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. 16146

Background

In April 2011, the National Marine Fisheries Service (NMFS) received an application for a permit (File No. 16146) from Kristen Hart, Ph.D. to conduct research on sea turtles in the U.S. Virgin Islands. In accordance with the National Environmental Policy Act, NMFS has prepared an Environmental Assessment (EA) analyzing the impacts on the human environment associated with permit issuance [EA Issuance of a Permit for Sea Turtle Research in the U.S. Virgin Islands (File No. 16146)]. In addition, a Biological Opinion was issued under the Endangered Species Act (ESA) (December 2011) 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 (NAO; 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?

Response: The action is not expected to damage the ocean/coastal habitat or EFH. The study sites consist of seagrass and coral reef interspersed with sandy bottom. Nets would not be placed in seagrass or coral habitat; only sandy areas would be targeted for net deployment. They would also not be set in areas with strong current to prevent the net from being entangled in such sensitive habitats. Further, the permit would contain conditions prohibiting setting gear on seagrass, live, or hard bottom habitat. Therefore, the action is not expected to substantially damage any physical habitat, including EFH.

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

Response: The proposed action is not expected to have a substantial impact on biodiversity and/or ecosystem function. The sea turtles would be released alive, benthic productivity would not be affected, and no sediment would be disrupted as a result of the

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proposed activities. Any non-target species captured during netting would be released alive.

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

Response: The proposed action requires the researchers to store and transport biological samples. Researchers would handle and transport samples following safety protocols to ensure there is no impact to public health or safety.

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

Response: Critical habitat has been designated for elkhorn and staghorn coral in the action area; however, the proposed action will not adversely affect these areas. See Response #1 for more information. Based on informal consultation with the U.S. Fish and Wildlife Service, endangered Florida manatees are not likely to be adversely affected given that conditions would be included in the permit to prevent interactions. Other marine mammals are also not expected to be affected as the permit would contain conditions to prevent entanglements in nets.

The proposed action would affect the target endangered and threatened sea turtle species: loggerhead, green and hawksbill sea turtles. However, the effects of the proposed action on individuals would not be severe and would be short-term in nature. No injuries or mortality to listed species are expected and individual animals would be released after they are sampled or handled. The Biological Opinion prepared for this action determined that the action is not likely to jeopardize the continued existence of any listed species and is not likely to destroy or adversely modify designated critical habitat. The research could affect other non-target species (sharks and rays), but all efforts would be made to release animals alive as a requirement of the permit. Therefore non-target species are not expected to be appreciably affected by this research. Further, the permit would contain conditions to minimize the potential effects and stress to target and non-target species resulting from the capture.

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

Response: There would be no significant social or economic impacts as a result of the proposed action. The action area is managed by the National Park Service and research would not impact use of the monument by others.

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

Response: The action is not likely to be controversial. The application was made available for public comment and no substantive comments were received. The research

methods are commonly used and NMFS is not aware of any controversy surrounding the permit application.

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

Response: See responses to Question #1 and #5. The action area is located within the Buck Island Reef National Monument. No other unique or protected areas are found in the action area. The applicant would ensure that the nets would not drag along the bottom and are continuously monitored to minimize impacts to the target species, incidental species and the environment. Given the precautionary approach researchers would take, and the conditions that would be included in the permit, NMFS does not expect the research would adversely impact the action area.

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

Response: The research activities of the proposed permit are not new. Researchers have previously conducted the same type of research with no significant impacts to the environment. The effects on the human environment are not highly uncertain and the risks would be minimal and known.

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

Response: The proposed action is not related to other actions with individually insignificant, but cumulatively significant impacts. No other NMFS permitted researchers are working specifically at Buck Island. If the proposed permit is issued, it is not expected that the additional effects of this research would result in cumulatively significant impacts to the target species or other portions of the environment. The short-term stresses (separately and cumulatively when added to other stresses the species face in the environment) resulting from the proposed activities are expected to be minimal. Animals would be exposed to low level harassment and no serious injury or mortality is expected. Further, the permit would contain conditions to mitigate adverse impacts to species from these activities.

Overall, the proposed action is expected to have no more than short-term effects on endangered and threatened sea turtles and minimal to no effects on other aspects of the environment. The incremental impact of the action when added to other past, present, and reasonably foreseeable future actions discussed in the EA would be minimal and not significant.

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

Response: The proposed research would not take place in areas listed in the National Register of Historic Places. As stated above for Question 7, though work would occur within the Monument, based on permit conditions and the design of the proposed fieldwork, the research would not adversely affect its 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?

Response: The proposed research is not expected to result in the spread of non-indigenous species. Researchers would not be transiting between water bodies. All work would be conducted within the bounds of the Monument.

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

Response: The decision to issue the permit would not be precedent setting and would not affect any future decisions. Issuing a permit to a specific individual or organization for a given activity does not in any way guarantee or imply that NMFS would authorize other individuals or organizations to conduct the same or similar activity, nor does it involve irreversible or irretrievable commitment of resources.

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

Response: The action would not result in any violation of Federal, State, or local laws for environmental protection. In addition, the permit would not relieve the Permit Holder of the responsibility to obtain any other permits, or comply with any other Federal, State, local, or international laws or regulations necessary to carry out the action.

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

Response: The action is not expected to result in cumulative adverse effects to any species. The proposed action is expected to have minimal effects on the target species' populations. No substantial adverse effects on non-target species are expected. No cumulative adverse effects that could have a substantial effect on any species 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. 16146, 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.

for James H. Lecky
Director, Office of Protected Resources

12/15/11
Date

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

Environmental Assessment
Issuance of a Permit for Sea Turtle Research in the U.S. Virgin Islands [File No. 16146]

December 2011

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

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Location: U.S. Virgin Islands; Buck Island Reef National Monument

Abstract: The National Marine Fisheries Service (NMFS) proposes to issue scientific research permit No. 16146 to Kristen Hart. The purpose of this research is to quantify real-time habitat-use of sea turtles within and around the Buck Island Reef National Monument. The research would also provide information on genetic stock structure, vital rates, and local population abundance. All turtles would be subject to capture and removal of epibiota; photographed, measured and weighed; blood, biopsy, and fecal sampled; flipper and passive integrated transponder tagged; lavaged; and released. A subset of animals would have satellite transmitters, VHF transmitters, and/or accelerometers attached. 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 EA to facilitate a more thorough assessment of potential impacts on endangered and threatened sea turtles. This EA evaluates the potential impacts to the human environment from issuance of the proposed permit.

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CONTENTS

CHAPTER 1 PURPOSE OF AND NEED FOR ACTION **3**

1.1 DESCRIPTION OF ACTION 3

1.1.1 Purpose and Need *3*

1.1.2 Research Objectives *3*

1.2 OTHER EA/EIS THAT INFLUENCE SCOPE OF THIS EA 3

1.3 SCOPING SUMMARY 3

1.4 APPLICABLE LAWS AND NECESSARY FEDERAL PERMITS, LICENSES, AND ENTITLEMENTS . 4

CHAPTER 2 ALTERNATIVES INCLUDING THE PROPOSED ACTION **4**

2.1 ALTERNATIVE 1 – NO ACTION 4

2.2 ALTERNATIVE 2 – PROPOSED ACTION (ISSUANCE OF PERMIT WITH STANDARD CONDITIONS) 4

CHAPTER 3 AFFECTED ENVIRONMENT **9**

3.1 SOCIAL AND ECONOMIC ENVIRONMENT 9

3.2 PHYSICAL ENVIRONMENT 9

3.3 BIOLOGICAL ENVIRONMENT 10

3.3.1 ESA Target Species *10*

3.3.2 Non-Target Species *12*

CHAPTER 4 ENVIRONMENTAL CONSEQUENCES **13**

4.1 EFFECTS OF ALTERNATIVE 1: NO ACTION 13

4.2 EFFECTS OF ALTERNATIVE 2: ISSUE PERMIT WITH STANDARD CONDITIONS 13

4.3 COMPARISON OF ALTERNATIVES 17

4.4 MITIGATION MEASURES 17

4.5 UNAVOIDABLE ADVERSE EFFECTS 18

4.6 CUMULATIVE EFFECTS 18

4.6.1 Research Permits *18*

4.6.2 Other Human Activities *18*

4.6.3 Summary of Cumulative Effects *19*

CHAPTER 5 LIST OF PREPARERS AND AGENCIES CONSULTED **19**

LITERATURE CITED **20**

APPENDIX A. MAP OF STUDY AREA. WORK WOULD BE CONCENTRATED WITHIN THE BOUNDARY IN WATER UP TO 20 M DEEP (I.E., LIGHTER BLUE COLORS) **22**

APPENDIX B. ANNUAL TAKES OF MALE AND FEMALE SEA TURTLES IN BUCK ISLAND REEF NATIONAL MONUMENT, USVI FOR PERMIT NO. 16146 ..... **23**

APPENDIX C. ACTIVE PERMITS IN OR NEAR THE ACTION AREA **24**

CHAPTER 1 PURPOSE OF AND NEED FOR ACTION

1.1 DESCRIPTION OF ACTION

NMFS proposes to issue a scientific research permit (File No. 16146) that authorizes "takes"[1] under 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 Kristen Hart, United States Geological Survey (USGS).

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". The need for issuance of the permit is related to NMFS' mandates under the ESA. NMFS has a responsibility to implement the ESA to protect, conserve, and recover threatened and endangered species under its jurisdiction. The ESA prohibits takes of threatened and endangered species, with only a few specific exceptions, including for scientific research and enhancement purposes. Permit issuance criteria require that research activities are consistent with the purposes and policies of the ESA and will not have a significant adverse impact on the species.

1.1.2 Research Objectives

The purposes of the research are to determine species-specific habitat-use patterns over time, increase understanding of genetic stock structure, and estimate vital rates and local population abundance.

1.2 OTHER EA/EIS THAT INFLUENCE SCOPE OF THIS EA

A variety of Environmental Assessments (EAs) have been completed in the past, analyzing the effects of similar research activities on the human environment. Each of these EAs have resulted in a Finding of No Significant Impact (FONSI).

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 covered by prior environmental review, and
- identify the concerns of the affected public and Federal agencies, states, and Indian tribes.

The Council on Environmental Quality's (CEQ) regulations implementing the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 et seq.) and NAO 216-6 do not require a public scoping process for an EA.

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1 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."

Comments on Application

The CEQ regulations implementing the NEPA and NAO 216-6 do not require that a draft EA be made available for public comment; however NOAA did publish a Notice of Receipt of the application in the *Federal Register*, announcing the availability of File No. 16146 for public comment. No substantive public comments were received.

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

As stated in Ch. 1.1, the applicant requires an ESA permit for scientific research of the target species. It is the applicant's responsibility to obtain any other required permits or authorizations necessary to conduct the proposed research, including authorization from the National Park Service (NPS). The applicant is working on renewing her NPS permit to conduct the proposed research.

CHAPTER 2 ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1 ALTERNATIVE 1 – NO ACTION

Under the No Action alternative, no permit would be issued and the applicant would not receive an exemption from the ESA prohibitions against take.

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

Under the Proposed Action, a permit would be issued to exempt the applicant from ESA take prohibitions during conduct of research that is consistent with the purposes and policies of the ESA and applicable permit issuance criteria.

The permit would be valid for five years and would contain terms and conditions standard to such permits as issued by NMFS.

Action area

Activities would occur in the Caribbean Sea surrounding the U.S. Virgin Islands within the boundary of Buck Island Reef National Monument in water up to 20 m deep (see Appendix A for map).

Proposed Activities

The purpose of the proposed research would be to study loggerhead (*Caretta caretta*), green (*Chelonia mydas*), and hawksbill (*Eretmochelys imbricata*) sea turtles in Buck Island Reef National Monument. The research would document habitat-use patterns over time, increase understanding of genetic stock structure, and estimate vital rates and local population abundance.

Design of the in-water work would involve preliminary, gridded surveys across all aquatic habitats less than 20 m deep within the Monument to log turtle sightings. The applicant would use this information to determine the location of areas with high densities of turtles where researchers would conduct consistent, standard in-water capture-recapture efforts. Sampling

trips would be 7 to 10 days long and would occur several months apart. Activities would occur as described in the application; methods are summarized here.

Turtles would be captured during the day by hand or dip net, rodeo, tangle net, or cast net. The applicant would capture up to 160 green turtles each year. All would be subject to count, measure, photograph, weighing, epibiota removal, temporary carapace marking, flipper and passive integrated transponder (PIT) tagging, tissue biopsy, blood sampling, fecal sampling, lavage, and potential recapture. Of the 160, 20 would also be tagged with satellite tags and data loggers (epoxy attachments) and acoustic transmitters (epoxy or drill carapace and attach with wire). A portion but not all 20 turtles may receive three tags. The same procedures would be authorized for hawksbills with a total of 190 annually captured, with 30 of those subject to a combination of tags. Fifteen loggerheads would be captured per year, and all would be subject to all of the activities. Appendix B lists the proposed take numbers and suite of activities for each species for the proposed action.

Capture

Dip-netting: Turtles would be briefly pursued at a distance of approximately 25 ft. When the turtle is within reach, researchers would capture the turtle using a 1 m by 1 m net with a 15 ft long handle.

Rodeo: Swimming turtles would be followed by boat. When the turtle comes up for air, two divers in snorkels and gloves would enter the water. The first diver would grab the turtle at the nape of the neck and rear of the carapace. The second diver would grab onto one limb of the turtle to help restrain the animal. All three would surface and signal the boat driver, who observes the capture with engines in neutral. They would then swim slowly to the boat and two additional scientists on the boat would lift the turtle onto a foam pad on the boat's deck.

Hand capture while snorkeling: Similar to rodeo capture, except divers would bring turtles to a moored boat. Divers would hand-grab turtles and come to the surface as described for rodeo capture and would then swim to the processing boat. Scientists on the boat would lift the turtle onto the boat for immediate work-up.

Cast nets: The net would be deployed over an individual turtle that is at or near the surface to encircle it. Then, the "draw" string that cinches the lead weights together would be pulled, capturing the turtle. After capture, the animal would be taken out of the net, quickly examined, and briefly secured, if necessary, in a modified cargo net on deck so that its limbs are held close to its body to prevent injuries to the turtle and personnel, but breathing will be unrestricted.

Tangle nets: A 100-250 m long, 4-5 m deep tangle net composed of 20 cm stretch-mesh multi-filament nylon would be deployed from the boat. The net would have large bullet floats attached every 3-4 meters at the surface and weighted lines along the bottom. The net would be constantly monitored while in the water and would be physically checked at least every 30 min. Snorkelers would also check the length of the net for entangled animals constantly. All parts of the net would be visible to researchers in clear water; most of the net would be visible when it is in partially turbid water. Moving floats would indicate that something is entangled in the net. When a turtle is caught in the mesh it would quickly be pulled into the boat and freed of the net.

Nets would not be deployed in the vicinity of sensitive corals or high coral cover. Nor would they be used in areas with strong current to avoid nets becoming entangled in corals and other benthic features.

Handling

In ideal weather conditions, turtles would be collected and held for no more than 1.5 hours each. Upon capture, each turtle would be placed in its own padded rectangular plastic tub, approximately 2 ft wide by 1 ft deep by 3 ft long. The research boat would be approximately 26 ft; two to four boxes containing one turtle each would be on board the boat at any one time. Four boxes would fit safely in the boat while allowing researchers to move around safely.

If for some reason turtles need to be transported to land for a longer holding period (e.g., until stormy weather clears up):

- Boxes would be secured to the boat with line.
- Turtles' eyes would be covered with a wet towel.
- Upon arrival at the dock, turtles in boxes would be transferred to the covered deck or patio where turtles would remain cool. Wet towels would be kept over the turtles' eyes.

Marking: Flipper and PIT Tagging

All sea turtles would be examined for existing flipper and PIT tags. If existing tags are found, the tag identification numbers would be recorded and reported. All turtles would be tagged with four Inconel flipper tags and one PIT tag (Biomark, Inc or AVID, Inc., all non-encrypted) to minimize the probability of complete tag loss.

Flipper tags would be cleaned to remove oil and residue and disinfected with Betadine or alcohol prior to application. Applicators would be cleaned and disinfected between animals. The application site would be cleaned and scrubbed with Betadine or alcohol before the tag pierces the animal's skin, and researchers would wear disposable latex gloves. Flipper tags would be located to accommodate future growth in young turtles. To avoid injury and minimize tag loss, researchers would ensure that the tag is securely folded over.

The application site would be swabbed with Betadine or alcohol and sterile PIT tags would be applied within the soft, fleshy area dorsal to the wrist bones of the front flipper at a seam between scales, nearly parallel with the skin of the flipper and with the needle directed proximally. Gauze with antiseptic would be placed with slight pressure over the entry point after the needle has been withdrawn, until no bleeding persists.

Measuring, Photography, Carapace Marking and Weighing

Immediately after marking each animal, researchers would take standard morphometric measurements using forestry calipers. Researchers would measure straight carapace length (SCL) and width (SCW). Each animal would be photographed to document shell and skin anomalies. In addition, researchers would apply white temporary paint on captured turtles to distinguish turtles that have already been seen during a sampling occasion. Each turtle would be weighed by carefully placing it on a 5' x 5' small-mesh (2") net, then gathering the net up around the turtle, and looping the hook end of a spring scale into the gathered net. Researchers would then lift the spring scale and turtle in the net and get a measure of weight/mass.

Blood Sampling

Blood samples would be collected from adult and subadult sea turtles over 5kg. Blood would be collected in vacutainer tubes using a vacutainer hub and a sterile 21-gauge, 1" to 1.5" needle (adults) or a 23 gauge, 0.5" needle (smaller animals) from the dorsal cervical sinus as described by Owens and Ruiz (1980). Prior to inserting the sterile vacutainer needle, the blood draw site would be prepped with 70% ethanol and Betadine or alcohol. A maximum of four blood sticks (two per side of the neck) would be attempted per sea turtle. Blood samples would consist of a maximum of 20 ml total volume (<10% of total blood volume). Blood samples in tubes would be kept on ice in a small cooler for up to 4 hours before being transferred to a lysis buffer or being centrifuged. Blood would be centrifuged and blood components (sera, clotted cells) separately frozen (-20°C or -60°C at the lab; -80°C at the University of Georgia).

Skin/tissue sampling

A new, sterile, disposable 6 mm AcuPunch biopsy tool (Acuderm Inc.) would be used to sample skin following standard procedures (Dutton 1996), removing a small biopsy about 6mm in diameter. The sampling area would be cleaned and disinfected with a 10% povidone iodine or Betadine® 7.5% surgical scrub prior to and after the procedure. Samples would be stored in ethanol or in a 20% DMSO buffer saturated in salt (Amos and Hoelzel 1991). This procedure would not be performed on any compromised animals (e.g. those that are emaciated or having heavy parasite loads, bacterial infections, etc.). Any bleeding would be stopped with Clotisol© drops.

Fecal Sampling

Fecal samples would be collected either after turtles have defecated during biological sampling or by digital extraction of feces from the cloaca. Those turtles that do not defecate during the sampling period would be temporarily overturned onto the carapace and restrained. While wearing lubricated latex gloves, a finger would be inserted into the cloaca of the turtle to feel for the presence of a fecal mass. Fecal matter would be removed and placed into either a polyethylene bag or a conical centrifuge tube and placed on ice.

Gastric (Oral) Lavage

Turtles larger than 25 cm Straight Carapace Length (SCL) would be subject to lavage. A thin stainless steel pry bar, rounded and smooth in shape and cleaned with ethanol prior to insertion, would be used to separate the maxilla and mandible. A standard veterinary mouth gag would be inserted at the anterior end of the mouth. Lavage would be conducted using a two-tube method, with one tube used to pump water into the turtle and one tube used for expelling food and water into a collection bucket. To minimize impacts to turtles:

- Tubes and lavage equipment would be cleaned with ethanol and water before insertion.
- A separate set of tubes used for turtles displaying fibropapillomas.
- The ends of each tube would be rounded to reduce damage to the esophagus.
- The tube would be aligned exterior to the turtle to pre-measure the distance to the caudal margin of the pectoral scute of the plastron, roughly corresponding to the level of the stomach. This distance would be marked on the tube for that turtle and the tube would be inserted no further than this mark, or no further than it passes without resistance.

- If water does not flow freely, the tube would be withdrawn slightly to allow unobstructed entry of water into the tube. If water continues to not exit for more than 15-20 seconds, lavage would be halted and the tube removed and reinserted.
- Lavage would not exceed 3 minutes to reduce the chance of the turtle inhaling during the process.

Satellite, Acoustic, and Data-logging Tags

Satellite and acoustic transmitters and data-logging tags (i.e., accelerometers that measure pitch, yaw, and roll to determine behavior and dive depth) would be attached to a subset of captured sea turtles. All turtles authorized to be tagged (Appendix B) would not necessarily be subject to all three tag types, but no more than the authorized number of turtles would have any type of tag attached. In addition, only turtles >45 cm SCL would be double or triple-tagged (acoustic/satellite/accelerometer). The carapace would be cleaned at the tag site (i.e., anterior vertebral scute) to remove epibionts and sanded lightly before attachment.

For all tag types, transmitters and attachment materials would not exceed 5% of the turtle's body weight, and cool-setting epoxy used for attachment would be streamlined for hydrodynamics so that neither buoyancy nor drag would minimize the turtle's swimming ability. The entire tagging procedure should take under two hours. All tagged turtles would be subject to standard workup procedures prior to tag application (as specified in Appendix B).

- Vemco V16 acoustic transmitters (approximately 16 mm diameter, 54-98 mm long and 9-16 g, depending on model) would be attached at the base of the carapace, along the posterior marginal scutes. They would be attached with either cool-setting epoxy or by drill and wire, which would be affixed to the ends of the rear marginal scutes.

- Wildlife Computers SPOT5 satellite tags (approximately 71 mm long, 54 mm wide, 24 mm high, 115 g) would be centered on the anterior carapace.

- Cefas or Vemco accelerometers (approximately 40 mm x 28 mm x 16.3 mm, 7.3 g) would be attached to the highest point of the carapace.

If animals are recaptured during the life of the permit and the tag is found to be no longer functioning (e.g., dead battery), the tag would be removed before release. Acoustically tagged animals would be passive monitored/tracked through a suite of fixed acoustic receivers in the area.

Mitigation Measures

If issued, the permit would contain a standard set of conditions considered 'best practices' to minimize impacts to the target species and other protected species that may be found in the area. Specific to the action and as described above, these conditions would include but are not limited to:

- Checking for existing flipper and PIT tags before applying new ones;
- Ensuring that equipment is cleaned and disinfected before use and between animals;
- Cleaning the sample site prior to collection;

- Using a separate set of equipment for infected animals;
- Releasing bycatch alive and unharmed;
- Limiting the volume of blood drawn and number of attempts to draw blood; and
- Monitoring deployed nets and avoiding setting nets over sensitive habitat.

Many of these conditions have been developed in consultation with qualified veterinarians to minimize impacts and ensure safety to the target animals. In addition, researchers would be required to coordinate their activities with those of other Permit Holders to avoid unnecessary repeated disturbance of individual animals.

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

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 any 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. There are no social or economic impacts of the proposed action interrelated with 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

Activities proposed under File No. 16146 would occur within the boundaries of Buck Island Reef National Monument in the U.S. Virgin Islands. No nets would be placed in seagrass or coral areas; sandy areas would be targeted for net deployment.

Buck Island Reef National Monument

Established in 1961, the monument consists of 176 acre island and coral reef ecosystem around the island. Two-thirds of the island is surrounded by an elkhorn coral barrier reef. It is home to a variety of marine life and serves as developmental habitat for leatherback (*Dermochelys coriacea*), green, and hawksbill sea turtles.

Essential Fish Habitat

Congress defined Essential Fish Habitat (EFH) as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (16 U.S.C. 1802(10)). The EFH provisions of the Magnuson-Stevens Fishery Conservation and Management Act offer resource managers means to accomplish the goal of giving heightened consideration to fish habitat in

resource management. EFH has been designated for federally managed fisheries. Details of the designations and descriptions of the habitats within the action area can be found at www.habitat.noaa.gov/protection/efh/habitatmapper.html.

Activities that have been shown to adversely 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. NMFS determined that the proposed activities would not affect EFH; therefore it is not considered further.

Elkhorn and Staghorn Coral Critical Habitat

Designated critical habitat for elkhorn and staghorn coral (73 FR 72210) can be found in the action area. However, no impacts to coral are expected. Due to the nature of how the applicant would set and monitor nets as described in the application, the proposed action would not alter the physical and biological features (substrate features that will facilitate successful larval settlement and recruitment, and reattachment and recruitment of asexual fragments) that were the basis for determining this habitat to be critical; therefore this habitat is not considered further.

3.3 BIOLOGICAL ENVIRONMENT

3.3.1 ESA Target Species

ESA Endangered	
Green sea turtle	*Chelonia mydas**
Hawksbill sea turtle	*Eretmochelys imbricata*
Loggerhead sea turtle	*Caretta caretta**

**Green sea turtles in U.S. waters are listed as threatened except for the Florida breeding population which is listed as endangered. Some population segments of loggerhead sea turtles are listed as threatened. Due to the inability to distinguish between these populations away from the nesting beach, these species are considered endangered wherever they occur in U.S. waters.*

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.

Hawksbill sea turtle

The hawksbill sea turtle occurs in tropical and subtropical seas of the Atlantic, Pacific, and Indian Oceans. The species is widely distributed in the Caribbean Sea and western Atlantic Ocean, with representatives of at least some life history stages regularly occurring in southern Florida and the northern Gulf of Mexico (especially Texas); in the Greater and Lesser Antilles; and along the Central American mainland south to Brazil.

Within the United States, hawksbills are most common in Puerto Rico and its associated islands, and in the USVI. In the continental United States, hawksbill sea turtles have been recorded from all the Gulf States and from along the eastern seaboard as far north as Massachusetts, with the exception of Connecticut, but sightings north of Florida are rare (Meylan and Donnelly 1999). They are closely associated with coral reefs and other hard-bottom habitats, but they are also found in other habitats including inlets, bays, and coastal lagoons. At least some life history stages regularly occur in southern Florida and the northern Gulf of Mexico (especially Texas); in the Greater and Lesser Antilles; and along the Central American mainland south to Brazil.

In Florida, hawksbills are observed with some regularity on the reefs off Palm Beach County, where the warm Gulf Stream current passes close to shore, and in the Florida Keys. Texas is the only other state where hawksbills are sighted with any regularity. Most sightings involve post-hatchlings and juveniles.

The life history of hawksbills consists of a pelagic stage that lasts from the time they leave the nesting beach as hatchlings until they are approximately 22-25 cm in straight carapace length (Meylan 1988), followed by residency in developmental habitats (foraging areas where immature turtles reside and grow) in coastal waters. Adult foraging habitat, which may or may not overlap with developmental habitat, is typically coral reefs, although other hard-bottom communities and occasionally mangrove-fringed bays may be occupied. Hawksbills show fidelity to their foraging areas over periods of time as great as several years (van Dam and Diez 1998).

In the Western Atlantic, the largest hawksbill nesting population occurs in the Yucatán Peninsula of Mexico, where several thousand nests are recorded annually in the states of Campeche, Yucatán, and Quintana Roo (Garduño-Andrade et al. 1999). Important but significantly smaller nesting aggregations are documented elsewhere in the region in Puerto Rico, the USVI, Antigua, Barbados, Costa Rica, Cuba, and Jamaica (Meylan 1999). Estimates of the annual number of nests for each of these areas are of the order of hundreds to a few thousand. Nesting within the southeastern United States and U.S. Caribbean is restricted to Puerto Rico (>650 nests/yr), the

USVI (~400 nests/yr), and, rarely, Florida (0-4 nests/yr) (Eckert 1992; Meylan 1999; Florida Statewide Nesting Beach Survey database). At the two principal nesting beaches in the U.S. Caribbean where long-term monitoring has been carried out, populations appear to be increasing (Mona Island, Puerto Rico) or stable (Buck Island Reef National Monument, St. Croix, USVI) (Meylan 1999).

The hawksbill sea turtle was listed as endangered under the ESA in 1970, and is considered Critically Endangered by the International Union for the Conservation of Nature (IUCN) based on global population declines of over 80 percent during the last three generations (105 years) (Meylan and Donnelly 1999). Critical habitat for the hawksbill sea turtle is designated under 50 CFR 226.209. It includes the waters surrounding the islands of Mona and Monito, Puerto Rico from the mean high water line seaward to 3 nautical miles (5.6 km).

Critical habitat for the hawksbill sea turtle includes the waters surrounding the islands of Mona and Monito, Puerto Rico from the mean high water line seaward to 3 nautical miles (5.6 km).

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 United States and throughout the Caribbean Sea. Non-nesting, adult female loggerheads are reported throughout the United States 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 suggest that loggerheads (benthic immatures and adults) in U.S. waters are distributed in the following proportions: 54 percent in the southeast U.S. Atlantic, 29 percent in the northeast U.S. Atlantic, 12 percent in the eastern Gulf of Mexico, and 5 percent in the western Gulf of Mexico (TEWG 1998).

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. The information provided in the status review represents the most recent and available information relative to the status of this species. On September 16, 2011 NMFS formally designated the loggerhead with these nine DPS' worldwide. Of these DPS', five are listed as endangered: Northeast Atlantic Ocean DPS, Mediterranean Sea DPS, North Indian Ocean DPS, North Pacific Ocean DPS and South Pacific Ocean DPS.

3.3.2 Non-Target Species

Before deployment of the tangle net, a careful visual inspection of the area would be made to ensure there are no marine mammals present and researchers would monitor the area during

netting for non-target ESA species. As a condition of the permit, if marine mammals are sighted, nets either would not be deployed or would be pulled in and netting activity would cease until the area is clear of marine mammals. Though rare, the Florida manatee (*Trichechus monatus latirostris*) could be found in the area. NMFS contacted the U.S. Fish and Wildlife Service for potential impacts to manatees. In reviewing the application, the USFWS provided additional conditions for the permit that would prevent manatee interactions. Because the permit would contain conditions that would minimize the potential for marine mammal interactions, and the applicant has no intent to interact with these species, NMFS does not expect marine mammals or non-target ESA species to be affected by this action and therefore they are not considered further in this EA.

Bycatch species and numbers anticipated to be captured in tangle nets incidental to sea turtle captures over the life of the permit include:

- Nurse shark (*Ginglymostoma cirratum*), approximately 50
- Southern stingray (*Dasyatis americana*), approximately 50
- Spotted eagle ray (*Aetobatus narinari*), approximately 10
- Lemon shark (*Negaprion brevirostris*), approximately 50
- Blacktip shark (*Carcharhinus limbatus*), approximately 25
- Bull shark (*C. leucas*), approximately 25
- Manta ray (*Manta birostris*), approximately 10.

Researchers would make every effort to release all bycatch alive. Researchers would continuously observe the net, releasing bycatch as soon as it is seen. Because of the low levels of bycatch and the mitigation measures used to release bycatch alive, bycatch species are not considered further in this EA.

CHAPTER 4 ENVIRONMENTAL CONSEQUENCES

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

4.1 EFFECTS OF ALTERNATIVE 1: No Action

No action, i.e., denial of the permit request, would eliminate any potential risk to target species from the proposed research activities. This alternative would prohibit researchers from gathering information that could help endangered and protected sea turtles.

4.2 EFFECTS OF ALTERNATIVE 2: Issue permit with standard conditions

Impacts of the Proposed Action would be limited to the biological environment, specifically the target sea turtles. The type of action proposed in the permit request would be unlikely to affect the physical or socioeconomic environment or pose a risk to public health and safety.

The effects of the proposed activities would primarily be limited to short-term harassment of individual sea turtles. Conditions in the proposed permit would be similar to those in other

permits for sea turtle research issued by NMFS, and were designed to minimize effects to individual sea turtles and non-target species. The applicant has used these methods under current and previous permits (e.g., Permit Nos. 13307 and 1541) and has not reported death or serious injury of individual sea turtles. Further, a biological opinion was prepared for the Proposed Action and NMFS concluded that issuance of Permit No. 16146 is not likely to jeopardize the continued existence of listed species and is not likely to destroy or adversely modify designated critical habitat (NMFS 2011). More information on expected effects of the research activities is discussed here.

Effects of Capture

Capture of a turtle by the proposed netting methods could result in stresses due to interaction with the gear. The methods described by the applicant and the mitigation measures in the proposed permit are designed to minimize the risks to individuals, including the risk of drowning as a result of forced submergence. Researchers would be required to monitor capture techniques and activities.

Effects of Hand Capture, Dip Net, and Cast Net: These types of capture are simple and not invasive. However, these methods can lead to an increased level of stressor hormones in the turtle. Turtles would be handled in a manner to minimize stress. Based on studies and results of previous research, NMFS expects that this would result in short-term stress to individual turtles. No injury or mortality would be expected. These are direct capture methods; there would be no incidental capture of non-target species.

Effects of Entanglement Net: Hoopes et al. (2000) found that entanglement netting produced notable changes in blood chemistry in wild Kemp's ridley sea turtles, with plasma lactate concentrations at capture elevated up to 6-fold above those measured 6 to 10 hours post capture. However, they note that the lactate response resulting from the stress of capture in entanglement netting was relatively slight compared with that reported from trawl capture of sea turtles. Although it appears that entanglement netting can result in temporary changes in blood chemistry of sea turtles, it appears that animals that are immediately placed back into a marine environment after removal from the gear can recover from the short-term stress of capture (Hoopes et al. 2000). Animals captured during the proposed research would typically be removed immediately from the nets, and blood acidosis could be ameliorated by animal hyperventilation after removal from the net. Hoopes et al. (2000) conclude that entanglement netting is an appropriate "low-stress" method for researchers working on turtles in shallow, coastal areas.

Effects of Handle, Measure, Weigh

NMFS does not expect that individual turtles would experience more than short-term stresses during the handling, measuring, weighing, or photography process. No injury would be expected from these activities. Turtles would be worked up as quickly as possible to minimize stresses resulting from their capture. Researchers have taken measurements on thousands of turtles with no apparent ill effect; NMFS Southeast Fisheries Science Center researchers have conducted the oral measurements on more than 200 turtles with no reported ill effects.

Effects of Flipper and PIT Tagging

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 whose tags have failed are 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 may experience some discomfort during the application of external and/or internal tagging procedures, and these procedures would likely produce some level of pain. The discomfort appears highly variable between individuals (Balazs 1999). Most seem to barely notice, while some exhibit a marked response. NMFS expects the stresses to be minimal and short-term, and that the small wound-site resulting from a tag applied to the flipper would heal completely in a short period of time. NMFS does not expect that individual turtles would experience more than short-term stresses during the application of the PIT tags. These tags have been used for cattle and pets for years without any adverse effects. The proposed tagging methods have been regularly employed in sea turtle research with little lasting impact on the individuals tagged and handled (Balazs 1999). The NMFS Southeast Fisheries Science Center Galveston Laboratory has flipper and PIT tagged up to 56 loggerheads per year from 1999 to present holding the animals for approximately 3 years after tagging. Turtles were held in a laboratory setting, did fine, and were later released. It suggests that if a turtle is tagged using proper techniques and protocol and released back into a suitable environment, the chances for problems associated with the tagging are negligible. Additionally, in the 17 years that the NMFS Southeast Fisheries Science Center has been Inconel (metal) flipper tagging turtles, all turtles exhibited normal behavior shortly after being tagged and swam normally once released. Of the close to 1,000 tagged turtle recaptures the NMFS Southeast Fisheries Science Center Beaufort Laboratory has encountered, no turtles show any adverse effects of being tagged in this manner. In the nine years that the NMFS Southeast Fisheries Science Center has been PIT tagging turtles, turtle behavior indicative of discomfort was observed to be temporary, and the turtles exhibited normal behavior shortly after tagging and swam normally after release. Of the close to 1,000 tag recaptures that the NMFS Beaufort Laboratory has encountered, none show any adverse effects of being tagged in this manner.

Effects of Lavage

Prey preferences of turtles can be determined by a variety of methods, but the preferred technique is gastric lavage or stomach flushing. This technique has been successfully used on green, hawksbill, olive ridley, and loggerhead turtles ranging in size from 25 to 115 inches curved carapace length. Some turtles have been lavaged more than three times without any known detrimental effect to their health (Forbes 1999). Individuals have been recaptured from the day after the procedure up to three years later and appear healthy and feeding normally. Laparoscopic examination following the procedure has not detected any swelling or damage to the intestines. While individual turtles are likely to experience discomfort during this procedure, NMFS does not expect individual turtles to experience more than short-term stress. Injuries and mortalities are not anticipated.

Effects of Blood and Tissue Sample

It is not expected that individual turtles would experience more than short-term stresses during tissue sampling. Researchers who examined turtles caught two to three weeks after sample collection noted the sample collection site was almost completely healed. During the more than five years of tissue biopsying using sterile techniques, NMFS Southeast Fisheries Science Center researchers have encountered no infections or mortality resulting from this procedure.

NMFS does not expect that individual turtles would experience any more than short-term stresses during blood sampling. Taking a blood sample from the dorsal side of the neck is a routine procedure when conducted by trained personnel following proper guidelines (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 should take about 30 seconds. Sample collection sites would be sterilized with alcohol or other antiseptics prior to sampling. The permit would be conditioned to limit blood sampling volume to a conservative amount based on the size of the turtle captured. Blood hormones and heart rate have been measured in animals that have had blood drawn from them and no stress has been observed.

NMFS expects that the collection of a blood or tissue sample would cause minimal additional stress or discomfort to the turtle beyond what was experienced during capture, collection of measurements, tagging, etc.

Effects of Acoustic and Satellite Tags

Transmitters attached to the carapace of turtles, as well as biofouling of the instrument, increase hydrodynamic drag and affect lift and pitch. For example, Watson and Granger (1998) performed wind tunnel tests on a full-scale juvenile green turtle and found that at small flow angles representative of straight-line swimming, a transmitter mounted on the carapace increased drag by 27-30%, reduced lift by less than 10% and increased pitch moment by 11-42%. It is likely that this type of transmitter attachment would negatively affect the swimming energetics of the turtle. However, based on the results of studies of hardshell sea turtles equipped with this tag setup, there is no evidence of transmitters resulting in any serious injury to these species. Attachment of satellite, sonic, or radio tags with epoxy is a commonly used and permitted technique by NMFS. These tags are unlikely to become entangled due to their streamlined profile and would typically be shed after about one year, posing no long-term risks to the turtle.

Researchers with the South Carolina Department of Natural Resources (SCDNR) satellite-tagged 36 juvenile loggerheads (56.6 - 76.8 cm SCLmin) during 2004-2007 and 29 adult male loggerheads (86.6 - 107 cm SCLmin) during 2006-2007. Their track durations for tags on juveniles have ranged from 30 days to 496 days, with an average for expired tags of 169 days. Track durations for adult males ranged from 7 to 238 days, with an average for expired tags of 117 days. Satellite transmitter attachments can affect the hydrodynamic drag (and thus things like swimming speed or efficiency); however, long track durations suggest animals are not severely compromised. Shorter track durations have multiple possible explanations, including tag-shedding; physical damage to transmitter; and biological fouling which interferes with data transmission. Although mortality of the tagged individual is also a theoretically possible

explanation of short track durations, it is impossible to establish this or to determine whether it occurred directly or indirectly as a result of satellite-tagging (or as a result of some other cause).

Long-distance movements of satellite-tagged juvenile and adult male loggerheads also help substantiate the idea that sea turtles can survive the tagging experience as well as continue normal activities. The SCDNR reported that 15 adult male loggerheads dispersed from Cape Canaveral, FL, to locations as far away as Panama City, FL; Andros Island in the Caribbean; and off the coast of New Jersey. SCDNR reported that several juvenile loggerheads have traveled from SC to GA and NC, with one juvenile loggerhead traveling as far north as Delaware Bay.

During a study of sonic tracked turtles by Seminoff et al. (2002), green turtles returned to areas of initial capture, suggesting that the transmitters and the tagging experience left no lasting effect on habitat use patterns. During previous tracking sessions in San Diego Bay by the NMFS Southwest Fisheries Science Center, both telemetered and non-telemetered turtles were seen in the same areas exhibiting roughly similar surface behavior, even swimming within meters of their tracking vessel, suggesting negligible effects of the transmitter packages.

Effects of Fecal Sampling

NMFS does not expect that individual turtles would experience more than short-term stresses and minor discomfort as a result of this activity. No injury or lasting effects are expected from this procedure. NMFS Beaufort Laboratory has conducted fecal sampling for at least the past five years on hundreds of sea turtles, and turtles exhibited normal behavior as they were released.

4.3 COMPARISON OF ALTERNATIVES

While the No Action alternative would have no environmental effects, the opportunity would be lost to collect information that would contribute to better understanding sea turtles and that would provide information needed to implement NMFS' management activities to help conserve and manage sea turtles, as required by the ESA and NMFS' implementing regulations. The Proposed Action would affect individual sea turtles. However, the effects would be minimal and the alternative would allow the collection of valuable information that could help NMFS' efforts to recover sea turtles. In accordance with section 7 of the ESA, a Biological Opinion was prepared for the Proposed Action and NMFS concluded that issuance of the permit is not likely to jeopardize the continued existence of listed species and is not likely to destroy or adversely modify designated critical habitat (NMFS 2011). Neither the No Action nor the Proposed Action alternatives are anticipated to have adverse population or stock-level effects on sea turtles.

4.4 MITIGATION MEASURES

There are no additional mitigation measures beyond those that are part of the applicant's protocols or conditions that would be required by permit. The permit would require that the applicant follow the protocols described in the application except where conditioned by the permit to minimize impacts to target and non-target species.

Review of monitoring reports of previous permits for the same or similar research protocols indicate that these types of mitigation measures are effective at minimizing stress, pain, injury, and mortality associated with takes.

4.5 UNAVOIDABLE ADVERSE EFFECTS

The measures required by permit conditions are intended to reduce, to the maximum extent practical, the potential for adverse effects of the research. Individual sea turtles may experience short-term stress and discomfort in response to the activities of researchers, but the research is not expected to have more than a minimal effect on individuals, and no effect on populations.

4.6 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.

Research under the Proposed Action is not expected to result in more than localized disturbance 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.

4.6.1 Research Permits

As summarized in Appendix C, only three active permits, held by the NMFS Southeast Fisheries Science Center, allow year-round research on a combination of the target species in areas that could overlap with the Proposed Action area. These permits are set to expire within the next 12 months; however, they represent long-term studies that inform the agency's conservation and management of these species. NMFS therefore expects these projects to continue into the foreseeable future at a scope and magnitude similar to what is currently authorized. To that end, new permit applications are being processed to replace two of these permits (Nos. 1570 and 1571) for the SEFSC. It should be noted that the active permits have broad action areas encompassing most of the North Atlantic Ocean. Although it is possible that the active permits would target and therefore affect the same individual animals or populations as the proposed research, NMFS is not aware of any dedicated projects by the SEFSC at Buck Island and no other NMFS permits authorize sea turtle research solely at Buck Island. The target animals will migrate beyond the region of the Virgin Islands; however, the effects of many individual research activities (e.g., a survey, a field trip to capture animals) are short-term, lasting hours to days following the research event. Therefore, NMFS expects that the effects of the proposed research activities would dissipate before the animals could be targeted by another Permit Holder. Further, impacts to the target animals are likely to be lower than in other areas, such as Florida coastal waters, that are populated, easier to access and have more human activities occurring. Thus, the chance of repeated disturbance of individual animals by researchers or other human activities within the course of a day is minimal at Buck Island. In addition, permitted researchers 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 research coordination and take other steps appropriate to minimize disturbance from multiple Permit Holders and other human activities.

4.6.2 Other Human 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 activities, lethal takes of turtles and the 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 the proposed research activities.

The target species also benefit from 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.

4.6.3 Summary of Cumulative Effects

It is likely that issuance of the proposed permit would have some cumulative adverse effects on target animals. These effects would 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.

The Proposed Action, when combined with past, present, and reasonably-foreseeable actions, would not have more than minimal effects to the target species at the population or species level. Any increase in stress levels to individual turtles or non-target species resulting from capture or procedures would dissipate within approximately a day. Injuries caused by tagging and sampling would be expected to heal. NMFS does not expect the authorization of the proposed research activities 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. Likewise, NMFS does not expect significant impacts to non-target species as a result of the Proposed Action.

CHAPTER 5 LIST OF PREPARERS AND AGENCIES CONSULTED

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

Agencies Consulted: National Park Service and the U.S. Fish and Wildlife Service

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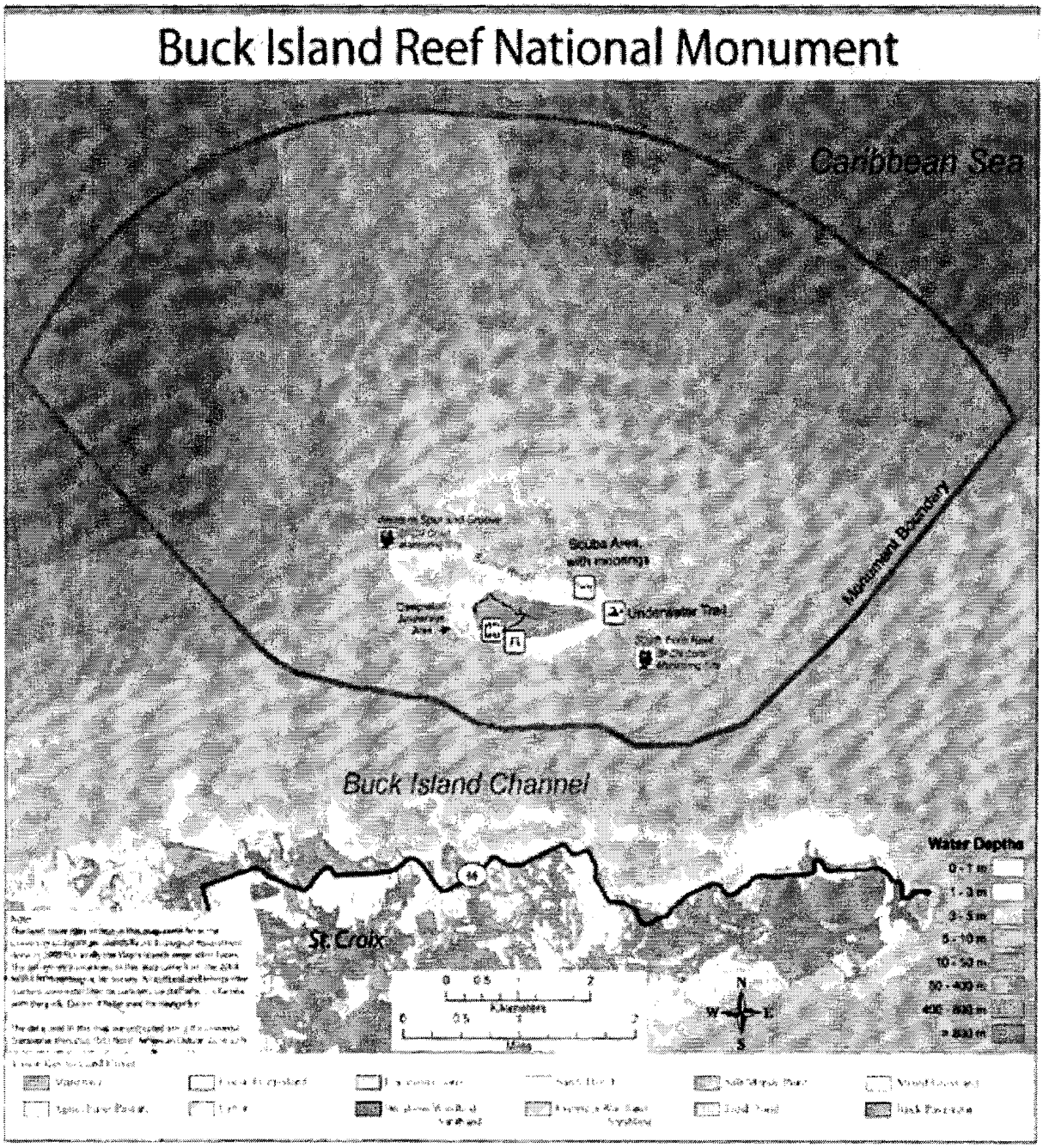
APPENDIX A. MAP OF STUDY AREA. Work would be concentrated within the boundary in water up to 20 m deep (i.e., lighter blue colors).



APPENDIX B. Annual Takes of Male and Female Sea Turtles in Buck Island Reef National Monument, USVI for Permit No. 16146.

SPECIES	NO. ANIMALS	TAKE ACTION	OBSERVE/COLLECT METHOD	PROCEDURES
Turtle, green sea	140	Capture/ Handle/ Release	Hand and/or Dip Net; rodeo, tangle net, cast net	Count/survey; Epibiota removal; Lavage; Mark, carapace (temporary); Mark, flipper tag; Mark, PIT tag; Measure; Photograph/Video; Recapture (gear removal); Sample, blood; Sample, fecal; Sample, tissue; Weigh
Turtle, green sea	20	Capture/ Handle/ Release	Hand and/or Dip Net; rodeo, tangle net, cast net	Count/survey; Epibiota removal; Instrument, drill carapace attachment; Instrument, epoxy attachment (e.g., satellite tag, VHF tag); Lavage; Mark, carapace (temporary); Mark, flipper tag; Mark, PIT tag; Measure; Photograph/Video; Recapture (gear removal); Sample, blood; Sample, fecal; Sample, tissue; Weigh
Turtle, hawksbill sea	30	Capture/ Handle/ Release	Hand and/or Dip Net; rodeo, tangle net, cast net	Count/survey; Epibiota removal; Instrument, drill carapace attachment; Instrument, epoxy attachment (e.g., satellite tag, VHF tag); Lavage; Mark, carapace (temporary); Mark, flipper tag; Mark, PIT tag; Measure; Photograph/Video; Recapture (gear removal); Sample, blood; Sample, fecal; Sample, tissue; Weigh
Turtle, hawksbill sea	160	Capture/ Handle/ Release	Hand and/or Dip Net; rodeo, tangle net, cast net	Count/survey; Epibiota removal; Lavage; Mark, carapace (temporary); Mark, flipper tag; Mark, PIT tag; Measure; Photograph/Video; Recapture (gear removal); Sample, blood; Sample, fecal; Sample, tissue; Weigh
Turtle, loggerhead sea	15	Capture/ Handle/ Release	Hand and/or Dip Net; rodeo, tangle net, cast net	Count/survey; Epibiota removal; Instrument, drill carapace attachment; Instrument, epoxy attachment (e.g., satellite tag, VHF tag); Lavage; Mark, carapace (temporary); Mark, flipper tag; Mark, PIT tag; Measure; Photograph/Video; Recapture (gear removal); Sample, blood; Sample, fecal; Sample, tissue; Weigh

APPENDIX C. ACTIVE PERMITS IN OR NEAR THE ACTION AREA

Table 1. Existing Permits Authorizing Takes for the Target Sea Turtle Species in the Action Area.

Permit Number	Permit Holder	Expiration Date
1570	NMFS SEFSC	December 31, 2011
1571	NMFS SEFSC	December 31, 2011
1551	NMFS SEFSC	July 1, 2013

Table 2. Types of research activities authorized by active permits. The sex and age class of animals affected varies by permit, as does the time of year and frequency of activity. The Proposed Action appears in ***italics***.

Permit No.	Capture	Blood sampling	Fecal sampling/ lavage	Laparoscopy	Tissue sampling	Attach instruments	Tags or marks	Mortality
1570	√				√		√	√
1571					√		√	
1551	√	√	√	√	√	√	√	
16146	√	√	√		√	√	√	