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

ENVIRONMENTAL ASSESSMENT ON THE EFFECTS OF THE ISSUANCE OF A SCIENTIFIC RESEARCH PERMIT FILE NO. 15552 FOR THE SOUTHEAST FISHERIES SCIENCE CENTER OBSERVER PROGRAM TO CONDUCT SEA TURTLE RESEARCH FROM SPECIMENS TAKEN IN COMMERCIAL FISHERIES

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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) 427-8401

Location: U.S. Locations including offshore waters, Gulf of Mexico and off the East Coast

Abstract: The National Marine Fisheries Service (NMFS) proposes to issue a scientific research permit for NMFS Southeast Fisheries Science Center (SEFSC), 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 and would authorize research activities to be carried out by SEFSC fishery observers on ESA-listed sea turtles incidentally captured in commercial fisheries. The purpose of this research would be to document take of ESA-listed sea turtles at multiple life stages in commercial fisheries and to enhance estimates of sea turtle by-catch in order to characterize the effects on sea turtle sub-populations. This data would provide valuable information on sea turtle genetics, habitat use, movement, migration, and population dynamics. This research would create a better understanding of sea turtle ecology and allow for the enhancement and evaluation of conservation and recovery efforts for sea turtle populations in the Gulf of Mexico, Atlantic Ocean, Caribbean Sea, and their tributaries.

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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 National Marine Fisheries Service Southeast Fisheries Science Center (SEFSC) [Bonnie Ponwith, Director, Responsible Party] (File No. 15552), 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.*).

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" of endangered species, 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 the ESA to protect, conserve, and recover threatened and endangered species under its jurisdiction. The ESA prohibits takes of threatened and endangered species, respectively, with only a few very specific exceptions, including for scientific research and enhancement purposes. Permit issuance criteria require that a research activity is consistent with the purposes and policies of this federal law 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 monitor the take of ESA-listed sea turtle species by observed fisheries and estimate rates of by-catch and its effects on sea turtle sub-populations in the Gulf of Mexico and the East coast of the United States. 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. 15552 would be a continuation of the SEFSC's current research on sea turtles, the action area and a majority of the proposed activities have been previously described and analyzed for its current permit, No. 1552. The Environment Assessment prepared for the current permit, *Environmental Assessment Scientific Research Permit to National Marine Fisheries Service (NMFS) Southeast Fisheries Science Center (SEFSC) (Permit File No. 1552) to Conduct Research on Endangered and Threatened Sea Turtles* (NMFS 2005), 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 remains the same.

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

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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."

scoping process is to identify the concerns of the affected public and Federal agencies, states, and Indian tribes. Council on Environmental Quality (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 4635, January 26, 2011). No substantive public comments were received.

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).

NMFS has, through NOAA Administrative Order (NAO) 216-6, established agency procedures for complying with NEPA and the implementing regulations issued by the Council on Environmental Quality. NAO 216-6 specifies that issuance of scientific research permits under the 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 EA is prepared in accordance with NEPA, its implementing regulations, and NAO 216-6.

1.4.2 Endangered Species Act

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

NMFS has promulgated regulations to implement the permit provisions of the ESA (50 CFR Part 222) and has produced Office of Management and Budget-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 would not operate to the disadvantage of the species; and would 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 (USFWS)) for federal actions that "may affect" a listed species or adversely modify critical habitat. NMFS issuance of a permit affecting ESA-listed species or designated critical habitat, directly or indirectly, is a federal action subject to these Section 7 consultation requirements. Section 7 requires federal agencies to use their authorities in furtherance of the purposes of the ESA by carrying out programs for the conservation of endangered and threatened species. NMFS is further required to ensure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any threatened or endangered species or result in destruction or adverse modification of habitat for such species. Regulations specify the procedural requirements for these consultations (50 Part CFR 402).

1.4.3 Convention on International Trade in Endangered Species of Wild Fauna (CITES)

CITES is an international agreement between governments with the goal of ensuring that international trade in specimens of wild animals and plants does not threaten their survival. All import, export, re-export and introduction from the sea of species covered by CITES has to be

authorized through a licensing system. In the U.S., the Fish and Wildlife Service is the Management Authority for CITES. Obtaining CITES permits is the responsibility of individual researchers.

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, because the capture of these listed sea turtles is already authorized, under an existing Incidental Take Statement or ESA 10(a)(1)(B) incidental take permit, the sea turtles would continue to be incidentally taken in the fisheries. Unlike the proposed research activities, by design, capture inherently poses more risk to the target animals because the methods of capture may result in serious injury or mortality. Thus without authorization for research activities under the permit, SEFOP-certified observers would not be able to handle, resuscitate, or attend to any sea turtle captured in a fishery. In this way, the No Action Alternative represents a potentially negative impact to these species, as it would deny sea turtles access to trained individuals who are qualified to act in the best interest of the turtles.

Furthermore, this alternative would not allow the proposed research to be conducted, and the opportunity would be lost to collect information that would contribute to better understanding 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, Permit No. 15552 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.

The SEFSC proposes to obtain data from sea turtles that interact with fisheries in the Gulf of Mexico, Atlantic Ocean, and the Caribbean Sea and their tributaries through the Southeast Fisheries Observer Program. The activities authorized in this permit would be only for sea turtles legally captured under an incidental take statement (ITS) of a biological opinion from a Section 7

consultation for each respective fishery. See Appendix 1 for the specific level of take and activities that would be authorized for each species in each fishery. Work would be conducted year round.

Action Area

The proposed research under File No. 15552 would take place in the Gulf of Mexico, Atlantic Basin, Caribbean Sea, and their tributaries on authorized fisheries that SEFSC observers may observe, typically off the southeastern Atlantic coast and in the Gulf of Mexico. Each fishery/program for which there will be SEFSC observer coverage has a general area of activity as listed in Table 1.

Research Activities

The following sections provide a description of the proposed research activities. Southeast Fisheries Observer Program (SEFOP) certified observers aboard commercial fishing vessels would handle, identify, photograph, measure, Passive Integrated Transponder (PIT) tag, biopsy, and flipper tag sea turtles, salvage parts, and would transport dead or injured turtles that are incidentally taken during commercial fishing operations to shore to be transferred to NMFS approved Sea Turtle Stranding and Salvage Network (STSSN) personnel.

Capture

This permit would not authorize captures since the applicant would not be capturing turtles. Activities would be performed on turtles legally caught incidental to commercial fishing operations.

Handling and Holding

Sea turtles would be handled and resuscitated, if necessary, according to procedures specified in 50 CFR 223.206(d)(1)(i). SEFOP certified observers would be provided with and required to follow the sea turtle handling guidelines and resuscitation requirements as described in the Southeast Fisheries Science Center Sea Turtle Research Techniques Manual (NMFS SEFSC 2008). While onboard the vessel, sea turtles would be protected from temperature extremes, provided adequate air flow, and kept moist during sampling. Attempts to revive comatose or unresponsive turtles would be made by holding turtles onboard for up to 24 hours and elevating the hindquarters to allow for water drainage (NMFS SEFSC 2008).

Extra care would be used when handling, sampling, and releasing leatherback turtles. Very large leatherbacks would typically not be boarded. They would be sampled alongside the vessel and then released at the water's surface as instructed in the SEFSC's sampling techniques manual. Only in the rare case when a vessel is equipped with a large turtle hoist apparatus to retrieve the turtle from the water would a large leatherback be brought on deck. In longline fisheries, smaller leatherbacks and other sea turtle species would be brought onboard when a dipnet is available. After the physical workup and tagging, sea turtles would be released close to the site of capture. The applicant estimates that on average these workup procedures would not take more than approximately 10 minutes to complete.

Measure, Weigh, and Photograph

Captured turtles would be measured with forestry calipers to obtain straight carapace length (SCL), carapace width, head width, and plastron length. A flexible tape measure would be used to obtain curved carapace length, carapace width, and tail length. Turtles would be weighed to the nearest 0.5 kg using a digital hanging scale. Hardshell turtles would be gently turned onto their carapace (within the padded and shaded portion of the boat) and into the center of a square piece of small mesh (2 cm) soft cotton net. Two corners of the net would each be brought over one shoulder of the turtle and the other two corners would be brought over the carapace near each back flipper. The two sides of the net along each side of the carapace would also be pulled up to completely enclose the turtle (except for the front flippers and head - the latter to avoid covering the eyes). The four corners and the middle edges of the net would be secured together with a short piece of looped rope with clips on each end. The hanging scale would be hung from the center of a padded metal pole. The hook at the bottom of the scale would then be placed through the loop on the rope that is clipped to the netting and the netting and turtle would be gently lifted by two people (one on each end of the pole) just high enough to clear the floor padding. Turtles also would be photographed and carefully examined. During external examinations, the size and location of any tumors characteristic of fibropapillomatosis (FP) would be noted. A separate set of equipment would be used to measure and weigh turtles with FP. All equipment coming in contact with turtles would be cleaned between uses.

Mark: Flipper and PIT tagging and Carapace Painting

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 would be placed, using a sterile 12-gauge hypodermic needle, into the dorsal surface of the front flipper in the flexor carpi ulnaris muscle (between the trailing-edge scutes of the flipper and the ulna). 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. If a previously tagged turtle is missing any of its original tags, replacement tags would be applied.

A temporary, identifying number would be painted on the carapace of each hardshell turtle to enable observers to identify and record recently captured turtles to aid observers in keeping turtles differentiated on deck should multiple turtles be captured. Temporary white gel coat paint would be applied to the scutes with no paint crossing sutures.

Biopsy Sampling

Small skin biopsies would be collected for genetic studies from live and dead sea turtles. A 6 mm disposable biopsy punch would be used on turtles larger than 25 cm Notch-to-Tip (Total Length) carapace length. The biopsy punch consists of a plastic handle that supports a sharp circular blade. Tissue samples would be preserved in 5 ml vials filled with 20% saturated DMSO, a non-toxic preservative. A piece of Parafilm would be wrapped around the vial cap and the vial placed in a Whirl-pak. Samples would be taken from the trailing edge of each rear flipper just past (away from the body) the Inconel tag location.

For turtles that are not boated, a corer attached to a biopsy pole would be used to obtain the sample alongside the vessel. Gear would consist of a 12' anodized aluminum breakdown biopsy pole or similar biopsy harpoon (NMFS SEFSC 2008). Corers would be stored in ethanol-cleaned vials. The threaded stud on the biopsy pole would be cleaned with an alcohol swab before attaching the corer. For leatherbacks, a ribbon of tissue would be scraped off the carapace with the corer, leaving a gray superficial scar that would heal well over time. If a scrape cannot be obtained, a forceful jab perpendicular to the flipper or at an oblique angle would be employed. Nerve bundles high on the shoulders near the carapace as well as the "armpit" area would be avoided. The corer with the tissue would be stored in a vial of NaCl saturated 20% DMSO buffer. No compromised animals would be biopsied if it would further compromise their health.

Post-mortem Tissue, Parts and Carcass Collection

Sea turtle carcasses, tissues, or parts would be collected from dead animals--incidental lethal takes would have been authorized by the fisheries or other activities. Samples would be stored on ice or frozen and subsequently used for scientific studies. Carcasses would be bagged and shipped on ice to NMFS facilities for necropsy to determine cause of death. Tissue samples from non-frozen animals would be examined for histopathology and contaminant analyses. Hard parts would be salvaged for aging and life history studies. Tissue biopsies would be collected for genetic studies. Gut contents would be salvaged for diet studies. The applicant also holds a CITES permit to import salvaged sea turtle carcasses, parts, and tissue samples from live animals from the high seas.

Release

Sea turtles would be released according to SEFSC protocols; sea turtles would be lowered as close to the surface of the water as possible, while fishing gear is not in use and the boat's engines are in neutral (NMFS SEFSC 2008).

In addition to the handling and resuscitation requirements, the below protocols would be followed by all SEFOP certified observers:

- Observers must not intentionally kill or cause any sea turtle to be killed.
- Care must be taken when handling live turtles to minimize injury to turtles and the observer.
- Observers would request that all observed sea turtles captured during commercial fishing operations be lowered to the deck as carefully as possible.
- All sea turtles brought on board would be protected from any weather or fishing activity that may cause injury. The area surrounding the turtle would be free of any material that the turtle might ingest.
- Healthy, active turtles would not be kept on board longer than 30 minutes.
- Appropriate resuscitation techniques must be used on any comatose turtle prior to returning it to the water.
- During release, engines should be in neutral and turtles shall be released away from fishing gear and as close to the surface of the water as possible.
- The observer would observe the newly released animal and record the behavior on the Marine Mammal, Sea Turtle and Sea Bird Incidental Take Log.

- When possible, observers should coordinate with the STSSN to transfer stressed or injured animals to rehabilitation facilities ashore. The easiest and quickest way to do this might be through the Area Coordinator. "Stressed" turtles are those that have been subjected to forced submergence. In addition, any turtle with any injury will also be considered as "stressed".

Several of these requirements are out of the observers' control. In those cases, the observer would work with the crew to meet these requirements. If the vessel operator is unable or unwilling to meet a request, then the observer would provide comments on the Marine Mammal, Sea Turtle and Sea Bird Incidental Take Log. Observers would be responsible for their actions only, not for those of the crew.

CHAPTER 3 AFFECTED ENVIRONMENT

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

The affected environment is biological and physical resources occurring within the watersheds of the Gulf of Mexico, the Atlantic Ocean, and the Caribbean Sea and its tributaries. More specifically, since the proposed research activities would primarily involve work on the sea turtles captured under authority, the affected environment for purposes of this analysis focuses primarily on the biological resources occurring within these waters that would be accessed by the researchers.

3.1 SOCIAL AND ECONOMIC 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

Due to the nature of the Proposed Action, the physical environment would not be impacted because all activities would occur onboard a commercial fishing vessel or oil-gas platforms (or related vessels). None of the activities in the Proposed Action are directed at or likely to have any impact on any designated EFH, protected areas, or designated critical habitat or any other aspect of the physical environment. Thus, the effects of the actions on the physical environment will not be discussed further in this EA.

3.3 BIOLOGICAL ENVIRONMENT

3.3.1 ESA Target Species Under NMFS Jurisdiction

ESA Endangered	
Green sea turtle	*Chelonia mydas**
Kemp's ridley sea turtle	*Lepidochelys kempii*
Hawksbill sea turtle	*Eretmochelys imbricata*
Leatherback sea turtle	*Dermochelys coriacea*
ESA Threatened	
Loggerhead sea turtle	*Caretta caretta***

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

*** NMFS has proposed changing the listing of the loggerhead sea turtle to endangered (75 FR 12598).*

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.

Kemp's ridley sea turtle

Of the seven extant species of sea turtles of the world, the Kemp's ridley has declined to the lowest population level. This species has a very restricted range relative to other sea turtle species.

Kemp's ridleys nest in daytime aggregations known as arribadas, primarily at Rancho Nuevo, a stretch of beach in Mexico. Most of the population of adult females nests in this single locality (Pritchard 1969). When nesting aggregations at Rancho Nuevo were discovered in 1947, adult female populations were estimated to be in excess of 40,000 individuals (Hildebrand 1963). By the early 1970s, the world population estimate of mature female Kemp's ridleys had been reduced to 2,500-5,000 individuals. The population declined further through the mid-1980s. Recent observations of increased nesting suggest that the decline in the ridley population has stopped and there is cautious optimism that the population is now increasing (Turtle Expert Working Group (TEWG) 1998). The number of nests has grown from a low of approximately 702 nests in 1985, to greater than 1,940 nests in 1995, to approximately 5,800 nests in 2000, to approximately 8,300 nests in 2003, to approximately 10,300 nests in 2005. USFWS recorded approximately 12,000 nests in 2006 suggesting that the adult nesting female population is about 7,400 individuals.

It appears that adult Kemp's ridley sea turtles are restricted somewhat to the Gulf of Mexico in shallow near shore waters, although adult-sized individuals sometimes are found on the eastern seaboard of the United States. Juvenile/subadult Kemp's ridleys have been found along the eastern seaboard of the United States and in the Gulf of Mexico. Atlantic juveniles/subadults travel northward with vernal warming to feed in the productive, coastal waters of Georgia through New England, returning southward with the onset of winter to escape the cold (Lutcavage and Musick 1985; Henwood and Ogren 1987; Ogren 1989). In the Gulf, juvenile/subadult ridleys occupy shallow, coastal regions. The near shore waters of the Gulf of Mexico are believed to provide important developmental habitat for juvenile Kemp's ridley sea turtles. Ogren (1988) suggests that the Gulf coast, from Port Aransas, Texas, through Cedar Key, Florida, represents the primary habitat for subadult ridleys in the northern Gulf of Mexico. Ogren (1989) suggested that in the northern Gulf this species moves offshore to deeper, warmer water during winter. Studies suggest that subadult Kemp's ridleys stay in shallow, warm, nearshore waters in the northern Gulf of Mexico until cooling waters force them offshore or south along the Florida coast (Renaud 1995). Little is known of the movements of the post-hatching, planktonic stage within the Gulf. Studies have shown the post-hatchling pelagic stage varies from 1-4 or more years, and the benthic immature stage lasts 7-9 years (Schmid and Witzell 1997).

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

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

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

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 Non-Target Species

No non-target species would be impacted because all permitted activities would occur onboard a commercial fishing vessel or related platforms.

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. However, it also would prohibit researchers from gathering information that could help endangered and protected sea turtles. The No Action alternative represents the status quo and would have no additional effects on the target species.

4.2 EFFECTS OF ALTERNATIVE 2: Issue permit with standard conditions

The proposed actions would be performed in the same manner as authorized in the current permit (File. No. 1552), the issuance of which resulted in a finding of no significant impact (NMFS 2005). The effects of the proposed action to individual sea turtles would not be expected to differ from those analyzed in the 2005 EA. Researchers would only be authorized to take turtles up to the amount authorized in the ITS or section 10(a)(1)(B) incidental take permit but may not exceed the upper totals of the proposed permit. If the takes for a fishery decreases, researchers would only be authorized to take the number authorized in the new ITS.

4.2.1 Effects of Handling and Holding

In the more than 15 years that the SEFSC has been conducting sea turtle research they have had no turtle injuries or mortalities as a result of their handling protocol (NMFS SEFSC 2005). In cases where turtles have ingested hooks, examination of the oral cavity may in fact prevent further injury

by ensuring proper removal. Untrained individuals can unwittingly do severe damage in removing hooks from turtles. Under the Proposed Action, turtles would be handled by SEFOP-certified observers who have been trained by veterinarians and SEFSC staff in safe removal techniques to minimize harm to the turtle. Furthermore, observers have received training in handling and resuscitation of sea turtles, allowing the turtles captured during fishing operations a better chance at recovery than if an observer had not been present. 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. In addition, the Permit Holder would only be able to conduct the authorized activities on compromised or injured sea turtles if the activities would not further compromise the animal.

4.2.2 Effects of Measuring, Weighing and Photographing

Handling, measuring, weighing, and photographing can result in raised levels of stress hormones in sea turtles. Turtles may experience stress as a result of being immobilized or during standard processing protocols, but it is anticipated that this stress would be minimal and of short duration. The handling, measuring, and weighing procedures would be simple and not invasive. NMFS expects that individual turtles would normally experience no more than short-term stresses or discomfort 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. The proposed actions described in this EA are the same as those authorized in the applicant's current permit (File No. 1552). Measurements would require less than five minutes to complete (NMFS SEFSC 2005).

4.2.3 Effects of Flipper and PIT Tagging and Carapace Painting

Tagging activities are minimally invasive and all tag types have associated negative factors, 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 must 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). The tendency of PIT tags to migrate once inserted has been examined, and PIT tags placed in the triceps (shoulder muscle) of the sea turtle are less likely to move and easier to detect, increasing recognition of recaptures, and making double-tagging less likely (Wyneken et al. 2010). As such, SEFOP observers are instructed to PIT tag sea turtles in the shoulder muscle (NMFS SEFSC 2008). Turtles can experience some discomfort during the tagging procedures and these procedures may produce some level of pain. The discomfort is usually 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 would be minimal and short-term and that the small wound-site resulting from a tag would heal completely in a short period of time. Animals with existing tags would not be retagged. 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).

In the 17 years that the SEFSC has been Inconel tagging turtles, all turtles exhibited normal behavior shortly afterward and swam normally once released (NMFS SEFSC 2005). Likewise, in the 9 years the applicant has conducted PIT tagging, discomfort was observed to be temporary. Turtles exhibited normal behavior shortly afterward and swam normally after release (NMFS SEFSC 2005). The NMFS Beaufort Laboratory, having recaptured almost 1,000 tagged turtles, has never encountered an animal showing adverse effects to either tagging methods (NMFS SEFSC 2005). In addition, the Permit Holder would only be able to conduct the authorized activities on compromised or injured sea turtles if the activities would not further compromise the animal.

The carapace paint applied to hardshell turtles is temporary and would eventually wear away (after approximately 1 month); thus, no long-term impacts are expected.

4.2.4 Effects of Release

To minimize stress and prevent potential injury, during release the applicant would be required to lower the animal as close to the water's surface as possible. Only debilitated turtles would be transported back to land to a STSSN coordinator. NMFS has determined that the benefits of care and rehabilitation the animal would receive would outweigh the minimal effects that could result from transport. Given the precautions that would be taken by the researchers and the permit conditions they would be required to follow to ensure the safety of the turtles, NMFS believes that the transport from the capture site would have minimal, insignificant effects on the animals. Turtles would be transported via a climate-controlled environment, protected from temperature extremes and kept moist. The turtles would be placed on pads for cushioning. The area surrounding the turtle would not contain any materials that could be accidentally ingested.

4.2.5 Effects of Salvage

NMFS PR believes that the collection of tissues, parts, and carcasses from incidental lethal takes of sea turtles accrued to the fisheries would not have an effect to sea turtle populations since these samples would not be collected from live animals. The incidental lethal take of the sea turtles by these fisheries would have been analyzed and covered by the individual section 7 biological opinions or 10(a)(1)(B) permits for each fishery or the platform removal program.

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 ESA and NMFS regulations. NMFS' issuance of the permit would be consistent with the ESA. The applicant has received IACUC approval from NMFS for their research protocols.

4.3.1 Endangered Species Act

To comply with section 7 of the regulations (50 CFR 402.14(c)), a consultation was initiated by NMFS PR under the ESA. In accordance with section 7, a biological opinion was prepared for the Proposed Action and NMFS concluded that issuance of Permit No. 15552 is not likely to

jeopardize the continued existence of loggerhead, green, hawksbill, leatherback, and Kemp's ridley sea turtles and is not likely to destroy or adversely modify designated critical habitat (NMFS 2011).

4.4 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. Because the capture of these sea turtles would be authorized through the individual fisheries, and the observer coverage is a required NMFS program, NMFS believes this would be an opportunity to collect invaluable data on animals already legally captured. 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 and better manage human activities. Neither the No Action nor the Proposed Action alternatives are anticipated to have adverse population or stock-level effects on sea turtles. The effects of the proposed activities would be limited to short-term harassment of individual sea turtles, as described above, therefore NMFS believes the proposed action would not have additional species-level effects than what was analyzed in the 2005 EA (NMFS 2005). Conditions in the proposed permit would be similar to those in Permit No. 1552, and were designed to minimize effects to individual sea turtles.

4.5 MITIGATION MEASURES

There are no additional mitigation measures beyond those identified by the applicant (described in section 2.2) and the conditions in the proposed permit, all of which are intended to minimize adverse effects of the various research activities. By statute, regulation, and permit conditions, NMFS has authority to modify the permit or suspend the research if information suggests it is having a greater than anticipated adverse impact on target species or the environment. Researchers would only be authorized to take turtles up to the amount authorized in the ITS or section 10(a)(1)(B) incidental take permit but may not exceed the upper totals of the proposed permit. If the fishery's take decreases during the life of the permit, researchers would only be authorized to take the number authorized in the new ITS.

4.6 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, short-term effect on individuals, and no effect on populations. No serious injury, mortality, or reduced fecundity would be expected.

4.7 CUMULATIVE EFFECTS

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

For a more detailed description of the cumulative effects, please see the Biological Opinion prepared for this action (NMFS 2011).

4.7.1 Commercial Fisheries

The applicant has requested authorization to handle, photograph, measure, flipper and PIT tag, skin biopsy, and release turtles that already have been legally captured incidentally in one of several commercial fisheries and to salvage parts from dead sea turtles. Commercial fishery activities are not part of the proposed action and the incidental take of sea turtles is analyzed and authorized separately under the existing Incidental Take Statement for each program's respective biological opinion or by an incidental take permit. The research that would be authorized by the proposed action would only occur on animals for which the incidental capture has already been analyzed and authorized under another authority. The effects of the research authorized under the proposed action would occur immediately after, and in addition to, the effects of the fishery. Commercial fisheries have incidentally taken sea turtles for decades though the magnitude of take by fisheries as a whole has likely changed over time as a result of the protection of sea turtles under the ESA, population declines, changes in fishing practices, and the management of turtle take by fisheries. While regulated, the take of sea turtles in these fisheries is expected to continue for the foreseeable future. A summary of the effects on sea turtles from these fisheries and programs is provided here to provide a more comprehensive discussion related to cumulative effects.

4.7.1.1 General Fisheries Impacts

The effects of fishery operations on sea turtles are not limited to the fisheries described in the Proposed Action. The operation of a fishery vessel in waters where sea turtles may be encountered poses some threat to these species due to risk of collisions with moving vessels. Sea turtles also interact with fishing gear such as longlines, hook and line, and bandit reel gear through hooking or entanglement in the fishing gear. Turtles that are hooked by this gear can be injured or killed by the hooking event, depending on whether they are hooked internally or externally and whether the hook sets deep in their tissue. Interaction with fishing gear can have long-term effects on a turtle's ability to swim, forage, migrate, and breed, although these effects are difficult to monitor or measure.

Pound nets, traps, pots, gillnet and trawl fisheries can entangle or entrap sea turtles. Sea turtles are particularly prone to entanglement as a result of their body configuration and behavior. Records of stranded or entangled sea turtles reveal that fishing debris can wrap around the neck, flipper, or body of a sea turtle and severely restrict swimming or feeding. Sea turtles may also experience constriction of appendages as a result of the entanglement. Constriction may cut off blood flow, causing deep gashes, some severe enough to remove an appendage. In the case of trawls, the gear is pulled across the bottom and would sweep over and capture the turtles as they rest, forage, or swim on or near the bottom. Video footage (NMFS Pascagoula Laboratory 2002) of wild loggerhead sea turtles encountering a turtle excluder device (TED) in a trawl reveals that the turtles are usually oriented forward, apparently trying to out-swim the advancing trawl. Because of the trawl's greater speed or the turtles' eventually tiring the turtles gradually fall back toward the rear of the net and into the cod end where they are caught. In most cases turtles would escape capture through the TEDs. Turtles that are taken would usually be in the try-net, with some in the main trawl that did not make it back to the TED area. The interaction of individual turtles with trawl gear during trawling activities can result in raised levels of stress hormones and turtle fatigue.

Turtles captured or entangled in any fishing gear used in these fisheries may also suffer forced submergence.

Sea turtles are air-breathing reptiles, and when forcibly submerged they undergo respiratory and metabolic stress that can lead to severe disturbance of acid-base balance. Most voluntary dives by sea turtles appear to be aerobic, showing little if any increases in blood lactate and only minor changes in acid-base status (pH level of the blood). Sea turtles that are stressed as a result of being forcibly submerged rapidly consume oxygen stores, triggering an activation of anaerobic glycolysis and subsequently disturbing the acid-base balance. It is likely that the rapidity and extent of the physiological changes that occur during forced submergence are functions of the intensity of struggling as well as the length of submergence (Lutcavage and Lutz 1997). These physiological mechanisms explain the link between tow-time length and mortality and injury (comatose condition). Although sea turtles are able to conduct lengthy voluntary dives, if they are captured in a trawl and unable to surface within a certain period of time, they will eventually die. However, studies analyzing the shrimp fishery show that tows of short duration have little effect on mortality, intermediate tow times result in a rapid escalation to mortality, and eventually reach a plateau of high mortality (Epperly et al. 2002). Epperly et al. (2002) did not attempt to estimate differing mortality rates based on the captured species, and the vast majority of animals in their data set were loggerheads. It is also probable that the different sea turtle species have different physiological responses to lengthy forced submergence due to differing average body sizes and corresponding oxygen capacities. In the absence of species-specific estimates, however, this work represents the best available scientific information available. Mortality in summer did not exceed 1% until after 50 minutes, but in winter, mortality exceeded 1% after 10 minute tow time run in the logistic equation developed for the shrimp fishery bycatch analysis (Sasso and Epperly 2006). Other factors to consider in the effects of forced submergence include the size of the turtle, ambient water temperature, and multiple submergences. Larger sea turtles are capable of longer voluntary dives than small turtles, so juveniles may be more vulnerable to the stress due to entanglement. During the warmer months, routine metabolic rates are higher, so the impacts of the stress due to entanglement may be magnified. With each forced submergence lactate levels increase and require a long (even as much as 20 hours) time to recover to normal levels. Another issue to consider is a repeated capture of the same individual turtle, particularly within a short time period. Previous biological opinions on trawling and the shrimp fishery (NMFS 2002) have discussed the possible role of repeated captures of individual turtles in trawls. As mentioned above, sea turtles that are forcibly submerged in fishery gear undergo respiratory and metabolic stress that can lead to severe disturbance of acid-base balance. Sea turtles forcibly submerged for extended periods of time show marked, even severe, metabolic acidosis as a result of high blood lactate levels. With such increased lactate levels, lactate recovery times are long (even as much as 20 hours or more). This indicates that turtles are probably more susceptible to lethal metabolic acidosis if they experience multiple captures in a short period of time, because they would not have had time to process lactic acid loads (Lutcavage and Lutz 1997). It is unclear how many captured turtles will be animals that are being recaptured immediately prior to the Proposed Action.

4.7.2 Research Permits

As summarized in Appendix 2, 16 active permits, including the applicant's current permit, allow research year-round on a combination of the five target species in areas that could overlap with the proposed action area. 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. There is not enough information about the exact location and timing of the research under the various permits to specifically identify the extent of overlap in time and space of all of the permitted research, or to identify the frequency with which any given local population may be disturbed. However, it is a standard condition of NMFS permits for research on sea turtles that researchers coordinate their activities with other Permit Holders to avoid unnecessary disturbance of animals. In addition, to mitigate the risk of negative cumulative effects to target animals, the researchers would scan the turtles for PIT tags before tagging. Turtles that have existing, functional flipper or PIT tags would not be tagged again in the same manner. Researchers would not be allowed to conduct activities on compromised animals if research would further compromise or harm the animal. Permitted researchers are also 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 this coordination and take other steps appropriate to minimize disturbance from multiple Permit Holders.

4.7.3 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 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.

4.7.4 Summary of Cumulative Effects

It is likely that issuance of the proposed permit would have some cumulative adverse effects on target animals. 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, such as the fisheries in which they are incidentally captured. 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 target animals or other portions of the human environment.

The Proposed Action would not be expected to have more than short-term effects on endangered and threatened sea turtle species. Any increase in stress levels resulting from the research would dissipate within approximately a day. Injuries caused by tagging and sampling would be expected to heal, and no serious injury or mortality would be expected to result from research activities. 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.

Based on this information, the incremental impact of the Proposed Action, when added to other past, present, and reasonably foreseeable future actions, would not be significant at a population or species level.

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.

No outside agencies were consulted.

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APPENDICES

Appendix 1: General Action Areas Table and Take Tables

Table I: General Action Areas for Each Commercial Fishery or Program.	
Fishery or Program	Action Area
Directed Shark Gillnet Fishery	Georgia to West Palm Beach, Florida
Shark Bottom Longline Fishery	Mid-Atlantic Bight to south Florida and Gulf of Mexico
Pelagic Longline Fisheries (includes 4 fisheries listed below)	Western Atlantic Ocean, Gulf of Mexico, and Caribbean Sea
Yellowfin tuna fishery	Gulf of Mexico
Southern Atlantic swordfish fishery	Florida East Coast to Cape Hatteras, NC
U.S. Atlantic Distant Water swordfish fishery	Atlantic Ocean
Caribbean tuna and swordfish fishery	Caribbean Sea
Commercial Shrimp Trawl Fishery	Gulf of Mexico and southeastern Atlantic Ocean
Directed Reef fish Fishery	U.S. Gulf of Mexico and off the east coast of the U.S.
Oil and Gas Platform Removal Program	U.S. Gulf of Mexico, from Texas to Alabama
Other NMFS Authorized Fisheries and Activities	Atlantic Ocean, Gulf of Mexico, Caribbean Sea, and their tributaries

Table 1: Maximum Total Takes (Course of Permit) of Sea Turtles under Permit No. 15552 in the Directed Shark Gillnet Fishery. Location: Atlantic Ocean, Gulf of Mexico, Caribbean Sea, and tributaries			
No. of Animals	Species	Age/Sex	Activity
16*	Loggerhead	Post-hatchling, subadult & adult of both sexes	Handle, measure, weigh, photograph, carapace mark (temporary), flipper tag, PIT tag, skin biopsy, release
2*	Leatherback	Post-hatchling, subadult & adult of both sexes	Handle, measure, weigh, photograph, carapace mark (temporary), flipper tag, PIT tag, skin biopsy, release
2*	Kemp's ridley	Post-hatchling, subadult & adult of both sexes	Handle, measure, weigh, photograph, carapace mark (temporary), flipper tag, PIT tag, skin biopsy, release
2*	Hawksbill	Post-hatchling, subadult & adult of both sexes	Handle, measure, weigh, photograph, carapace mark (temporary), flipper tag, PIT tag, skin biopsy, release
5*	Green	Post-hatchling, subadult & adult of both sexes	Handle, measure, weigh, photograph, carapace mark (temporary), flipper tag, PIT tag, skin biopsy, release
5*	Other sea turtle species (olive ridley, or unknown/hybrid)	Post-hatchling, subadult & adult of both sexes	Handle, measure, weigh, photograph, carapace mark (temporary), flipper tag, PIT tag, skin biopsy, release
29*	Any species above, combined total (mortality authorized by fishery ITS)	Post-hatchling, subadult & adult of both sexes	Salvage carcass, tissue samples/parts from incidental lethal take accrued to fishery

* = The number of takes authorized is contingent upon the ESA Section 7 biological opinion for the Incidental Take Statement (ITS) of fishery. If the ITS of the fishery increases, and only if a no jeopardy conclusion was made on the new consultation, researchers may take additional turtles up to the amount of the new ITS but not to exceed the upper totals of this permit. If the ITS decreases, researchers may take only the number authorized in the lower ITS.

Table 2: Maximum Total Takes (Course of Permit) of Sea Turtles under Permit No. 15552 in the Directed Shark Bottom Longline Fishery. Location: Atlantic Ocean, Gulf of Mexico, Caribbean Sea, and tributaries			
No. of Animals	Species	Age/Sex	Activity
27*	Loggerhead	Post-hatchling, subadult & adult of both sexes	Handle, measure, weigh, photograph, carapace mark (temporary), flipper tag, PIT tag, skin biopsy, release
2*	Leatherback	Post-hatchling, subadult & adult of both sexes	Handle, measure, weigh, photograph, carapace mark (temporary), flipper tag, PIT tag, skin biopsy, release
10* (combined total, all species)	Green, Kemp's ridley, Hawksbill	Post-hatchling, subadult & adult of both sexes	Handle, measure, weigh, photograph, carapace mark (temporary), flipper tag, PIT tag, skin biopsy, release
5*	Olive ridley or unknown/ hybrid	Post-hatchling, subadult & adult of both sexes	Handle, measure, weigh, photograph, carapace mark (temporary), flipper tag, PIT tag, skin biopsy, release
37*	Any species above, combined total (mortality authorized by fishery ITS)	Post-hatchling, subadult & adult of both sexes	Salvage carcass, tissue samples/parts from incidental lethal take accrued to fishery

* = The number of takes authorized is contingent upon the ESA Section 7 biological opinion for the Incidental Take Statement (ITS) of fishery. If the ITS of the fishery increases, and only if a no jeopardy conclusion was made on the new consultation, researchers may take additional turtles up to the amount of the new ITS but not to exceed the upper totals of this permit. If the ITS decreases, researchers may take only the number authorized in the lower ITS.

Table 3: Maximum Annual Takes of Sea Turtles under Permit No. 15552 in the Pelagic Longline Fishery. Accounts for maximum expected observer coverage.

Takes per species	Species	Age/Sex	Activity	Location
159	Loggerhead	Post-hatchling, subadult & adult of both sexes	Handle, measure, weigh, photograph, carapace mark (temporary), flipper tag, PIT tag, skin biopsy, release	Atlantic Ocean, Gulf of Mexico, Caribbean Sea, and tributaries
147	Leatherback	Post-hatchling, subadult & adult of both sexes	Handle, measure, weigh, photograph, carapace mark (temporary), flipper tag, PIT tag, skin biopsy, release	Atlantic Ocean, Gulf of Mexico, Caribbean Sea, and tributaries
10 (total, combined, all species)	Green, Kemp's ridley, Hawksbill, Olive ridley, or Unknown/ Hybrid	Post-hatchling, subadult & adult of both sexes	Handle, measure, weigh, photograph, carapace mark (temporary), flipper tag, PIT tag, skin biopsy, release	Atlantic Ocean, Gulf of Mexico, Caribbean Sea, and tributaries
52 (total combined, all species)	Any species above, combined total (mortality authorized by fishery ITS)	Post-hatchling, subadult & adult of both sexes	Salvage carcass, tissue samples/parts from incidental lethal take accrued to fishery	Atlantic Ocean, Gulf of Mexico, Caribbean Sea, and tributaries

Table 4: Maximum Annual Takes of Sea Turtles under Permit No. 15552 in the Commercial Shrimp Trawl Fishery. Takes occur year-round.

Takes per species	Species	Age/Sex	Activity	Location
50	Green	Post-hatchling, subadult & adult of both sexes	Handle, measure, weigh, photograph, carapace mark (temporary), flipper tag, PIT tag, skin biopsy, release OR salvage carcass, tissue samples/parts	Atlantic Ocean, Gulf of Mexico, Caribbean Sea, and tributaries
150	Loggerhead	Post-hatchling, subadult & adult of both sexes	Handle, measure, weigh, photograph, carapace mark (temporary), flipper tag, PIT tag, skin biopsy, release OR salvage carcass, tissue samples/parts	Atlantic Ocean, Gulf of Mexico, Caribbean Sea, and tributaries
100	Kemp's ridley	Post-hatchling, subadult & adult of both sexes	Handle, measure, weigh, photograph, carapace mark (temporary), flipper tag, PIT tag, skin biopsy, release OR salvage carcass, tissue samples/parts	Atlantic Ocean, Gulf of Mexico, Caribbean Sea, and tributaries
50	Hawksbill	Post-hatchling, subadult & adult of both sexes	Handle, measure, weigh, photograph, carapace mark (temporary), flipper tag, PIT tag, skin biopsy, release OR salvage carcass, tissue samples/parts	Atlantic Ocean, Gulf of Mexico, Caribbean Sea, and tributaries
50	Leatherback	Post-hatchling, subadult & adult of both sexes	Handle, measure, weigh, photograph, carapace mark (temporary), flipper tag, PIT tag, skin biopsy, release OR salvage carcass, tissue samples/parts	Atlantic Ocean, Gulf of Mexico, Caribbean Sea, and tributaries

50**	Olive ridley or unknown/ hybrid	Post-hatchling, subadult & adult of both sexes	Handle, measure, weigh, photograph, carapace mark (temporary), flipper tag, PIT tag, skin biopsy, release OR salvage carcass, tissue samples/parts	Atlantic Ocean, Gulf of Mexico, Caribbean Sea, and tributaries

** = These takes are not anticipated under the current fishery ITS; however, should they occur, they would be documented by the researchers to provide data for future fishery consultations.

Table 5: Maximum Annual Takes of Sea Turtles under Permit No. 15552 in the Directed Reef Fish Fishery (Bottom Longline and Bandit Reel Gear).

Takes per species	Species	Age/Sex	Activity	Location
17	Green	Post-hatchling, subadult & adult of both sexes	Handle, measure, weigh, photograph, carapace mark (temporary), flipper tag, PIT tag, skin biopsy, release	Atlantic Ocean, Gulf of Mexico, Caribbean Sea, and tributaries
269	Loggerhead	Post-hatchling, subadult & adult of both sexes	Handle, measure, weigh, photograph, carapace mark (temporary), flipper tag, PIT tag, skin biopsy, release	Atlantic Ocean, Gulf of Mexico, Caribbean Sea, and tributaries
9	Kemp's ridley	Post-hatchling, subadult & adult of both sexes	Handle, measure, weigh, photograph, carapace mark (temporary), flipper tag, PIT tag, skin biopsy, release	Atlantic Ocean, Gulf of Mexico, Caribbean Sea, and tributaries
2	Hawksbill	Post-hatchling, subadult & adult of both sexes	Handle, measure, weigh, photograph, carapace mark (temporary), flipper tag, PIT tag, skin biopsy, release	Atlantic Ocean, Gulf of Mexico, Caribbean Sea, and tributaries
2	Leatherback	Post-hatchling, subadult & adult of both sexes	Handle, measure, weigh, photograph, carapace mark (temporary), flipper tag, PIT tag, skin biopsy, release	Atlantic Ocean, Gulf of Mexico, Caribbean Sea, and tributaries
33**	Olive ridley or Unknown/ Hybrid	Post-hatchling, subadult & adult of both sexes	Handle, measure, weigh, photograph, carapace mark (temporary), flipper tag, PIT tag, skin biopsy, release	Atlantic Ocean, Gulf of Mexico, Caribbean Sea, and tributaries

168 (total combined, all species)	Any species above, combined total (mortality authorized by fishery ITS)	Post-hatchling, subadult & adult of both sexes	Salvage carcass, tissue samples/parts	Atlantic Ocean, Gulf of Mexico, Caribbean Sea, and tributaries

** = These takes are not anticipated under the current fishery ITS; however, should they occur, they would be documented by the researchers to provide data for future fishery consultations.

Table 6: Maximum Annual Takes of Sea Turtles under Permit No. 15552 in the Oil/Gas Platform Removal Program. Takes occur year-round.

Takes per species	Species	Age/Sex	Activity	Location
2	Green	Post-hatchling, subadult & adult of both sexes	Handle, measure, weigh, photograph, carapace mark (temporary), flipper tag, PIT tag, skin biopsy, release OR salvage carcass, tissue samples/parts	Atlantic Ocean, Gulf of Mexico, Caribbean Sea, and tributaries
10	Loggerhead	Post-hatchling, subadult & adult of both sexes	Handle, measure, weigh, photograph, carapace mark (temporary), flipper tag, PIT tag, skin biopsy, release OR salvage carcass, tissue samples/parts	Atlantic Ocean, Gulf of Mexico, Caribbean Sea, and tributaries
2	Kemp's ridley	Post-hatchling, subadult & adult of both sexes	Handle, measure, weigh, photograph, carapace mark (temporary), flipper tag, PIT tag, skin biopsy, release OR salvage carcass, tissue samples/parts	Atlantic Ocean, Gulf of Mexico, Caribbean Sea, and tributaries
2	Hawksbill	Post-hatchling, subadult & adult of both sexes	Handle, measure, weigh, photograph, carapace mark (temporary), flipper tag, PIT tag, skin biopsy, release OR salvage carcass, tissue samples/parts	Atlantic Ocean, Gulf of Mexico, Caribbean Sea, and tributaries
2	Leatherback	Post-hatchling, subadult & adult of both sexes	Handle, measure, weigh, photograph, carapace mark (temporary), flipper tag, PIT tag, skin biopsy, release OR salvage carcass, tissue samples/parts	Atlantic Ocean, Gulf of Mexico, Caribbean Sea, and tributaries

2	Olive ridley, or Unknown/ Hybrid**	Post-hatchling, subadult & adult of both sexes	Handle, measure, weigh, photograph, carapace mark (temporary), flipper tag, PIT tag, skin biopsy, release OR salvage carcass, tissue samples/parts	Atlantic Ocean, Gulf of Mexico, Caribbean Sea, and tributaries

** = These takes are not anticipated under the current fishery ITS; however, should they occur, they would be documented by the researchers to provide data for future Oil/Gas Platform Removal Program consultations.

Table 7: Maximum Annual Takes of Sea Turtles under Permit No. 15552 in other Authorized NMFS Fisheries and Activities NMFS May Observe***.

Takes per species	Species	Age/Sex	Activity	Location
20	Green	Post-hatchling, subadult & adult of both sexes	Handle, measure, weigh, photograph, carapace mark (temporary), flipper tag, PIT tag, skin biopsy, release	Atlantic Ocean, Gulf of Mexico, Caribbean Sea, and tributaries
100	Loggerhead	Post-hatchling, subadult & adult of both sexes	Handle, measure, weigh, photograph, carapace mark (temporary), flipper tag, PIT tag, skin biopsy, release	Atlantic Ocean, Gulf of Mexico, Caribbean Sea, and tributaries
50	Kemp's ridley	Post-hatchling, subadult & adult of both sexes	Handle, measure, weigh, photograph, carapace mark (temporary), flipper tag, PIT tag, skin biopsy, release	Atlantic Ocean, Gulf of Mexico, Caribbean Sea, and tributaries
20	Hawksbill	Post-hatchling, subadult & adult of both sexes	Handle, measure, weigh, photograph, carapace mark (temporary), flipper tag, PIT tag, skin biopsy, release	Atlantic Ocean, Gulf of Mexico, Caribbean Sea, and tributaries
50	Leatherback	Post-hatchling, subadult & adult of both sexes	Handle, measure, weigh, photograph, carapace mark (temporary), flipper tag, PIT tag, skin biopsy, release	Atlantic Ocean, Gulf of Mexico, Caribbean Sea, and tributaries
20	Olive ridley	Post-hatchling, subadult & adult of both sexes	Handle, measure, weigh, photograph, carapace mark (temporary), flipper tag, PIT tag, skin biopsy, release	Atlantic Ocean, Gulf of Mexico, Caribbean Sea, and tributaries

5	Unidentified Cheloniid	Post-hatchling, subadult & adult of both sexes	Handle, measure, weigh, photograph, carapace mark (temporary), flipper tag, PIT tag, skin biopsy, release	Atlantic Ocean, Gulf of Mexico, Caribbean Sea, and tributaries
50	Any species above, combined total (if mortality authorized by fishery ITS)	Post-hatchling, subadult & adult of both sexes	Salvage carcass, tissue samples/parts from incidental lethal take accrued to fishery	Atlantic Ocean, Gulf of Mexico, Caribbean Sea, and tributaries

*** = The animals must have been legally taken (e.g., covered by the incidental take statement [ITS] of an ESA section 7 biological opinion or by an ESA incidental take permit [ITP] with "no jeopardy" conclusions). The number of animals used for research by the Permit Holder shall not exceed the number authorized by ITSs or ITPs).

Possible fisheries that would be observed and their gear types include the Migratory Coastal Pelagic Fisheries- Gulf of Mexico and South Atlantic (Trolling and Gill Nets); Southeastern and Gulf of Mexico Crab Fisheries (Crab Trap/Pot); South Atlantic Snapper-grouper (Trap); Lobster Trap Fishery (Pot); Butterfish, Squid Fish Trawl Fishery (Paired / Single Trawl); Recreational Private Boat Fishery (Hook and Line, Cast Net, Crab Pot, Gill Net, Rake, Tong, Seine); Jellyfish Surface Trawl Fishery (Trawl); Inshore Gillnet Fishery (Gillnet); North Carolina Coastal Gillnet Fishery in State and Federal Waters (Gillnet); North Carolina Pound-net Fishery (Pound Net); Southeastern Atlantic Croaker and Weakfish Fishery (Flynet); Atlantic Menhaden Purse-Seine Fishery (Purse Seine); Gulf Menhaden Purse-Seine Fishery (Purse Seine); Brown, White, Pink and Other Marine Shrimp Fishery (Cast net); Gulf of Mexico Pink Shrimp Fishery (Beam Trawl); Brown, White, Pink, Seabob and Other Marine Shrimp Fishery (Skimmer Trawl); Brown, White, Pink, Seabob and Other Marine Shrimp Fishery (Butterfly Net); North Carolina Haul/Beach Seine for Striped Bass, Weakfish, Spot, Striped Mullet (Multifilament Seine; Monofilament Gillnet/Seine); North Carolina Long-Haul Seines for Spot, Weakfish, and Atlantic Croaker (Seine); North Carolina Stop Nets for Striped Mullet (Multi-filament Anchored Net and Multifilament Beach Seine); Black Sea Bass Pot Fishery (Pot/Traps); Winter Fluke (Flounder) Trawl Fishery (Trawl).

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 or Near the Action Area.

Permit Number	Permit Holder	Expiration Date
14726	Blair Witherington, FFWCC	September 15, 2015
14506	Llewellyn Ehrhart	September 15, 2015
13573	Michael Salmon	May 1, 2012
14622-01	Allen Foley, FFWCC	February 28, 2016
14949	Carlos Diez	April 29, 2016
15606	Andre Landry	March 30, 2016
13543	State of South Carolina	April 30, 2014
1551	NMFS SEFSC	July 1, 2013
1552	NMFS SEFSC	June 30, 2011*
1570	NMFS SEFSC	December 31, 2011
1571	NMFS SEFSC	December 31, 2011
1576	NMFS NEFSC	September 30, 2011
1599	Inwater Research Group Inc.	June 30, 2012
13306	Karen Holloway-Adkins	June 30, 2013
10022-01	Ray Carthy	April 30, 2013
14655	Jane Provancha	June 1, 2015

* = This permit would expire on the date noted or upon issuance of the new permit within the Proposed Action, whichever occurs first.

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 associated with scallop dredging, in addition to the death of 1 loggerhead and 1 Kemp's ridley over the course of the permit, through 2011, for their satellite tagging project.

Permit No. 1570 authorizes the lethal take of up to 3 loggerhead, 2 green, 1 leatherback, 2 Kemp's ridley, 1 hawksbill, and 1 olive ridley sea turtle over the course of the permit through 2011.