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

Environmental Assessment
on the
Effects of Issuing a Permit for Scientific Research on
Protected Sea Turtles in the Remote Pacific Islands (File No. 17022)

February 2013

Lead Agency:	USDOC National Oceanic and Atmospheric Administration National Marine Fisheries Service Office of Protected Resources
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Location:	Remote U.S. Islands and Territories excluding Hawaii in the Central Pacific

Abstract: The National Marine Fisheries Service (NMFS) proposes to issue Scientific Research Permit No. 17022, 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 begin long-term monitoring to estimate abundance, size ranges, health status, habitat use, foraging ecology, local movements, and migration routes for 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 (NMFS) Pacific Islands Fisheries Science Center, (PIFSC, Samuel Pooley, Responsible Party), NMFS proposes to issue Scientific Research Permit No. 17022, pursuant to the Endangered Species Act of 1973 as amended (ESA; 16 U.S.C. 1531 et seq.) for "takes"[1] 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 2012) for their Marine Turtle Assessment Program (MTAP). The PEA describes all of the applicant's

[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."

research 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 throughout the Pacific Islands Region (PIR). All of the applicant's research activities proposed for Permit No. 17022 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 MTAP.

Additionally, NMFS PR recently prepared a separate EA (NMFS 2012) for Permit No. 15685 for the PIFSC's other turtle program, the Marine Turtle Research Program (MTRP). For a copy of the EA, please contact the Office of Protected Resources, Permits and Conservation Division at 301-427-8401. The EA resulted in a Finding of No Significant Impact on the human environment. All of the MTAP's requested activities except the oral exam of live sea turtles and the salvage of carcasses, tissues, or parts from dead animals were proposed for and authorized by Permit No. 15685. The 2012 EA is incorporated by reference in this document for the analysis of impacts to the target sea turtles from the proposed activities. See Ch. 4 for details.

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 begin long-term monitoring of the status of green and hawksbill sea turtles in several remote non-Hawaiian islands and atolls in the PIR beginning in January 2013. Researchers would capture, tag, and tissue sample up to 220 green turtles and 165 hawksbills annually to estimate their abundance, size ranges, health status, habitat use, foraging ecology, local movements, and migration routes. Research would be performed in concert with local island authorities and sea turtle programs to ensure efforts are not duplicative. A primary goal is to integrate data from genetic analysis, flipper tagging, and satellite telemetry to link nesting beach and foraging site origins of turtles occurring in the PIR and contribute to the overall understanding of sea turtle stock structure in the Pacific Ocean. These data would allow the PIFSC to determine the potential impact of threats from direct and incidental take in fisheries, climate, and habitat loss on the PIR populations.

Action Area: The proposed research would take place in the nearshore and coastal tropical waters of the U.S. islands and territories in the Pacific Islands Region: Johnston Atoll, Palmyra Atoll, Kingman Reef, Howland Island, Baker Island, Jarvis Island, Wake Island, American Samoa, Guam, and Commonwealth of the Northern Mariana Islands (CNMI).

Methods: The research protocols are described in detail in the application on file for this action and are briefly summarized here. A copy of the application is available upon request from the NMFS Office of Protected Resources, Permits and Conservation Division (phone: 301-427-8401). Juvenile, sub-adult, and adult turtles of both sexes would be captured by hand, scoop net or entanglement net. A variety of research techniques would be employed: *i*) flipper and passive integrated transponder (PIT) tagging to identify individual turtles, *ii*) morphometrics and exam to determine the size, mass, sex, and health of each captured animal, *iii*) genetic analysis of tissue samples collected from each turtle to determine nesting beach origin, *iv*) blood sampling to assess health status of individuals and/or for stable isotopes, *v*) stable isotope analysis of tissue samples for foraging ecology research, and *vi*) biotelemetry to determine movements and habitat use. A sea turtle could receive up to two transmitters (a satellite tag and/or an acoustic/radio or archival tag) affixed with epoxy or resin at one time. Researchers would also collect tissues and parts from dead sea turtles that are encountered opportunistically. See Table 1 for details on take activities. No lethal take would be authorized.

Duration: This permit would be valid for five years from the date of issuance. Fieldwork would occur year-round.

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

Table 1: Proposed annual takes of juvenile, sub-adult, and adult green and hawksbill sea turtles captured under Permit No. 17022.

Number of Turtles	Sea Turtle Species	Collection Method	Take Activity
200	Green	Tangle net, hand or dip net	Measure, weigh, flipper tag, PIT tag, photograph/video, blood sample, tissue sample, oral exam, and release or salvage (carcass, tissues, and parts)
20	Green	Tangle net, hand or dip net	Instrument, epoxy attachment (e.g., satellite, VHF tag)*, measure, oral exam, photograph/video, weigh, flipper tag, PIT tag, blood sample, tissue sample and release
150	Hawksbill	Tangle net, hand or dip net	Measure, weigh, flipper tag, PIT tag, photograph/video, blood sample, tissue sample, oral exam, and release or salvage (carcass, tissues, and parts)
15	Hawksbill	Tangle net, hand or dip net	Instrument, epoxy attachment (e.g., satellite, VHF tag)*, measure, oral exam, photograph/video, weigh, flipper tag, PIT tag, blood sample, tissue sample and release

*No more than 2 tags on an animal at a time.

Mitigation Measures
The MTAP's PEA (NMFS PIFSC 2012) identifies Standard Operating Procedures that would be followed to minimize impacts of their research techniques on the target sea turtles and other portions of the environment. These include:

- Cleaning tagging and sample sites on the animal prior to collection;
- Limiting the amount of time animals are held for work up and transmitter attachment; and
- Using a new, sterile PIT tag needle for each animal.

Some of these are standard conditions required for NMFS sea turtle research permits. The proposed permit also would include language that would minimize impacts to the target animals, prevent the spread of pathogens or disease, and prevent impacts to bottom habitat such as sea grasses and live bottom. These include:

- Checking for existing flipper and PIT tags before applying new ones;
- Ensuring that equipment is cleaned and disinfected before use and between animals;
- Using a separate set of equipment for infected animals;
- Releasing bycatch alive and unharmed;
- Making transmitter attachments as hydrodynamic as possible;
- Limiting the volume of blood drawn and number of attempts to draw blood;
- Monitoring animals after release to make sure they are behaving normally; and
- Monitoring deployed nets and avoiding setting nets over sensitive habitat.

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

3.0 AFFECTED ENVIRONMENT

Location
As identified in Ch. 2, research would occur in nearshore and coastal tropical waters of the U.S. Insular Areas of the Pacific Ocean in the PIR. More information on the protected areas in the action area can be found in the PEA prepared by the PIFSC for the MTAP (NMFS PIFSC 2012). These areas cover more than 4.5 million square miles in the PIR and include several National Wildlife Refuges and a National Marine Sanctuary.

Status of Target ESA Species

Green sea turtle	*Chelonia mydas**--Threatened
Hawksbill sea turtle	*Eretmochelys imbricata*--Endangered

**Green turtles in U.S. waters are listed as threatened except for the Florida and Mexico breeding populations which are listed as endangered.*

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 (NMFS 2008) prepared for Permit No. 10027 for research on the same turtle populations is briefly summarized here and incorporated by reference. To obtain a copy of the 2008 Biological Opinion, contact the NMFS Office of Protected Resources, Endangered Species Act Interagency Consultation Division in Silver Spring, Maryland, 301-427-8405.

Green sea turtle
Green turtles are found throughout the world, occurring primarily in tropical, and to a lesser extent, subtropical waters. Animals that PIFSC could target would likely come from threatened populations versus endangered turtles that may be found in the Atlantic. 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. Seminoff (2004) estimated that analyses of subpopulation changes at 32 Index Sites distributed globally showed a 48% to 67% decline in the number of mature females nesting annually over the last three generations. These estimates, however, are based on a conservative approach; actual declines were thought to possibly exceed 70%. Nevertheless, NMFS and USFWS (2007a) analyzed 23 threatened nesting concentrations among 11 ocean regions around the world that included both large and small rookeries and are believed to be representative of the overall trends for their respective regions. Of these 23 sites for which assessment of current trends was possible, 10 nesting populations are increasing, 9 are stable, and 4 are decreasing. 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). Threats to green sea turtles include present and threatened destruction, modification or curtailment of habitat. There are increasing impacts to the nesting (e.g., beach construction) and marine habitat (e.g., contamination, structural degradation) (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 1998). 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."

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. Small dip nets and hand capture do not pose a risk to non-target species of capture. Further, the permit would be conditioned so that larger tangle nets would not be set if marine mammals are observed in the area. If one was present at a field site, the PIFSC would halt operations until the animal(s) has/have moved out of the study area. Therefore, the Proposed Action is not expected to 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 would 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 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

Several protected areas are found in the action area where in-water research would occur including: the Marianas Trench Marine National Monument, Rose Atoll Marine National Monument, several reserves and protected areas in CNMI, and the following National Wildlife Refuges/Marine National Monuments: Howland Island, Palmyra Atoll, Kingman Reef, Jarvis Island, and Baker Island. Research would not occur in the National Marine Sanctuary of American Samoa. These areas are discussed in detail in the PIFSC's PEA for the MTAP (NMFS PIFSC 2012). PIFSC intends to apply for the appropriate USFWS or local government permits to work in these areas where needed.

The Proposed Action is directed at the target sea turtle species and would not affect protected areas or habitat. As noted in the PIFSC's PEA, researchers plan to work in sandy substrates, avoid contacting coral and do not expect adverse direct or indirect impacts to habitat. In addition, the permit would require researchers to avoid sensitive habitat areas, such as live bottom, when setting nets. 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. 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 in this EA.

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. Further, 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 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 proposed activities except oral exam and the salvage of carcasses, tissues, or parts from dead animals have been analyzed in the 2012 EA prepared for the PIFSC's MTRP for Permit No. 15685. The EA determined that:

- NMFS expects that simple, non-invasive procedures such as handling, measuring, and weighing would result in no more than short-term stress to individual sea turtles.

- The stresses from flipper and PIT tagging, tissue sampling, and blood sampling would be minimal and short-term and that the small wound-site resulting would heal completely in a short period of time.

- Blood and tissue sampling would not have a negative impact on growth or weight gain or pose a risk of infection.

- Transmitters would not pose a risk of entanglement and would typically be shed in about one year, posing no long-term risks to the turtle.

- Sonic transmitters are not likely to attract predators or be heard by the subject sea turtle.

- Transmitter attachments would not cause significant increases in stress to the turtle beyond what was experienced during capture and other research activities. While tagged sea turtles would experience some hydrodynamic drag, animals would not be severely compromised. Transmitters would not significantly interfere with the turtles' normal activities after they are released.

- Overall, the activities would not significantly impact the human environment.

This analysis is incorporated by reference. It also is supported by similar findings of the PIFSC's PEA (NMFS PIFSC 2012; available online: www.pifsc.noaa.gov/nepa/documents.php) concluding that no significant impacts would result from the MTAP. The PEA also considered impacts of the oral exam of live animals and the salvage of carcasses, tissues and parts of dead animals which were not considered in the 2012 EA for No. 15685. These activities likewise are not expected to result in adverse impacts to the target animals. Oral exam only involves handling the animals to view the oral cavity; it does not involve piercing the skin and thus does not pose a risk of infection or scarring. The salvage of parts likewise is not expected to result in impacts as these turtles would already be dead and lost to the populations and species. No mortality would be authorized by the permit for this activity.

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. No substantive comments were received.

Cumulative Impacts

Summary of Effects from Total Number of Permits: 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. That the green sea turtle population in Hawaii has increased steadily for more than 30 years suggests that the type of research activities authorized and level of cumulative research occurring is not detrimental to the species as a whole.

Two other permits authorize sea turtle research in the action area:

- No. 10027-05 held by the American Museum of Natural History for work at Palmyra Atoll (expires July 2013), and
- No. 15661 held by the CNMI Division of Fish and Wildlife for work in the Northern Mariana Islands (expires January 2017).

The MTAP intends to closely collaborate with existing Permit Holders to maximize data collection and reduce the chance that animals could be targeted more than once within the course of a day by Permit Holders. Only two other research permits (No. 15685 held by the PIFSC MTRP and No. 14381 held by the NMFS Pacific Islands Regional Office (PIRO)) authorize research on the target species nearby in the Hawaiian Islands. No. 14381 does not authorize 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. No. 14381 authorizes a relatively minimal amount of take; researchers may conduct procedures on up to 28 green and 10 hawksbill sea turtles annually taken in the fisheries. Though it should be noted that based on Dutton et al. (2008), data suggest that the target green sea turtles at the PIR remote islands are not from the same stock as animals found in Hawaii. Thus the applicant likely will not be targeting the same populations of sea turtles as researchers in Hawaii thereby reducing the potential for cumulative impacts to the populations or the species. For hawksbills, not enough information is known of these populations to determine whether the MTAP would target and therefore affect the same individual animals or populations as researchers in Hawaii. Even if the MTAP 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, before other researchers are likely to encounter them. 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.

Summary of Other Actions: 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.

Summary: 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. The proposed action would not be expected to have any more than minor short-term effects to any marine life species or other portions of the environment and would not result in any cumulatively significant effects.

5.0 LIST OF PREPARERS AND AGENCIES CONSULTED

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

Agency Consulted: National Ocean Service, National Marine Sanctuaries Program

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