

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

## JAN 26 2012

To All Interested Government Agencies and Public Groups:

Under the National Environmental Policy Act (NEPA), an environmental review has been performed on the following action.

TITLE:	Environmental Assessment on the Effects of Issuing a Permit for Scientific Research on Protected Sea Turtles in the Hawaiian Islands
LOCATION:	Hawaiian Islands
SUMMARY:	NMFS proposes to issue a scientific research permit for takes under the authority of the Endangered Species Act. The purpose of File No. 15685 is to determine growth rates, health status, stock and population structure, foraging ecology, habitat use, and movements of green and hawksbill sea turtles. The preferred alternative is not expected to have more than short-term effects on individual sea turtles and will not significantly impact the quality of the human environment.
RESPONSIBLE	
OFFICIAL:	James H. Lecky
	Director, Office of Protected Resources
	National Marine Fisheries Service
	National Oceanic and Atmospheric Administration
	1315 East-West Highway, Room 13821
	Silver Spring, MD 20910
	(301) 427-8400

The environmental review process led us to conclude that this action will not have a significant effect on the human environment. Therefore, an environmental impact statement will not be prepared. A copy of the finding of no significant impact (FONSI) including the supporting environmental assessment (EA) is enclosed for your information.

Although NOAA is not soliciting comments on this completed EA and FONSI we will consider any comments submitted that would assist us in preparing future NEPA documents. Please submit any written comments to the responsible official named above.

Sincerely,

Patricia A. Montanic

NOAA NEPA Coordinator

Enclosure



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## **Environmental Assessment**

on the Effects of Issuing a Permit for Scientific Research on Protected Sea Turtles in the Hawaiian Islands

January 2012		
Lead Agency:	USDOC National Oceanic and Atmospheric Administration National Marine Fisheries Service Office of Protected Resources	
Responsible Official:	James H. Lecky, Director, Office of Protected Resources	
For Further Information Contact:	Office of Protected Resources National Marine Fisheries Service 1315 East West Highway Silver Spring, MD 20910 (301) 427-8400	
Location:	Hawaiian Islands	

**Abstract**: The National Marine Fisheries Service (NMFS) proposes to issue Scientific Research Permit No. 15685, 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 permit would exempt the holder from takes of sea turtles under the ESA, by capture, harassment, wounding and harm. The purpose of the research is to determine growth rates, health status, stock and population structure, foraging ecology, habitat use, and movements of green (*Chelonia mydas*) and hawksbill (*Eretmochelys imbricata*) sea turtles.

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## 1.0 PURPOSE OF AND NEED FOR ACTION

**Proposed Action**: In response to an application from the National Marine Fisheries Service Pacific Islands Fisheries Science Center, (NMFS PIFSC, Samuel Pooley, Responsible Party), NMFS proposes to issue Scientific Research Permit No. 15685, pursuant to the Endangered Species Act of 1973 as amended (ESA; 16 U.S.C. 1531 <u>et seq</u>.) for "takes"<sup>1</sup> of protected sea turtles.

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

The purpose of the permit is to provide the applicant with an exemption from the take prohibitions under the ESA for harassment of threatened or endangered species, during conduct of research that is consistent with the ESA issuance criteria.

The need for issuance of the permit is related to the purposes and policies of 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 green (*Chelonia mydas*) and hawksbill (*Eretmochelys imbricata*) sea turtle populations in the Pacific Ocean, listed as threatened and endangered under the ESA, respectively. These are the target species of the applicant's research.

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 protected 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). Therefore, 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 the target sea turtles, to assist in making the decision about permit issuance under the ESA.

## Other EA/EIS that Influence Scope of this EA:

The PIFSC has prepared a programmatic environmental assessment (PEA, NMFS PIFSC 2011) for their Marine Turtle Research Program. The PEA describes all of the applicant's research

<sup>&</sup>lt;sup>1</sup> 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."

and education and outreach activities in the terrestrial and marine environment and analyzes impacts to the target sea turtles and non-target species that could be affected within Hawaii. All of the applicant's research activities proposed for Permit No. 15685 within the action area are described and analyzed as part of the PEA's marine portion of research activities. The PEA determined that the human environment would not be significantly impacted by the PIFSC's Marine Turtle Research Program.

In addition, the applicant is currently permitted to conduct sea turtle research under Permit No. 1581. An EA was prepared for that permit and similarly concluded with a finding of no significant impact to the marine environment (NMFS 2006a). The proposed action would replace this permit and would be almost identical in scope. The location and species would be the same. The only change in methods would be a slight reduction in activities as a previously authorized manner of capture would not be authorized under Permit No. 15685.

# 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 prohibition against take.

Alternative 2 - Proposed Permit: Under the Proposed Permit alternative, a permit would be issued to exempt the applicant from the ESA take prohibition during conduct of research that is consistent with the purposes and policies of the ESA and applicable permit issuance criteria.

The purpose of the applicant's research is to continue long-term monitoring of the status of green and hawksbill sea turtles in the Hawaiian Islands. Researchers would capture, tag, and biologically sample up to 600 green turtles and 25 hawksbills annually to determine their abundance, size ranges, health and disease status, diving behavior, habitat use, foraging ecology, local movements, and migration routes. A primary goal is to integrate data from genetic analysis, flipper tagging, and satellite telemetry to identify nesting beach origins of turtles occurring in the Hawaiian Islands and contribute to the overall understanding of sea turtle stock structure in the Pacific Ocean. Researchers would compare current data with those collected in the Hawaiian Islands since 1973 to determine growth rates of juveniles and adults, assess changes in the health status of the population, and examine population abundance trends.

<u>Action Area</u>: The proposed research would take place in the coastal waters of the Hawaiian Islands including Hawaii, Maui, Lanai, Molokai, Oahu, Kauai, and Midway Atoll. For specific study site maps see Appendix 1.

<u>Methods</u>: The research protocols are described in detail in the application on file for this action and are briefly summarized here. Juvenile, subadult and adult turtles of both sexes would be captured by hand capture with a scoop net in shallow coastal waters, hand capture while snorkeling, hand capture while diving from a slow moving boat, and entanglement net capture. A variety of research techniques would be employed: *i*) flipper tagging, passive integrated transponder (PIT) tagging, and shell etchings (mototool) to identify individual turtles, *ii*) morphometric analysis to determine the size, mass, sex, and health of each captured animal, *iiii*) genetic analysis of tissue samples collected from each turtle to determine nesting beach origin, *iv*) biotelemetry (radio, acoustic, satellite, archival) to determine movements and habitat use of a subset of captures, *v*) blood sampling for genetic analysis to determine nesting beach origin and/or assess health status of individuals, *vi*) diet sampling using esophageal lavage (for greens only), and *vii*) stable isotope analysis of tissue samples for foraging ecology research. A primary goal would be to integrate data from genetic analysis, flipper tagging, and satellite telemetry to identify nesting beach origins of turtles occurring in the Hawaiian Islands and contribute to the overall understanding of sea turtle stock structure in the Pacific Ocean. An animal could receive up to three transmitters (1 satellite or sonic tag + 1 or 2 Time Depth Recorders (TDRs)) affixed with epoxy or resin at one time. If tagged animals are opportunistically recaptured, transmitters (gear) may be removed. See Table 1 for details on take activities. No lethal take would be authorized.

Further descriptions of the research procedures can be found in the PIFSC's draft PEA (NMFS PIFSC 2011) of their marine turtle research program. The PEA describes all of the applicant's research activities in the terrestrial and marine environment, which are hereby incorporated by reference.

<u>Duration</u>: This permit would be valid for 5 years from the date of issuance. Researchers expect to begin fieldwork in January 2012.

<u>Target species or stocks</u>: The applicant proposes to take green and hawksbill sea turtles. The proposed annual take for each species is summarized in Table 1.

Number of Turtles	Sea Turtle Species	Take Activity
250	Green	Mark, carapace (temporary), measure, weigh, flipper tag, PIT tag, release
100	Green	Mark, carapace (temporary), measure, weigh, flipper tag, PIT tag, shell etch, release
200	Green	Lavage, Mark, carapace (temporary), measure, weigh, flipper tag, PIT tag, blood sample, scute scrape sample, shell etch, tissue sample, tumor sample, release.
50	Green	Instrument, epoxy attachment (e.g., satellite, VHF tag), Lavage, Mark, carapace (temporary), measure, weigh, flipper tag, PIT tag, blood sample, scute scrape sample, shell etch, tissue sample, tumor sample, release and recapture (gear removal)
20	Hawksbill	Mark, carapace (temporary), measure, weigh, flipper tag, PIT tag, blood sample, scute scrape sample, tissue sample, shell etch, tumor sample, and release

Table 1: Proposed annual takes of juvenile, sub-adult, and adult green and hawksbill sea turtles captured under Permit No. 15685.

		Instrument, epoxy attachment (e.g., satellite, VHF tag), Mark,
		carapace (temporary), measure, weigh, flipper tag, PIT tag,
		blood sample, scute scrape sample, shell etch, tissue sample,
5	Hawksbill	tumor sample, release and recapture (gear removal)

#### Mitigation Measures

In addition to the applicant's stated methods, the proposed permit would include language that would minimize impacts to the target animals and prevent impacts to bottom habitat such as sea grasses and live bottom.

## 3.0 AFFECTED ENVIRONMENT

#### Location

As identified in Ch. 2, research would occur in the coastal waters of the Hawaiian Islands of the Pacific Ocean. Research could occur in the Hawaiian Islands Humpback Whale National Marine Sanctuary. Protected areas include Hanauma Bay Marine Life Conservation District (Oahu), Kaloko-Honokohau National Historic Park (Hawaii), Puuhonua O Honaunau National Historic Park (Hawaii). A more detailed description of the action area can be found in the PEA prepared by the PIFSC for their marine turtle research program (NMFS PIFSC 2011), and is hereby incorporated by reference.

### **Status of Target ESA Species**

ESA Endangered	
Green sea turtle	Chelonia mydas*
Hawksbill sea turtle	Eretmochelys imbricata

\*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 sea turtles are considered endangered wherever they occur in U.S. waters.

A brief summary of these species is provided here. A more detailed description of the biology, status and threats for these species is provided in the Biological Opinion prepared for Permit No. 14381 and is hereby incorporated by reference (NMFS 2010).

#### Green sea turtle

Green turtles are found throughout the world, occurring primarily in tropical, and to a lesser extent, subtropical waters. Throughout the Pacific, nesting assemblages group into two distinct regional clades: 1) western Pacific and South Pacific islands, and 2) eastern Pacific and central Pacific, including the rookery at French Frigate Shoals, Hawaii. In the Hawaiian Islands, green turtles are site-specific and consistently feed in the same areas on preferred substrates, which

vary by location and between islands (Landsberg et al. 1999). In Hawaii, green turtles lay up to six clutches of eggs per year (mean of 3.7) and clutches consist of about 100 eggs each. Females migrate to breed only once every two or possibly many more years. On the Hawaiian Archipelago, females nest every 3 to 4 years (Balazs and Chaloupka 2004). Eastern Pacific green turtles have reported nesting between two and six times during a season, laying a mean of between 65 and 86 eggs per clutch, depending on the area studied (Michoacán, Mexico and Playa Naranjo, Costa Rica) (in Eckert 1993 and NMFS and USFWS 1998a). Mean observed and estimated clutch frequency for green turtles nesting at Colola beach (Michoacan, Mexico) was 2.5 and 3.2, respectively (Arias-Coyotl et al. 2003). Nesting populations are doing relatively well in the Pacific, Western Atlantic, and Central Atlantic Ocean but are doing relatively poorly in Southeast Asia, Eastern Indian Ocean, and perhaps the Mediterranean (NMFS and USFWS 2007a).

#### Hawksbill sea turtle

The hawksbill sea turtle occurs in tropical and subtropical seas of the Atlantic, Pacific, and Indian Oceans. Within the Central Pacific, nesting is widely distributed but scattered and in very low numbers. Foraging hawksbills have been reported from virtually all of the island groups of Oceania, from the Galapagos Islands in the eastern Pacific to the Republic of Palau in the western Pacific (Witzell 1983; NMFS and USFWS 1998b). NMFS and USFWS (2007b) suggest that some regions are doing better than others based on available trend data, and explain:

"Although greatly depleted from historical levels, nesting populations in the Atlantic in general are doing better than in the Indo-Pacific. In the Atlantic, more population increases have been recorded in the Insular Caribbean than along the Western Caribbean Mainland or the Eastern Atlantic. In general, hawksbills are doing better in the Indian Ocean (especially the South Western and North Western Indian Ocean) than in the Pacific Ocean. In fact, the situation for hawksbills in the Pacific Ocean is particularly dire, despite the fact that it still has more nesting hawksbills than in either the Atlantic or Indian Oceans."

### Critical Habitat for the Hawaiian Monk Seal

Research could occur in designated critical habitat for the Hawaiian monk seal (*Monachus schauinslandi*). NMFS is proposing to revise the current critical habitat by extending the current designation in the Northwestern Hawaiian Islands out to the 500-m depth contour and including Sand Island at Midway Islands; and by designating six new areas in the main Hawaiian Islands (MHI). Specific areas proposed for the MHI include terrestrial and marine habitat from 5 m inland from the shoreline extending seaward to the 500-m depth contour around: Kaula Island, Niihau, Kauai, Oahu, Maui Nui (including Kahoolawe, Lanai, Maui, and Molokai), and Hawaii (except those areas that have been identified as not included in the designation). NMFS accepted public comment on the revision through August 31, 2011 and a decision on the rule is due June 2, 2012. Although work could occur in this area, the Proposed Action would not affect the habitat in a way as to modify, damage or destroy habitat.

### **Non-Target Marine Animals**

In addition to the target sea turtle species, an assortment of marine mammals, fish and invertebrates may be found in the action area but would be largely unaffected by the proposed research. The PIFSC has not previously encountered an ESA-listed or MMPA protected species during field work and notes that field research is conducted at sites where interactions with other ESA-listed animals are unlikely to occur. Small dip nets and hand capture do not pose a risk to non-target species of capture. However, the permit would be conditioned so that larger nets would not be set if marine mammals are observed in the area. If one were present at a field site, the PIFSC would halt operations until the animal(s) has/have moved out of the study area. Further, researchers would maintain a distance of at least 100 meters away from humpback whales, *Balaenoptera novaeangliae* as required by regulation at 50 CFR 224.103 and follow federal guidelines that recommend remaining 50 meters away from monk seals at all times. Therefore, the proposed action would not significantly affect non-target marine animals and they are not considered further.

#### **Biodiversity and Ecosystem Function**

The proposed action is directed at the target sea turtles and does not interfere with benthic productivity, predator-prey interactions or other biodiversity or ecosystem functions. Living sea turtles 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 non-indigenous 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 and Unique Areas**

The proposed action is directed at the target sea turtle species and would not affect habitat. Researchers would be required to avoid sensitive habitat areas during capture. Based on the proposed research methods and mitigating conditions of the permit, the proposed action does not involve substantial alteration of substrate, movement of water or air masses, or other interactions with physical features of ocean and coastal habitat. Although essential fish habitat (EFH) may be found in the area, the nature of the research is not expected to result in impacts to EFH.

The following protected areas are found in the action area: Hanauma Bay Marine Life Conservation District, Papahanaumokuakea Marine National Monument and Hawaiian Islands Humpback Whale National Marine Sanctuary. No prime farmlands, wetlands, or wild and scenic rivers are found within the action area. The proposed action is directed at sea turtles and as noted above would not alter or affect habitat, unique areas, including any components of EFH. Thus, effects on habitat and these 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. Based on the nature of the proposed research, issuance of the permit would have no potential to cause effects to cultural resources. More information on cultural resources in the action area can be found in the PIFSC's PEA (NMFS PIFSC 2011). The proposed action represents non-consumptive use of sea turtles 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 sea turtles resulting from the applicant's research would not be exempted. The No Action alternative would result in the loss of valuable information about the biology and ecology of these species.

### **Effects of the Proposed Action Alternative**

Effects would occur at the time when the applicant's research results in takes of the target sea turtles.

### Environmental Consequences to the Biological Environment-Turtles

The PIFSC has requested authorization to take sea turtles as described in the table in Ch. 2. While individual animals may experience short-lived stress or minimal injury during procedures, NMFS expects that animals would recover overall from the proposed activities within the course of a day. No mortalities or serious injuries from activities authorized by this permit would be expected. The following lays out potential impacts of each proposed research activity. This analysis is also supported by similar findings of the PIFSC's PEA (NMFS PIFSC 2011) concluding that no significant impacts would result from their marine turtle research program.

### Effects of Capture

If done correctly, without pursuing the animals in chase, the effects are minimal. Divers would capture one turtle at a time. While holding on to the anterior and posterior ends of the carapace the diver would immediately bring the turtle to the surface. While hand capturing there would be no nets or equipment used that could cause entanglement or forced submergence. No bycatch would be produced from this activity.

SCUBA would be used in deeper waters and divers would not chase or wrestle the turtles to avoid prolonged submergence or stress on the animal. NMFS expects no mortalities or serious injuries from activities authorized by this permit.

Turtles may exhibit respiratory and metabolic stress, particularly if a turtle is chased and /or forced to remain submerged (swimming or evasive behavior to avoid capture). Metabolic changes that can impair a sea turtle's ability to function can occur within minutes of a forced submergence. While most voluntary dives appear to be aerobic, showing little if any increases in

blood lactate and only minor changes in acid-base status, the story is quite different in forcibly submerged turtles where oxygen stores are rapidly consumed, anaerobic glycolysis is activated, and acid-base balance is disturbed, sometimes to lethal levels (Lutcavage and Lutz 1997). Forced submergence of Kemp's ridley sea turtles in shrimp trawls resulted in an acid-base imbalance after just a few minutes (times that were within the normal dive times for the species) (Stabenau et al. 1991) and recovery times for acid-base levels to return to normal may be prolonged as long as 20 hours or more (Henwood and Stuntz 1987). This effect is expected to be worse for sea turtles that are recaptured before metabolic levels have returned to normal. Respiratory and metabolic stress due to forced submergence is also correlated with additional factors such as size and activity of the turtle, water temperatures, and biological and behavioral differences between species.

To minimize the potential for adverse impact and stress due to forced submergence on the turtles, when entanglement nets are in the water they would be constantly monitored, so that any turtle caught would be instantly retrieved. In addition, several field personnel would be in the water during all capture activities (hand capture and tangle netting) to ensure that stress to the animal is minimized during capture. A veterinarian would be on call during all capture activities in the event veterinary consultation is required. If a turtle is encountered in a comatose state, researchers would immediately commence resuscitation techniques.

Animals that are tagged with transmitters may be recaptured to remove the transmitter gear. However, impacts of the recapture are not likely to be additive to stress from the initial capture event as the effects of capture would dissipate within a day before animals would be recaptured. These animals would not be sampled again to minimize impacts to the animals.

*Effects of Handling, Weighing, Measuring, Photographing, Flipper Tagging, and PIT Tagging* Handling, measuring, and weighing can result in raised levels of stressor hormones in sea turtles. However, the handling, measuring, and weighing procedures are simple and not invasive and NMFS expects that individual turtles would normally experience no more than short-term stresses as a result of these activities. No injury would be expected from these activities, and turtles would be worked up as quickly as possible to minimize stresses resulting from their capture. The applicant 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. Turtles would be held for approximately one to twelve hours depending on what sampling activities the turtle would experience.

Tagging activities are minimally invasive and all tag types have negative aspects associated with them, especially concerning tag retention. Plastic tags can become brittle, break and fall off underwater, and titanium tags can bend during implantation and thus not close properly, leading to tag loss. Tag malfunction can result from rusted or clogged applicators or applicators that are worn from heavy use (Balazs 1999). Turtles that have lost external tags 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). Turtles can experience some discomfort during the tagging procedures and these procedures would produce some level of pain. The discomfort is usually short and highly variable between individuals (Balazs 1999). Most turtles barely seem to notice, while a few others exhibit a marked response. However, NMFS expects the stresses to be minimal and short-term and that the small wound-site resulting from a tag would heal completely in a short period of time. Similarly, turtles that must be re-tagged would also experience minimal short-term stress and heal completely in a short period of time. Re-tagging would not be expected to appreciably affect these turtles. The proposed tagging methods have been regularly employed in sea turtle research with little lasting impact on the individuals tagged and handled (Balazs 1999).

No problems with this tagging method have been reported by NMFS permit holders. The NMFS SEFSC Galveston Laboratory has flipper and PIT tagged up to 56 loggerheads per year from 1999 to present holding the animals for approximately 3 years after tagging. Turtles were held in a laboratory setting, did fine, and were later released. This suggests that if a turtle is tagged using proper techniques and protocol and released back into a suitable environment, the chances for problems associated with the tagging are negligible. Additionally, in the 17+ years that the NMFS SEFSC has been using Inconel flipper tagging turtles, all turtles exhibited normal behavior shortly after being tagged and swam normally once released. Of the close to 1,000 tagged turtle recaptures the NMFS SEFSC Beaufort Laboratory has encountered, no turtles have shown adverse effects of being tagged in this manner (NMFS 2006b). In the 10+ years that the NMFS SEFSC has been PIT tagging turtles, turtle behavior indicative of discomfort was observed to be temporary, and the turtles exhibited normal behavior shortly after tagging and swam normally after release. Of the close to 1,000 tag recaptures that the NMFS Beaufort Laboratory has encountered, none show any adverse effects of being tagged in this manner (NMFS 2006b). In addition, the permit holder would be required to follow procedures designed to minimize the risk of either introducing a new pathogen into a population or amplifying the rate of transmission from animal to animal of an endemic pathogen when handling animals.

### Effects of Carapace Marking and Shell Etching

Carapace marking is a minimally invasive technique that involves the shallow (1-2 mm deep) etching and painting of a number into the animal's hardshell carapace for identification. The applicant has tested this method on the tops of his own fingernails and experienced no pain. NMFS believes that the turtle would feel the vibration but also not experience pain. Based on the applicant's past experience the etched area would grow back within a year or so. Painting would consist of a minor amount of non-toxic white spray paint on the shell. This marking method is temporary to allow researchers to resight previously captured and tagged animals and prevent needless recapture.

### Effects of Tissue and Blood Sampling

The permit would contain conditions to mitigate adverse impacts to turtles. The applicant would be required to follow procedures designed to minimize the risk of either introducing a new pathogen into a population or amplifying the rate of transmission from animal to animal of an endemic pathogen when handling and sampling animals. It is not expected that individual turtles would experience more than short-term stress during tissue sampling. Researchers who

examined turtles caught two to three weeks after sample collection noted the sample collection site was almost completely healed. During the more than five years of tissue biopsying using sterile techniques, NMFS SEFSC researchers have encountered no infections or mortality resulting from this procedure (NMFS 2006b).

Likewise, NMFS does not expect that individual turtles would experience any more than shortterm stresses during blood sampling. Taking a blood sample from the dorsal side of the neck is a routine procedure when conducted by trained personnel following proper guidelines (Owens 1999). According to Owens (1999), with practice it is possible to obtain a blood sample 95 percent of the time, and the sample collection time should take about 30 seconds. Sample collection sites would always be disinfected with alcohol or other antiseptics, prior to sampling. The permits would be conditioned to limit blood sampling volume to a conservative amount based on the size of the turtle captured. Blood hormones and heart rate have been measured in animals that have had blood drawn from them and no stress has been observed. Bjorndal et al. (2010) investigated the effects of repeated skin, blood and scute sampling on juvenile loggerhead growth. Turtles were sampled for each tissue type three times over a 120-day period. The authors found that repeated sampling had no effect on growth rates; growth rates of sampled turtles were not significantly different from control animals. Turtles exhibited rapid healing at the sampling site with no infection or scarring. Further, all turtles increased in body mass during the study proving that sampling did not have a negative impact on growth or weight gain. The authors conclude that the sampling did not adversely impact turtle physiology or health (Bjorndal et al. 2010).

Based on this information, NMFS expects that the proposed sample collection would cause no more than minimal additional stress or discomfort to the turtle beyond what was experienced during capture, collection of measurements, tagging, etc.

### Effects of Lavage

The feeding habits of wild turtles can be determined by a variety of methods, but the preferred technique is gastric lavage or stomach flushing. This comparatively simple and reliable technique has been used to successfully sample the gut contents of various vertebrate animals groups without harm to the animal (Forbes 1999). This technique has been successfully used on green, hawksbill, olive ridley, and loggerhead turtles ranging in size from 25 to 115 cm curved carapace length. Forbes (1999) states that many individual turtles have been lavaged more than three times without any known detrimental effect. Individuals have been recaptured from the day after the procedure up to three years later and appear healthy and feeding normally. Laproscopic examination following the procedure has not detected any swelling or damage to the intestines from lavage. While individual turtles are likely to experience discomfort during this procedure, NMFS does not expect individual turtles to experience more than short-term distress. Injuries are not anticipated.

### Effects of Carapace Mounted Transmitters

Transmitters, as well as biofouling of the instrument, attached to the carapace of turtles increase hydrodynamic drag and affect lift and pitch. For example, Watson and Granger (1998) performed wind tunnel tests on a full-scale juvenile green turtle and found that at small flow

angles representative of straight-line swimming, a transmitter mounted on the carapace increased drag by 27-30 percent, reduced lift by less than 10 percent and increased pitch moment by 11-42 percent. It is likely that this type of transmitter attachment would negatively affect the swimming energetics of the turtle. However, based on the results of studies of hardshell sea turtles equipped with this tag setup, there is no evidence of transmitters resulting in any serious injury to these species. Attachment of satellite, sonic, or radio tags with epoxy is a commonly used and permitted technique by NMFS. These tags are unlikely to become entangled due to their streamlined profile and would typically be shed in about one year (if not physically removed by researchers before then), posing no long-term risks to the turtle.

The permit would require the total weight of transmitter attachments for any one turtle not exceed 5% of the body mass of the animal and that transmitters be as hydrodynamic as possible. Each attachment would be made so that there is no risk of entanglement. The permit would also require that the applicants provide adequate ventilation around the turtle's head during the attachment of all transmitters. To prevent skin or eye injury due to the chemicals in the resin during the transmitter application process, the transmitter attachment procedures would not take place in the water.

South Carolina Department of Natural Resources (SCDNR) researchers satellite-tagged 36 juvenile loggerheads (56.6-76.8 cm SCL min) during 2004-2007 and 29 adult male loggerheads (86.6-107 cm SCL min) during 2006-2007. Their track durations for tags on juveniles have ranged from 30 days to 496 days, with an average for expired tags of 169 days. Track durations for adult males ranged from 7 to 238 days, with an average for expired tags of 117 days. Satellite transmitter attachments may affect the hydrodynamic drag (and thus things like swimming speed or efficiency); however, long track durations suggest animals are not severely compromised. Shorter track durations have multiple possible explanations, including tagshedding; physical damage to transmitter; and biological fouling which interferes with data transmission. Although mortality of the tagged individual is also a theoretically possible explanation of short track durations, it is impossible to establish this or to determine whether it occurred directly or indirectly as a result of satellite-tagging (or as a result of some other cause).

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

Based on past experience with these techniques used by turtle researchers and the documented effects of transmitter attachment, NMFS expects that the turtles would experience some small additional stress from attaching satellite transmitters to turtles taken during this research, but not significant increases in stress or discomfort to the turtle beyond what was experienced during capture and other research activities. NMFS expects the transmitters would not significantly interfere with the turtles' normal activities after they are released.

### Effects of Sonic Tags

Signals from the sonic tag would be tracked underwater using a directional hydrophone. Researchers would use sonic tags within the 69 kHz range. 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 hearing range 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 be 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 after they are released.

Another important consideration is whether the sounds emitted by the sonic transmitters would attract potential predators, primarily sharks. Unfortunately, hearing data on sharks is limited. Casper and Mann (2004) 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. Hueter et al. (2004) explained that few audiograms have been published in elasmobranchs to date. 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 we don't have hearing information for all the sharks that could potentially prey on sea turtles, estimates for hearing sensitivity in available studies provided ranges of 25 Hz to 1,000 Hz. In general, these studies found that shark hearing is not as sensitive as in other tested fishes and that sharks 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 attract potential shark predators to the turtles, given the frequency of the sonic tags is well above the 1,000 Hz threshold.

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 not be expected to have any measurable impact on these species. NMFS believes the use of sonic tags under the proposed research would not appreciably affect any sea turtle or other marine animal species.

Sonic tags would be shed when turtles shed their scutes. Although tags used in this research would be shed into the ocean, given the very small amount of debris they would represent and the fact that they do not contain any highly dangerous or radioactive materials, NMFS does not expect them to have any significant effect on the environment.

### Effects of Transport and Holding

Given the precautions that would be taken by the researchers to ensure the safety of the turtles and the permit conditions relating to transport and holding, NMFS expects the holding of the animals as described in the permit and the transport to and from the work station would have minimal and insignificant effects on the animals.

### 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 for 30 days (76 FR 35842). No public comments were received.

### **Cumulative Impacts**

<u>Summary of Effects from Total Number of Permits</u>: In general, takes of sea turtles by harassment during permitted research using the proposed methodologies have not been shown to result in long-term or permanent adverse effects on individuals regardless of the number of times the harassment occurs. The frequency and duration of the disturbance under the proposed permit would allow adequate time for animals to recover from adverse effects such that additive or cumulative effects of the action on its own are not expected.

No measurable effects on population demographics are anticipated because any sub-lethal (disturbance) effects are expected to be short-term, with the animals recovering within a day from procedures, and the proposed action is not expected to result in mortality of any animals. There is no evidence that current or past levels of permitted takes have resulted in cumulative population or species level effects. And the fact that the green sea turtle population has increased steadily for more than 30 years in the area suggests that the level of cumulative research occurring is not detrimental to the population.

Other than the applicant's current permit, No. 1581, which the proposed action would replace, only one other NMFS permit (No. 14381 held by NMFS Pacific Islands Regional Office (PIRO)) authorize takes of these species around Hawaii. No. 14381, however, does not authorize any capture of these species. Rather it authorizes researchers to collect data on sea turtles already legally taken as bycatch in commercial fisheries in the area. This permit authorizes a relatively minimal amount of take: researchers may conduct research activities on up to 28 green and 10 hawksbill sea turtles annually taken in the fisheries. Two other research permits (No. 1581 in the Hawaiian Islands and No. 10027 at the Palmyra Atoll) in nearby regions of the Western Pacific authorize take of these species, but based on Dutton et al. 2008, data suggest that green sea turtles at these remote islands are not from the same stock as animals found in Hawaii. For hawksbills, not enough information is known of these populations to determine whether either of the permits in the Western Pacific would target and therefore affect the same individual animals or populations as the proposed research. Even if the proposed action is able to target the same animals as other Permit Holders in the Pacific, NMFS would not expect cumulative impacts since effects of research activities would dissipate within a day as previously discussed. Moreover, researchers working under NMFS permits are required to notify the appropriate NMFS Regional Office in advance of field work. The PIRO is tasked with coordinating activities under multiple permits for the action area to ensure there is not unnecessary duplication of research.

<u>Summary of Other Actions</u>: The target sea turtle populations may be exposed to other human activities including subsistence harvest, entanglement in fishing gear, and noise from vessel traffic. Effects of past and ongoing human and natural factors (fisheries, ecotourism, existing NMFS research permits and other activities) occurring in or near the action area that have contributed to the current status of the species are described in the baseline section of the

attached biological opinion done for the ESA Section 7 Consultation for this permit. General threats facing sea turtle species range-wide are also discussed in the opinion. These activities and threats are expected to continue into the future.

The conclusion of the biological opinion was that the proposed action would not likely jeopardize the continued existence of any of the species and would not likely destroy or adversely modify designated critical habitat. NMFS expects the proposed research activities not to appreciably reduce the species likelihood of survival and recovery in the wild by adversely affecting their birth rates, death rates, or recruitment rates. In particular, NMFS expects the proposed research activities not 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 species.

<u>Summary</u>: Overall, the proposed action would not be expected to have more than short-term effects on endangered and threatened sea turtles. The incremental impact of the action when added to other past, present, and reasonably foreseeable future actions discussed here would be minimal and not significant. The data generated by the research activities associated with the proposed action would help determine the movement and habitat use of sea turtles found in the waters of the action area. The research would provide information that would help manage and recover threatened and endangered species and would outweigh any adverse impacts that may occur. The proposed action would not be expected to have any more than short-term effects any marine life species or other portions of the environment and would not result in any cumulatively significant effects.

## 5.0 LIST OF PREPARERS

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

Agency Consulted: NOAA National Ocean Service, National Marine Sanctuary Program

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# Appendix 1: Maps of study sites within the Action Area

GMT 2006 Sep 18 23:03:01 seaturtle.org/maptool Projection: Mercator

Figure 1: Study sites on the island of Oahu.



Figure 2: Study sites on the islands of Molokai, Lanai, and Maui.



-156°00' -155°50' -155°40' -155°30' -155°20' -155°10' -155°00' -154°50'

Figure 3: Study sites on the island of Hawaii. \*Protected areas.



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

### Finding of No Significant Impact for Issuance of Scientific Research Permit No. 15685 to Conduct Research on Protected Sea Turtles in the Hawaiian Islands

National Marine Fisheries Service

National Oceanic and Atmospheric Administration Administrative Order 216-6 (May 20, 1999) contains criteria for determining the significance of the impacts of a proposed action. In addition, the Council on Environmental Quality (CEQ) regulations at 40 C.F.R. 1508.27 state that the significance of an action should be analyzed both in terms of "context" and "intensity." The proposed action is to issue Permit No. 15685 to the NMFS Pacific Islands Fisheries Science Center (PIFSC) for research on sea turtles in the Hawaiian Islands. Each criterion listed below is relevant to making a finding of no significant impact and has been considered individually, as well as in combination with the others. The significance of this action is analyzed based on the NAO 216-6 criteria and CEQ's context and intensity criteria. These include:

1) Can the proposed action reasonably be expected to cause substantial damage to the ocean and coastal habitats and/or essential fish habitat as defined under the Magnuson-Stevens Act and identified in Fishery Management Plans?

<u>Response</u>: This action would not cause substantial damage to any ocean, coastal habitats, or essential fish habitat (EFH). Research would not affect the quality of the water column in which it would work. The permit would not involve substantial alteration of substrate, movement of water or air masses, or other interactions with physical features of ocean and coastal habitat. Further, a programmatic environmental assessment (PEA, NMFS 2011) determined that the human environment would not be significantly impacted by the PIFSC's sea turtle research program.

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

<u>Response</u>: The research authorized by the permit would not substantially affect biodiversity and/or ecosystem function. The research would cause short-term effects to target sea turtles but not significantly affect them, and the research would not have any population level effects. No other species or portion of the environment would be affected.

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





<u>Response</u>: The proposed action involves basic research of sea turtles and does not involve hazardous methods, toxic agents or pathogens, other materials, or activities that would have a substantial adverse impact on public health and safety.

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

<u>Response</u>: The proposed action would affect sea turtles. However, the effects of the proposed action would not be severe and would be short-term in nature. No significant injuries to any animals would be expected and they would be released after they are sampled. The permit would contain mitigation and minimization measures to minimize the effects of the research and to avoid unnecessary stress to the sea turtles by requiring use of specific research protocols. The proposed action would not likely jeopardize the continued existence of any ESA endangered or threatened species and would not destroy or adversely modify any critical habitat. The action would not interact with marine mammals or other non-target species.

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

<u>Response</u>: There would be no significant social or economic impacts interrelated with significant natural or physical environmental effects. No significant social or economic impacts would result from the proposed research.

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

<u>Response</u>: A *Federal Register* notice was published to allow other agencies and the public the opportunity to review and comment on each permit request. No comments were received for the request. Given the proposed research methodologies are well known and are expected to have minimal effects, NMFS believes that it is not likely to be controversial.

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

<u>Response</u>: See response to question #1. Activities that have been shown to adversely affect EFH include disturbance or destruction of habitat from stationary fishing gear, dredging and filling, agricultural and urban runoff, direct discharge, and the introduction of exotic species. None of these activities would occur under the proposed action. The proposed action would not affect any unique or ecologically critical areas.

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

<u>Response</u>: The research activities of the proposed research are not new or novel. Researchers have previously conducted the same type of research with no significant impacts to the environment. NMFS believes that the effects on the human environment would not be highly uncertain and the risks would be minimal and known.

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

<u>Response</u>: The proposed action is not related to other actions with individually insignificant, but cumulatively significant impacts. If the permit is issued, it is not expected that the additional effects of this research would result in cumulatively significant impacts given the remote study area in the Central Pacific Ocean. The shortterm stresses (separately and cumulatively when added to other stresses the species face in the environment) resulting from the research activities would be expected to be minimal. Animals would be exposed to low level harassment and no serious injuries or mortalities would be expected. The permit would contain conditions to mitigate adverse impacts to species from these activities.

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

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

<u>Response</u>: The type of survey methodology dictates that the action would not affect any districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places, thus none would be adversely affected. The research would not cause loss or destruction of significant scientific, cultural or historical resources.

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

<u>Response</u>: The action would not remove or introduce any species; therefore, it would not result in the introduction or spread of a nonindigenous species. The research activities would not involve bilge water or other issues of concern relative to nonindigenous species.

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

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

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

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

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

<u>Response</u>: The action is not expected to result in cumulative adverse effects to the species that are the subject of the proposed research. The proposed action would be expected to have no minimal effects on affected species' populations. No substantial adverse effects on other non-target species are expected. No cumulative adverse effects that could have a substantial effect on any species would be expected.

### DETERMINATION

In view of the information presented in this document and the analysis contained in the supporting Environmental Assessment prepared for Issuance of Endangered Species Act Section 10(a)(1)(A) Scientific Research Permit No. 15685, and the ESA section 7 biological opinion, it is hereby determined that the issuance of Permit No. 15685 will not significantly impact the quality of the human environment as described above and in the EA/SEA. In addition, all beneficial and adverse impacts of the proposed action have been addressed to reach the conclusion of no significant impacts. Accordingly, preparation of an Environment Impact Statement for this action is not necessary.

1 July

James H. Lecky Director, Office of Protected Resources

JAN 18 2012

Date