



OCT 18 2011

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 the Issuance of a Scientific Research Permit for Aerial and Vessel surveys of North Atlantic Right Whales off the Southeastern United States (File No. 13927)

LOCATION: Coastal waters off the southeastern U.S. coast from Georgia to Florida, with a focus on the area south of St. Augustine, Florida.

SUMMARY: NMFS proposes to issue a scientific research permit that would authorize aerial surveys and close approach by vessel to study North Atlantic right whales (*Eubalaena glacialis*). Research activities would consist of photo-identification, surveys, and passive acoustics off the southeastern U.S. coast from December through April, annually. Three other cetacean species may be incidentally harassed as a result of the 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 listed 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.





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

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,

A handwritten signature in blue ink, appearing to read "P. Doremus", with a stylized flourish at the end.

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

Enclosure



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

OCT 17 2011

Environmental Assessment
for the Issuance of a Scientific Research Permit for Aerial and Vessel Surveys of North
Atlantic Right Whales off the Southeastern United States (File No. 13927)

October 2011

Lead Agency: USDOC 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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Silver Spring, MD 20910
(301) 427-8401

Location: Coastal waters of the southeastern United States, primarily
focused on the area south of St. Augustine, Florida

Abstract: The National Marine Fisheries Service (NMFS) proposes to issue a 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.*). The permit would be valid for five years from the date of issuance and would authorize aerial and vessel surveys, focused on North Atlantic right whales (*Eubalaena glacialis*). Research activities would consist of photo-identification, surveys, and passive acoustics and would occur off the southeastern U.S. coast from December through April, annually. Three other cetacean species may be incidentally harassed as a result of the research. The objectives of the research are to: 1) monitor the distribution of right whales in the portion of the southeast critical habitat south of St. Augustine, Florida; 2) improve knowledge of right whale habitat utilization; 3) monitor reproductive success; 4) contribute to the right whale photo-identification catalog; 5) explore linkages between right whale vocalizations and behavior; and 6) evaluate the efficacy of a passive acoustic monitoring system.



TABLE OF CONTENTS

CHAPTER 1	PURPOSE OF AND NEED FOR ACTION.....	4
1.1	DESCRIPTION OF ACTION.....	4
1.1.1	Purpose and Need.....	4
1.1.2	Research Objectives.....	5
1.2	OTHER EA/EIS THAT INFLUENCE SCOPE OF THIS EA.....	5
1.3	SCOPING SUMMARY.....	5
1.3.1	Comments on application.....	5
1.3.2	Issues within the scope of this EA.....	7
1.4	APPLICABLE LAWS AND NECESSARY FEDERAL PERMITS, LICENSES, AND ENTITLEMENTS.....	7
1.4.1	National Environmental Policy Act.....	7
1.4.2	Endangered Species Act.....	8
1.4.3	Marine Mammal Protection Act.....	9
CHAPTER 2	ALTERNATIVES INCLUDING THE PROPOSED ACTION	9
2.1	ALTERNATIVE 1 – NO ACTION.....	9
2.2	ALTERNATIVE 2 – PROPOSED ACTION (ISSUANCE OF PERMIT WITH STANDARD CONDITIONS).....	10
CHAPTER 3	AFFECTED ENVIRONMENT	18
3.1	SOCIAL AND ECONOMIC ENVIRONMENT	19
3.2	PHYSICAL ENVIRONMENT	19
3.2.1	Sanctuaries, Parks, Historic Sites, etc.	19
3.2.2	Essential Fish Habitat.....	19
3.2.3	North Atlantic Right Whale Critical Habitat	19
3.3	BIOLOGICAL ENVIRONMENT	20
3.3.1	ESA Target Species Under NMFS Jurisdiction.....	21
3.3.2	Non-target species	22
CHAPTER 4	ENVIRONMENTAL CONSEQUENCES.....	28
4.1	EFFECTS OF ALTERNATIVE 1: No ACTION.....	28
4.2	EFFECTS OF ALTERNATIVE 2: ISSUE PERMIT WITH STANDARD CONDITIONS.....	28
4.3	SUMMARY OF COMPLIANCE WITH APPLICABLE LAWS, NECESSARY FEDERAL PERMITS, LICENSES, AND ENTITLEMENTS.....	32
4.3.1	Endangered Species Act.....	32
4.3.2	Marine Mammal Protection Act	32
4.4	COMPARISON OF ALTERNATIVES.....	32
4.5	MITIGATION MEASURES	33
4.6	UNAVOIDABLE ADVERSE EFFECTS.....	33
4.7	CUMULATIVE EFFECTS.....	34
4.7.1	Research.....	34
4.7.2	Ship Strikes	35
4.7.3	Fishing Gear Entanglement.....	37
4.7.4	Habitat Degradation.....	38
4.7.5	Contaminants.....	39
4.7.6	Conservation Efforts	39
4.7.7	Noise	40
4.7.8	Climate and Ecosystem Change.....	42
4.7.9	Military Activities.....	43
4.7.10	Energy Development.....	44
4.7.11	Summary of Cumulative Effects.....	46
CHAPTER 5	LIST OF PREPARERS AND AGENCIES CONSULTED	47

LITERATURE CITED	47
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CHAPTER 1 PURPOSE OF AND NEED FOR ACTION

1.1 DESCRIPTION OF ACTION

NMFS proposes to issue a scientific research permit that authorizes “takes”¹ by “Level 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) to:

- Dr. James H.W. Hain, Associated Scientists at Woods Hole, Box 721, Woods Hole, MA 02543 (File No. 13927).

1.1.1 Purpose and Need

The MMPA and ESA prohibit “takes” of marine mammals and of threatened and endangered species, respectively, with only a few specific exceptions. The applicable exceptions in this case are an exemption for *bona fide*³ scientific research under Section 104 of the MMPA and for scientific purposes related to species recovery under Section 10(a)(1)(A) of the ESA.

The purpose of the permit is to provide the applicant with an exemption from the take prohibitions under the MMPA and ESA for harassment (including level B harassment as defined under the MMPA) of marine mammals, including those listed as threatened or endangered, during conduct of research that is consistent with the MMPA and ESA issuance criteria.

The need for issuance of the permit is related to the purposes and policies of the MMPA and ESA. 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. Facilitating research about species’ basic biology and ecology or that identifies, evaluates, or resolves specific conservation problems informs NMFS management of protected species.

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.”

1.1.2 Research Objectives

The objectives of the research are to: 1) monitor the distribution of right whales in the portion of the southeast critical habitat south of St. Augustine, Florida; 2) improve knowledge of right whale habitat utilization; 3) monitor reproductive success; 4) contribute to the photo-identification catalog; 5) explore linkages between right whale vocalizations and behavior; and 6) evaluate the efficacy of a passive acoustic monitoring system.

1.2 OTHER EA/EIS THAT INFLUENCE SCOPE OF THIS EA

Dr. Hain's previous permit (No. 376-1520), which authorized activities similar to what he is currently requesting, was issued on March 10, 2000. The action was categorically excluded and an Environmental Assessment (EA) was not prepared for that permit.

On October 17, 2005, NMFS issued a notice of intent to voluntarily prepare an Environmental Impact Statement (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 the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 *et seq.*) and its implementing regulations at 40 CFR Section 1506.1, nothing precludes NMFS from issuing permits in the interim while the EIS is being developed. Given that the applicant is only requesting activities that typically result in Level B harassment, NMFS is evaluating the applicant's request for right whale research to determine whether the action would result in significant impacts to the species or other portions of the environment.

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 (CEQ) regulations implementing NEPA do not require that a draft EA be made available for public comment as part of the scoping process.

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*.

1.3.1 Comments on application

A Notice of Receipt was published in the *Federal Register*, announcing the availability of the application for public comment (73 FR 75084, December 10, 2008). The notice summarized the purpose of the requested permit, included a statement about whether an EA or EIS was prepared,

and invited interested parties to submit written comments concerning the application. The application was made available for public review and comment for 30 days and provided to the Marine Mammal Commission (MMC). As a result of the comment period and distributing the application to reviewers, NMFS received multiple substantive comments on the permit application. The overall themes of the comments were similar among reviewers. Those issues were:

- lack of a clear experimental design; objectives did not match the proposed research
- vague project descriptions (especially the Cape Cod and Florida-Maine research)
- poor justification of sample sizes
- duplication of effort/need for the research
- use of kayaks to conduct research

Specific comments can be found in the permit file. The applicant and NMFS PR engaged in several email, phone, and in person conversations regarding the proposed research and the comments. As a result of these conversations, the more questionable objectives and projects were removed from consideration. See Section 1.3.2.

After review of the application, the MMC recommended that NMFS defer authorization for the applicant, or any other permit applicant, to take right whales until NMFS has resolved NEPA issues concerning the programmatic EIS on right whale research. See Section 1.2 for information about the EIS and NMFS' plan to continue issuing permits under EAs.

Furthermore, the MMC recommended that NMFS ensure that:

- researchers take steps to minimize disturbance of the subject animals by exercising caution when approaching animals, particularly mother/calf pairs, and halt an approach if there is evidence that a whale may be injured in an unintended way, that mother/calf pairs may be separated for a prolonged period of time, or that a whale may exhibit a marked change in behavior, such as leaving a feeding or resting area
- researchers working under the permit and other permit holders who might be carrying out research on the same species in the same areas coordinate their studies and, as possible, share data to avoid unnecessary duplication of research and disturbance of animals.

The items in the first bullet are standard permit conditions and would be included in the proposed permit. In regard to the second bullet, right whale researchers are already collaborating: they hold a research meeting each fall and they have a single, standardized catalog. The applicant participates in these meetings and would contribute any sighting data to the catalog. Like all researchers, the applicant would be required to notify the relevant NMFS regional office before beginning field work, thus allowing the region to coordinate. Lastly, the focus of the applicant's project, the area south of St. Augustine, Florida, is not typically monitored by other right whale researchers, so it is unlikely that duplicative research would occur.

1.3.2 Issues within the scope of this EA

Based on comments received and subsequent conversations with the applicant, several aspects of the original application have been removed from consideration. The following elements of the application are not part of the Proposed Action:

- non-motorized vessel (i.e., kayak) research,
- large whale aerial surveys off the northeast U.S. coast, and
- many non-target species, including four species of endangered whales and all (two species) pinnipeds.

In addition:

- the action area has been decreased (research in the northeast was removed) and
- some take numbers have been reduced.

The scope of this EA is only that research which NMFS is considering permitting: vessel and aerial surveys in waters of the U.S. southeast coast. See Section 2.2 for details on the Proposed Action.

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

NEPA 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 the CEQ. NAO 216-6 specifies that issuance of scientific research permits under the MMPA and ESA is among a category of actions that are generally exempted (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 NOAA 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 Office of Management and Budget (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 walrus⁴.

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.

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 any related mitigation of each alternative.

2.1 ALTERNATIVE 1 – NO ACTION

Under the No Action alternative, no permit would be issued for the activities proposed by the applicant. The entire permit request (File No. 13927) would be denied. This alternative would eliminate any potential risk to the environment from the proposed research activities. However, it would not allow the research to be conducted and the opportunity would be lost to collect information that would contribute to better understanding large whale populations and provide information to NMFS that is needed to implement NMFS management activities. Other research, authorized by existing permits, would continue under the No Action alternative. The No Action alternative is the baseline for rest of the analyses.

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.”

2.2 ALTERNATIVE 2 – PROPOSED ACTION (ISSUANCE OF PERMIT WITH STANDARD CONDITIONS)

Under the Proposed Action alternative, a permit would be issued for activities as proposed by the applicant and later revised based on comments from reviewers and conversations between NMFS and the applicant. The permit would contain terms and conditions standard to NMFS scientific research permits. Special conditions are intended to mitigate potential adverse effects on animals caused by specific research methods. Many of the permit conditions, including these mitigation measures that are part of the Proposed Action alternative, can be found in Section 4.5. The permit would be valid for five years from the date of issuance.

The objectives of the permitted activities would be to: 1) monitor the distribution of right whales in the portion of the southeast critical habitat south of St. Augustine, Florida; 2) improve knowledge of right whale habitat utilization; 3) monitor reproductive success; 4) contribute to the photo-identification catalog; 5) explore linkages between right whale vocalizations and behavior; and 6) evaluate the efficacy of a passive acoustic monitoring system.

The proposed research would occur in coastal waters off the southeastern U.S. coast from December through April each year. Research would occur in Georgia and Florida, with a focus on the area south of St. Augustine, Florida. The specific research methods are described in the application (NMFS permit application File No. 13927). Right whales are the focus of the proposed research. Other cetacean species may be incidentally harassed during right whale research. Any humpback whales opportunistically sighted would be photographed for identification. The proposed research entails only noninvasive methodologies, and would only result in Level B harassment of the target whales and non-target animals. Takes may include individuals of all species, age, size, sex, and reproductive classes.

The proposed aerial and vessel research would complement the applicant's shore-based right whale observer network in which volunteers identify and observe whales from land. The aerial surveys and vessel approaches would be used to obtain photo-identity images for the whales that often are beyond high-quality photo range from shore. The following table outlines the proposed numbers of animals and research activities that would be authorized by the permit.

Table 1. Proposed activities to occur in the coastal waters of the southeastern U.S. from December through April. Numbers would be annual take for all age and sex classes.

Species	Life Stage	Sex	Expected Take*	Takes per animal	Observe Method	Procedures
North Atlantic right whale	All	Male and female	50	3	Aerial surveys	Count/ survey; Photo-id
North Atlantic right whale	All	Male and female	10	3	Motorized vessel surveys	Acoustics, passive recording; Count/ survey; Observations, behavioral; Photo-id

Humpback whale	All	Male and female	10	3	Aerial/vessel surveys	Incidental harassment, Photo-id
Bottlenose dolphin	All	Male and female	100	1	Aerial/vessel surveys	Incidental harassment
Atlantic spotted dolphin	All	Male and female	50	1	Aerial/vessel surveys	Incidental harassment
Loggerhead sea turtle	All	Male and female	50	1	Aerial/vessel surveys	Incidental harassment
Green sea turtle	All	Male and female	25	1	Aerial/vessel surveys	Incidental harassment
Kemp's ridley sea turtle	All	Male and female	25	1	Aerial/vessel surveys	Incidental harassment
Leatherback sea turtle	All	Male and female	25	1	Aerial/vessel surveys	Incidental harassment

* Takes = the **maximum** number of animals, not necessarily individuals, that may be taken annually in each row of the table. If any animal is harassed more than once during research, each additional attempt (i.e., take) reduces the number of total takes remaining.

NOTE: Sea turtle takes were requested by the applicant in case incidental harassment occurred. However, the Biological Opinion determined that the whale research is not likely to adversely affect any sea turtle species (See Section 4.2). Thus, sea turtle takes would not be authorized by the permit.

Aerial surveys

The applicant proposes to use a variety of aerial platforms to locate, photograph, and observe right whales off the southeastern U.S. coast.

AirCam aircraft

Aerial surveys would be conducted from December through April over the coastal waters of northeast Florida for right whale photo-identification and documentation (human impacts, behavior) from a fixed-wing AirCam aircraft (Figures 1-2). The twin-engine, slow-flight, quiet aircraft was originally designed for National Geographic wildlife studies in Africa. The surveys would be done in conjunction with a shore-based sighting network. The aircraft would respond to sightings relayed from the shore network, and/or, survey independently in designated areas (a typical flight track is shown in Figure 3). In survey mode, the aircraft would fly at 60 kt and

between 750 and 1000 ft. It would carry two persons, a pilot and scientist/photographer. On many days, the second person would also be a pilot. The aircraft would fly every good weather day (winds < 15 kts, sea state < Beaufort 4). This would typically result in flights on three or four days per week, December to April. When descending for photographs, approaches would be quiet and non-obtrusive and typically to within 700 ft. Photo approaches would typically be no more than 15 minutes in duration. For the “big picture” observations and photographs of groups and relation to environmental features, the aircraft would increase altitude to 1200 ft or above. Multiple approaches to the same animal within the same day would be rare. When they do occur, it would be after a period of several hours, would be brief, and would be used only to check the position and direction/rate of movement. Aerial surveys in Florida would usually be flown parallel to the coast (see Figure 3). Typical surveys would be within three nautical miles of shore and about 3.5 hours in length. Occasionally flights would extend farther to the south. Note that the track would be flown in replicate fashion, reducing the effect of sun glare and wave action and increasing sighting probability. Positions would be recorded every minute, as shown in Figure 3. The flight pattern would be altered if sightings are reported by the shore-based network and the aircraft responds for photo-identification.



Figure 1. AirCam plane. It has been operated by Associated Scientists for right whale studies in coastal waters of northeast Florida since 2002.

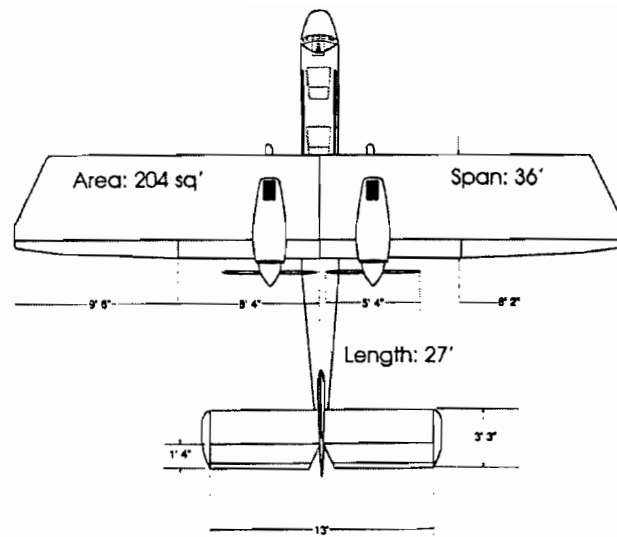


Figure 2. AirCam aircraft diagram

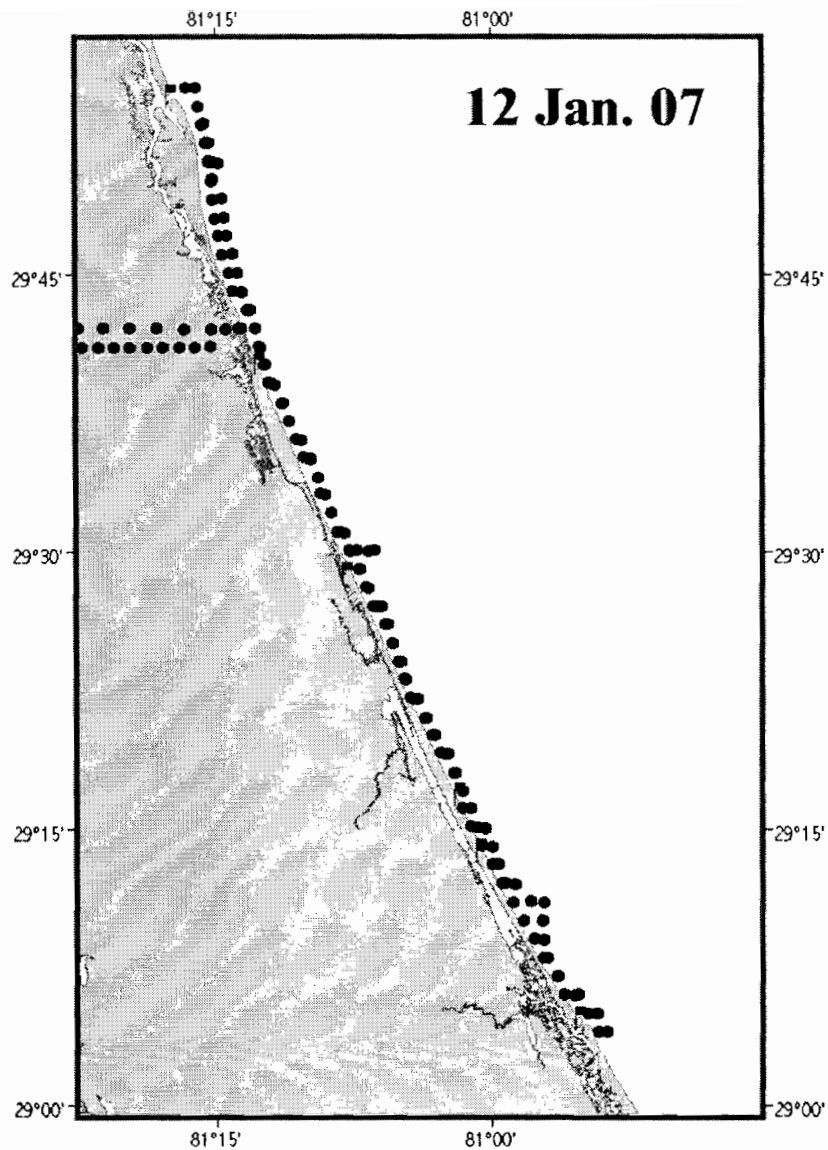


Figure 3. Typical flight track for right whale surveys in coastal waters of northeast Florida.

Blimps

The applicant also proposes to use a variety of blimps (Figure 4) to conduct aerial surveys. As with the fixed-wing aircraft, the blimp would fly at an altitude of 750 to 1000 ft in survey mode, and descend to a minimum of 700 ft for photographic periods lasting up to 15 min. Smaller blimps typically would carry a single pilot and two scientists and would operate for up to eight hours. Larger blimps could carry two pilots and up to four scientists, and operate for up to 12 hours. All blimps have the ability to carry external camera pods or in-cabin camera equipment (Hain 1992). The blimps used by the applicant in the past 15 years of research have either been chartered (e.g., Office of Naval Research, January 2003), or, more commonly, flight time has been donated. The applicant states that the greatest advantage of a blimp is its ability to “station-

keep” in the vicinity of whales and/or environmental features of interest. This would allow for extended observations (e.g., an hour or more for dive-time and behavioral observations—typically conducted from non-obtrusive altitudes of 1200 ft and higher) and provide a stable video platform.

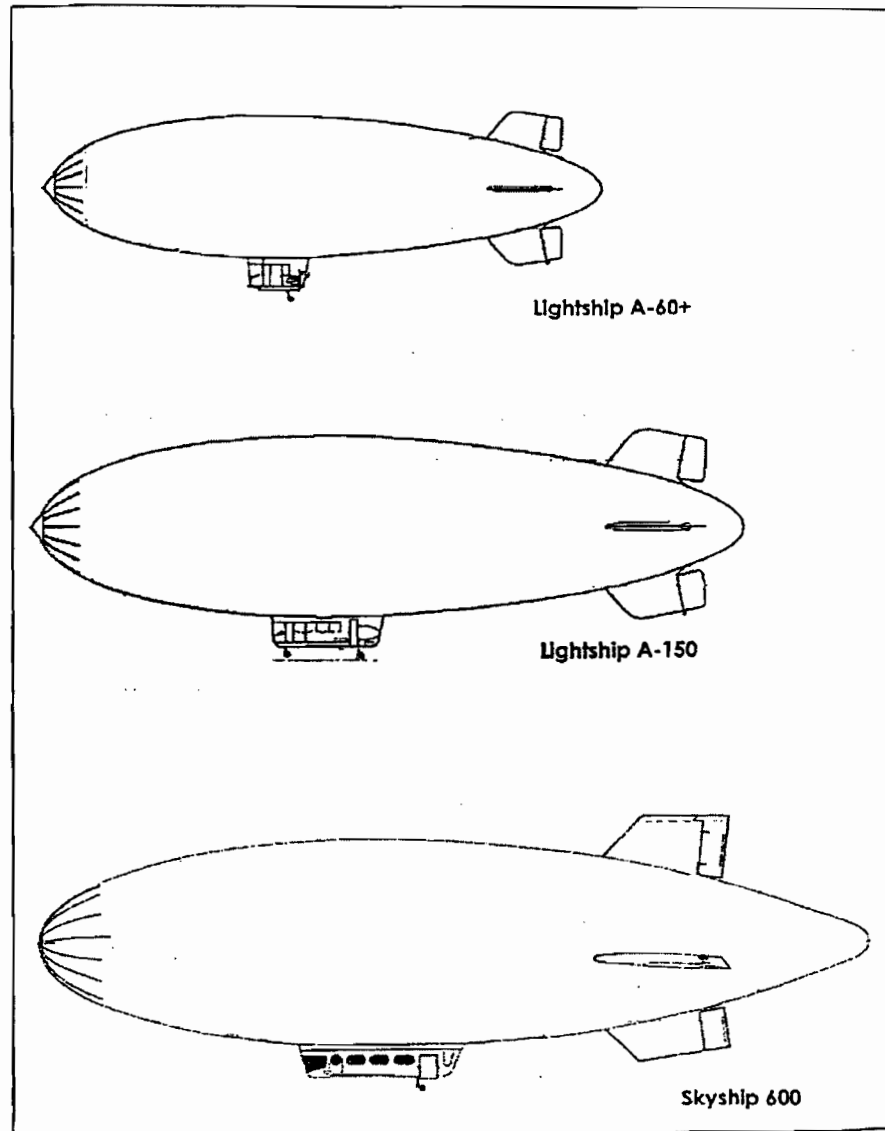


Figure 4. These ships have been used for marine mammal research projects under previous permits. Lengths of ships shown are 132 ft, 160 ft, and 194 ft, respectively.

Aerostat

An aerostat (i.e., tethered balloon) also would be used to conduct photo-ID and behavioral observations of right whales (Figure 5). The aerostat would be deployed at altitudes of 150 to 300 ft while tethered to a research vessel. In the past, a 45 ft lobster boat has been used, but a boat as small as 25 ft may be used. The boat would be positioned with engines off, a minimum

of 100 ft from whales and allowed to drift. Observation periods, aimed at unobtrusive recording of behaviors, would be from one to several hours. The 29-ft aerostat would be fitted with a remotely operated video camera, which can record for up to several hours. In Dr. Hain's previous research, high-resolution video was recorded in-camera, and lower resolution video was transmitted wirelessly to a monitor on the vessel and used for camera control (pan, tilt, and zoom). This technique was used for two seasons in the Bay of Fundy (Hain and Harris 2004) and provided documentation of behavior, vessel approaches by whale-watching boats, and in one case, images of a prop-scarred right whale. For the proposed research, similar cameras would be used to film right whales off the southeast U.S. coast.

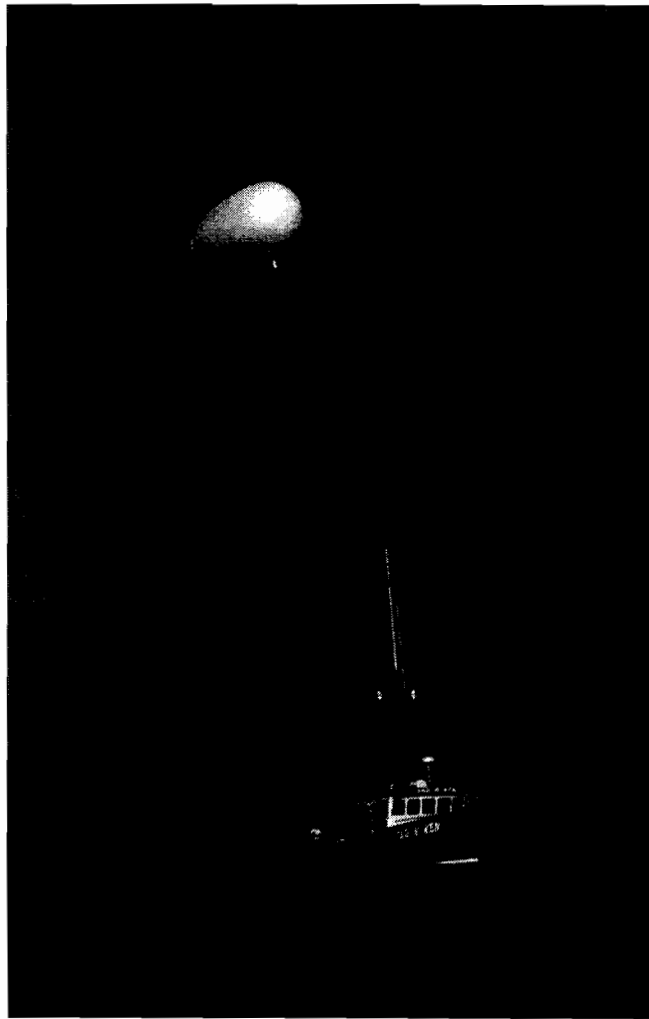


Figure 5. The 29-ft aerostat (tethered balloon) as used on a right whale project in the Bay of Fundy.

Vessel surveys

Similar to the aerial surveys, vessel surveys would often be conducted in conjunction with the shore-based right whale sighting network program. On occasions when the whales are too

distant from shore for useful shore-based photographs and an aircraft is not available, boats would be used. The motorized vessels would be of two types: 1) existing small craft on an as-available basis and operated by local agencies (e.g., U.S. Coast Guard, Volusia County Beach Patrol), and 2) dedicated vessels (e.g., a rigid-bottomed inflatable with an outboard) with experienced operators and scientists. In past seasons, the applicant used both Coast Guard and Beach Patrol vessels, once or twice a season. To the extent possible, four-stroke engines would be used as they are quieter than two-stroke engines. Personnel with extensive experience in operating vessels near whales would be involved in the vessel approaches. Other cautionary practices and mitigating measures are described below.

The purposes of vessel approaches are to: 1) collect individual identification photographs; 2) document scars and marks and characteristics used for health assessment; and 3) obtain behavioral, including acoustic, observations.

Photo-identification

A major component of the proposed research is to obtain high-quality photographs of right whales that would provide for individual identification, documentation of human-impacts, and documentation corresponding to behavioral observations. The applicant would minimize impacts on the whale's behavior so it will not swim away, dive, or otherwise avoid the research platform.

For aerial observations and photographs, the aircraft would circle over the whale at altitudes between 700 and 750 ft to obtain photographs of the callosity patterns and any marks or scars that may be present. The applicant's proposed methodology is: 1) initial approach would be slow and at higher altitude to assess whale's movement and dive pattern, and allow the whale to acclimate, 2) a series of slow, quiet, lower altitude approaches for photographs, and 3) withdraw to farther distance and higher altitude to make further observations and obtain "big-picture" photographs. The applicant states that with the platforms and methods they propose to use, close approaches would almost always be limited to a few passes and less than 15 minutes.

For vessel-based photo-identification observations and photographs, the applicant's objective is the same, to avoid behavioral disruption. A vessel would likewise follow a three-step method: 1) initial approach on a converging course, and avoiding approaches from behind, while maintaining quiet and distance to make initial assessments; 2) a quiet, "soft" close approach at slow or idling speeds (including allowing the whale to swim past a stationary vessel) to within a minimum of 100 ft to obtain photographs; and 3) withdraw to a greater distance (e.g., greater than ¼ nmi) for further assessment and observations. In the event a disturbance to the whales continues to be suspected, the vessel would depart the area completely. Vessel close approaches would likewise be limited and generally less than 15 minutes. Although right whales are the primary target species, if a humpback whale is observed in the study area, the applicant would approach the whale to obtain photo-identification images.

Photo-identification images of right and humpback whales would be shared with the appropriate catalog databases.

Behavioral Observations

Aside from the close approach for photography, vessel approaches for behavioral observations would be intentionally unobtrusive and typically at distances greater than 100 yards.

Passive Acoustics

The applicant proposes to collect passive acoustic data in the vicinity of right whales. In response to a right whale sighting, a hydrophone (*e.g.*, Model SQ26-MT, Cetacean Research Technology, Seattle, Washington) would be deployed from a vessel. Aided in part by the shore-based network, researchers would conduct follows of a whale for up to 12 hours. The boat would be positioned a minimum of 100 ft from whales but almost always would be at distances of greater than ¼ nmi. During the boat follows or drifts, time-synched (to the hydrophone recording) sighting and behavioral data would be collected, and would be supplemented by photos and video. Emphasis would be on mother/calf pairs, but other categories may be included.

The manner of taking for all species listed in Table 1, except right whales, would be incidental harassment to surveys, observations, and approaches from vessels and various aircraft, including blimps, fixed-wing aircraft, and aerostats. Humpback whales observed in the study area would be approached opportunistically for photo-identification purposes.

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 permit 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.

3.1 SOCIAL AND ECONOMIC ENVIRONMENT

Although a variety of human activities may occur in the action area such as commercial fishing, shipping, military activities, recreational uses (such as fishing and boating), and ecotourism, the social and economic effects of the Proposed Action mainly involve the effects on the people involved in the research, as well as industries that support the research, such as charter vessels and suppliers of equipment needed to accomplish the research. 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 (state) level and therefore are not considered significant. There are no significant social or economic impacts of the Proposed Action interrelated with significant natural or physical environmental effects. Thus, the EA does not include any further analysis of social or economic effects of the Proposed Action.

3.2 PHYSICAL ENVIRONMENT

Research would occur in the coastal waters of the southeastern U.S. More specifically, the applicant intends to conduct research off the Florida and Georgia coasts from December through April. The majority of the effort would take place south of St. Augustine, Florida.

3.2.1 Sanctuaries, Parks, Historic Sites, etc.

No National Marine Sanctuaries occur in the proposed study area. Several Florida state parks dot the coastline (e.g., Anastasia, Gamble Rogers Memorial State Recreation Area at Flagler Beach, North Peninsula). In Georgia, Cumberland Island is administered by the National Park Service as a National Seashore. However, all research activities would occur either over water or in the water and are not expected to affect park resources.

3.2.2 Essential Fish Habitat (EFH)

EFH has been designated for many of the fish species within the action area. Details of the designations and descriptions of the habitats are available in the Atlantic Fishery Management Plans. Activities that have been shown to affect EFH include disturbance or destruction of habitat from stationary fishing gear, dredging and filling, agricultural and urban runoff, direct discharge, and the introduction of exotic species. Although EFH is found within the action area, none of the activities in the Proposed Action are directed at or likely to have any impact on any designated EFH. Therefore, this EA does not include further analysis of effects to EFH within the action area.

3.2.3 North Atlantic Right Whale Critical Habitat

Research would occur in a portion of right whale critical habitat. Three areas were designated by NMFS as critical habitat on June 3, 1994 (59 FR 28973; codified 50 CFR 226.203). NMFS designated critical habitat areas for the North Atlantic right whale population because the areas were deemed essential for the reproduction, rest and refuge, health, continued survival, conservation, and recovery of the population. The critical habitat area where the proposed research would occur is:

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 isobath; where it drops off to the 200 m isobath. The continental slope is steeply angled and extends approximately from the 200 m to the 700 m 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. Continental slope sediments in the SEUS area are primarily composed of silt and clay. There are also traces of gravelly sand, sand and clay, and fine-grained sand and silt found in deeper waters. 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 (Department of Navy 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, Georgia) and 30°15'N (approximately Jacksonville, Florida) from the shoreline out to 15 nm (28 km) offshore; and the waters between 30°15'N and 28°00'N (approximately Sebastian Inlet, Florida) from the shoreline out to five nm (nine km).

3.3 BIOLOGICAL ENVIRONMENT

The following is a brief summary of the status and occurrence of targeted and potentially affected marine mammal species in the proposed study area. Descriptions of the status of these species can be found in the biological opinion that accompanies this document as well as the NMFS Recovery Plans, and the NMFS stock assessment reports for these species. A brief update to the most recent plans for each species has been provided.

3.3.1 ESA Target Species Under NMFS Jurisdiction

ESA Endangered

North Atlantic right whale *Eubalaena glacialis*

Humpback whale *Megaptera novaeangliae*

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 suggest an extended range, at least for some individuals. There are at least six major habitats or congregation areas for this stock of right whales: the coastal waters of the southeastern United States, the Great South Channel, Georges Bank/Gulf of Maine, Cape Cod and Massachusetts Bays, the Bay of Fundy, and the Scotian Shelf. Critical habitat is designated for right whales in the Atlantic Ocean in Cape Cod Bay, Great South Channel, and coastal waters off the southeastern United States (Waring et al. 2009).

The western North Atlantic right whale population was estimated to include a minimum of 325 individuals based on 2003 data (Waring et al. 2009). Although the 2008 SAR indicates the population declined in the 1990s, more recent data indicate the population may be increasing at a slow rate. Data on the reproductive success of this population suggest that the number of calves born annually is declining and the mean calving interval is increasing (Knowlton et al. 1994). However, recent sightings by the NMFS Southeast Fisheries Science Center on the southeast U.S. calving grounds identified 40 mother–calf pairs in the 2008–2009 season. This is the highest number of mother–calf pairs recorded for the population since the 1980s. Approximately one-third of all Northern right whale mortalities have been attributed to human activities, including entanglement in fishing gear and collision with vessels (Kraus 1990). Given the small population size and low reproductive rate, human-related mortalities may be the principal factors inhibiting growth and recovery of the population. The stock is considered to be critically endangered and is designated as strategic under the MMPA.

Humpback whale

In spring, summer, and fall, humpback whales in the western North Atlantic congregate in relatively discreet feeding grounds: eastern coast of the U.S. (including the Gulf of Maine), Gulf of St. Lawrence, Newfoundland/Labrador, and western Greenland. Although once lumped into a single stock, NMFS has recently reclassified the Gulf of Maine stock separately, based on the strong site fidelity of whales to their matrilineally-determined feeding grounds and recent genetic evidence (Waring et al. 2009).

In winter, whales from most of the western North Atlantic feeding grounds mate and calve in the West Indies, in places such as Silver Bank and Navidad Bank off the Dominican Republic (Balcomb and Nichols 1982; Whitehead and Moore 1982; Mattila et al. 1989; Mattila et al. 1994).

The proposed study area is visited by some humpback whales as they migrate between the feeding and mating grounds along the U.S. east coast. Furthermore, not all whales migrate to the West Indies in winter; some whales remain in mid and high latitudes (Clapham et al. 1993; Swingle et al. 1993). Whales have been observed off Delaware, Virginia, North Carolina, and in coastal waters of the southeastern U.S. in winter (Swingle et al. 1993; Waring et al. 2009). Photo-identification data suggest that many, but not all, of these animals are members of the Gulf of Maine stock (Barco et al. 2002).

In the Northwest Atlantic, Mitchell and Reeves (1983) estimated a pre-exploitation humpback whale population size of 4,700 animals based on 1865 whaling records in the areas around and between Davis Strait, Iceland, and the West Indies. Current population estimates based on mark-recapture of photographed animals suggest that there are 11,570 humpback whales in the entire North Atlantic (Stevick et al. 2003). The Gulf of Maine stock has a minimum population estimate of 549, with a best estimate of 847 animals (Waring et al. 2009). Data suggest that the Gulf of Maine stock was increasing in recent decades, as was the overall North Atlantic population from 1979-1993 (Stevick et al. 2003). However, recent population growth data are insufficient to reliably determine trends conclusive for the overall North Atlantic population. Recent estimates of annual population growth rates include 3.9-11.8% in the western North Atlantic (Whitehead et al. 1982), 6.5% in the Gulf of Maine (Barlow and Clapham 1997), and 0% or 4% in the Gulf of Maine (Clapham et al. 2003). Major threats to North Atlantic humpback whales, including the Gulf of Maine stock, are ship strikes and fishery interactions or entanglement.

Humpback whales are listed as endangered under the ESA and strategic under the MMPA.

3.3.2 *Non-target species*

In addition to the target species that are the subject of the permit, a wide variety of non-target species can be found within the action area, including other marine mammals, sea turtles, invertebrates, teleost and elasmobranch fish, and sea birds. However, merely being present within the action area does not necessarily mean a marine organism will be affected by the Proposed Action. Thus, the following discussion focuses only on the distribution and abundance of those species which may be affected by the proposed research activities.

ESA Non-Target Species Under NMFS Jurisdiction

ESA Endangered

Green sea turtle	<i>Chelonia mydas</i> *
Kemp's ridley sea turtle	<i>Lepidochelys kempii</i>
Leatherback sea turtle	<i>Dermochelys coriacea</i>

ESA Threatened

Loggerhead sea turtle	<i>Caretta caretta</i> **
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**Green turtles in U.S. waters are listed as threatened except for the Florida breeding population which is listed as endangered. Due to the inability to distinguish between these populations away from the nesting beach, green turtles are considered endangered wherever they occur in U.S. waters.*

*** Although loggerheads are currently listed as threatened, NMFS published a proposed rule in March 2010 to recognize nine DPS' of the species. Seven of the DPS', including the two in U.S. waters, would be changed from threatened to endangered.*

Note: Sea turtle takes were requested by the applicant in case incidental harassment occurred. Thus they are discussed here. However, the Biological Opinion determined that the whale research is not likely to adversely affect any sea turtle species (See Section 4.2). As a result, sea turtle takes would not be authorized by the permit.

Green sea turtle

Green sea turtles are distributed around the world, mainly in waters between the northern and southern 20° C isotherms (Hirth 1971). The complete nesting range of the green sea turtle within the southeastern U.S. includes sandy beaches of mainland shores, barrier islands, coral islands, and volcanic islands between Texas and North Carolina and at the U.S. Virgin Islands (USVI) and Puerto Rico (NMFS and USFWS 1991). Principal U.S. nesting areas for green turtles are in eastern Florida, predominantly Brevard through Broward counties. Regular green sea turtle nesting also occurs on the U.S. Virgin Islands and Puerto Rico.

Green sea turtle mating occurs in the waters off the nesting beaches. Each female deposits 1-7 clutches (usually 2-3) during the breeding season at 12 to 14 day intervals. Mean clutch size is highly variable among populations, but averages 110-115 eggs. After hatching, green sea turtles go through a post-hatchling pelagic stage where they are associated with drift lines of algae and other debris.

The green sea turtle was listed as threatened in 1978, except for the Florida and Pacific coast of Mexico breeding populations that were listed as endangered. Critical habitat for the green sea turtle has been designated for the waters surrounding Isla Culebra, Puerto Rico and its associated keys from the mean high water line seaward to 3 nautical miles (5.6 km). These waters include Culebra's outlying Keys including Cayo Norte, Cayo Ballena, Cayos Geniqui, Isla Culebrita, Arrecife Culebrita, Cayo de Luis Pena, Las Hermanas, El Mono, Cayo Lobo, Cayo Lobito, Cayo Botijuela, Alcarraza, Los Gemelos, and Piedra Steven. Key physical or biological features essential for the conservation of the green sea turtle found in this designated critical habitat include important food resources and developmental habitat, water quality, and shelter.

Loggerhead sea turtle

Loggerheads occur throughout the temperate and tropical regions of the Atlantic, Pacific, and Indian Oceans and inhabit continental shelves and estuarine environments. Developmental habitat for small juveniles includes the pelagic waters of the North Atlantic Ocean and the Mediterranean Sea.

Adults have been reported throughout the range of this species in the U.S. and throughout the Caribbean Sea. Non-nesting, adult female loggerheads are reported throughout the U.S. and Caribbean Sea; however, little is known about the distribution of adult males who are seasonally abundant near nesting beaches during the nesting season. Aerial surveys (TEWG 1998) suggest that loggerheads (benthic immatures and adults) in U.S. waters are distributed in the following proportions:

- 54% in the southeast U.S. Atlantic

- 29% in the northeast U.S. Atlantic
- 12% in the eastern Gulf of Mexico
- 5% in the western Gulf of Mexico

Five nesting subpopulations exist in northwestern Atlantic. Low gene flow and strong nesting site fidelity may make these subpopulations vulnerable.

Annual nesting trends of Northwest Atlantic Recovery Units (NMFS and USFWS 2008)

Name	Location	Percent Decrease	Year
Northern	FL/GA Border to S. VA	1.3	Since 1983
Peninsular Florida	FL/GA Border through Pinellas County	41	Since 1998
Dry Tortugas	islands of the Dry Tortugas, near Key West	Not enough information	--
Northern Gulf of Mexico	Franklin County, FL through TX	Appears to be declining	--
Greater Caribbean	Mexico, French Guiana, Bahamas, Lesser and Greater Antilles	Not enough information	--

It is important to note that these trend analyses numbers are not compared to larger historical numbers, and only reflect one segment of the population (just nesting females). Nesting females are the only segment of the population for which we have reasonably good data and are cautiously used as one measure of the possible trend of populations.

The loggerheads in the major different geographic areas represent differing proportions of the western Atlantic subpopulations. The northern nesting subpopulation produces about 9 percent of the loggerhead nests; however, they comprise more loggerheads found in foraging areas.

Northern nesting subpopulation sea turtles in foraging areas

Foraging Area	Percent	Reference
Maine to Georgia	25-59	Sears 1994, Norrgard 1995, Sears et al. 1995, Rankin-Baransky 1997, Bass et al. 1998
Central Florida	10	Witzell 2002
Gulf of Mexico	10	--

Another consideration adding to the vulnerability of the northern subpopulation is that NMFS scientists estimate, using genetics data from Texas, South Carolina, and North Carolina in combination with juvenile sex ratios from those states, that the northern subpopulation produces 65% males, while the south Florida subpopulation is estimated to produce 80% females (NMFS SEFSC 2001). It is possible that the high proportion of males produced in the northern subpopulation is an important source to the entire southeast U.S. nesting population. Further

declines or loss of the northern subpopulation and its disproportionate share of males could contribute to a serious population decline over the entire region (NMFS SEFSC 2001).

The loggerhead was listed as a threatened species in 1978. Critical habitat has not been designated for the loggerhead.

The recent loggerhead status review (Conant et al. 2009) concluded that there are nine loggerhead distinct population segments (DPSs). These include the North Pacific Ocean DPS; the South Pacific DPS; the North Indian Ocean DPS; the Southeast Indo-Pacific Ocean DPS; the Southwest Indian Ocean DPS; the Northwest Atlantic Ocean DPS; the Northeast Atlantic Ocean DPS; the Mediterranean Sea DPS; and the South Atlantic Ocean DPS. While NMFS has not yet officially recognized these DPSs, the information provided in the status review represents the most recent and available information relative to the status of this species. On March 16, 2010 NMFS published a Notice of a Proposed Rule (75 FR 12598) to formally designate the loggerhead with these nine DPS' worldwide. The notice also stated that NMFS plans to reclassify both DPS' within the United States as endangered (N. Pacific DPS and Northwest Atlantic Ocean DPS).

Kemp's ridley sea turtle

Of the seven extant species of sea turtles of the world, the Kemp's ridley has declined to the lowest population level. This species has a very restricted range relative to other sea turtle species. Kemp's ridleys nest in daytime aggregations known as arribadas, primarily at Rancho Nuevo, a stretch of beach in Mexico. Most of the population of adult females nests in this single locality (Pritchard 1969). When nesting aggregations at Rancho Nuevo were discovered in 1947, adult female populations were estimated to be in excess of 40,000 individuals (Hildebrand 1963). By the early 1970s, the world population estimate of mature female Kemp's ridleys had been reduced to 2,500-5,000 individuals. The growing trend in total number of nests suggests that the adult nesting female population is about 7,400 individuals.

Table 3: Total number of nests at Rancho Nuevo

Year	# of Nests
1985	702
1995	1,940
2000	5,800
2003	8,300
2005	10,300
2006	12,000

It appears that adult Kemp's ridley sea turtles are restricted somewhat to the Gulf of Mexico in shallow near shore waters, although adult-sized individuals sometimes are found on the eastern seaboard of the United States. Juvenile/subadult Kemp's ridleys have been found along the eastern seaboard of the United States and in the Gulf of Mexico. Atlantic juveniles/subadults travel northward with vernal warming to feed in the productive, coastal waters of Georgia

through New England, returning southward with the onset of winter to escape the cold (Lutcavage and Musick 1985; Henwood and Ogren 1987; Ogren 1989).

In the Gulf, juvenile/subadult ridleys occupy shallow, coastal regions. The near shore waters of the Gulf of Mexico are believed to provide important developmental habitat for juvenile Kemp's ridley sea turtles. Ogren (1988) suggests that the Gulf coast, from Port Aransas, Texas, through Cedar Key, Florida, represents the primary habitat for subadult ridleys in the northern Gulf of Mexico.

Ogren (1989) suggested that in the northern Gulf this species moves offshore to deeper, warmer water during winter. Studies suggest that subadult Kemp's ridleys stay in shallow, warm, nearshore waters in the northern Gulf of Mexico until cooling waters force them offshore or south along the Florida coast (Renaud 1995). Little is known of the movements of the post-hatching, planktonic stage within the Gulf. Studies have shown the post-hatching pelagic stage varies from 1-4 or more years, and the benthic immature stage lasts 7-9 years (Schmid and Witzell 1997).

The Kemp's ridley was listed as endangered on December 2, 1970. There is no designated critical habitat for the Kemp's ridley sea turtle.

Leatherback sea turtle

The leatherback ranges farther than any other sea turtle species, exhibiting broad thermal tolerances (NMFS and USFWS 1995). Leatherbacks are widely distributed throughout the oceans of the world, and are found throughout waters of the Atlantic, Pacific, Caribbean, and the Gulf of Mexico (Ernst and Barbour 1972). Adult leatherbacks forage in temperate and subpolar regions from 71°N to 47°S latitude in all oceans and undergo extensive migrations between 90°N and 20°S, to and from the tropical nesting beaches. In the Atlantic Ocean, leatherbacks have been recorded as far north as Newfoundland, Canada, and Norway, and as far south as Uruguay, Argentina, and South Africa (NMFS SEFSC 2001). Female leatherbacks nest from the southeastern United States to southern Brazil in the western Atlantic and from Mauritania to Angola in the eastern Atlantic. Leatherbacks are predominantly distributed pelagically, however but can be found in nearshore waters. Shoop and Kenney (1992) also observed concentrations of leatherbacks during the summer off the south shore of Long Island and off New Jersey. Leatherbacks in these waters are thought to be following their preferred jellyfish prey.

Recent analysis suggests that seven stocks exist in the Atlantic including Florida, Northern Caribbean, Western Caribbean, Southern Caribbean-Guyana Shield-Trinidad, West Africa, South Africa, and Brazil (TEWG 2007). The primary western Atlantic leatherback nesting beaches occur in French Guiana, Suriname, Trinidad, and Costa Rica-Panama while important nesting in the eastern Atlantic occurs on the coast of central western Africa (TEWG 2007).

The Turtle Expert Working Group (2007) estimated the population growth trends of six of the Atlantic nesting stocks (due to data constraints, trends for West Africa could not be estimated). Except for the Western Caribbean, these stocks appeared to be increasing. However, they cautioned that the trend estimates were based only on information of nesting females (one segment of the population). They estimated the adult population of the North Atlantic to be

approximately 34,000 to 94,000 animals. The range of the estimate is large, reflecting the Group's uncertainty in the nest numbers and their extrapolation to adults. The Group believes that as estimates improve the range will likely decrease.

The leatherback was listed as endangered on June 2, 1970. Critical habitat for the leatherback includes the waters adjacent to Sandy Point, St. Croix, U.S. Virgin Islands, up to and inclusive of the waters from the hundred fathom curve shoreward to the level of the mean high tide with boundaries at 17° 42' 12" North and 65° 50' 00" West. Key physical or biological features essential for the conservation of the leatherback sea turtle found in this designated critical habitat include elements important for reproduction.

Other Non-Target Species

Bottlenose dolphin

The bottlenose dolphins (*Tursiops truncatus*) in the study area are part of the Western North Atlantic coastal morphotype stock system. Originally listed as a single stock ranging along the U.S. eastern seaboard from New York to Florida, the stock was designated as depleted after a die off in 1988. Based on years of photo-identification, genetic, and tagging data, NMFS began reorganizing the coastal dolphins into multiple stocks and management units beginning in 2002. The 2008 stock assessment report divides the coastal bottlenose dolphins into seven prospective stocks. Based on the proposed study area and the timing of the research (i.e., winter), dolphins in the study area may belong to following stocks: Georgia, Northern Florida, Central Florida, and Southern Migratory. Below are the abundance estimates for each prospective stock that may be harassed:

Stock	Best Estimate
Georgia	5996
Northern Florida	3064
Central Florida	6317
Southern Migratory	10341

The data are currently insufficient to determine population trends for these stocks. A variety of fisheries, using gear such as gillnets, pound nets, crab pots, and seine nets, incidentally catch, kill and seriously injure bottlenose dolphins. Because the fishery-related mortality for some of the prospective stocks is not insignificant and because data collection and analyses to fully separate the prospective stocks are ongoing, all of the prospective stocks are currently designated as depleted and strategic under the MMPA. Bottlenose dolphins are not listed as threatened or endangered under the ESA (Waring et al. 2009).

Atlantic spotted dolphin

Atlantic spotted dolphins (*Stenella frontalis*) are distributed in tropical and warm temperate waters of the Atlantic Ocean. In U.S. waters they range from southern New England to Florida and into the Gulf of Mexico and are divided into a Western North Atlantic and a Gulf of Mexico stock. The abundance estimate for the Western North Atlantic stock is 50,978, with over 90% of those animals occurring from Florida to Maryland. The minimum population estimate for the stock is 36,235 animals. Data are currently insufficient to determine population trends for this

species. However, Atlantic spotted dolphins are not listed as threatened or endangered under the ESA and are not considered depleted or strategic under the MMPA. (Waring et al. 2007)

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

An alternative to the Proposed Action is no action, i.e., denial of the permit request. This alternative would eliminate any potential risk to all aspects of the environment from the proposed research activities. It would prohibit the researcher from gathering information that could help endangered and protected large whales; although, the applicant's shore-based right whale sighting network, which does not require a permit, would continue.

4.2 EFFECTS OF ALTERNATIVE 2: Issue permit with standard conditions

Effects to the Physical Environment

The Proposed Action is directed at specific marine mammals and would not have a significant cumulative effect on the physical environment. Although research may occur within critical habitat, Essential Fish Habitat, national seashores, and state parks, it is not likely that the proposed scientific research would affect such areas. The proposed research would not occur within a National Marine Sanctuary, thus no sanctuaries would be affected.

Effects to Target Species

Under the Proposed Action, the applicant requests to take a maximum of 50 right whales during aerial surveys and 10 right whales during vessel surveys, annually. For the purposes of aerial surveys, the applicant would consider all animals approached within 1000 ft as being "taken." All right whales would be photographed for inclusion in the national North Atlantic Right Whale Catalog, curated by the New England Aquarium. Right whales approached by boat may also be followed to conduct behavioral observations and collect passive acoustics data. Although not the primary target species, any humpbacks (max. 10/year) observed in the study area would be approached and photographed for identification purposes. These photos would be shared with the appropriate humpback researchers.

All of the proposed research activities are non-intrusive, and generally categorized as Level B harassment because there is the potential to disturb the whales, but not the potential to result in injury. The following is a discussion of documented effects of the proposed activities by researchers.

Effects of Aerial Surveys

The applicant proposes to use a variety of aerial platforms (fixed wing aircraft, aerostats, blimps) to find, photograph, and observe right whales. These approaches could lead to disturbance of whales; however, the reactions are expected to be short-term and of a low impact. Less research

has been conducted on the responses of cetaceans to aerial approaches, compared to vessel approaches, though several literature reviews have been conducted (Richardson et al. 1995, Nowacek et al. 2007, Luksenburg and Parsons 2009). Studying aircraft noise is more complex because the sound is propagated in air, is transmitted through the water surface, and then propagates underwater to the animal (Luksenburg and Parsons 2009). In addition to producing sounds that cetaceans can hear, aircraft also provide visual stimuli (i.e., the aircraft itself and its shadow) that may disturb animals (Mullin et al. 1991, Richardson et al. 1995). Reactions to aircraft vary by many factors, including: species, type of aircraft, altitude, behavior prior to approach, lateral distance, group size, and water depth (see Luksenburg and Parsons for a review). Typical responses to aerial surveys are: abrupt dives, changes in heading, and turns to look upward (Wursig et al. 1998, Patenaude et al. 2002, Smultea et al. 2008). Many animals do not react at all. Of 507 bowhead whales approached by a Twin Otter plane, only 2.2% reacted and the majority of those occurred when the plane's altitude was <182 m (597 ft) (Patenaude et al. 2002). When animals do show a response, it is expected that these behaviors dissipate quickly after the aircraft moves away.

In the AirCam plane and blimps, the applicant would descend to a minimum altitude of 700 ft only for approximately 15 minutes to obtain photographs. Longer observation periods would be conducted from 1200 ft or higher. NMFS PR typically does not require permits for aerial surveys above 1000 ft because the animals are unlikely to sense and thus be disturbed by the aircraft at that altitude. The aerostat is simply a large balloon tethered to a boat. Although the altitude of the aerostat is much lower than other aircraft (150-300 ft), it is unlikely that the balloon will evoke any reaction than perhaps curiosity on the part of the whales or a startle reaction to the shadow. Potential effects from using the aerostat are more likely to be associated with the vessel approach (see below).

The permit would be conditioned so that if an animal shows a response to the presence of the aircraft, the aircraft must leave the vicinity, helping to minimize potential survey effects. NMFS PR expects that although some animals may be harassed by the aerial platforms, such disturbance will be minimal, short in duration, and should dissipate quickly.

Effects of Vessel Approaches for Photo-identification, Behavioral Observations, and Passive Acoustics

During the proposed research activities, the presence of the vessel could lead to the disturbance of right whales. A number of studies involving close approach of research vessels of humpback whales indicate that the whales' responses are generally minimal to non-existent when approaches are slow and careful, and when more pronounced behavioral changes occur, the effects appear to be short-lived (e.g. Gauthier and Sears 1999; Weinrich et al. 1991, 1992; Clapham and Mattila 1993; Clapham et al. 1993). Studies of baleen whales, including bowhead (*Balaena mysticetus*) and gray (*Eschrichtius robustus*), found short-term behavioral disturbances in response to a variety of actual and simulated vessel activity and noise (Malme et al. 1983; Richardson et al. 1985). Studies of bowhead whales revealed that these whales oriented themselves in relation to a vessel when the engine was on, and a significant avoidance response was invoked simply by turning the engine on, even at a distance of approximately 3,000 ft (900 m). Watkins et al. (1981) found that both finback and humpback whales appeared to react to boat approach by increasing swim speed, exhibiting a startled reaction, and moving away from

the boat with strong fluke motions. Similar patterns of disturbance caused by vessel activity were observed in humpback whales on their summering and wintering grounds (Bauer and Herman 1986; Baker and Herman 1987). Baker et al. (1983) described two responses of humpback whales to vessels: “horizontal avoidance” of vessels 2,000 to 4,000 meters away characterized by faster swimming and fewer long dives, and “vertical avoidance” of vessels from 0 to 2,000 meters away during which whales swam more slowly, but spent more time submerged. Based on years of field experience with North Atlantic right whales, the NMFS Northeast Fisheries Science Center stated that reactions to the vessel approach are typically short term and that the whales quickly reverted back to normal behaviors once the approach was finished.

The applicant plans to approach right whales for photographs, documentation of scars, and health assessment. Close approaches would generally be short in duration, only lasting long enough to acquire the images. Behavioral observations and passive acoustics would be conducted from a greater distance. The application states that although these observations may last for as long as 12 hours, they would be conducted from a minimum distance of 100 ft and more likely, from greater than 0.25 nmi (1519 ft). As the goal of the research is to observe natural behaviors, the researchers would attempt to be unobtrusive and not disturb the whales.

Passive Acoustics

The proposed acoustic recording of right whales involves the use of a hydrophone towed or suspended from the back of the vessel. Sounds would be then recorded and taped via an apparatus on the vessel. As a passive system, the array would not emit any sounds or signals into the water column. The actual presence of the array in the marine environment is not expected to have any impact on marine mammals or critical habitat. On occasion, researchers have noted some instances of animals investigating a hydrophone but NMFS is not aware of any documentation of the presence of a hydrophone, array, or similar recording device, resulting in a significant impact to a protected species. NMFS does not expect that the hydrophone poses a risk of entanglement with target or non-target species. The array or hydrophone would not touch the ocean floor and thus would not affect the benthic environment.

Summary of vessel approaches

Based on published information on the effects of these activities on large cetacean species, unpublished reports from research conducted by permit holders, and expert advice of agency marine mammal biologists, NMFS expects vessel approaches for photo-identification, behavioral observations, and passive acoustic recordings to result in no more than temporary, minimal harassment to the target individuals. Researchers have noted that large whales often exhibit no response or mild responses, such as local movements away from the vessel or a startle/flinch, to the proposed Level B activities. Animals would be expected to recover from such harassment within minutes. Close approaches would be made in a controlled manner at safe speeds so as not to alarm the whale and no vessel strikes would be expected. Research efforts would be abandoned if an animal exhibits a response that indicates the approach may be interfering with reproduction, feeding, or other vital functions.

Given the minimal effects of the research that would occur and the ability of the animals to recover from effects between surveys, NMFS expects that even those animals that may be

affected more than once a field season would not suffer any significant consequences. No serious injury or mortality would result from these activities. The proposed activities considered individually and as a group are not likely to disrupt the migration, breathing, nursing, feeding, breeding, or sheltering behavior of large whales. NMFS does not expect that disturbance from these activities will have a significant effect on target animals, populations, or species of endangered large whales.

Summary of Effects on Right Whales

The most likely cause for harassment through the proposed research activities is disturbance from the close approach of the research vessel and aircraft. However, disturbance would be temporary and animals would be expected to recover from any harassment fairly quickly (within a day). Conditions within the permit would also limit the potential for harassment during research. Using the minimum population size of 325 animals (Waring et al. 2009), the proposed aerial and vessel takes combined would represent the harassment of approximately 18.5% of the western Atlantic right whale stock annually (aerial takes = 15.4%; vessel takes = 3.1%). These takes would be counted quite conservatively and regardless of any behavioral reaction by the whale: 1) any aerial approach less than 1000 ft; and 2) any vessel approach within 300 ft. These activities would not be expected to result in any serious injury or mortality. NMFS expects that such harassment is not likely to have a measurable long-term effect on right whale stocks or populations.

Effects to Non-target Species: Incidental Harassment

Since the Proposed Action is specific to the target species, research activities would not be expected to have any significant effects on other marine species. There is the potential for incidental harassment of other marine mammals and sea turtles that may be in the vicinity during aerial and vessel approaches. However, the presence of the research vessel in the water column or an aircraft above is expected to be no different to non-target animals than any other boat or plane that could be in their vicinity.

Furthermore, the number of other marine mammals that may be harassed is expected to be small and any harassment would not likely have a measurable long-term effect on stocks or populations of non-target species. Other than collecting photo-identification images of humpback whales, the applicant would not attempt to approach or interact with any non-target species. The activities would not pose any risk of entanglement since the only gear that would briefly enter the water would be a hydrophone. Due to the nature of the proposed research activities, any sea turtles that would be encountered are not likely to be affected by the Proposed Action. In fact, the Biological Opinion determined that the whale research is not likely to adversely affect any sea turtle species. As a result of this determination, the Permits Division would not authorize takes of sea turtles in the permit. Given the applicant's study design, NMFS does not expect non-target species in the action area to be significantly impacted by the proposed research.

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 conclusion of the opinion was that the proposed action would not likely jeopardize the continued existence of North Atlantic right or humpback whales and is not likely to destroy or adversely modify designated critical habitat for North Atlantic right whales.

4.3.2 Marine Mammal Protection Act

The applicant submitted an application which included responses to all applicable questions in the application instructions. 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. As a result of the comments received, the proposed research was modified and some parts were eliminated from consideration. The resulting research request is consistent with applicable issuance criteria in the MMPA and NMFS implementing regulations.

The permit would contain standard terms and conditions stipulated in the MMPA and NMFS' 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.

4.4 COMPARISON OF ALTERNATIVES

While the no action alternative would have zero environmental effects, the opportunity would be lost to collect information that may contribute to a better understanding of right whales and that would provide information to NMFS that is needed to implement NMFS management activities. This is important information that would help conserve and manage right whales as required by the MMPA, ESA and NMFS's implementing regulations. The Proposed Action would affect the environment, primarily individual marine mammals. However, the effects would be minimal and the alternative would allow the collection of valuable information that could help NMFS' efforts to recover large whales. Neither the no action nor the Proposed Action alternatives are anticipated to have adverse population or stock-level effects on right whales, or other marine mammals and sea turtles.

4.5 MITIGATION MEASURES

In addition to the mitigation measures identified by the researcher in the application and discussed in Section 2 of this EA, specific conditions would be incorporated into the permit. Some of these measures are standard conditions placed in all research permits; others are special conditions based on the proposed research activities and target species. Together these conditions are expected to reduce the potential for harassment of non-target protected species during research and minimize the extent and degree of harassment to the target cetacean species.

Conditions would include:

- Limitations on activities authorized for specific age classes and species.
- 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.
- During authorized activities on cetacean females with calves:
 - Termination of efforts if there is evidence that the activity may be interfering with pair-bonding or other vital functions.
 - Not positioning the research vessel between the mother and calf.
 - Approaching mothers and calves gradually to minimize or avoid startle response.
 - Not approaching mothers or calves while the calf is actively nursing.
- Requirements for regular reports on the effectiveness of the research at achieving the applicant's stated objectives (and thus at achieving the purpose and need of the federal action) and on the effectiveness of the mitigation measures required by the permit.
- Requirements for Researchers to notify the relevant NMFS Regional Office prior to beginning field work and to coordinate activities with other Permit Holders working in the same area and with the same species.
- NMFS has authority to modify the permit or suspend the research if information suggests it is having a greater than anticipated adverse impact on target species or the environment.

In addition to these mitigation measures, in signing the permit, the applicant acknowledges that the permit does not relieve him of the responsibility to obtain any other permits, or comply with any other Federal, State, local, or international laws or regulations.

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. However, as discussed above, the most likely effect would be disturbance to some of the target marine mammals from research activities. This may temporarily interrupt normal activities such as feeding and resting. The effect on the animals is not expected to have a significant long-term effect on individuals or the population. In other words, while individual whales or dolphins may exhibit temporary disturbance or evasive behaviors in response to the activities of researchers, the impact to

individual animals is not likely to be significant because the reactions will be short-lived and animals will recover physically within minutes of the activities.

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.

4.7.1 Research

Marine mammals have been the subject of field studies for decades. The objectives of most studies are to monitor populations and/or gather data for behavioral and ecological studies. Over time, NMFS has issued dozens of permits for scientific research of marine mammals in the North Atlantic. These permits have authorized harassment from a variety of activities, including aerial and vessel surveys, photo-identification, remote biopsy sampling, and attachment of scientific instruments. In addition to the typical research permits, one permit (No. 932-1905), issued to the NMFS Marine Mammal Health and Stranding Response Program (MMHSRP), authorizes takes of stranded or distressed marine mammals, including the disentanglement and health assessment of large whales.

In addition to the MMHSRP permit, 12 permits currently authorize research on North Atlantic right whales in the action area. See Appendix 1 (Tables A and B) for a list of the permits and their expiration dates. These permits will gradually expire over the next five years. However it is expected that most, if not all, of the researchers will apply for a new permit after their current one expires. For example, one of the holders (NMFS SEFSC) is currently working under an extension while the new permit application is in process. Their new application: 1) is a continuation of the holder's current research; 2) included right whale research and 3) would replace their expiring permit.

The number of research permits and associated takes by harassment indicate a high level of research effort relative to the population size of North Atlantic right whales. This is due, in part, to intense interest in developing appropriate management and conservation measures to recover this highly endangered species. It is important to note that of the 12 active permits, only seven authorize Level A harassment (see Appendix 1). Many researchers studying right whales are only authorized for Level B harassment. Most research consists of photo-identification and aerial surveys. Dr. Hain's permit would fall into this same category of low level, low risk activities.

None of the current permits authorize activities likely to result in the serious injury or mortality of a right whale. No right whale injuries or deaths have been attributed to permitted research.

Therefore, the number of takes proposed by Dr. Hain, when added to the currently authorized research activities in the action area, is not expected to result in a significant adverse impact on the target right whales or any other protected species.

Furthermore, right whale research is distributed between the northeast feeding grounds, the southeast breeding grounds, and the migration corridor. Many researchers are limited to a specific portion of the U.S. east coast, reducing the chance of repeated harassment of individual whales by researchers. Although other researchers are working in the vicinity of Dr. Hain's proposed study area, his focus is on the waters south of St. Augustine, where there is less effort. There is not enough information about the exact location and timing of the research under the various permits to specifically identify the extent of overlap in time and space of all of the permitted research, or to identify the frequency with which individual right whales may be disturbed. However, it is a standard condition of NMFS permits that researchers coordinate their activities with those of other permit holders to avoid unnecessary disturbance of animals. Permitted researchers are also required to notify the NMFS Regional Offices at least two weeks in advance of any planned field work so that the Regional Office can facilitate this coordination and take other steps appropriate to minimize disturbance from multiple permits. Lastly, the right whale research community is well coordinated. They share data, contribute to a single identification catalog, and hold annual meetings to transfer knowledge.

As the existing permits gradually expire, it is possible that the level of impact to right whales could gradually decrease. However this assumes that none of the current permits are amended to increase take activities and that expired permits are not replaced by newer permits. In fact, most researchers, including the NMFS science centers, are likely to request new permits to continue studying large whales. Dr. Hain is an example of this latter point; he has held several five-year permits for right whale research in the past and is now requesting a new permit to continue his work. NMFS cannot predict with certainty the level of take of each species that may be requested in the future but, conservatively, expects the amount of future research to be similar to or slightly greater than current levels as interest in marine conservation, biology, and management of this species grows.

Research under the Proposed Action alternative is not expected to result in more than minimal, temporary harassment of animals in the action area. It is likely the effects of the disturbance would be short-term and that the affected areas would recover between disturbances and following conclusion of the permitted research. Considering the nature of the proposed research activities, 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.

4.7.2 Ship Strikes

Collisions with commercial ships are an increasing threat to many large whale species, particularly as shipping lanes cross important large whale breeding and feeding habitats or migratory routes. 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, and whale watching vessels (Jensen and Silber 2003).

Vessel speed (if recorded) at the time of a large whale collision has ranged from 2 to 51 knots (Jensen and Silber 2003). 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 10-14 knots. None occurred at speeds below 10 knots, although there is a predicted 45 percent chance of death or serious injury to the whale at 10 knots (Pace and Silber 2005). New regulations (discussed in Section 4.7.6) requiring vessels to slow down in certain circumstances may reduce the likelihood of future vessel collisions with large whales.

Ship strikes are responsible for the majority of human-caused right whale mortalities (Knowlton and Kraus 2001; Jensen and Silber 2003; NMFS 2005b). 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%) 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).

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, representing 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).

Researchers believe that the primary causes for right whale ship strikes relate to their hearing and inability to detect the presence of the vessels. 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. Furthermore, a whale must perceive a ship as a threat in order to avoid it. Unless a given individual has had a previous close encounter with a ship, survived the encounter, and learned the threat posed by the vessel, then the urge to avoid a ship may not be great. 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. Furthermore, detecting a right whale from the bow of the ship is difficult because of the whale's dark coloration and its low profile while

swimming (WWF 2005, as cited in USCG and Environmental Resources Management Inc. 2006).

Ship strikes are also a threat to humpback whales. Of 20 dead humpback whales, Wiley *et al.* (1995) reported that six (30%) had major injuries possibly attributable to ship strikes. In the NMFS records for 2002 through 2006, nine humpbacks had some evidence of a collision with a vessel and seven of those were mortalities (Glass *et al.* 2009).

Based on a recent estimate of the mortality rate and records of ship strikes to large whales, scientists estimate that less than one-quarter (17 percent) of ship strikes are actually detected (Kraus *et al.* 2005). Incidences of ship strikes on large whales in the proposed action area are difficult to quantify because not all whales that are hit will strand, and if they do, there is not always a clear indicator of the cause of death or injury.

4.7.3 *Fishing Gear Entanglement*

Because the distribution of many large whales overlaps 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. 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.

The number of deaths attributed to fishing gear interactions may be grossly underestimated. In many cases, investigators 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.

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.

Records of right whale 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). 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). The recent Stock Assessment Report states that 37% of confirmed right whale human-caused mortalities (3) and serious injuries (4) reported from 2002 through 2006 resulted from entanglements or fishery interactions (Waring *et al.* 2009). 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).

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 Catalog⁶ 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).

Fishery interactions and entanglements are also a threat to humpback whales in the Atlantic. For example, a study of entanglement-related scarring on the caudal peduncle of 134 individual humpback whales in the Gulf of Maine suggested that between 48% and 65% had experienced entanglements (Robbins and Mattila 2001). Of 20 dead humpback whales Wiley et al. (1995) reported that five (25%) had injuries consistent with possible entanglement in fishing gear. One whale displayed scars that may have been caused by both ship strike and entanglement.

The records of dead, injured, and/or entangled humpbacks (found either stranded or at sea) for the period 2002 through 2006 were reviewed. Humpbacks were involved in 162 reported events. Of these, 70 of the 79 reported entanglements could be confirmed (Glass et al. 2008). Entanglements accounted for ten mortalities and six serious injuries (Waring et al. 2009).

4.7.4 Habitat Degradation

Anthropogenic activities, such as emitting discharge from wastewater facilities, dredging, ocean dumping and disposal, aquaculture, and coastal development are also known to have deleterious impacts on the habitat of marine mammals and their prey, ultimately affecting the animals themselves. Point source pollutants from coastal runoff, at sea disposal of dredged material and sewage effluents, and oil spills, continue to negatively affect marine mammals in the proposed action area.

Right whales 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.

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. 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.

⁶ The Right Whale Catalog is a database of whale sightings and photographs maintained by the New England Aquarium.

4.7.5 Contaminants

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 North Atlantic 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. Doucette et al. (2006) suggest that the trophic transfer of marine algal toxins is a factor contributing to the recovery failure of the North Atlantic right whale.

Some researchers have correlated contaminant exposure to possible adverse health effects in marine mammals. Chronic exposure to the neurotoxins associated with paralytic shellfish poisoning (PSP) via contaminated zooplankton prey has been shown to have detrimental effects on marine mammals. Estimated ingestion rates are sufficiently high enough to suggest that the PSP toxins are affecting marine mammals, possibly resulting in lower respiratory function, changes in feeding behaviour, and a lower reproductive fitness (Durbin et al. 2002). For example, between November 1987 and January 1988, at least 14 humpback whales died after consuming Atlantic mackerel containing a dinoflagellate saxitoxin (Geraci *et al.* 1989). The whales subsequently stranded or were recovered in the vicinity of Cape Cod Bay and Nantucket Sound, and it is highly likely that other unrecorded mortalities occurred during this event.

4.7.6 Conservation Efforts

Some human activities result in beneficial impacts to the target cetacean species, including guidelines that encourage responsible, safe viewing of protected animals by the public, regulations that reduce the potential for harmful interactions with aircraft and vessels, and conservation efforts to reduce interactions with commercial fisheries. NMFS has launched an education and outreach campaign to provide commercial boat operators and the general public with responsible marine mammal viewing guidelines. Each NMFS Regional Office provides guidelines for the public’s viewing of marine wildlife. Viewing distances vary slightly by region, but NMFS generally recommends the public remain at least 50 to 100 yards away from protected marine mammals.

In addition to the viewing guidelines, federal regulations (50 CFR 224.103) prohibit vessels from approaching right whales within 500 yards. There are a few exceptions to these regulations, such as for permitted researchers, but whale-watching vessels must maintain the regulatory distance. However, collisions between whale-watching boats and a humpback (2001) and a minke whale (1998) illustrate that death or serious injury is still possible.

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.

4.7.7 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. Several researchers have confirmed that right whales should be able to hear the sounds that approaching vessels emit. However, right whales do not appear to avoid vessels. 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). Many sources of low frequency noises from human activities 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 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 capabilities. 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). Ship strikes by large vessels cause the most lethal and serious injury to whales and yet these ships 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 deep, 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 vessels, 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 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 these activities described in the sections above 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.

4.7.8 *Climate and Ecosystem Change*

The extent to which climate and/or ecosystem changes impact the target cetacean species is largely unknown. However, NMFS recognizes that such impacts may occur based on the biology, diet, and foraging behavior of whales. Interannual, decadal, and longer time-scale variability in climate can alter the distribution and biomass of prey available to large whales. The effects of climate-induced shifts in productivity, biomass, and species composition of zooplankton on the foraging success of planktivorous whales have received little attention. Such shifts in community structure and productivity may alter the distribution and occurrence of foraging whales in coastal habitats and affect their reproductive potential as well. Similar shifts in prey resources could likewise impact large whales if climate change alters the density, distribution, or range of prey.

For example, 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). Decadal 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 (NAOS) (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 NAOS index measures the difference in sea-level pressure between the subtropical high (Azores) and the subpolar (Iceland) low. The climactic change caused by the NAOS can have an impact on right whale foraging. During a positive phase 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 NAOS 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).

As mentioned above, the NAOS 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 [NAOS] index, whale food becomes plentiful, and right whales produce many calves. After a negative NAOS

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.

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.

4.7.9 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. 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.

Upon request by the Navy pursuant to Section 101(a)(5)(A) of the MMPA, in 2009 NMFS promulgated five-year regulations governing the take of marine mammals incidental to Navy training, maintenance, and research, development, testing, and evaluation activities to be conducted in the along the Atlantic and Gulf of Mexico coasts in the Atlantic Fleet Active Sonar Training (AFAST) Study Area, and issued an associated one-year letter of authorization (LOA). These Navy activities may incidentally take marine mammals present within the AFAST Study Area by exposing them to sound from mid-frequency or high frequency active sonar (MFAS, HFAS) or to underwater detonations at levels that NMFS associates with the take of marine mammals. For right whales, NMFS expects the Navy’s activities may result in Level B Harassment in the form of avoidance of the source, temporary changes in vocalizations or dive patterns, temporary avoidance of an area, temporary disruption of feeding or migrating, and - in very few individuals – a relatively mild temporary loss of hearing sensitivity. Annual LOAs issued under these regulations authorize the take of individuals of 39 species of marine mammals, including right whales. In 2010, the Navy was authorized to take 733 right whales, by Level B harassment and NMFS would anticipate authorizing approximately the same numbers of annual take through January 2014, when the regulations expire. The regulations and LOAs include mitigation measures to reduce adverse impacts to marine mammals, including several

measures specifically directed at right whales (e.g., a reduction of certain types of exercises in right whale critical habitat and measures to reduce the likelihood of ship strikes), as well as a robust monitoring plan to help further determine the effects that MFAS/HFAS has on marine mammals.

4.7.10 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. The tower project would not overlap with the proposed research, but would overlap with the range of North Atlantic 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 Great South Channel (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. However, consultation will likely be reinitiated in late 2010 or early 2011 due to right whale sightings in the area.

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.

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 μ Pa. "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, few studies have examined the effects of pile-driving or other high-level, low-frequency impulsive sounds on marine mammals. Similarly, no studies have been assessed 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 poses both a noise threat and a ship strike threat,
- elevated total suspended solids,
- habitat shift from structure-oriented ecosystem to non-structure oriented ecosystem once the monopiles are removed,
- submarine vibrations, and
- electromagnetic/thermal emissions from submarine cables and inner-array cables (USACE 2004).

The Cape Wind Project DEIS (USACE 2004) also indicates some potential indirect impacts to marine mammals: prey mortality and/or displacement and bioaccumulation from consuming contaminated prey. As more of these wind parks are built in marine environments, studies will be needed to understand the full range of effects the noise of such operations may 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. Two of the most recently constructed LNG Deepwater Ports licensed by the USCG/Maritime Administration (MARAD) are located off of Boston, MA near Stellwagen Bank NMS.

Two facilities are located in areas deemed as primary late winter/early spring feeding habitat for the western North Atlantic right whale. 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 has issued

several IHAs for the construction, operation, and repair and maintenance of the NEG Port facility. The most recent IHA was issued on August 27, 2010, and expires on August 31, 2011. NMFS intends to issue regulations and subsequent LOAs for the continued operation and maintenance of the NEG facility to cover a five-year period from September 2011 to September 2016. 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). NMFS has issued several IHAs for the construction, operation, and repair and maintenance of the Neptune Port facility. The most recent IHA was issued on July 12, 2010, to cover operations and repair and maintenance activities. It expires on July 11, 2011. NMFS is currently in the process of promulgating 5-year regulations to cover operation and repair/maintenance activities of the Neptune LNG port facility from July 2011 through July 2016.

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. Consultation was reinitiated for the Neptune Port in March 2010 to analyze the impacts to ESA-listed species from repair and maintenance activities. In a Biological Opinion issued on July 12, 2010, NMFS concluded that the operation of the Neptune LNG deepwater port, including required maintenance and repair work, is likely to adversely affect, but is not likely to jeopardize the continued existence of the North Atlantic right, humpback, fin, and sei whales. Additionally, during the MMPA IHA issuance process, NMFS determined that construction and operation of the LNG facilities will have only a negligible impact on the North Atlantic right whale population.

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 result in some level of impact to right whales in the proposed action area, but 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 and humpback 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 permit. 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

Agencies Consulted:

Marine Mammal Commission

Prepared By:

Permits, Conservation and Education Division of NMFS' Office of Protected Resources in Silver Spring, Maryland.

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APPENDIX 1: Current NMFS Scientific Research Permits authorizing takes in the North Atlantic.
 * denotes permits operating under an extension while a new application is in process.

Table A. North Atlantic right whale permits

Permit No.	Holder	Expiration Date	Level of Harassment Authorized
779-1633-01	NMFS SEFSC	12/31/2011*	B only
1058-1733	Baumgartner	5/31/2012	A & B
10014	New Jersey Dept. of Environmental Protection	12/31/2012	B only
948-1692	Ann Pabst	5/31/2012*	B only
775-1875	NMFS NEFSC	1/15/2013	A & B
605-1904	Whale Center of New England	2/15/2013	B only
13545	Ocean Alliance	2/15/2015	B only
14791	Doug Nowacek	7/30/2015	A & B
14233	Scott Kraus	9/30/2015	A & B
15415	Scott Kraus	3/31/2014	B only
14603	Center for Coastal Studies	9/30/2015	A & B
15488	Georgia DNR	6/30/2016	A & B

Table B. Humpback whale permits

Permit No.	Holder	Expiration Date	Level of Harassment Authorized
779-1633-01	NMFS SEFSC*	12/31/2011	A & B
369-1757	Bruce Mate	5/31/2012	A & B
948-1692	Ann Pabst	5/31/2011	B only
633-1778-01	Center for Coastal Studies	6/30/2011	A & B
1058-1733	Baumgartner	5/31/2012	A & B
10014	New Jersey Dept. of Environmental Protection	12/31/2012	B only
775-1875	NMFS NEFSC	1/15/2013	A & B
605-1904	Whale Center of New England	2/15/2013	A & B
1128-1922	Eduardo Mercado	1/15/2014	A & B
13545	Ocean Alliance	2/15/2015	A & B
14451	Joseph Mobley	7/31/2015	B only



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

Finding of No Significant Impact **Issuance of Scientific Research Permit No. 13927**

Background

In December 2008, the National Marine Fisheries Service (NMFS) received a complete application for a permit (File No. 13927) from Dr. James Hain to conduct research on North Atlantic right whales off the southeastern coast of the 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. In addition, a Biological Opinion was prepared under the Endangered Species Act summarizing the results of an intra-agency consultation. The analyses in the EA, as informed by the Biological Opinion, support the below findings and determination.

Analysis

National Oceanic and Atmospheric Administration Administrative Order 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 (EFH) as defined under the Magnuson-Stevens Act and identified in Fishery Management Plans?

The permit would authorize aerial and vessel approaches, observation, and passive acoustic recording of several cetacean species. These activities are not expected to cause substantial damage to the ocean, coastal habitats, or EFH. Nothing would be removed from or intentionally left in the marine environment during research. All activities would occur at or near the surface of the water and would not be expected to substantially impact any biological, chemical, or physical properties of such habitat.

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.)?

The effects of the action on the target endangered species, and their habitat, EFH, and non-target species were all considered in the EA. The proposed action is not expected to affect predator-prey relationships, biodiversity, or other non-target



species. No wildlife would be intentionally removed from the wild or their survival or reproductive success affected. Therefore, no substantial impacts would be expected to occur as a result of the proposed action.

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

No negative impacts on human health or safety are anticipated during the proposed research. The proposed action involves close approaches of aerial platforms and vessels for behavioral observations, photo-identification, and passive acoustic recordings 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.

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?

As determined in the attached Biological Opinion and evaluated in the EA, the proposed action would affect individual North Atlantic right, humpback whales, and some small cetaceans during the research. Researchers would closely approach these ESA-listed species by vessels, by various aerial platforms, photo-identify, observe, acoustically record, and incidentally harass individual whales. However, the Biological Opinion concluded that the effects of the proposed action would not be severe and would be short-term in nature to individual animals. The Biological Opinion determined that the proposed action would not likely jeopardize the continued existence of any ESA-listed species and would not likely destroy or adversely modify designated critical habitat.

The research would take place in right whale critical habitat; however, the researchers would only operate a vessel at the water surface and gear would only enter the upper portion of the water column temporarily during tagging and sampling activities. None of the research activities would affect the primary constituent elements of designated critical habitat.

The research activities would not affect the whale's prey species or the quality of the water. No other non-target species would be targeted or intentionally approached during research. Although other ESA-listed species, such as sea turtles and shortnose sturgeon may be in the action area, the Biological Opinion determined that those species are not likely to adversely affected by the proposed research.

Additionally, the permit would contain mitigation measures to minimize the effects of the research and to avoid unnecessary stress to any listed species by requiring use of specific research protocols.

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

NMFS does not expect any significant social or economic impacts as a result of or interrelated with the natural effects of the proposed action. Effects of the research would be limited to the short-term harassment of the target large whale species and dolphins. 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.

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

The effects to the quality of the human environment are not likely to be highly controversial. Similar research has been conducted by the applicant and other researchers for decades without controversy.

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?

The proposed research would not be expected to result in substantial impacts to any such area. The majority of these habitats are not part of the action area. EFH would not be adversely affected. The proposed research would occur at or near the water surface and would not substantially affect bottom habitat or any biological, physical or chemical property of such habitat. While research could occur in designated right whale critical habitat in the North Atlantic the proposed action would not be expected to substantially impact either of these areas as stated in response to question #4.

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

The proposed research is not unique. The applicant has conducted similar research under previous permits on the same species and in the same study area. Throughout the world, scientists have used these same techniques to study cetaceans for decades. The risks are known and would involve the temporary, minimal harassment of individual large whales and dolphins. 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 the proposed activities. Based on the description of the activities by the applicant and mitigation measures of the permit, no mortalities or serious injuries would be expected. 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?

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 short-term stresses (separately and cumulatively when added to other stresses the marine mammals 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 harassment to dissipate before animals could be harassed by other human activities. Significant cumulative impacts are not expected since 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. 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?

The 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. Issuance of the permit would not cause the loss or destruction of any significant scientific, cultural or historical resources.

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

No. The action is not expected to result in the introduction or spread of non-indigenous species. The action would not remove or introduce any new species. Researchers would be working from aerial platforms or small vessels that do not take on ballast water and do not move between large water bodies.

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?

No. 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 upon 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?

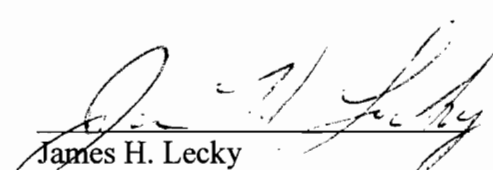
No. The action would not result in any violation of Federal, State, or local laws for environmental protection. The permit would contain language stating that the applicant is required to obtain any state and local permits necessary to carry out the action.

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?

No. The action is not expected to result in any cumulative adverse effects to the species that are the subject of the proposed research or non-target species. For targeted species, the proposed action is expected to have no more than short-term effects to individuals and negligible effects at the population and species level. All of the proposed research (behavioral observations, photo-identification, passive acoustic recordings, aerial and vessel surveys) is considered Level B harassment under the MMPA, and does not have the potential to injure an individual. The proposed action would not result in the loss of individuals from these populations or appreciably reduce the target animals' fecundity. NMFS also does not expect that issuance of the permit would result in cumulative adverse effects to non-target species. The researchers would not attempt to approach or interact with non-target 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 analyses contained in the EA and Biological Opinion prepared for issuance of Permit No. 13927, it is hereby determined that permit issuance will not significantly impact the quality of the human environment. 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 Environmental Impact Statement for this action is not necessary.


James H. Lecky
Director, Office of Protected Resources

OCT 17 2011

Date