wind turbines installed off the Atlantic coast.

Bureau of Ocean Energy Management, Regulations and Enforcement (BOEMRE) is also currently drafting an EIS regarding a proposal from the Long Island Power Authority and Florida Power and Light Energy to construct an eight square mile wind park of 40, 3.6 MW wind turbine generators in Federal waters, approximately 3.6 miles south of Jones Beach Island, Long Island, New York. This area is not currently known to be a critical habitat location for the western North Atlantic

right whale population. However, there is a possibility that the whales may use this area as they migrate between the calving grounds in the south and the feeding grounds in the north.

The possible effects of wind turbines on marine mammals differ depending on the location of the structures (i.e. < 20 m or 20 to 100 m depth). Dangers can be posed to the animals both during the construction and the operating phases of the projects. The possibilities for acoustic harassment will be greater during the construction/pile-driving phase (Madsen et al. 2006). Based on a review of airgun studies, Madsen et al. (2006) noted that right whales may demonstrate avoidance responses to transient signals from the pile-driving above some 120 dB (RMS) re 1 μPa. "Thus, pile-driving has the potential to affect right whales over very large ranges, depending on the propagation conditions" (Madsen et al. 2006). However, to date, there have been few studies that examine the effects of pile-driving or other high-level, low-frequency impulsive sounds on marine mammals. Similarly, no studies have been conducted to determine the effects of turbine noise on baleen whales. The data suggest that the noise emitted from the turbines may affect right whales up to a few kilometers away; however, the behavioral effects are likely to be minor (USACE 2004; Madsen et al. 2006).

Other potential impacts to marine mammals during the construction and/or operational phases of the project include increased vessel traffic, which pose both a noise threat and a ship strike threat, elevated total suspended solids, habitat shift from structure-oriented to non-structure oriented system once the monopiles are removed, submarine vibrations, and electromagnetic/thermal emissions from submarine cables and inner-array cables (USACE 2004). The Cape Wind Project FEIS (MMS 2010) also indicates some potential indirect impacts: prey mortality and/or temporary prey displacement. As more of these wind parks are built in marine environments, studies will need to be done to understand the full range of effects the noise of such operations will have on right whales.

Liquefied Natural Gas Installations

Liquefied Natural Gas (LNG) will be an increasingly important supply component to meet domestic demand for natural gas. According to the Federal Energy Regulatory Commission (FERC) website (http://www.ferc.gov/industries/lng.asp#skipnavsub), approximately 40 LNG terminals are either before FERC or being discussed by the LNG industry. Six terminals are already operating along the eastern seaboard, Puerto Rico, and Alaska. Of the 16 facilities currently under FERC jurisdiction, 12 are land-based. However, two of the most recently proposed sites received by the USCG/Maritime Administration (MARAD) are located off of Boston, MA near Stellwagen Bank NMS.

Northeast Gateway Energy Bridge, LLC (NEG) submitted a proposal for a LNG facility approximately 13 miles south-southeast of the city of Gloucester, MA in Massachusetts Bay waters (71 FR 29211, May 19, 2006). NMFS issued an incidental harassment authorization (IHA) to NEG in May 2007 to begin construction of the terminal facility (72 FR 27077, May 14, 2007). The construction of the NEG LNG port facility was completed by the end of 2007, and subsequent IHAs were issued to Northeast Gateway for its LNG port facility operations in 2008, 2009, and 2010. The current IHA for NEG expires in August 2010 and the company has applied for a renewal. Monitoring reports for the NEG operations since August 2010 and June 2011 show that only one LNG shipment was delivered to the LNG port facility during that period.

Neptune LNG, LLC also submitted a proposal to the USCG/MARAD to construct an installation 22 miles northeast of Boston, Massachusetts in the Federal waters of the Outer Continental Shelf (70 FR 58729, October 7, 2005). Neptune received an IHA in summer 2008 to cover the first phase of construction of a port facility. A second IHA was issued in June 2009 and was effective through June 30, 2010 tocover the completion of construction in late 2009 and the beginning of operations. A third IHA was issued July 12, 2010 to cover operation and repair/maintenance activities until July 11, 2011. The final rule for continued operation and repair and maintenance of the Neptune Port is expected to be effective from mid-July 2011 through mid-July 2016. Both of these facilities, if approved, will be in areas deemed as primary late winter/early spring feeding habitat for the western North Atlantic right whale.

According to the EIS prepared by the USCG and its contracting company, Environmental Resources Management, Inc. (2006), right whales have the potential to be affected by construction activities as the result of physical harassment, vessel strikes, alteration to habitat, acoustic harassment, alteration of prey species abundance and distribution, and entanglement. However, the findings in the EIS (USCG and Environmental Resources Management Inc. 2006) indicate that impacts from these activities will be minimal, especially when mitigation measures are employed. The greatest risk from these activities is the increased chance of ship strikes because of the increased vessel traffic in the area, especially during the construction phase. NMFS and the National Ocean Service noted other potential impacts to the USCG during the comment period for the DEIS: ingestion of marine debris, fuel spills, impingement and entrainment during ballast water intake (including prey species), and bioaccumulation of contaminants. NMFS issued Biological Opinions (Neptune, January 12, 2007; NEG, February 5, 2007) for each facility. Both documents state that construction and operation of each deepwater port are likely to adversely affect but are not likely to jeopardize the continued existence of the North Atlantic right whale.

4.7.10 Other Scientific Research Permits and Authorizations

Marine mammals have been the subject of field studies for decades. The primary purpose of most research is to monitor populations and gather data for behavioral and ecological studies.

Over time, NMFS has issued dozens of permits for the take of marine mammals throughout the North Atlantic by harassment from a variety of activities, including aerial and vessel surveys, photo-identification, remote biopsy sampling, and attachment of scientific instruments. The number of research permits and associated takes by harassment indicate a high level of research effort relative to the population size of some endangered marine mammal species throughout the North Atlantic. This is due, in part, to intense interest in developing appropriate management and conservation measures to recover these species. One permit, NMFS Marine Mammal Health and Stranding Response Program (MMHSRP), File No. 932-1905, authorizes takes of stranded or distressed marine mammals, including the disentanglement and health assessment of large whales.

In addition to the MMHSRP permit eleven permits authorize research on North Atlantic right whales, including the applicant's current permit, No. 594-1759 (Table 4).

In addition to current permits that authorize take of North Atlantic right whales, NMFS is processing three other permit requests to conduct right whale research in the North Atlantic (File Nos. 15415, 14450, and 13927).

Based on annual permit reports and the nature of field work, NMFS expects that for the foreseeable future, Permit Holders will continue to have a portion of authorized takes that are not used each year due to a host of factors, such as weather, funding, whale sightings, etc. Therefore, although additional takes of right whales may be authorized during the next five years, NMFS expects that the Proposed Action would not significantly change the cumulative level of research effort on North Atlantic right whales and that potential impacts to the right whale population over the next five years would remain similar to that authorized by existing permits.

None of the current permits or new requests involves activities that are likely to result in the serious injury or mortality of an animal and no such incidences have been reported by permitted researchers. Hence, the number of takes proposed by the applicant, when added, cumulatively, to the currently authorized research activities in the action area, is not expected to result in a significant adverse impact on North Atlantic right whales or any other endangered species.

Table 4: NMFS Scientific Research Permits Authorizing Take of North Atlantic Right Whales

	Permit Holder	Level A		Level B	Expiration
		1-6 mo	> 6 mo	all ages	
current permits	GA DNR (594-1759)*	-	-	200	5/1/2011
	SEFSC (779-1633-01)	-	-	100	6/30/2011
	UNCW/Pabst (948-1692)	-	-	200	5/31/2011
	WHOI/Baumgartner (1058-1733-01)	-	135	300	5/31/2012
	NJ DEP (10014)	-	-	50	12/31/2012
	NEFSC (775-1875)	35; 25 after GA DNR	65	600	1/15/2013
	WCNE (605-1904-01)	-	-	75	2/15/2013
	Kraus (15415)	-	-	200	3/31/2014
	Ocean Alliance (13545)	-	-	20	2/15/2015
	Nowacek (14791)	-	80	90	7/30/2015
	PCCS (14603)	-	20	1,050	9/30/2015
	Kraus (14233)	20	30	2,000	9/30/2015
pending applications	Hain (13927)	-	-	60	-
	SEFSC (14450)	-	-	50	-
	GA DNR (15488) [Proposed Action]	20	50	350	-
	Annual Total	**65**	**380**	**5,045**	

* Permit would be replaced by the proposed permit.
Gray rows indicate permits that would be replaced by pending permits.

In addition, all permits issued by NMFS for research on marine mammals contain conditions requiring the Permit Holders to coordinate their activities with the NMFS regional offices and other Permit Holders conducting research on the same species in the same areas, and, to the extent possible, share data to avoid unnecessary duplication of research and disturbance of animals. More specifically, research on North Atlantic right whales, including the Proposed Action, is closely coordinated by the NMFS Northeast Regional Office and the North Atlantic Right Whale Consortium, a group of non-government and government organizations and individuals in the United States and Canada who share the common goals to research, protect, and ultimately conserve this species.

Members of the Consortium contribute to two major, centralized datasets: the "Sightings database" and the "Identification database". The Sightings database contains records of thousands of sightings of right whales in the North Atlantic Ocean, as well as sightings of many other species of whales, dolphins, sea turtles, seals, and large fishes. The Identification database contains all known photographed sightings of right whales since 1935 and any record that can lead to an individual identification, including "sightings" with skin or fecal samples collected from un-photographed whales. In addition, several other databases contain biological data on right whales, including genetics, which link data to individuals in the Identification database. Collectively, these databases represent a scientific resource, and access to the data for scientific, educational, conservation and management purposes is encouraged and not limited to contributors. These databases not only promote collaboration among researchers but minimize harassment of individual right whales by allowing researchers to target known data gaps, such as photographic and genetic identification, of animals within the population. For example, upon approaching a whale, researchers can determine whether it is an individual that already has been photographed or sampled, thereby preventing unnecessary or duplicative sampling and harassment. Sighting information is also provided through the Sighting Advisory System, limiting repeated harassment of individuals in the population.

NMFS acknowledges that repeated disturbance of some individual right whales could occur during research. However, in the event that repeated disturbance occurs, NMFS expects that the temporary harassment of individuals would dissipate (within minutes) before animals could be targeted for research by another Permit Holder. Further, NMFS has taken steps to limit repeated harassment and avoid unnecessary duplication of effort through permit conditions requiring coordination among Permit Holders. NMFS continues to monitor the effectiveness of these conditions in avoiding unnecessary repeated disturbances, and would do so for the Proposed Action, if approved.

It is also important to note that the target right whales are migratory and may transit in and out of U.S. waters. NMFS does not have jurisdiction over the activities of individuals conducting field studies in other nations' waters and cumulative effects from all scientific research on these species beyond the Proposed Action area cannot be fully assessed. However, where possible, NMFS attempts to collaborate with foreign governments to address management and conservation of transboundary ESA-listed species.

4.7.11 Summary of Cumulative Effects

All of the issues noted above are likely to have some level of impact on marine mammal populations in the Proposed Action area, particularly where ESA-listed (endangered and threatened) and MMPA depleted species are involved. Historically North Atlantic right whales were hunted to near extinction, and, despite being under protection for 70 years, the population remains small. Human activities continue to impact right whales in the proposed action area; the most common threats to this species remain entanglement in fishing gear and vessel collisions which have the potential to seriously injure or kill whales.

Conservation efforts, research, and recent regulations are aimed at eliminating these threats and have positive benefits for right whales, reducing the number of animals killed and seriously injured by ship strikes and fishing gear interactions. It is too early to measure the value of some of these measures; however, the threat to whales from shipping is the lowest it has been in the last 50 years due to a number of changes in shipping traffic rules. Other impacts, such as habitat degradation, energy development, and noise, may temporarily harass individual right whales but are not likely to be life threatening.

Although right whales are impacted by a number of human activities, it is important to note that these activities are not occurring simultaneously on the same individuals of a population/stock on a daily basis and most human impacts are not known to cause serious injury or mortality of right whales. Further, right whales are not exposed to all human activities at all times, particularly given this species' migratory nature. The short-term stresses (separately and cumulatively when added to other stresses right whales face in the environment) resulting from the proposed research activities would be expected to be minimal to targeted right whales. Behavioral reactions suggest that harassment is brief, lasting minutes, before animals resume normal behaviors. NMFS expects any effects of harassment to dissipate before animals could be harassed by other human activities.

Significant cumulative impacts are not expected because no serious injury or mortality is expected (resulting in no direct loss of animals from the population) nor an appreciable reduction in the fecundity of target individuals. Therefore, the proposed research would contribute a negligible increment of harassment over and above the effects of the baseline activities currently occurring in the marine environment of the proposed action area over the life of the permits. Though the effects of repeated or chronic disturbance from scientific research activities should not be dismissed, the potential long-term benefits and value of information gained on these species also must be considered. The proposed research would provide valuable information on right whale biology and ecology which in turn may be used to improve their management and reduce the effects of human activities to this species.

CHAPTER 5 LIST OF PREPARERS AND AGENCIES CONSULTED

This document was prepared by Kristy Beard with the Permits, Conservation and Education Division of NMFS' Office of Protected Resources in Silver Spring, Maryland.

The National Marine Sanctuary Program was consulted for activities that would be conducted in the Gray's Reef National Marine Sanctuary.

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

Dan Forster
Director, Wildlife Resources Division
Georgia Department of Natural Resources
2070 U.S. Hwy 278 SE
Social Circle, Georgia 30025

AUG 0 2 2010

SUBJECT: Coordination of biopsy sampling North Atlantic right whale calves

Dear Mr. Forster:

The National Marine Fisheries Service (NMFS), Office of Protected Resources, Permits, Conservation and Education Division (Permits Office) received three permit requests to biopsy North Atlantic right whale (NARW) calves in the past year. If issued, this would increase the number of takes authorized for this purpose (primarily on the calving grounds of Georgia and Florida) from 30 to 115 takes per year. Approximately 40 NARW calves have been documented during recent calving seasons. Researchers and the Permits Office recognize the need to increase the total number of authorized takes for calf biopsy sampling so that all calves can be sampled. However, this need does not require that we more than double the number of calf biopsy takes for this critically endangered species.

Therefore, in order to avoid duplicative sampling, holders of permits authorizing biopsy sampling, applicants for new permits, and the Permits Office have agreed to the following conditions for all current and future NMFS Scientific Research Permits that authorize biopsy sampling of NARW calves:

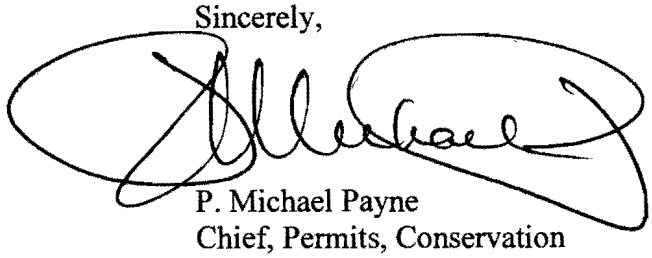
- Up to 60 annual takes of NARW calves for purposes of obtaining biopsy samples, including missed attempts, will be authorized. In the future, if the NARW calving rate indicates that a change in this number would be appropriate, the Permits Office will assess with input from researchers.
- Individual NARW calves can only be sampled once (i.e., a tissue sample is obtained). All biopsy attempts, regardless of success, must be counted and reported as "takes" as specified in permit conditions.
- The NEFSC will monitor the total number of takes of calves for biopsy sampling on the calving grounds. To accomplish this:
    - all Permit Holders must report takes of NARW calves for biopsy sampling, including the ID number of the mother, to the NEFSC on the day they occur and in the format requested by the NEFSC; and
    - the NEFSC will distribute take information to authorized researchers, thereby providing information on the ID number of the mother of all calves sampled, and the number of takes remaining on each permit.

- If a Permit Holder uses all his/her authorized annual takes, he/she must either stop work or continue research as a designated Co-investigator (CI) under the authority of another permit that authorizes biopsy sampling of NARW calves.
- In addition to reporting to the NEFSC, each Permit Holder is still responsible for providing annual reports to the Permits Office.

The Permits Office will ask Permit Holders to provide feedback on the effectiveness of this allocation and monitoring in preventing unnecessarily duplicative sampling following the first year of coordination efforts. If you are currently authorized to biopsy sample North Atlantic right whale calves, please attach this letter to your permit and ensure that all CIs receive a copy.

Thank you for your cooperation.

Sincerely,



P. Michael Payne
Chief, Permits, Conservation
and Education Division
Office of Protected Resources
(phone: 301-713-2289)

cc: Clay George
Laura Engleby

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

JUN 23 2011

Finding of No Significant Impact
Issuance of Scientific Research Permit No. 15488

Background

In May 2010, the National Marine Fisheries Service (NMFS) received an application for a permit (File No. 15488) from the Georgia Department of Natural Resources, Wildlife Resources Division [GDNR; Responsible Party: Dan Forster] to conduct research on North Atlantic whales off the southeastern United States. In accordance with the National Environmental Policy Act, NMFS has prepared an Environmental Assessment (EA) analyzing the impacts on the human environment associated with permit issuance (EA Issuance of a Scientific Research Permit [File No. 15488] for Research on North Atlantic Right Whales in the Southeast United States; June 2011). In addition, a Biological Opinion was issued under the Endangered Species Act (ESA) (June 2011) summarizing the results of an intra-agency consultation. The analyses in the EA, as informed by the Biological Opinion, support the following findings and determination.

Analysis

National Oceanic and Atmospheric Administration Administrative Order (NAO) 216-6 (May 20, 1999) contains criteria for determining the significance of the impacts of a proposed action. In addition, the Council on Environmental Quality (CEQ) regulations at 40 C.F.R. 1508.27 state that the significance of an action should be analyzed both in terms of "context" and "intensity." Each criterion listed below is relevant to making a finding of no significant impact and has been considered individually, as well as in combination with the others. The significance of this action is analyzed based on the NAO 216-6 criteria and CEQ's context and intensity criteria. These include:

1) Can the proposed action reasonably be expected to cause substantial damage to the ocean and coastal habitats and/or essential fish habitat as defined under the Magnuson-Stevens Act and identified in Fishery Management Plans?

Response: Although Essential Fish Habitat (EFH) may be present in the action area, the Proposed Action would only affect large whales authorized for research by the permit. Because in-water research would only involve routine vessel movements at the water surface the Proposed Action would not be expected to cause damage to other aspects of ocean and coastal habitat such as reefs, seagrass beds, soft-bottom sediment, etc. Therefore, no EFH consultation was required.

2) Can the proposed action be expected to have a substantial impact on biodiversity and/or ecosystem function within the affected area (e.g., benthic productivity, predator-prey relationships, etc.)?

Response: The effects of the action on target species, including ESA-listed species and their habitat, EFH, marine sanctuaries, and other marine mammals were all

considered. The Proposed Action would target large whales for biopsy and observation, which is expected to result in short-term minimal disturbance to individual whales. This work is not expected to affect an animal's susceptibility to predation, alter dietary preferences or foraging behavior, or change distribution or abundance of predators or prey. Therefore, the Proposed Action is not expected to have a substantial impact on biodiversity or ecosystem function.

3) Can the proposed action reasonably be expected to have a substantial adverse impact on public health or safety?

Response: The Proposed Action involves aerial surveys and close approach of vessels for biopsy sampling, behavioral observation, and photo-identification of large whales. It would not involve hazardous methods, toxic agents or pathogens, or other materials that would have a substantial adverse impact on public health and safety. Research would be conducted by or under the close supervision of experienced personnel, as required by the permit. Therefore, no negative impacts on human health or safety are anticipated during research.

4) Can the proposed action reasonably be expected to adversely affect endangered or threatened species, their critical habitat, marine mammals, or other non-target species?

Response: The Proposed Action would affect the target species, North Atlantic right whales, during aerial and vessel surveys. The 2011 biological opinion prepared for the Proposed Action concluded that the effects of the Proposed Action on individual right whales would be short-term in nature, and would not be likely to jeopardize the continued existence of the species or to cause the destruction or adverse modification of designated critical habitat. The Proposed Action would also affect bottlenose and Atlantic spotted dolphins, which would be harassed incidental to research. No other non-target species would be affected by the proposed research. The permit would contain mitigation measures to minimize the effects of the research and to avoid unnecessary stress to any protected species by requiring use of specific research protocols.

5) Are significant social or economic impacts interrelated with natural or physical environmental effects?

Response: Effects of the research would be limited to the short-term harassment of target animals. Permitting the proposed research could result in a low level of economic benefit to local economies in the action area. However, such impacts would be negligible on a national or regional level and therefore are not considered significant. These impacts are not interrelated with any natural or physical impacts. The Proposed Action would not result in inequitable distributions of environmental burdens or affect access (short- or long-term use) to any natural or depletable resources in the action area.

6) Are the effects on the quality of the human environment likely to be highly controversial?

Response: NMFS does not consider the Proposed Action controversial nor has it been considered controversial in the past. All of the proposed research activities are standard research activities that have been conducted on these species by the scientific community for decades. No other portion of the environment beyond the whale species identified above would be impacted by the Proposed Action.

7) Can the proposed action reasonably be expected to result in substantial impacts to unique areas, such as historic or cultural resources, park land, prime farmlands, wetlands, wild and scenic rivers, essential fish habitat, or ecologically critical areas?

Response: The proposed research would not be expected to result in substantial impacts to any such area. The majority of these are not part of the action area. EFH would not be substantially impacted since research would not affect bottom habitat (see Question 1). Research activities might occur in Gray's Reef National Marine Sanctuary but would be coordinated with Sanctuary staff and would not result in substantial impacts to the Sanctuary.

8) Are the effects on the human environment likely to be highly uncertain or involve unique or unknown risks?

Response: The proposed research is not unique. The proposed activities have been previously authorized as research activities for large whales; some activities have occurred for decades. There have been no reported serious injuries or mortalities of cetacean species or risks to any other portion of the human environment as a result of these research activities. Therefore, the risks to the human environment are not unique or unknown.

9) Is the proposed action related to other actions with individually insignificant, but cumulatively significant impacts?

Response: The Proposed Action is not related to other actions with individually insignificant, but cumulatively significant impacts. While these species are impacted by other human activities, including other scientific research, these activities are not occurring simultaneously on the same individuals of a population/stock. The applicant is a member of the North Atlantic Right Whale Consortium, a highly-coordinated community of researchers who meet annually to share their findings and coordinate research activities at the start of each field season. The short-term stresses (separately and cumulatively when added to other stresses right whales face in the environment) resulting from the research activities would be expected to be minimal. Behavioral reactions suggest that harassment is brief, lasting minutes, before animals resume normal behaviors. Hence, NMFS expects any effects of research to dissipate before animals could be harassed by other human activities. Significant cumulative impacts are not expected because no serious injury or mortality is expected (resulting in no direct loss of animals from the population), nor is an appreciable reduction in the fecundity of target individuals. Furthermore, the permit would contain conditions to mitigate and minimize any impacts to the animals from research activities, including the coordination of

research activities with other researchers in the area.

10) Is the proposed action likely to adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural or historical resources?

Response: The Proposed Action would not take place in any district, site, highway, structure, or object listed in or eligible for listing in the National Register of Historic Places, thus none would be impacted. The Proposed Action would not occur in other areas of significant scientific, cultural or historical resources and thus would not cause their loss or destruction. None of these resources are expected to be directly or indirectly impacted.

11) Can the proposed action reasonably be expected to result in the introduction or spread of a non-indigenous species?

Response: The action would not be removing or introducing any species; therefore, it would not likely result in the introduction or spread of a non-indigenous species. Researchers would not be exchanging ballast water or moving between large water bodies during the course of research.

12) Is the proposed action likely to establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration?

Response: The decision to issue the permit would not be precedent setting and would not affect any future decisions. Issuance of a permit to a specific individual or organization for a given research activity does not in any way guarantee or imply that NMFS will authorize other individuals or organizations to conduct the same research activity. Any future request received would be evaluated on its own merits relative to the criteria established in the MMPA, ESA, and NMFS' implementing regulations.

13) Can the proposed action reasonably be expected to threaten a violation of Federal, State, or local law or requirements imposed for the protection of the environment?

Response: The action would not result in any violation of Federal, State, or local laws for environmental protection. The permit would contain language stating that the Holder is required to obtain any state and local permits necessary to carry out the action.

14) Can the proposed action reasonably be expected to result in cumulative adverse effects that could have a substantial effect on the target species or non-target species?

Response: The action is not expected to result in any cumulative adverse effects to the target or non-target species. For targeted species, the Proposed Action would not be expected to have more than short-term effects to individuals and negligible effects to large whale populations. The effects on non-target species were also considered and no substantial effects are expected as research would not be directed on these species.

Therefore, no cumulative adverse effects that could have a substantial effect on any species, target or non-target, would be expected.

DETERMINATION

In view of the information presented in this document and the analysis contained in the EA prepared for Issuance of Permit No. 15488, pursuant to the ESA and MMPA, and the ESA section 7 biological opinion, it is hereby determined that the issuance of Permit No. 15488 will not significantly impact the quality of the human environment as described above and in the EA. In addition, all beneficial and adverse impacts of the proposed action have been addressed to reach the conclusion of no significant impacts. Accordingly, preparation of an Environment Impact Statement for this action is not necessary.

JUN 2 3 2011

James H. Lecky
Director, Office of Protected Resources

Date