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

Environmental Assessment
on
Effects of Issuing Endangered Species Scientific Research Permit No. 15802

June 2012

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

Responsible Official: Helen M. Golde, Acting 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) 427-8400

Location: U.S. Locations; primarily the coastal waters of Florida

Abstract: The National Marine Fisheries Service (NMFS) proposes to issue Scientific Research Permit No. 15802, pursuant to the Endangered Species Act of 1973 (ESA; 16 U.S.C. 1531 *et seq.*). The permit would be valid for five years from the date of issuance. The primary purpose of the proposed permit is to authorize takes of endangered smalltooth sawfish (*Pristis pectinata*) for scientific purposes related to research and monitoring of smalltooth sawfish in order to develop conservation and protective measures to ensure smalltooth sawfish recovery range-wide. The proposed permit would also authorize takes of threatened and endangered sea turtles incidentally caught during sampling. The proposed permit would authorize the capture, measuring, tissue and blood sampling, passive integrated transponder, roto, and internal and external satellite tagging of smalltooth sawfish. The proposed research would take place in state and Federal waters of Florida and the southeastern United States.

Printed on Recycled Paper

Contents

1.0 Purpose of and Need for Action.....3

2.0 Alternatives Including the Proposed Action 4

3.0 Affected Environment.....8

4.0 Environmental Consequences 16

5.0 Mitigation Measures.....22

6.0 List of Preparers and Agencies Consulted……22

7.0 Literature Cited.....23

Appendix A: Permit Conditions.....26

Appendix B: Recent Environmental Assessments for Sawfish Research Permits 27

1.0 PURPOSE OF AND NEED FOR ACTION

Proposed Action: In response to an application from the Florida Fish and Wildlife Conservation Commission [Gregg Poulakis, Responsible Party], 100 Eighth Avenue, SE, St. Petersburg, FL, 33701, NMFS proposes to issue Scientific Research Permit No. 15802, pursuant to the Endangered Species Act of 1973 (ESA; 16 U.S.C. 1531 *et seq*.) for "takes"[1] of smalltooth sawfish and sea turtles species, including those listed as threatened or endangered.

Purpose of and Need for Action: The ESA prohibits "takes" of threatened and endangered species with only a few specific exceptions. The applicable exception in this case is an exemption for scientific purposes related to species recovery under Section 10(a)(1)(A) of the ESA.

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 that is consistent with the ESA issuance criteria. The need for issuance of the permit is related to NMFS's mandates under the ESA. NMFS has a responsibility to implement the ESA to protect, conserve, and recover threatened and endangered species under its jurisdiction. Facilitating research about species' basic biology and ecology or that identifies, evaluates, or resolves specific conservation problems informs NMFS management of protected species.

Scope of Environmental Assessment: This EA focuses primarily on effects on smalltooth sawfish, listed as endangered under the ESA. This EA will also discuss the effects of research on listed sea turtle species encountered during research which will have research activities performed on them.

The National Oceanic and Atmospheric Administration (NOAA) has, in NOAA Administrative Order 216-6 (NAO 216-6; 1999), listed issuance of permits for research on threatened and endangered species as categories of actions that "do not individually or cumulatively have a significant effect on the human environment…" and which therefore do not require preparation of an environmental assessment (EA) or environmental impact statement (EIS). A possible exception to the use of these categorical exclusions is when the action may adversely affect species listed as threatened or endangered under the ESA (NAO 216-6 Section 5.05c).

The target species of the applicant's research is smalltooth sawfish (*Pristis pectinata*), which are listed as endangered under the ESA. Other listed species that are the subject of the permit include green (*Chelonia mydas*), hawksbill (*Eretmochelys imbricata*), Kemp's ridley (*Lepidocheyls kempii*), leatherback (*Dermochelys coriacea*), and loggerhead (*Caretta caretta*) sea turtles. There is no evidence from prior analyses[2] of the effects of permit issuance, or from

[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."

[2] Since 2005, NMFS has prepared over 100 EAs for issuance of permits under the MMPA and ESA. In every case, the EA supported a finding of no significant impact regardless of the nature of the permitted take or the status of the species that were the subject of the permit. These EAs were accompanied by Biological Opinions prepared pursuant to interagency consultation under section 7 of the ESA and further document that such permits are not likely to adversely affect listed species. A listing of recently completed EAs on this species is provided in Appendix B.

monitoring reports submitted by permit holders[3], that issuance of research permits for take of marine mammals listed under the ESA results in adverse effects on stocks or species. Nevertheless, NMFS has prepared this EA, with a more detailed analysis of the potential for adverse impacts on threatened or endangered species resulting from takes of a specified number of smalltooth sawfish and listed sea turtle species, to assist in making the decision about permit issuance under the ESA.

2.0 ALTERNATIVES INCLUDING THE PROPOSED ACTION

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.

Alternative 2 - Proposed Permit: Under the Proposed Permit alternative, 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 objective of the applicant's research is directly related to objectives identified in the Smalltooth Sawfish Recovery Plan by characterizing habitat utilization by juveniles and adults, performing genetic assessments, and gathering data for population viability analyses. The permit would contain terms and conditions standard to such permits as issued by NMFS (see Appendix A).

The following is a summary of the applicant's request to take endangered smalltooth sawfish, and sea turtles, including those listed as threatened or endangered under the ESA.

Methods: The research protocols are described in detail in the application on file for this action (available by contacting the Office of the responsible official for this EA) and are briefly summarized here. The proposed research protocols consist of capturing smalltooth sawfish, measuring, tissue and blood sampling, tagging with rototags, PIT tags, acoustic tags, and satellite/conductivity temperature depth (CTD) tags, biopsy punch, and ultrasound. Sea turtles captured during sampling would be measured, photographed, and released.

The proposed project would capture smalltooth sawfish by longlines, hook and line, gill nets, and seines. The type of gear used would vary depending on location, habitat, and season in order to optimize the likelihood of collecting smalltooth sawfish.

Monthly directed or targeted sampling would be conducted year-round using a multi-gear approach and would be based on encounter reports by the public. Gear used would depend upon the location, habitat and season to maximize likelihood of capture. Sampling gear used for directed sampling would include 183m x 3m haul seines with 25mm nylon mesh; standard hook and line gear; a small customized longline system (heavy monofilament mainline that would be a maximum of 800m long and equipped with 15/0 corrodible non-offset circle hooks that would be about 1m in length and spaced every 10m); and 45m, 91m, and 183m gillnets with 152mm (6") stretched mesh.

[3] All NMFS permits for research on endangered species require submission of annual reports, which include information on responses of animals to the permitted takes.

Monthly stratified-random sampling (SRS), stratified by zone and shoreline habitat (i.e., presence/absence of overhanging shoreline habitat), would be conducted year-round using a 183 m x 2.5 m center-bag haul seine with 38-mm stretched nylon mesh (~25 hauls/month). The seine would be deployed by boat, set in a rectangular shape along the shoreline, and retrieved by hand. To standardize the dimensions of the area sampled (~ 40 m x 103 m), the net would be pre-marked (painted floats) at 40 m from each end of the net, designating the corner locations of the rectangular-shaped set.

In addition, where opportunity allows, a hook and line system would be employed. This would consist of a large reel with heavy line and a 1 m leader, baited with fish, including mullet, stingray, and ladyfish.

The researchers would not administer drugs of any kind during their sampling.

Although all species would be handled, only sawfish would be tagged. Because this study would be conducted as a portion of and in conjunction with the ongoing State of Florida's Fisheries-Independent Monitoring (FIM) program, all samples from randomly selected sites would be processed according to standard FIM protocol, with some additional sample processing specifically for sawfish and sea turtles. This has the advantages of allowing the researchers to characterize both the biological and physical settings in which sawfish are found.

In order to process the fish, the researchers would fill a net well in the stern of the boat with water or use a small plastic wading pool as a temporary environment for small (<6 feet total length) sawfish before and during sample processing and data recording. Larger sawfish would be tethered to the side of the boat using ropes tied around the rostrum and body, including around the caudal peduncle (base of tail). These large animals would be kept submerged and brought aboard the boat for processing only if necessary. If sufficiently large (>10 feet total length), they would be secured along the side of the boat in a manner such that their gills would be submerged and they would be processed there. All sawfish would be measured (precaudal length, rostrum length, rostral tooth count per side, rostral tooth length, disc width, maximum total length, and clasper length) to the nearest millimeter. Sawfish would also be assessed for overall health (e.g., external condition, broken rostral teeth), and a small fin clip (~1 cm^2) would be taken for genetic analysis from the free rear tip of the dorsal fin of each animal. In addition, small blood samples (1-5ml) would be obtained via caudal venipuncture and less than 6% of total blood volume from any individual sawfish would be collected.

Rototags, passive integrated transponder tags (PIT tags), external acoustic tags (e.g., Vemco), Conductivity Temperature Depth (CTD) tag, and/or satellite tags (e.g., Wildlife Computers) would be applied directly to a dorsal fin or the base of the dorsal fin of captured sawfish. All smalltooth sawfish would receive a PIT tag, a rototag, acoustic tag, and a CTD tag. Fifteen juvenile and fifteen adult smalltooth sawfish would also receive an external satellite tag. Duration of attachment depends on initial tag placement and sawfish habitat use. Tag types and attachment methods would be chosen based on success with other elasmobranch species including sawfish (e.g., rototags) as well as new technology (e.g., satellite tags) and they have remained on individuals for up to several months (P. O'Donnell, Florida Department of

Environmental Protection, *pers. comm.*; Thorson 1982). For example, the NMFS shark tagging program uses rototags for sharks. All of the above mentioned tags are small (e.g., 12 mm x 1.5 mm for PIT tags, about 18 cm long x 25 mm diameter for satellite or sonic tags) compared with the size of a sawfish and involve making small leather-punch-like holes in dorsal fins to affix rototags. External acoustic or CTD tags would be attached to the rototag or attached via a neoprene clasp. Small syringe-like holes at the base of a dorsal fin would be used to apply internal PIT tags. Satellite tags would be attached via a harness assembly. Sonic tag frequency would be between 69 kHz and 81 kHz.

Table 1: Summary of Tag Types and Attachment Methods

Tag Type	Tag Attachment Method
Rototags	Leather punch to make hole, secure tag through hole
PIT tags	Needle at base of first dorsal fin
External acoustic tags (Vemco)	Attached to rototag OR neoprene clasp
CTD tags	Attached to rototag OR neoprene clasp
Satellite tags	Harness assembly

Ultrasound examination would occur as part of the normal health assessment work-up procedure of sawfish upon capture. This procedure would be used to determine stomach contents and gonad size in juveniles and adults; additionally, in adult females, brood size would also be examined using ultrasound. Time required for ultrasound examination would be between 5-10 minutes. During examination, the gills and spiracles of the sawfish would be kept in water.

Biopsy punches would be taken from the "shoulder" of the sawfish, i.e., the area on the side of the fish just in front of the first dorsal fin. If any sawfish exhibit gross external lesions elsewhere on the body, the applicant will forego the shoulder biopsy and the biopsy wherever the lesion is located.

Duration: The proposed research is a continuation of the smalltooth sawfish monitoring currently authorized under Permit File No. 1475. The permit would be valid for five years from date of issuance, which is the maximum duration of an ESA permit.

Target species or stocks: The applicant's research is directed at smalltooth sawfish. However, as the research involves research in areas where sea turtles are present, the applicant requests takes of green, hawksbill, Kemp's ridley, leatherback, and loggerhead sea turtles for measuring, photographing and release. The researchers have received training in sea turtle sampling from NMFS Southeast Fisheries Science Center (SEFSC) and will provide data on sea turtles encountered during sampling as instructed by NMFS SEFSC.

Table 2: Proposed Annual Takes of Listed Species

No. per Year	Species	Lifestage	Take Activity	Details
125	Smalltooth Sawfish	juvenile (<2.0 m[6 ft.] TL)	Capture[a], measure, genetic and blood sample, biopsy punch, PIT tag, rototag, acoustic tag, CTD tag*, ultrasound, release	Recaptured sawfish will only be captured, measured, and released. Tags will be reapplied if lost.
15	Smalltooth Sawfish	juvenile (>2.0 m [6 ft.] TL)	Capture[a], measure, genetic and blood sample, biopsy punch, PIT tag, rototag, CTD tag*, external satellite tag, ultrasound, release	Recaptured sawfish will only be captured, measured, and released. Tags will be reapplied if lost.
50	Smalltooth Sawfish	adult (<3.0 m [10 ft.] TL)	Capture[a], measure, genetic and blood sample, biopsy punch, PIT tag, rototag, acoustic tag, CTD tag*, ultrasound, release	Recaptured sawfish will only be captured, measured, and released. Tags will be reapplied if lost.
15	Smalltooth Sawfish	adult (<3.0 m [10 ft.] TL)	Capture[a], measure, genetic and blood sample, biopsy punch, PIT tag, rototag, CTD tag*, external satellite tag, ultrasound, release	Recaptured sawfish will only be captured, measured, and released. Tags will be reapplied if lost.
50	Smalltooth Sawfish	All	Salvage (carcass, tissue, parts), necropsy	From strandings or law enforcement
50	Smalltooth Sawfish	All	Receipt and analysis of blood samples	Taken by other permitted researchers
10[b]	Loggerhead sea turtle	All except hatchling	Capture[a], measure carapace and release	Capture is incidental to sawfish sampling.
10[b]	Green sea turtle	All except hatchling	Capture[a], measure carapace and release	Capture is incidental to sawfish sampling.
10[b]	Kemp's ridley sea turtle	All except hatchling	Capture[a], measure carapace and release	Capture is incidental to sawfish sampling.

No. per Year	Species	Lifestage	Take Activity	Details
6[b]	Hawksbill sea turtle	All except hatchling	Capture[a], measure carapace and release	Capture is incidental to sawfish sampling.
6 [b]	Leatherback sea turtle	All except hatchling	Capture[a], measure carapace and release	Capture is incidental to sawfish sampling.

[a] Capture by longline, hook and line, gill nets or seine.
[b] Over the life of the permit.
*CTD = Conductivity Temperature Depth

3.0 AFFECTED ENVIRONMENT

Location

Smalltooth sawfish have been reported in both the Pacific and Atlantic Oceans, but the U.S. population is found only in the Atlantic. Historically, the U.S. population was common throughout the Gulf of Mexico from Texas to Florida, and along the east coast from Florida to Cape Hatteras. The current range of this species has contracted to peninsular Florida where they are relatively common only in the Everglades region at the southern tip of the state.

The proposed research would primarily take place in state and federal waters off Florida, but may occur in state waters of North Carolina to Texas. The main areas of directed sampling for smalltooth sawfish would be the Charlotte Harbor estuarine system, including the Peace, Myakka, and Caloosahatchee rivers in southern Florida.

Located on the west coast of peninsular Florida, Charlotte Harbor is the second largest open water estuary in the state with the entire watershed measuring more than 12,000 square kilometers. The basins of the Peace, Myakka, and Caloosahatchee Rivers feed freshwater into the coastal area. In southwest Florida, barrier islands and coastal waters such as Lemon Bay, Matlacha Pass, Pine Island Sound, Charlotte Harbor, and Estero Bay are supplied with freshwater from those three rivers and nearby areas. Despite impacts from the expanding human population, the main body of Charlotte Harbor and its adjacent estuarine systems are in comparatively good condition.

The Charlotte Harbor estuary and contiguous coastal waters serve as important habitat including feeding grounds and nursery areas for more than 270 species of resident, migrant, and commercial fishes of the Gulf of Mexico. This estuarine system and its watershed are both directly and indirectly a vitally important economic asset to the Florida coast. Manatees, sea turtles, wood storks, and dolphins are also found in the estuary and its watershed. Seitz and Poulakis (2002) state that between 1990 and 2001, there were 100 reports of sawfish encounters in the Greater Charlotte Harbor. These reports were from fishermen, other biologists, guides, scuba divers and several other sources.

Status of Target Species Status of ESA-listed species

Smalltooth Sawfish

Smalltooth sawfish typically inhabit the shallow coastal waters of warm seas, rarely descending below ten meters. They are often found close to shore in muddy and sandy bottoms in sheltered bays, on shallow banks, and in estuaries or river mouths. According to the smalltooth sawfish recovery plan, historically, smalltooth sawfish were found as far north as New Jersey in the warm summer months (NMFS 2009); however, in recent decades the population size and range have severely declined due to fishing pressures and habitat alteration and degradation.

Due to a lack of data, the current population size cannot be estimated. It is known, however, that the current known populations are limited to the lower reaches of the Florida peninsula, primarily in the Everglades and Florida Keys (Seitz and Poulakis 2002). Based on reported sightings through several sources (Seitz and Poulakis 2002), the researchers propose to direct sampling efforts in the greater Charlotte Harbor estuarine system (e.g., Caloosahatchee River, Peace River, and Myakka River); however, they also propose to sample throughout the statewide range of the animal when they receive reports of sawfish sightings.

The number of each species that would be affected is provided in Table 1 found in the preceding section. For further information about smalltooth sawfish, please refer to the attached Biological Opinion.

Sea Turtles

The following species would be affected.

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

**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.*

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 USVI 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) (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).

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. TDR 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. 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.

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.

Status of Other Affected Species

Non-Target ESA-Listed Species

Florida Manatee: Manatees are listed as endangered under the ESA and designated as depleted under the MMPA. The West Indian manatee stock is divided into two subspecies, the Antillean manatee (*Trichechus manatus manatus*) and the Florida manatee (*Trichechus manatus latirostris*). Florida manatees may be encountered in canals, rivers, estuarine habitats, saltwater bays, and on occasion have been observed as much as 3.7 miles off the Florida Gulf coast.

Interactions with the Florida manatee are not expected, based on the applicant's past sampling history under Permit No. 1475. Researchers would comply with State guidelines for minimizing impacts to Florida Manatee while sampling in addition to standard permit mitigation conditions developed through discussions with the U.S. Fish and Wildlife Service (USFWS). During research activities, researchers would stay on site and tend the gear constantly. Therefore, no consultation was conducted with the USFWS.

Gulf, Shortnose, and Atlantic Sturgeon:
Gulf sturgeon (*Acipenser oxyrinchus desotoi*) was listed as a threatened species under the Endangered Species Act in 1991, and is under the joint jurisdiction of FWS and NOAA Fisheries. Critical habitat for Gulf sturgeon was established on March 19, 2003 (68 FR 13370). Historically, the Gulf sturgeon occurred from the Mississippi River to Tampa Bay (Wooley and Crateau 1985). Its present range extends from Lake Pontchartrain and the Pearl River system in Louisiana and Mississippi east to the Suwannee River in Florida. Sporadic occurrences have been recorded as far west as the Rio Grande River between Texas and Mexico, and as far east and south as Florida Bay (Wooley and Crateau 1985, Reynolds 1993).

Endangered shortnose sturgeon (*Acipenser brevirostrom*) are benthic fish that mainly occupy the deep channel sections of large rivers. They can be found in rivers along the western Atlantic coast from St. Johns River, Florida (possibly extirpated from this system), to the Saint John River in New Brunswick, Canada. The species is anadromous in the southern portion of its range (*i.e.*, south of Chesapeake Bay), while some northern populations are amphidromous. Since the experimental trawling would not occur in or near the rivers where concentrations of shortnose sturgeon are most likely found, it is highly unlikely that the proposed action will affect shortnose sturgeon.

Atlantic sturgeon (*A. oxyrinchus oxyrinchus*), with a variety of Distinct Population Segments listed as threatened or endangered under the ESA, are anadromous. They spawn in moderately flowing water (46-76 cm/s) in deep parts of large rivers. Juveniles usually reside in estuarine waters for months to years. Subadults and adults live in coastal waters and estuaries when not spawning, generally in shallow (10-50 m depth) nearshore areas dominated by gravel and sand substrates. Long distance migrations away from spawning rivers are common.

The applicant has not reported any sturgeon encounters as part of previous permits. In the unlikely event that a sturgeon is encountered, the researchers would be able to promptly disentangle the fish because they would be staying on site and constantly tending the gear.

The permit would be conditioned as follows: This permit does not authorize takes of any protected species not identified in the take table, including those species under the jurisdiction of the USFWS (e.g., manatees). Should other protected species be encountered during the research activities authorized under this permit, researchers must exercise caution and remain a safe distance from the animal(s) to avoid take, including harassment.

Non-Target Marine Animals

In addition to the species that are the subject of the permit, an assortment of sea birds, fish and invertebrates may be found in the action area. The permit would only authorize takes of smalltooth sawfish and green, loggerhead, Kemp's ridley, leatherback, and hawksbill sea turtles. Numerous species of fishes and invertebrates reside within the proposed sampling areas, and would potentially be captured incidentally during the directed sampling. Such bycatch species, as based on previously published research (Poulakis et al. 2004) would likely include striped mullet (*Mugil cephalus*), hardhead catfish (*Ariopsis felis*), cownose ray (*Rhinoptera bonasus*), Atlantic stingray (*Dasyatis sabina*), blue crab (*Callinectes sapidus*), and blacktip shark (*Carcharhinus limbatus*), among others. Due to mitigation measures in the permit such as frequent net checks, NMFS PR expects that all bycatch species will be released alive and they are not considered further.

Biodiversity and Ecosystem Function

The proposed action is directed at endangered smalltooth sawfish and listed sea turtle species and does not interfere with benthic productivity, predator-prey interactions or other biodiversity or ecosystem functions. Target species will not be removed from the ecosystem or displaced from habitat, nor will the permitted research affect their diet or foraging patterns. Further, the proposed action does not involve activities known or likely to result in the introduction or spread of nonindigenous species, such as ballast water exchange or movement of vessels among water bodies. Thus, effects on biodiversity and ecosystem function will not be considered further.

Ocean and Coastal Habitats

The proposed action is directed at smalltooth sawfish and listed sea turtle species and would not cause adverse long-term impacts on habitat. It does not involve alteration of substrate, movement of water or air masses, or other interactions with physical features of ocean and coastal habitat. Thus, effects on habitat will not be considered further.

Unique Areas

The proposed action areas would primarily be the state and federal waters of Florida, largely in the Charlotte Harbor estuarine system, but could also encompass unique areas like Everglades National Park. The applicant would be required to obtain all necessary permits and permissions in order to conduct sampling within Everglades National Park or any other unique or ecologically critical areas. Within the proposed action areas, essential fish habitat (EFH) is designated for various species of fish, which includes hard and soft bottom substrates. The proposed action is directed at smalltooth sawfish and listed sea turtle species and does not alter or affect unique areas, including any components of EFH. The permit would contain standard conditions to mitigate adverse impacts to bottom substrate and EFH. Thus, effects on such unique areas will not be considered further.

Historic Places, Scientific, Cultural, and Historical Resources
There are no districts, sites, highways or structures listed in or eligible for listing in the National Register of Historic Places in the action area. The proposed action represents non-consumptive use of marine animals and does not preclude their availability for other scientific, cultural, or historic uses. Thus, effects on such resources will not be considered further.

Social and Economic Resources
The proposed action does not affect distribution of environmental burdens, access to natural or depletable resources or other social or economic concerns. It does not affect traffic and transportation patterns, risk of exposure to hazardous materials or wastes, risk of contracting disease, risk of damages from natural disasters, food safety, or other aspects of public health and safety. Thus, effects on such resources will not be considered further.

4.0 ENVIRONMENTAL CONSEQUENCES

Effects of the No Action Alternative
There are no direct or indirect effects on the environment of not issuing the permit. The takes of smalltooth sawfish and sea turtles, including those listed as threatened or endangered, resulting from the applicant's research would not be exempted. It is unlikely the applicant would conduct the research in the absence of a permit, because to do so would risk sanctions and enforcement actions.

Effects of the Proposed Permit Alternative
Effects would occur at the time when the applicant's research results in takes of smalltooth sawfish and sea turtle species, including those listed as threatened or endangered.

Any impacts of the proposed action would be limited to the biological environment and primarily to the target species of the permit. Thus, the types of research activities proposed in the permit request are not likely to affect the physical or socioeconomic environment, pose a risk to public health and safety, or affect any critical habitat.

The proposed project would require the directed take of smalltooth sawfish by longlines, hook and line, gill nets, and seines. The type of gear used would vary depending on location, habitat, and season in order to optimize the likelihood of collecting smalltooth sawfish.

The proposed capture methods pose a potential risk to smalltooth sawfish but would not likely kill the sawfish based on the applicant's previous experience on his current permit, File No. 1475. On another permit, Dr. Simpfendorfer (File No. 1352) has employed all of these capture methods without a smalltooth sawfish mortality or any negative effects to the physical and biological environment. In surveys conducted by Mote Marine Laboratory 30 individual smalltooth sawfish have been captured, handled, tagged, and released in good condition from 2000 to 2004. The majority of these were captured in gillnets.

The proposed capture methods could generally affect sea turtles by entangling or hooking the turtles in fishing gear. Turtles that become entangled in the gear may drown when they are forcibly submerged or the entangling lines may injure them. Turtles that are hooked by longline

gear can be injured or killed, depending on whether they are hooked internally or externally and whether the hook sets deep in their tissue. In addition to these immediate effects, the gear can have long-term effects on a turtle's ability to swim, forage, migrate, and breed, although these long-term effects are difficult to monitor or measure. However, the probability of catching a turtle using the proposed methods would be low. Under the applicant's current permit (File No. 1475), researchers have captured and safely released 2 green, 1 loggerhead, and one Kemp's Ridley sea turtle in five years of sampling. Since effort for the proposed research would be increased relative to File No. 1475, the applicant believes there is an increased chance for turtle interactions, and so has requested slightly more sea turtle takes (see Table 2). (Please note that these takes are requested for over the life of the permit, not annually.) The applicant has been trained by Southeast Fisheries Science Center personnel in safe handling practices of sea turtles, and would provide information on any captures to biologists that would provide information about the species abundance and distribution. Additionally, researchers would be required to follow mitigation measures to minimize the impact of any sea turtle capture. These measures would be incorporated as conditions in the permit and no mortalities would be expected.

The permit would include conditions that minimize the effects of the research activities on all species. To mitigate any possible effects of capture, the soak time of longlines and nets would be limited. Hooks would be removed, if possible, or only a short length of line left on the imbedded hook. Corrodible non-offset circle hooks equal to or greater than 14/0 would be used, which would allow the researchers to catch a wide size range of sawfish while at the same time minimize the negative effect of hooking on both sawfish and turtles. Actively fished nets (i.e., seines) would be monitored constantly from the beginning of the set until the sample is completed. Passively fished gears (gillnets and longlines) would be constantly monitored while being set and checked a minimum of every 30 min, with the crew remaining on station. All animals caught would be immediately untangled (if necessary), processed (e.g., measured and, for sawfish only, rostral teeth counted, tagged, genetics and blood sample taken), and returned to the water as quickly as possible.

The rostrum of a sawfish would be immobilized to prevent injury to the sawfish (i.e., chipping of rostral teeth) and researchers by 1) holding the tip of the rostrum firmly between the thumb and forefinger of a researcher for small sawfish or 2) a rope, tied into a bowline for easy removal, would be looped around the tip of the rostrum and held for large sawfish. The researchers would take this precaution to prevent damage to the rostral teeth because the rostral teeth are used by the sawfish for feeding and defense.

Other procedures performed on sawfish would include ultrasound imaging. Ultrasound imaging would be used to evaluate the stomach contents and gonad size of juveniles (and brood size in adult females). This technique is non-invasive and would typically last between 5-10 minutes. Any stresses associated with this activity are expected to be minimal and short-term.

The researchers would take a small (less than one square centimeter) tissue sample clipped with surgical scissors from the rear tip of the dorsal fin for genetic analysis. The procedure is common and accepted practice in elasmobranch research. Research has shown that it does not impair the animal's ability to swim and is not thought to have any long-term adverse impact. An extensive tagging program for small sharks has been underway at Mote Marine Laboratory since

the early 1990s. Based on recapture data there has been no difference in recapture rate between clipped and unclipped blacktip sharks. This suggests that the survival of these animals is comparable, and that fin clips do not have a significant long-term impact on the health of elasmobranchs (C. Simpfendorfer, *pers. comm.*). The biopsy technique would be similar in size to a PIT tag injection site, and the applicant has witnessed signs of healing in recaptured sawfish (G. Poulakis, pers. comm.); therefore, it is expected that the biopsy sampling would not have long-term adverse impact.

Blood sampling would be conducted using the same technique currently authorized under Permit No. 13300 (SEFSC; John Carlson). Caudal venipuncture blood sampling (1-5ml) would constitute less than 6% of total blood volume from any individual sawfish (see Table 3).

Table 3: Blood Sampling	
Sawfish body weight	Amount of blood draw
<1 kg	1 ml
1-2 kg	3 ml
>2 kg	5 ml

Sterile, disposable 1-1 ½ inch 20-24 gauge needles and syringes would be used for blood sampling. All sawfish would be restrained with the ventral side up by securing the saw and caudal tail. The needle would enter the tail at the ventral midline and remain as close to the midline position as possible during penetration of the muscle until the vertebral column is reached. Slight penetration of the caudal vertebrae would allow access to the caudal vein (Walsh and Luer, 2004-Chapter 23 of the Elasmobranch Husbandry Manual: Captive Care of Sharks, Rays and their Relatives). No harmful side effects have been observed from the blood draws conducted under other permits, and no known mortalities have resulted from the process.

All tags would be attached to the dorsal fin or at its base and would cause short-term injury to the individuals but would not likely affect how the individual completes its life history. These methods have been regularly employed in elasmobranch research with little lasting impact on the individuals tagged (Heupel and Bennett, 1997). Wounds from tagging have healed following initial hemorrhaging and inflammation. Studies done on the effects of tagging on shark tissue showed inflammation at the tagging site but it was due to scar tissue, not infection. All animals tagged appeared healthy and free of infection and without signs of emaciation. Dr. Simpfendorfer has tagged at least 18 sawfish in 2003-2004 using these same methods and all were released in good condition. Recaptures of several individuals later in the sampling season confirmed the continued health of the individuals after tagging (C. Simpfendorfer, *pers. comm.*).

Handling and measuring can result in raised levels of stressor hormones in sea turtles. The measuring procedures are simple and not invasive and NMFS does not expect that individual turtles would normally experience more than short-term stresses as a result of these activities. Handling activities would also be necessary to free the turtles from the gear and would be necessary to minimize the impact of the capture on the animals. The applicant would be required to follow procedures designed to minimize the risk to sea turtles during handling.

In addition, conditions in the Permit would minimize the stress to the animals associated with tagging. These measures include restrictions on the length of time a sawfish or turtle may be handled or out of the water, types of handling and capture, conditions on tagging, and a re-evaluation of methods if any animal is killed.

Another important consideration is whether the sounds emitted by the satellite tags/sonic transmitters would affect the sawfish. Hueter et al. (2004) explained that few audiograms have been published in elasmobranchs to date. Casper and Mann (2006) examined the hearing abilities of the nurse shark (*Ginglymostoma cirratum*) and results show that this species detected low frequency sounds from 100-1000 Hz with best sensitivity from 100-400 Hz. However, available laboratory studies suggest that shark hearing is less sensitive than some other fishes and all sharks tested show mainly low-frequency sensitivity. While good hearing information is not available for smalltooth sawfish, estimates for hearing sensitivity in available studies of related species provided ranges of 25 Hz to 1,000 Hz. In general, these studies found that shark hearing is not as sensitive as other tested fishes and that sharks (close relatives of the sawfish) are most sensitive to low frequency sounds (Kritzler and Wood, 1961; Banner, 1967; Casper et al., 2003). Thus it appears that the sonic transmitters would not affect the smalltooth sawfish, given the frequency of the sonic tags is well above the 1,000 Hz threshold.

Similarly, this frequency level would not be expected to adversely affect turtles. Sea turtles have low-frequency hearing sensitivity and are potentially affected by sound energy in the band below 1,000 Hz (Lenhardt 2003). Bartol et al. (1999) found the effective bandpass of the loggerhead sea turtle to be between at least 250 and 1000 Hz. Ridgeway et al. (1969) found the maximum sensitivity of the green sea turtle hearing range to fall within 300-500 Hz with a sharp decline at 750 Hz. Since the sonic tags that would be authorized for sea turtle tracking research would transmit at frequencies well above this hearing threshold these tags would not be heard by the turtles. NMFS would not expect the transmitters to interfere with turtles' normal activities.

Although the sonic frequency of the tags does fall within the range of some other marine animal species (e.g., marine mammals), the intensity of the sound would be expected to have no measurable impact on these species. NMFS believes the use of sonic tags under the proposed research would not appreciably affect any marine animal species. Sonic tags would be shed by the sawfish.

Effects of Other Activities

As summarized in Appendix B, two active permits, including the applicant's current permit, allow research year-round on smalltooth sawfish 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 ESA-listed species 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 and sawfish for PIT tags. Specimens that have existing, functional satellite 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.

Smalltooth sawfish have historically faced numerous anthropogenic threats, chief among them being incidental capture in fisheries (Poulakis et al. 2010). Additionally, the sawfish's rostrum was a prized curio item, and the species was targeted so that the rostrum could be taken and sold for display (Seitz and Poulakis 2002). In addition, one of the major contributors to declines in sea turtle populations was the commercial harvest of eggs and turtles.

Today, target smalltooth sawfish and 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 sawfish and 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.

Chapter 4 of the EA prepared for issuance of a permit to monitor populations of smalltooth sawfish in coastal Florida waters (NMFS 2006) contains a discussion of the manner in which exposure to sounds is likely to affect smalltooth sawfish and listed sea turtles, including consideration of when an adverse effect upon an individual animal equates to an adverse effect upon the entire species to which that animal belongs. That discussion and evaluation is hereby incorporated by reference. In summary, takes of smalltooth sawfish and listed sea turtles, as may occur under the Proposed Permit Alternative, may adversely affect individual animals but do not result in adverse effects on stocks or species, because the effects on individuals are short-term and recoverable.

Controversy

Federal agencies are required to consider "the degree to which effects on the quality of the human environment are likely to be highly controversial" when evaluating potential impacts of a proposed action. [40 CFR §1508.27] The application for the proposed permit was made available for public review and comment. A Notice of Receipt of the application was published in the *Federal Register*, announcing the availability of the application for public comment (76 FR 45230, July 28, 2011). NMFS did not receive public comments on this application.

The action being considered by NMFS is issuance of a permit to exempt take of smalltooth sawfish and listed sea turtles during bona fide scientific research. Issuance of 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 will authorize other individuals or organizations to conduct the same or similar activity.

As previously noted, issuance of such permits is among a class of actions categorically excluded from the need to prepare an EA or EIS because they do not generally have a potential for significant impacts. An EIS is not required unless NMFS finds potential for significant impacts. This EA has been prepared to provide a more detailed analysis of the potential for significant impacts and to assist in making the decision about permit issuance under the MMPA and ESA.

Cumulative Impacts

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 smalltooth sawfish or 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.

5.0 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, as discussed in the description of the Proposed Permit Alternative.

In summary, the permit conditions limit the level of take and require notification, coordination, monitoring, and reporting. Although injury and mortality are not expected due to the proposed research activities, the permit contains precautionary measures to prevent such outcomes.

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.

6.0 LIST OF PREPARERS AND AGENCIES CONSULTED

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

Agencies Consulted: U.S. Fish and Wildlife Service was consulted regarding manatee conditions for this action.

7.0 LITERATURE CITED

Banner, A. 1967. Evidence of sensitivity to acoustic displacements in the lemon shark, *Negaprion brevirostris* (Poey). pp. 265–273. *In*: P.H. Cahn (ed.) Lateral Line Detectors, Indiana University Press, Bloomington, Indiana.

Bartol, S. M., J. A. Musick and M. L. Lenhardt. 1999. Auditory Evoked Potentials of the Loggerhead Sea Turtle (*Caretta caretta*). Copeia 3: 836-840.

Casper B.M., P.S. Lobel, H.Y. Yan. 2003. The Hearing Sensitivity of the Little Skate, *Raja erinacea*: A Comparison of Two Methods. Environmental Biology of Fishes, vol. 68, no. 4, pp. 371-379(9).

Casper B.M., and D.A. Mann. 2006. Evoked potential audiograms of the nurse shark (Ginglymostoma cirratum) and the yellow stingray (Urobatis jamaicensis). Environmental Biology of Fishes, vol. 76, pp. 101-108.

Conant, T.A., P.H. Dutton, T. Eguchi, S.P. Epperly, C.C. Fahy, M.H. Godfrey, S.L. MacPherson, E.E. Possardt, B.A. Schroeder, J.A. Seminoff, M.L. Snover, C.M. Upite, and B.E. Witherington. 2009. Loggerhead sea turtle *(Caretta caretta)* 2009 status review under the U.S. Endangered Species Act. Report of the Loggerhead Biological Review Team to the National Marine Fisheries Service, August 2009. 222 pages.

Eckert S.A., K.L. Eckert, P. Ponganis, and G.L. Kooyman. 1989. Diving and foraging behavior of leatherback sea-turtles (*Dermochelys coriacea*). Canadian Journal of Zoology; 67 2834-2840.

Garduño-Andrade, M., V. Guzmán, E. Miranda, R. Briseño-Dueñas, and F.A. Abreu-Grobois. 1999. Increases in hawksbill turtle (*Eretmochelys imbricata*) nestings in the Yucatán Peninsula, Mexico, 1977-1996: Data in support of successful conservation? Chelonian Conservation and Biology 3(2), 286-295.

Henwood, T.A. and L.H. Ogren. 1987. Distribution and migrations of immature Kemp's ridley turtles (*Lepidochelys kempii*) and green turtles (Chelonia mydas) off Florida, Georgia, and South Carolina. Northeast Gulf Science 9(2): 153-160.

Heupel, M.R. and M.B. Bennett. 1997. Histology of dart tag insertion sites in the epaulette shark. *Journal of Fish Biology* 50:1034-1041.

Hildebrand, H. 1963. Hallazgo del area de anidacion de la tortuga "lora" *Lepidochelys kempii* (Garman), en la costa occidental del Golfo de Mexico (Rept. Chel.). Ciencia Mex., 22(4):105-112.

Hirth, H.F. 1971. Synopsis of biological data on the green sea turtle, *Chelonia mydas*. FAO Fisheries Synopsis No. 85: 1-77.

Hueter, R.E., D.A. Mann, K.P. Maruska, J.A. Sisneros and L.S. Demski. 2004. Sensory biology of elasmobranchs. In Biology of Sharks and their Relatives, J. Carrier, J. Musick and M. Heithaus, eds. CRC Press, Boca Raton, Florida, p. 325-368.

Lenhardt, M.L. 2003. Effects of Noise on Sea Turtles, Proceedings of the First International Conference on Acoustic Communication by Animals, University of Maryland, July 27-30.

Lutcavage, M. and J.A. Musick. 1985. Aspects of the biology of sea turtles in Virginia. Copeia 1985(2): 449-456.

Meylan, A.B. 1988. Spongivory in hawksbill turtles: a diet of glass. Science 239:393-395.

Meylan, A.B. 1999. Status of the hawksbill turtle (*Eretmochelys imbricata*) in the Caribbean region. *Chelonian Conservation and Biology, 3*(2), 177-184.

Meylan, A.B. and M. Donnelly. 1999. Status justification for listing the hawksbill turtle (*Eretmochelys imbricata* as critically endangered on the 1996 IUCN Red List of Threatened Animals. Chelonian Conservation and Biology 3(2): 200-204.

NMFS SEFSC. 2001. Stock assessments of loggerhead and leatherback sea turtles and an assessment of the impact of the pelagic longline fishery on the loggerhead and leatherback sea turtles of the Western North Atlantic. U.S. Department of Commerce, National Marine Fisheries Service, Miami, FL, SEFSC Contribution PRD-00/01-08; Parts I-III and Appendices I-V1.

National Marine Fisheries Service. 2009. Recovery Plan for Smalltooth Sawfish (*Pristis pectinata*). Prepared by the Smalltooth Sawfish Recovery Team for the National Marine Fisheries Service, Silver Spring, Maryland.

NMFS and United States Fish and Wildlife Service. (USFWS) 1991. Recovery Plan for U.S. Population of Atlantic Green Turtle. National Marine Fisheries Service, Washington, D.C.

NMFS and USFWS. 1995. Status reviews for sea turtles listed under the Endangered Species Act of 1973. National Marine Fisheries Service, Silver Spring, MD. 139 pp.

Ogren, L.H. 1989. Distribution of juvenile and sub-adult Kemp's ridley sea turtle: Preliminary results from 1984-1987 surveys. Pp. 116-123 *In* Caillouet, C.W. and A.M. Landry (eds), First Intl. Symp. on Kemp's Ridley Sea Turtle Biol, Conserv. and Management. Texas A&M Univ.Galveston, TX., Oct. 1-4, 1985, TAMU-SG

Poulakis, G. R., R. E. Matheson Jr., M. E. Mitchell, D. A. Blewett, and C. F. Idelberger. 2004. Fishes of the Charlotte Harbor estuarine system, Florida. Gulf of Mexico Science 22:117–150.

Poulakis, G.R., P.W. Stevens, A.A. Timmers, C.J. Stafford, C. Curtis, M.D. Tringali, and M.D. Bakenhaster. 2010. Distribution, habitat use, and movements of juvenile smalltooth sawfish, Pristis pectinata, in the Charlotte Harbor estuarine system, Florida. Final Report to the National Marine Fisheries Service for Award NA06NMF4720032. FWRI Filecode F2616-06-09-F. 84 pp.

Pritchard, P.C.H. 1969. Endangered species: Kemp's ridley turtle. Florida Naturalist, 49: 15-19.

Renaud, M.L. 1995. Movements and submergence patterns of Kemp's ridley turtles (*Lepidochelys kempii*). Journal of Herpetology 29: 370-374.

Ridgeway, S.H., E.G. Wever, J.G. McCormic, J. Palin, and J.H. Anderson. 1969. Hearing in the Giant Sea Turtle, *Chelonia mydas*. Proceedings of the National Academy of Sciences, Vol. 64, No. 3, pp. 884-900.

Schmid, J.R. and W.N. Witzell. 1997. Age and growth of wild Kemp's ridley turtles (*Lepidochelys kempii*): cumulative results of tagging studies in Florida. Chelonian Conservation Biology 2: 532-537.

Seitz, J.C. and G.R. Poulakis. 2002. Recent occurrence of sawfishes (Elasmobranchiomorphi: Pristidae) along the southwest coast of Florida (USA). Florida Scientist 65:256-266.

Thorson, T. B. (1982). Life history implications of a tagging study of the largetooth sawfish, Pristis perotteti, in the Lake Nicaragua–Rio San Juan system. Environmental Biology of Fishes 7, 207–228.

Turtle Expert Working Group (TEWG). 1998. An assessment of the Kemp's ridley (*Lepidochelys kempii*) and loggerhead (*Caretta caretta*) sea turtle populations in the Western North Atlantic. NOAA Technical Memorandum NMFS-SEFSC-409. 96 pp.

TEWG. 2007. An Assessment of the Leatherback Turtle Population in the Atlantic Ocean. NOAA Technical Memorandum NMFS-SEFSC-555. 116 pp.

van Dam, R. and C. Diez. 1998. Home range of immature hawksbill turtles (*Eretmochelys imbricata*) at two Caribbean islands. Journal of Experimental Marine Biology and Ecology 220(1):15-24.

Walsh, C.J. and C.A. Luer. 2004. Elasmobranch Hemotology: Identification of Cell Types and Practical Applications. Pages 307-323 *in* The Elasmobranch Husbandry Manual: Captive Care of Sharks, Rays and their Relatives. (M. Smith, D. Warmolts, D. Thoney, and R. Hueter, eds.). Ohio Biological Survey, Inc, Columbus, Ohio.

Wooley, C.M. and E.J. Crateau. 1985. Movement, microhabitat, exploitation, and management of Gulf of Mexico sturgeon, Apalachicola River, Florida. North American Journal of Fisheries Management 5: 590-605.

APPENDIX A: PERMIT CONDITIONS

The following outlines the conditions that are included in permits for research on listed species issued by NMFS under the Endangered Species Act (ESA). The language of the conditions may vary slightly in actual permits, but still address the underlying statutory or regulatory requirements. All permits for research on endangered species specify that the activities authorized by the permit must occur by the means, in the areas, and for the purposes set forth in the permit application, and as limited by the following Terms and Conditions specified in the permit, including all attachments and appendices. These conditions originate from the permit requirements of the ESA, and NMFS regulations for permits.

Netting/Capture

- Nets would be of an appropriate size (e.g., mesh size)
- Nets would possess floats
- Nets would be monitored and frequently checked
- Longline gear would use off-set circle hooks
- Turtles would be handled and sampled as per NMFS Southeast Fisheries Science Center protocol

Biopsy Sampling

- Sterile techniques and equipment would be used
- Sample area would be cleaned before and after collection
- Limited number of samples would be taken

Tagging

- All sawfish would be scanned for the presence of existing tags
- Total weight of all tags would not exceed 4% body mass of the sawfish
- Placement of tags would be such so as to minimize the risk of entanglement

Non-target Species Mitigation Measures

- Nets would not be deployed if marine mammals are observed in the vicinity
- Net avoidance measures would be taken if marine mammals come into sampling area once nets are deployed
- Nets would be removed if marine mammals do not leave area
- USFWS guidance on avoiding Florida manatee interactions would be followed

Appendix B: Recent Environmental Assessments for Smalltooth Sawfish Research Permits

NMFS Permits Division has prepared EAs with Findings of No Significant Impact (FONSI) for issuance of permits to conduct research on smalltooth sawfish and sea turtles. Those EAs were prepared to take a closer look at potential environmental impacts of permitted research on endangered smalltooth sawfish and sea turtles listed as threatened or endangered, and not because the Permits Division determined that significant adverse environmental impacts were expected or that the a categorical exclusion was not applicable. As each EA demonstrates, and each FONSI has documented, research on smalltooth sawfish and listed sea turtles generally does not have a potential for significant adverse impacts on either of the respective populations or any other component of the environment.

Some of the most recently prepared EAs of relevance to the scope of this EA are:

- *Supplemental Environmental Assessment (SEA) on the Issuance of a Modification to Scientific Research Permit No. 13330 to the NMFS Southeast Fisheries Science Center to Conduct Research on Protected Smalltooth Sawfish (NMFS 2011)*

  A SEA was prepared for issuance of a modification to scientific research Permit No. 13330 and describes the effects of conducting research on smalltooth sawfish and listed sea turtles. The research protocols included changes to the tag attachment methods. Plastic rototags were replaced with neoprene clasp tags and nylon umbrella darts were replaced with dorsal fin harnesses. A Finding of No Significant Impact (FONSI) was signed on July 18, 2011, based on information indicating that these changes, in combination with the mitigation measures in the permit, would ensure no mortality or severe injuries will occur, and the effects on animals will be short-term in nature and not expected to result in any cumulative adverse effects. Permit 13330 as amended is effective thought October 31, 2013.

- *Environmental Assessment Scientific Research Permit to the Southeast Fisheries Science Center (Permit File No. 13330) to Conduct Research on Protected Smalltooth Sawfish* (NMFS 2008)

  The EA was prepared for issuance of scientific research Permit No. 13330 and describes the effects of conducting research on smalltooth sawfish and listed sea turtles. The research protocols include attachment of satellite tags, blood and tissue sampling of smalltooth sawfish, and the capture and handling of listed sea turtle species. The research occurs in waters off Florida. A Finding of No Significant Impact (FONSI) was signed on September 17, 2008, based on information indicating that the research protocols and mitigation measures in the permit ensure no mortality or severe injuries will occur, and the effects on animals will be short-term in nature and not expected to result in any cumulative adverse effects.

- *Environmental Assessment on the Effects of National Marine Fisheries Service (NMFS) Issuance of a Scientific Research Permit to the Florida Fish and Wildlife Conservation Commission (FFWCC) that would Authorize Research Activities on Smalltooth Sawfish in the State of Florida [File No. 1475]* (NMFS 2005)

  The EA was prepared for issuance of scientific research Permit No. 1475 and describes the effects of conducting research on smalltooth sawfish and listed sea turtles. The research protocols include capture and attachment of passive integrated transponder, acoustic, dart, and roto-tags, measurement, and tissue sampling of smalltooth sawfish, and the capture and measurement of listed sea turtles. The research occurs in waters off Florida. A Finding of No Significant Impact (FONSI) was signed on October 17, 2005, based on information indicating that the research protocols and mitigation measures in the permit ensure no mortality or severe injuries will occur, and the effects on animals will be short-term in nature and not expected to result in any cumulative adverse effects. Permit No. 1475 is the applicant's current permit, and would expire upon issuance of the new permit within the Proposed Action.