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

Environmental Assessment
FOR
{THE EFFECTS OF THE ISSUANCE OF A SCIENTIFIC RESEARCH PERMIT FILE NO. 15672 TO MOLLY LUTCAVAGE TO CONDUCT LEATHERBACK SEA TURTLE RESEARCH }

{March 2012}

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

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

For Further Information Contact: Office of Protected Resources
National Marine Fisheries Service
1315 East West Highway
Silver Spring, MD 20910
(301) 713-2289

Location: Atlantic waters off of Massachusetts, New York, and New England

Abstract: The National Marine Fisheries Service (NMFS) proposes to issue a scientific research permit for Dr. Molly Lutcavage (University of Massachusetts, Amherst), under Section 10(a)(1)(A) of the Endangered Species Act (ESA) of 1973 as amended (16 U.S.C. 1531 et seq.) and the regulations governing the taking, importing, and exporting of endangered and threatened species (50 CFR 222-226). The permit would be valid for five years from the date of issuance. Research authorized under Permit No. 15672 would characterize the distribution, movements and dive behavior of leatherback sea turtles. This research would create a better understanding of leatherback habitat utilization, foraging behavior, and threats posed by entanglement risk. Under NOAA Administrative Order 216-6, NMFS issuance of scientific research permits is generally categorically excluded from the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 et seq.) requirements to prepare an environmental assessment (EA) or environmental impact statement (EIS). However, for this permit NMFS prepared an Environmental Assessment (EA) to facilitate a more thorough assessment of potential impacts on endangered sea turtles. This EA evaluates the potential impacts to the human environment from issuance of the proposed permit.

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CHAPTER 1 PURPOSE OF AND NEED FOR ACTION

1.1 DESCRIPTION OF ACTION

In response to receipt of a request from Dr. Molly Lutcavage, University of Massachusetts, Amherst, Marine Fisheries Institute Department of Natural Resources Conservation, 108 East Main Street, Gloucester, MA, 01930 (File No. 15672), NMFS proposes to issue a scientific research permit that authorizes "takes"[1] pursuant to the Endangered Species Act of 1973 (ESA; 16 U.S.C. 1531 *et seq.*), the regulations governing the taking, importing, and exporting of endangered and threatened species (50 CFR Parts 222-226).

1.1.1 Purpose and Need

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

1.1.2 Research Objectives

The research objectives for this proposed permit would be to characterize leatherback turtle foraging habitat and dive behavior, identify anthropogenic threats to foraging habitat, and to determine the natal origin of leatherbacks foraging off the coast of New England. These efforts would aid in the development and refinement of management efforts to recover these species.

1.2 OTHER EA/EIS THAT INFLUENCE SCOPE OF THIS EA

Because Permit No. 15672 would be a continuation of Dr. Lutcavage's current research on leatherback sea turtles, the action area and a majority of the proposed activities have been previously described and analyzed for her current permit, No. 1557-03. The Environment Assessment prepared for the current permit, *Supplemental Environmental Assessment Conducted for a Modification to Scientific Research Permit No. 1557 held by Molly Lutcavage, Ph.D., University of New Hampshire* (NMFS 2007a), found that the research would not have significant impacts to the human environment. The proposed permit differs slightly from the current permit in the suite of research activities and number of takes requested; however, the action area and the sampling season have been reduced.

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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."

1.3 SCOPING SUMMARY

The purpose of scoping is to identify the issues to be addressed and the significant issues related to the proposed action, as well as identify and eliminate from detailed study the issues that are not significant or that have been covered by prior environmental review. An additional purpose of the scoping process is to identify the concerns of the affected public and Federal agencies, states, and Indian tribes. CEQ regulations implementing the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 et seq.) do not require that a draft EA be made available for public comment as part of the scoping process. A Notice of Receipt of the application was published in the *Federal Register*, announcing the availability of the application for public comment (76 FR 23305, April 26, 2011). No substantive public comments were received during the 30-day public comment period.

1.4 APPLICABLE LAWS AND NECESSARY FEDERAL PERMITS, LICENSES, AND ENTITLEMENTS

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

1.4.1 National Environmental Policy Act

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

Procedures for NMFS' compliance with NEPA and the implementing regulations issued by the CEQ are established in NOAA Administrative Order (NAO) 216-6. 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. When a proposed action that would otherwise be categorically excluded 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, preparation of an EA or EIS is required.

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 Environmental Assessment is prepared in accordance with NEPA, its implementing regulations, and NAO 216-6.

1.4.2 Endangered Species Act

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

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

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

Section 2 of the ESA sets forth the purposes and policy of the Act. The purposes of the ESA are to provide a means whereby the ecosystems upon which endangered and threatened species depend may be conserved, to provide a program for the conservation of such endangered species and threatened species, and to take such steps as may be appropriate to achieve the purposes of the treaties and conventions set forth in section 2(a) of the ESA. It is the policy of the ESA that all Federal departments and agencies shall seek to conserve endangered species and threatened species and shall utilize their authorities in furtherance of the purposes of the ESA. In consideration of the ESA's definition of conserve, which indicates an ultimate goal of bringing a species to the point where listing under the ESA is no longer necessary for its continued existence (i.e., the species is recovered), exemption permits issued pursuant to section 10 of the ESA are for activities that are likely to further the conservation of the affected species.

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

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. One alternative is the "No Action" alternative where the proposed permit would not be issued. The No Action alternative is the baseline for rest of the analyses. The Proposed Action alternative represents the research proposed in the submitted application for a permit, with standard permit terms and conditions specified by NMFS.

2.1 ALTERNATIVE 1 – NO ACTION

Under the No Action alternative, no permit would be issued for the activities proposed by the applicant. This alternative would eliminate any potential risk to the environment (e.g., harassment to animals) from the proposed research activities, and would not affect the applicant's current permit or any other existing permits. However, it would not provide exemptions from take prohibitions, and the opportunity would be lost to collect information that would contribute to better understanding leatherback sea turtle populations and provide basic information that is necessary for NMFS to make important management decisions concerning these species and their habitat.

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, with the permit terms and conditions standard to such permits as issued by NMFS. The proposed permit would be valid for five years from the date of issuance. Alternative 2 is the preferred alternative.

See Appendix 1 for the specific level of take and activities that would be authorized. Work would be conducted from June to October.

Research Activities

The following sections provide a description of the proposed research activities. Researchers would capture by hoopnet, handle, identify, photograph, measure, Passive Integrated Transponder (PIT), flipper and satellite tag, tissue, fecal and blood sample, and nasal, cloacal, and oral swab sample leatherback sea turtles as part of a habitat utilization study in the waters off of New England.

<u>Capture</u>

Capture (by hoopnet and spotter pilot network) And Release Protocol

A "call list" would be established, listing fishermen who are willing to charter their fishing vessels for day charter. Boats would meet the criteria of having open stern/transom (lobster or tuna boats) and a gear davit with lifting capacity of at least 2,000 lbs. Upon receipt of a sighting with GPS-fixed location, researchers would attempt to approach the location coordinates by boat following directions from spotter pilots. An advantage of the spotter pilot network is that their use of cell phones would allow for rapid communication from sea to shore in some areas such as Cape Cod Bay and Stellwagen Bank. A tuna harpoon boat or lobster boat (38-42 ft) should be able to close in on the turtle's location with sufficient speed, taking into account distance from

shore and weather conditions. Based on experience from harpoon boats (placing tags on giant bluefin tuna), researchers should be able to approach turtles so that they can guide a hoop net over them from the bow or pulpit area.

Researchers would use a breakaway hoop net to capture leatherbacks at the surface, a method that has been used successfully to safely capture porpoise, pinnipeds, small cetaceans (Asper 1975) and, more recently, leatherback turtles (P. Dutton NMFS Permit No. 1227; James et al. 2005). The breakaway hoop net would be custom made so that the hoop fits easily over a leatherback with front flippers loosely held at its side. One of the researchers would be positioned on the bow, ready to guide the hoop net (fitted to a long guiding pole) over the leatherback. The hoop net would be fitted with breakaway stays to a cast net which would be pursed over the turtle. Large turtles (> 500 lbs) would remain in this net to be brought aboard, while smaller turtles would be placed in a padded sea turtle stretcher and lifted carefully onto the flat deck by the davit. Modified by NMFS from a Sea World Australia design (Nielsen 1995), the stretcher would consist of non-abrasive and washable vinyl material, internal light foam padding, heavy duty Velcro binding flaps, and seat belt webbing for handles and lifting straps. The current version of this stretcher (designed for smaller cheloniid sea turtles) has been used successfully by the STSSN and several sea turtle research projects. This specific stretcher design has not been used for leatherbacks at sea, but the New England Aquarium rescue rehabilitation personnel have designed and used a variety of stretchers for work on marine mammals and sharks. The cheloniid design would be modified to accommodate the larger dimensions and weight of a leatherback, with a minimum handle breaking strength of 2000 lbs. James et al. (2005) used a pulley system to pull netted leatherbacks on board via drop-down stern ramp. In the research that would be conducted as part of the proposed action, the vertical distance that must be cleared would be minimal because research vessels would have an open transom or large tuna door. The distance from water to vessel would be no greater than 0.5 m.

Researchers could also possibly obtain leatherback turtles from a sea turtle disentanglement network under the authority of the Northeast Region Sea Turtle Disentanglement Network (NOAA 50 CFR Part 222.310). Turtles obtained in this manner would first be assessed by a veterinarian to determine the animal's well-being and suitability for satellite tag attachment. Obviously compromised animals would not be used.

Measuring, Photographing, Video

Once on deck, the leatherback would be examined, photographed, and briefly secured by the stretcher so that its limbs are held close to its body to prevent injuries to the turtle and personnel, but breathing would be unrestricted. The leatherback would be covered and shaded with wet toweling. Leatherbacks would be measured using a flexible fiberglass measuring tape.

Mark: Flipper and PIT tagging

Prior to release, all turtles would be checked for existing external flipper tags or internal Passive Integrated Transponders (PIT tags). If a turtle has not been previously tagged, inconel metal flipper tags would be applied to the proximal trailing edge of each front flipper typically in either the first or second scale. Prior to tagging, tags would be cleaned and soaked in alcohol to remove any residue. Antibiotic ointment would be applied to the cutting tip of each tag just prior to attachment. These tags are expected to last up to several years. A PIT tag (BioMark

TX1440L) would be inserted, using a sterile syringe implanter, into the dorsal shoulder musculature. These tags are expected to last indefinitely. Prior to the insertion of any tag, the skin in the target area would be scrubbed with 10% povidone-iodine and isopropyl alcohol-infused gauze pads. The Inconel flipper tag (Model 681) would be applied to the thin fold of skin between the tail and the rear flipper. If a previously tagged turtle is missing any of its original tags, replacement tags would be applied.

Oral, Cloacal, and Nasal Swabbing

Oral swabs would be limited to those turtles exhibiting oral lesions. Oral swabs would be taken using a sterile culture swab inserted into the oral cavity. Nasal and cloacal swabs for aerobic and fungal culture samples would be taken from leatherbacks. Nasal swabbing would be conducted using a sterile culture swab and would be gently inserted 1-2cm into the nares. The swab would be gently extracted and enclosed in its protective holder for labeling and transport to the lab. Swabs from the cloaca would be collected by inserting sterile culture swabs approximately 5-10cm into the cloaca (Miller 2006).

Tissue, Blood, and Fecal Sampling

Two skin samples (4-6mm) would be collected from each leatherback – one for stable isotope analysis (long-term diet) and one for genetic identity. One sample would be taken from the posterior margin of the rear flippers. The sampling sites would be disinfected before sampling and sites would receive 1mL of 2% lidocaine for local anesthesia. Samples would be taken with sterile, disposable 6 mm biopsy punches and each sample would be preserved in a pre-labeled vial. Biopsy punches would be disposed of between turtles in a sharps container (one punch per turtle). Blood samples would be taken from the dorsal cervical sinus as described in Lutcavage et al. (1992) or venapuncture via the saphenous venous complex of all turtles immediately after they are safely situated on deck. Two blood samples would be taken, one to be obtained immediately upon securing the turtle after capture and another right before release. The skin at the blood sampling site would be scrubbed for a minimum of 30 seconds with Betadine prior to sampling. The blood sample would be taken using a 18-21 gauge 1.5-3" vacutainer needle and a 7-ml heparinized vacutainer tube, processed and frozen. Blood samples would be used for health analysis and sex determination. The applicant would take two blood samples for comparison, as it is possible for blood parameters to change within minutes, and it is of interest to assess whether leatherbacks develop measurable changes in their physiological status while on board (M. Lutcavage, personal communication; Innis et al. 2010). Voided fecal samples would be opportunistically collected.

Medial Ridge Satellite Transmitter Attachment

The satellite transmitter would be attached to the turtle's carapace along the leading edge near the nuchal bone. This method is already authorized for use under the applicant's current permit (File No. 1557-03). The attachment site would be sterilized with Betadine and desensitized with a topical anesthetic (ethyl chloride, a topical freeze spray). A moist cloth would be placed over the leatherback's eyes to eliminate visual stimuli. Two to three small diameter (4.5mm) holes would then be drilled using an orthopedic drill bit into the medial ridge toward the front of the carapace. Monofilament line (300 lb test) or plastic-coated flexible braided steel (1.8 mm diameter) would be inserted into the drill tracts cushioned with surgical tubing. One end of this line would have a loop (secured with a corrodible stainless steel crimp) prior to insertion and a

loop would be crimped to the other end after insertion. A tag base would be formed over the ridge using a cold-curing, non-adhesive silicone putty base. The putty would not compress at depth and would conform perfectly to the shape of the ridge. The tag would be placed on the putty base and the line tightened over the tag – the loops would be secured with cable ties on top of the tag. The corrodible crimps used to secure the tag to the ridge would provide a weak link for eventual tag shedding after approximately one year. The entire procedure for attachment would take 10-15 minutes to complete, and the leatherbacks released within 30-45 minutes of capture. Photos would be taken of the mounted transmitter to document position on the medial ridge and included in each turtle's medical record to evaluate wound healing at the attachment site should recapture occur.

Medial ridge attachments would only be performed by properly trained individuals on healthy turtles based on observations of behavior and movement. Healthy turtles are defined as those animals that are able to actively swim and dive, show evidence of recent foraging activity (i.e., bits of jellies in or around mouth), demonstrate symmetrical use of the head and limbs, are mentally alert, in good nutritional condition, and have no evidence of recent debilitating traumatic injury or epibiont loads that compromised normal movement.

Suction Cup Attachment of Daily Diary Tags

Researchers also request permission to use a suction cup attachment for daily diary tags (DDTs) (120x20x35mm; mass 90g) or a time depth recording (TDR) tag (MK-9 Wildlife Computers, 67x17x17mm; mass 30g). Use of the DDTs will be prioritized over the TDR tags, and TDR tags would only be used in the event that a DDT is unavailable. Both tags are a non-invasive tagging method and would be employed for short term attachments on leatherbacks in their foraging grounds. The DDTs record very high resolution data on the orientation of the turtle. The tags have the capacity to record depth, speed, temperature, mouth opening behavior and compass heading. The sampling frequency is sufficiently high that individual flipper beats can be determined during dives. Suction cups would allow researchers to attach DDTs and TDR tags without drilling holes into the turtle (non-invasive), and without direct capture (pole deployment on turtle at surface), and require them to retrieve the tag later after it comes off. DDTs would allow researchers to examine leatherback behavior on a much finer scale and in three planes, which is not possible with satellite tags. Highly detailed spatial information will help researchers to understand regional movement and behavior, particularly in regards to how leatherbacks become entangled in fixed fishing gear.

Tags, housed in positively buoyant material, would have a remote release mechanism similar to the D-tag that was developed for use on cetaceans (Johnson and Tyack 2003). Leatherbacks at the surface would either be approached using the same methods already approved for hoopnet capture and the tag deployed from the vessel with a pole applicator, or the tag would be attached to a recently disentangled leatherback. Tags would include a VHF and sonic transmitter for tracking and relocation. Based on other studies employing suction cup attachment with leatherbacks (Harvey et al. 2006) and cetaceans, researchers do not expect the tag to stay on for more than 6-12 hours.

Mitigation Measures

In addition to the applicant's stated methods and measures, the proposed permit would include language that would minimize impacts to the target animals and prevent impacts to non-target species found in the area. These include:

- Aerial flights would not be conducted over marine mammal haul out areas or seabird nesting/roosting sites, and researchers would conduct research so as to avoid harassment of any marine mammal or other target or non-target species.
- During captures, the area would be scanned for marine mammals prior to setting the hoop net to eliminate the risk of unintended entanglement.
- Sampling and tagging sites would be cleaned beforehand.
- Equipment would be cleaned and disinfected or sterile disposable gear would be used.
- A trained veterinarian or dedicated veterinary trained observer would be on board during each capture effort.
- The condition and health of captured animals would be monitored during procedures.

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

Economic and social factors are listed in the definition of effects in the NEPA regulations. However, the definition of human environment states that "economic and social effects are not intended by themselves to require preparation of an EIS." An EA must include a discussion of a proposed action's economic and social effects when these effects are related to effects on the natural or physical environment.

The socioeconomic environment in the action area includes human activities such as industrial, commercial and recreational fishing, and boating. The research would not be expected to impact, inhibit, or prevent other human activities from occurring. More likely, researchers would have to adjust or modify their plans around such activities. No economic losses to other human activities would be expected as a result of the research. The research could result in some minor economic benefits to industries that support the research. The socioeconomic environment would not be significantly impacted and is not considered further in this analysis.

3.2 PHYSICAL ENVIRONMENT

None of the activities in the Proposed Action are directed at or likely to have any impact on any designated EFH or designated critical habitat. Thus, the effects of the actions on the physical environment will not be discussed further in this EA.

3.2.1 Sanctuaries, Parks, Historic Sites, etc.

The proposed action could take place in Stellwagen Bank National Marine Sanctuary. However, the activities would take place in the water column and would not be expected to adversely affect the sanctuary. In an email dated May 18, 2011, Vicki Wedell, the National Permit, Consultations and NEPA Coordinator for the NOAA National Marine Sanctuaries Program stated that there were no issues with the proposed research. Therefore, this protected area is not considered further in this EA.

3.2.2 Essential Fish Habitat

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 at http://www.nero.noaa.gov/hcd/list.htm. 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. None of the activities in the Proposed Action are directed at or likely to have any impact on any designated EFH. Researchers would use live, healthy turtles captured using a hoop net. The researchers would only be affecting the sea turtle and would not affect any EFH. Therefore the proposed action would not result in damage to EFH.

3.2.3 Designated Critical Habitat

The research could take place in right whale (*Balaena glacialis*) critical habitat (e.g., Cape Cod Bay). However, the researchers would only capture sea turtles using a hoop net in the water column. None of the research activities would affect the constituent elements of the habitat (which is an important foraging area). The research activities would not affect the whale's prey species or the quality of the water. Researchers would not interact with the whales or negatively affect its critical habitat in any way. Therefore, this habitat is not considered further in this EA.

3.3 BIOLOGICAL ENVIRONMENT

In addition to the species that are the subject of the permit (target species), a wide variety of non-target species could be found within the action area, including other marine mammals, sea turtles, invertebrates, teleost and elasmobranch fish, and sea birds. Since merely being present within the action area does not necessarily mean a marine organism will be affected by the proposed action, the following discussion focuses not only the distribution and abundance of various species with respect to the timing of the action, but also on whether and by what means the proposed research activities may affect the non-target species.

3.3.1 ESA Target Species Under NMFS Jurisdiction

Leatherback sea turtle

Leatherbacks utilize both coastal and pelagic waters. In the western Atlantic, adults routinely migrate between boreal, temperate and tropical waters, presumably to optimize both foraging and nesting opportunities (Bleakney 1965; Lazell 1980). Leatherbacks are deep divers, with recorded dives to depths in excess of 1000 m (Eckert et al. 1989), but they may come into shallow waters if there is an abundance of jellyfish near shore. Time depth recorder data recorded by Eckert et al. (1989) indicate that leatherbacks are night feeders.

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. The most significant nesting beaches in the Atlantic, and perhaps in the world, are in French Guiana and Suriname (NMFS SEFSC 2001). Leatherbacks are predominantly pelagic, however they can be found in near shore waters.

The TEWG (2007) estimated the adult leatherback sea turtle population of the North Atlantic to be approximately 34,000-94,000 animals. The range of the estimate is large, reflecting the Working Group's uncertainty in nest numbers and their extrapolation to adults. The Working Group believes that as estimates improve the range would likely decrease. However, this is the most current estimate available. It is important to note that while the analysis provides an estimate of adult abundance for all populations in the greater North Atlantic, it does not provide estimates for the number or origin of leatherbacks in specific foraging areas, nor does it provide an estimate of subadult abundance. Trends in the adult population size estimate were not possible since trends in sex ratio and remigration rates were not available (TEWG 2007).

The leatherback was listed as endangered on June 2, 1970. Critical habitat for the leatherback includes the waters adjacent to Sandy Point, St. Croix, USVI, 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.

3.3.2 Other ESA listed species potentially affected by the proposed action

The proposed action would not affect any species other than leatherback sea turtles. While northern right whales (*Eubalaena glacialis*) could occur in the research area researchers would not interact with them. In accordance with 50 CFR 224.103(c)(1), the Permit Holder would not get within 500 yards of a right whale. If a right whale is sighted within 500 yards of the vessel, immediate avoidance measures would be taken. Therefore this species is not considered further in the EA.

Researchers would use hoop nets to capture the leatherback sea turtles and would avoid capture of any other species. Therefore the proposed action would not result in bycatch.

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 researchers from gathering information that could help endangered leatherback sea turtles.

More specifically, the No Action alternative would prohibit researchers from collecting valuable information on leatherback sea turtles in the action area. Without good information on the natal origin, habitat use, and movement of leatherback sea turtles, management decisions may be too conservative or not sufficiently conservative to ensure a species to recover. Dr. Lutcavage's proposed research would determine the movements, behaviors, habitat-use, and natal origin of leatherback sea turtles in New England waters. The information the permit would yield is especially important to wildlife managers and agencies responsible for making decisions concerning recovery and conservation of leatherback sea turtles, and designating critical habitat for this species.

4.2 EFFECTS OF ALTERNATIVE 2: Issue permit with standard conditions

Impacts of the proposed action would be limited primarily to the biological environment, specifically the animals that would be studied or affected by the research. The type of actions proposed in the permit request would minimally affect the physical environment and would be unlikely to affect the socioeconomic environment or pose a risk to public health and safety.

4.2.1 Effects on the Biological Environment – Leatherback Sea Turtles

This section analyzes the potential impacts of each proposed research activity to leatherback sea turtles. Many of the activities are non-invasive and would result in no more than temporary disturbance of target animals. None of the proposed activities are expected to result in serious injury, mortality or reduced fecundity of target animals. Moreover, the permit would contain conditions to mitigate and minimize adverse impacts to turtles during authorized activities. Animals are expected to recover from the proposed activities within a day. In addition the applicant would be required to follow procedures designed to minimize the risk of either introducing a new pathogen into a population or amplifying the rate of transmission from animal to animal of an endemic pathogen when handling and sampling animals. In addition, all of the proposed activities were considered in the 2006 EA prepared for the issuance of Permit 1557 and the 2007 SEA prepared for issuance of Permit No. 1557-03 for the target species. Species and lifestages for the Proposed Action would remain the same as previously authorized. The action area and sampling season would be reduced from what was previously authorized. The annual number of animals that would be taken under the new permit would be slightly increased (from 20 to 25) from the annual number of sea turtles previously authorized under No. 1557-03.

Effects of Hoopnet Capture/Spotter Pilot Network and Handling

The harassment of turtles during capture and subsequent handling can result in raised levels of stress hormones and can cause some discomfort. Based on past observations of similar research, these effects are expected to dissipate within a day (Stabenau and Vietti 1999). NMFS would not anticipate any mortality or long-term adverse effect to the turtles due to the capture and activities to bring captured turtles aboard the research vessel. Since aerial surveys would be flown at altitude unlikely to disturbance to sea turtles or other species NMFS expects this activity to have no to minimal effects on animals. Some animals may exhibit diving avoidance behavior, however if this occurs it would be not be expected to have any appreciable effect on the animal and would not result in injury.

Leatherback sea turtles obtained through the disentanglement network would only be selected for research activities after assessment by a veterinarian. Evidence exists to show that the subsequent use of disentangled turtles for research has no apparent adverse effects, with disentangled sea turtles returning to typical migrations and behavior after release (López-Mendilaharsu et al. 2009, Innis et al. 2010); although in the past, there was one instance of a very short duration of satellite tag transmission, which could indicate a mortality, or tag failure (Innis et al. 2010). The decision to use a disentangled sea turtle would be left to the discretion of the attending veterinarian, who, in the assessment, would use criteria like the NOAA Sea Turtle Injury Assessment Standards (Upite 2011).

Effects of Examining, Measuring, Weighing, Photographing and Videoing

Examining, measuring, weighing, photographing, and videoing can result in raised levels of stress hormones in sea turtles. However, the procedures are simple and not invasive and NMFS expects that individual turtles would normally experience no more than short-term stresses as a result of these activities. No injury would be expected from these activities, and turtles would be worked up as quickly as possible to minimize stresses resulting from their capture; the applicant has used the same techniques under the previous permit (File No. 1557) with no apparent adverse effects. The applicant would also be required to follow procedures designed to minimize the risk of either introducing a new pathogen into a population or amplifying the rate of transmission from animal to animal of an endemic pathogen when handling animals.

Effects of PIT and Flipper Tagging

Tagging activities are minimally invasive and all tag types have negatives associated with them, especially concerning tag retention. Plastic tags can become brittle, break and fall off underwater, and titanium tags can bend during implantation and thus not close properly, leading to tag loss. Tag malfunction can result from rusted or clogged applicators or applicators that are worn from heavy use (Balazs 1999). Turtles that have lost external tags would be re-tagged if captured again at a later date, which subjects them to additional effects of tagging. PIT tags have the advantage of being encased in glass, which makes them inert, and are positioned inside the turtle where loss or damage due to abrasion, breakage, corrosion or age over time is virtually non-existent (Balazs 1999). Turtles would experience some discomfort during the tagging procedures and these procedures would produce some level of pain. The discomfort would usually be short and highly variable between individuals (Balazs 1999). Most barely seem to notice, while a few others exhibit a marked response. However, NMFS expects the stresses to be minimal and short-term and that the small wound-site resulting from a tag would heal completely

in a short period of time. Similarly, turtles that must be re-tagged would also experience minimal short-term stress and heal completely in a short period of time. Re-tagging would not be expected to appreciably affect these turtles. The proposed tagging methods have been regularly employed in sea turtle research with little lasting impact on the individuals tagged and handled (Balazs 1999).

Effects of Oral, Cloacal and Nasal Swabbing
Oral, cloacal and nasal swabbing is minimally invasive. NMFS expects that the animal would experience discomfort but that the stress from these procedures would be insignificant and short-term. No injury would be expected to occur from these procedures.

Given the precautions that would be taken by the researchers to ensure the safety of the turtles and the permit conditions relating to handling, NMFS expects that the activities would have minimal and insignificant effects on the animals. All animals would be handled with care, kept moist, protected from temperature extremes during sampling, and later returned to the sea.

Effects of Blood Sampling
NMFS expects that individual turtles would experience no more than short-term stresses during blood sampling. Taking a blood sample from the sinuses in the dorsal side of the neck is now a routine procedure (Owens 1999). According to Owens (1999), with practice it is possible to obtain a blood sample 95% of the time and the sample collection time would be expected to be about 30 seconds in duration. Sample collection sites would be disinfected with alcohol or other antiseptic prior to sampling.

Effects of Skin Sampling
NMFS expects that individual turtles would experience no more than short-term stresses during a tissue biopsy. NMFS expects that the collection of a tissue sample would not cause any additional significant stress or discomfort to the turtle beyond what was experienced during the other research activities. Sterile techniques would help prevent infection from pathogens. All tissue biopsy samples would be collected, handled, stored, and shipped in such a manner as to ensure human safety from injury or zoonotic disease transmission as well as provide for the protection of the sea turtles that are sampled.

Effects of Medial Ridge Attachment of Satellite Tags
Medial ridge attachment of satellite tags in leatherbacks is a relatively new technique developed by researchers after concerns were raised about the effects of the use of traditional harness attachment impeding leatherback mobility (Fossette et al. 2007) and the effects of prolonged harness attachment (Troëng et al. 2006).

Significant adverse effects are not anticipated from the medial ridge attachment technique. Use of sterilized techniques described above will minimize risk of infection, seroma, or hematoma formation. The SWFSC's co-investigator Scott Benson performed this procedure on two leatherbacks at nesting beaches in Mexico in February 2010 and did not observe bleeding associated with the drill tracts (File No. 1596-03). In addition, Casey and Southwood (2008) observed that turtles tagged with this method did not visibly react to the procedure and the tag site on the carapace looked healthy post-tagging.

In evaluating this technique for the applicant's previous permit (No. 1557-03), a suite of veterinarians and sea turtle experts reviewed the attachment method and provided the following input. Dr. George (veterinarian) suggested that the medial ridge location is a good location for attachment. He has often drilled small holes in the medial ridge to attach EKG wires running along the carapace to a transmitter on the peduncle, and stated that it provides enough dense tissue for an anchor and is far removed from any vital structures. He suggested that the best feature of the ridge is its superficial nature, stating that even in a worst case scenario, infection around the device with the device pulling out, the area affected would be minimal and superficial. He added that such a lesion would be easily dealt with by the turtle's immune system and should heal without problem. He was able to monitor turtles with the wires attached to the medial ridge and the equipment was removed after ten days when the turtles re-nested. There was no problem noted in the short term and when several of these turtles returned to nest two years later no problems were detected by the biologists who observed them. He stated that all things considered he has very positive feelings about this attachment system and feels the benefits from easily deployment, minimal invasiveness, and its attachment in a location that would cause minimal problems for the animal in the event of a system failure would make it worth using. Dr. Rhodin (orthopedic surgeon) suggested that the risk for carapacial infection or osteomyelitis (bone infection) is extremely low even in the case of hardware failure and breakout due in large part to the leatherback's inherent natural ability to heal from major natural injuries encountered in the environment. He suggested that the overall risks of the deployments are less than the risks animals (e.g., females) face from courting males, fishing gear, and other natural or human-induced trauma. Dr. Wyneken (sea turtle physiologist) stated that assuming they are careful to use aseptic techniques, she sees no reason to think this method would create greater problems than existing alternative techniques and it is likely to increase the data collected if the tags will stay on longer [than other tag units authorized for Permit No. 1557].

The size, shape, and footprint of the attachment would be substantially smaller than the previously authorized harness method thereby resulting in reduced hydrodynamic effects to the tagged animal. Little data exists on the impacts of satellite tagging on leatherback sea turtles; however, the size and design of the proposed method is similar to that of direct tag attachments using epoxy or resin for hardshell sea turtles. Hence, NMFS would expect any hydrodynamic impacts from the proposed medial ridge attachment to be comparable to those identified for epoxy or resin attached tags to hardshell sea turtles. Impacts of epoxy or resin attached tags were analyzed in the 2007 EA (NMFS 2007b) prepared for issuance of Permit No. 1591 and determined that the tagging would not result in significant impacts to the environment. Further, a recent preliminary study by Fosette et al. (2008) indicates that hydrodynamic effects of the proposed medial ridge attachment would be significantly lower than the previously authorized harness method for leatherback sea turtles. After monitoring tagged leatherbacks over a 3-month period, Fosette et al. (2008) found that harness-equipped turtles travelled 16 percent slower and had 12 percent shorter dives than turtles with direct carapace tag attachments. Laboratory tests also are currently underway to measure the hydrodynamic drag created by the harness attachment; however, results of this project are not available at this time. Based on the available information, NMFS therefore expects that hydrodynamic effects of the medial ridge attachment would be greatly reduced compared to the harness method.

Casey and Southwood (2008) tagged female leatherbacks under Permit No. 1557 in this manner while ovipositing during the nesting season on St. Croix; noted that 12 of 19 females returned to the beach to nest again indicating that nesting was not impacted by the tag attachment. All 12 animals behaved normally and the wound site did not have signs of infection, chaffing, or necrosis. Two of the 12 tags had shed prior to the animal's return to the beach. Of the seven females that did not return to nest, four turtles begin a post-nesting migration with the tag attached, some of which are thought to have nested elsewhere based on movements. Tags transmitted for at least one to two months each. The remaining three tags are believed to have been shed early based on the two observed animals that returned to the St. Croix nesting beach without tags. The applicant reported for Permit No. 1557 (in 2009 and 2010) tagging 12 and 3 turtles, respectively, noting a similar ease of tagging and behavior of animals. Transmissions from all tags ranged between 150 – 300 days and demonstrated that animals continued to migrate across the North Atlantic, possibly to nesting beaches. Based on these reports, the proposed tagging method would not be expected to reduce the numbers, distribution, or reproduction of sea turtles in the wild or reduce the likelihood of survival and recovery of these species.

In terms of acoustics of the proposed tagging method, the sonic tag frequency (34-75 kHz) would be above the hearing range of the turtles (under 1 kHz) (Lenhardt 2003) and any of their predators (approximately under 1 kHz) (Kritzler and Wood 1961; Banner 1967; Casper et al. 2003) and therefore would not affect the tagged sea turtle or attract predators. In summary, based on leatherback biology, direct observations, impacts of similar tagging methods, expert opinions and the available literature, NMFS does not expect the medial ridge attachment technique to result in significant impacts to tagged leatherback sea turtles, the population or species.

This technique (as was the rest of the research) was reviewed and approved by the permit holder's Institutional Animal Care and Use Committee (IACUC), and it was authorized previously by NMFS, resulting in a finding of no significant impact (File No. 1557-03). NMFS PR has recently issued a similar permit allowing scientists at the Southwest Fisheries Science Center to use the medial ridge attachment on leatherbacks (File No. 1596-03); the analysis of this action resulted in a finding of no significant impact (NMFS 2011a). The section 7 consultation conducted for the proposed action and resulting biological opinion concluded that the effects of the proposed research activities have the potential to elicit short-term changes in sea turtle behavior, but are not likely to result in long-term effects on individuals or populations of leatherbacks (NMFS 2011b). This research would affect leatherbacks by harassing individual turtles during the research thus raising levels of stressor hormones, and the turtle may experience some discomfort during research activity procedures. Based on past observations of similar research authorized by NMFS, these effects are expected to dissipate with minimal impact. NMFS does not expect any delayed mortality of turtles following their release based on past research efforts by other researchers and adherence to certain protocols that are included in the current permit.

Summary of Effects

The short-term stresses resulting from the research activities discussed above are expected to be minimal. Animals would be released within hours of capture and should recover from the

procedures within the same day. The permit would contain conditions to mitigate adverse impacts to turtles from these activities. Turtles would be worked up as quickly as possible to minimize stress resulting from the research and the permit holder also would be required to follow procedures designed to minimize the risk of either introducing a new pathogen into a population or amplifying the rate of transmission from animal to animal of an endemic pathogen when handling animals. The applicant would be required to exercise care when handling and sampling animals to minimize any possible injury. During release, turtles would be lowered as close to the water's surface as possible, to prevent potential injuries. Overall, the individual and combined impacts of the proposed research activities are not expected to have more than short-term effects on individual sea turtles.

The Proposed Action is not expected to cause serious injury or mortality of any animals. Thus the research would not result in a permanent decrease in a sea turtle species' or populations' reproductive success, lead to a long-term reduction in prey availability, the survival of young turtles, or the number of young turtles that annually recruit into the breeding populations of any of the sea turtle species. Given this analysis of impacts to sea turtles, NMFS does not expect the proposed action to result in significant impacts to the target sea turtles, their populations or species. As determined in the associated biological opinion, Permit No. 15672, as proposed, would not likely jeopardize the continued existence of the species and would not likely destroy or adversely modify designated critical habitat (NMFS 2011c). In addition, NMFS does not expect the proposed action to significantly impact any non-target species or other portions of the human environment.

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. The applicant has secured or applied for necessary permits from the Sanctuary, and has IACUC approval from their research institution for their research protocols.

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 and draft EA 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 EA represented NMFS' assessment of the potential biological impacts.

4.4 COMPARISON OF ALTERNATIVES

Although the No Action alternative would have no environmental effects, the opportunity would be lost to collect information that would contribute to better understanding leatherback sea turtles and provide information to NMFS that is needed to implement NMFS management activities. This is important information that would help conserve and manage sea turtles as required by the ESA and NMFS's implementing regulations. The Proposed Action would affect the environment, primarily individual leatherback sea turtles. However, the effects would be

minimal and the preferred alternative would allow the collection of valuable information that could aid NMFS' efforts to recover leatherback sea turtles. Neither the No Action nor the Proposed Action is anticipated to have adverse population or stock-level effects on leatherback sea turtles or other non-target species. Given the Proposed Action's minimal impact to the environment and the potential positive benefits of the research, it is the most desirable action to pursue.

4.5 MITIGATION MEASURES

The activities authorized under proposed Permit No. 15672, if approved, would follow certain procedures in order to minimize and mitigate effects of the proposed action. The permit would require specific conditions to ensure compliance with appropriate research protocols. These include conditions that will minimize the potential for injury and stress during procedures.

4.6 UNAVOIDABLE ADVERSE EFFECTS

The research activities would cause disturbance and stress to captured leatherback sea turtles. However, the research is not expected to have more than a minimal, temporary effect on individuals, and no effect on populations. While individual leatherback sea turtles may experience short-term stress or discomfort in response to the activities of researchers, the impact to individual animals is not expected to be significant. The minimization measures imposed by permit conditions are intended to reduce, to the maximum extent practical, the potential for adverse effects of the research on all species.

4.7 CUMULATIVE EFFECTS

Cumulative effects are defined 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.

4.7.1 Other research permits and authorizations

Sea turtles have been the focus of field studies for decades. The primary purpose of most studies is to monitor populations and gather data on behavior and ecology. Over time, NMFS has issued dozens of permits for takes of sea turtles in or near the proposed action area for a variety of activities, examples of which include vessel surveys, photo-identification, capture, handling, biopsy sampling, lavage, laparoscopy, and tagging. The number of permits and associated takes indicate that a portion of the populations of turtle species in the proposed action area have been subject to varying levels of stress due to research activities. This research is due to interest in developing appropriate management and conservation measures to recover and conserve these species.

Research on sea turtles in the United States is carefully controlled and managed so that it does not operate to the disadvantage of the species. In addition to permits issued by NMFS for the scientific research of sea turtles in the marine environment, similar ESA Section 10 federal permits are issued by the USFWS for the taking of endangered and threatened sea turtles on land for activities and efforts that aid the conservation and recovery of these species.

As summarized in Appendix 2, five active NMFS research permits allow research on the target species in areas that could overlap with the proposed action area. One of these permits, No. 1557-03, is held by the applicant and would expire upon issuance of the proposed action. It is a standard condition of NMFS research permits that researchers coordinate their activities with those of other permit holders to avoid unnecessary disturbance of animals. Further, to mitigate the risk of negative cumulative effects to turtles, researchers would be required to scan turtles for existing PIT tags before applying new tags; turtles that have existing PIT and flipper tags would not be re-tagged. Permitted researchers also are required to notify the appropriate NMFS Regional Office at least two weeks in advance of any planned field work so that the Regional Office can facilitate the coordination of research permits and other human activities in the area and take steps appropriate to minimize disturbance from multiple activities.

Under the proposed permit, animals in the action area would be disturbed by research year round for up to 5 years. Whether this frequency of disturbance, by itself or in combination with disturbance from other permitted research, would result in cumulative adverse effects depends on how long the effects of each disturbance last, whether the animals have sufficient time between disturbance events to resume or compensate for disrupted activities, and whether the effects of repeated disturbance are additive, synergistic or accumulate in some other way. Other research permits authorize take of the target species beyond the action area, for instance in the Gulf of Mexico or other Florida waters; however, impacts from other researchers would dissipate before turtles could be encountered or captured by Dr. Lutcavage. Further, as previously discussed, NMFS limits repeated harassment of individual turtles and avoids unnecessary duplication of research efforts by requiring coordination among permit holders. All scientific research permits also are conditioned with mitigation measures to ensure that the research impacts target and non-target species as minimally as possible. Further, the effects of many individual research activities (e.g., a survey, a field trip to capture animals) are short-term, dissipating within hours to days following the research event, impacting individual animals. These activities are not likely to result in the serious injury, mortality or reduced fecundity of target animals. Given this low degree of adverse impacts and the mechanisms in place to limit repeated disturbance of individual animals, NMFS does not expect the combination of research activities in the action area to significantly impact sea turtles at the population or species level.

4.7.2 Other activities

Historically, one of the major contributors to declines in sea turtle populations was the commercial harvest of eggs and turtles. Today, target sea turtles may be adversely affected by human activities including commercial and recreational fishing (as bycatch via entrapment and entanglement in fishing gear), habitat degradation, and tourism and recreation (via harassment from human approach and presence) within the action area. Of these, disturbance that results in displacement of animals or abandonment of behaviors such as feeding or breeding by groups of animals are more likely to have cumulative effects on the species than entanglement of animals in fishing gear. In addition, the target species benefit from other human activities operated by Federal, state, and or local agencies and organizations including management, conservation, and recovery efforts, nest monitoring, education and outreach, and stranding response programs.

4.7.3 Summary of cumulative effects

It is likely that issuance of the proposed permit may have some cumulative adverse effects on the target animals due to the frequency of the disturbances associated with research activities. These adverse effects would likely be additive to those resulting from disturbance under other permits, and to disturbances related to other human activities in the action area. Some animals may be acclimated to a certain level of human activity and may be able to tolerate disturbance associated with these activities with little adverse impacts on population or species vital rates. However, even animals acclimated to a certain level of disturbance may be adversely affected by additive effects that exceed their tolerance threshold. Based on the review of past, present and future actions that impact the target species, the incremental contribution of the short-lived impacts associated with the proposed action is not anticipated to result in significant cumulative impacts to the human environment.

Overall, the preferred alternative would not be expected to have more than short-term effects on endangered leatherback sea turtles. The impacts of the non-lethal research activities are not expected to have more than short-term effects on individual sea turtles and any increase in stress levels from the research would dissipate within approximately a day and injuries caused by tagging and sampling are expected to heal. Even if an animal is exposed to additional research effort (e.g., a week later), no significant cumulative effects of research would be expected given the nature of the effects. NMFS does not expect the authorization of the proposed research activities of the preferred alternative to appreciably reduce the species' likelihood of survival and recovery in the wild because it would not likely adversely affect their birth rates, death rates, or recruitment rates. In particular, NMFS does not expect the proposed research activities to affect adult female turtles in a way that appreciably reduces the reproductive success of adults, the survival of young, or the number of young that annually recruit into the breeding populations of any of the target species.

The incremental impact of the action when added to other past, present, and reasonably foreseeable future actions discussed here would not be significant at a population level. The data generated by the tagging, measuring, and sampling activities associated with the proposed action would help determine the movement and habitat use of leatherback sea turtles found in the waters of the action area. The research would provide information that would help manage, conserve, and recover threatened and endangered species and would outweigh any adverse impacts that may occur.

CHAPTER 5 LIST OF PREPARERS AND AGENCIES CONSULTED

This EA was prepared by the National Marine Fisheries Service, Office of Protected Resources in Silver Spring, Maryland.

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APPENDICES

APPENDIX 1: Table 1: Maximum Annual Takes of Leatherback Sea Turtles (*Dermochelys coriacea*) under Permit No. 15672.

Total # of Turtles	Species	Life Stage	Take Activity	Details
10	Leatherback *D. coriacea*	Adult, sub-adult, and juvenile	Capture; handle; examine; measure; photograph/video; flipper tag; PIT tag; blood sample; fecal sample; tissue sample; instrument, drill carapace attachment satellite tag; cloacal swab; nasal swab; oral swab; track; and release; recapture**	Sea Turtle Disentanglement Network* or Via Hoop-net Capture Field Season: June – October
15	Leatherback *D. coriacea*	Adult, sub-adult, and juvenile	Approach (by boat); photograph/video; suction cup attachment archival daily diary tag- (includes VHF tag-sonic tag to retrieve it); track; re-approach***	Harass

* Capture by hoop-net only, no gear entangled turtles would be used.
** Recapture of originally captured animals to address health issues related to attachment (e.g., including but not limited to removing attachment, debriding and cleaning the wound). Only authorized if needed to examine attachment and treat turtle for complications due to transmitter attachment.
***Re-approach of leatherbacks would only occur if the mechanism to release the tag malfunctions. In this case, the researchers would approach the turtle and gently prod the tag off the carapace with the same pole applicator used to apply the tag.

APPENDIX 2: Permits Authorizing Directed Takes for the Target Sea Turtle Species in the Action Area

Existing Permits Authorizing Takes for the Target Sea Turtle Species In the Action Area. (The proposed permit would replace the action in **bold**.)

Permit Number	Permit Holder	Expiration Date
15112	NMFS NEFSC	January 1, 2016
1576	NMFS NEFSC	October 31, 2011
10014	NJ DEP	December 31, 2012
1557-03	**Molly Lutcavage**	**June 30, 2011**
1527-01	VIMS	April 1, 2012

Authorized Mortality

Permit No. 1576 authorizes the lethal take of up to 23 loggerhead, 1 green, 1 leatherback, and 1 Kemp's ridley sea turtles annually, and up to 1 loggerhead and 1 Kemp's ridley over the course of the permit, through 2011. Deaths are authorized as part of gear testing in the Northeast Atlantic.