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

# Environmental Assessment

## for Emergency Action Issuance of Scientific Research Permit to Andre Landry (File No. 15606) to Conduct Research on Endangered and Threatened Sea Turtles

**March 2011**

National Oceanic and Atmospheric Administration

National Marine Fisheries Service

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## 1.0 Introduction

### 1.1 Background

On April 20, 2010, a fire and explosion occurred aboard the semisubmersible drilling platform Deepwater Horizon roughly 80 km southeast of the Mississippi Delta (NOAA 2010a). The platform had 17,500 barrels of fuel aboard, which likely burned, escaped, or sank with the platform (NOAA 2010a). Once the platform sank, the riser pipe connecting the platform to the wellhead on the seafloor broke in multiple locations, initiating an uncontrolled release of oil from the exploratory well. Oil flowed into the Gulf of Mexico (Gulf) at an estimated 5,000 barrels (210,000 gallons) per day from three leaks in damaged piping on the sea floor from the Deepwater Horizon incident which was declared a Spill of National Significance (SONS) on April 29, 2010 (NOAA 2010a). A SONS is defined as "a spill that, due to its severity, size, location, actual or potential impact on public health and welfare or the environment, or necessary response effort, is so complex that it requires extraordinary coordination of federal, state, local, and responsible party resources to contain and clean up the discharge" and allows greater federal involvement.

Over the next three months, oil was released into the Gulf, resulting in oiled regions of Texas, Louisiana, Mississippi, Alabama, and Florida and widespread oil slicks throughout the northern Gulf that closed more than one-third of the Gulf Exclusive Economic Zone to fishing due to contamination concerns. Apart from the widespread surface slick, massive undersea oil plumes formed, possibly through the widespread use of dispersants and reports of tarballs washing ashore throughout the region were common. Although estimates vary, NOAA has estimated that 4.9 million barrels of oil were released (Lubchenco et al. 2010). A total of 720 sea turtles have been verified in the spill zone of which 172 were verified as having oil exposure (NOAA 2010b). However, specific causes of injury or death have not yet been established for many of these individuals as investigations into the role of oil in these animals' health status continue. To study impacts to natural resources in the wake of an oil spill or the release of a hazardous substance into the environment, the damage assessment process known as the Natural Resource Damage Assessment (NRDA) was created with the Oil Pollution Act (OPA) in 1990.
To determine whether damage to natural resources has occurred, a NRDA assessment is conducted to establish the extent and severity of impacts from an oil spill (NOAA DARRP 2011). Portions of the proposed action will address potential impacts to sea turtle assemblages in the Gulf as part of the NRDA assessment phase.

### 1.2 Purpose and Need for Action

#### Description of Action

In response to receipt of the request from Andre Landry, Ph.D., Texas A&M University at Galveston, Department of Marine Biology, 5007 Avenue U, Galveston, Texas, 77553 (File No. 15606), NMFS proposes to issue a scientific research permit that authorizes scientific research pursuant to the Endangered Species Act of 1973 (ESA; 16 U.S.C. 1531 *et seq.*), and the regulations governing the taking, importing, and exporting of endangered and threatened species (50 CFR Parts 222-226).

## Purpose and Need

The primary purpose of the permit is to provide an exemption from the take prohibitions under the ESA to allow "takes" for bona fide scientific research. The need for issuance of the permit is related to NMFS mandates under the ESA. Specifically, NMFS has a responsibility to implement the ESA to protect, conserve, and recover threatened and endangered species under its jurisdiction. The ESA prohibits takes of threatened and endangered species, respectively, with only a few very specific exceptions, including for scientific research and enhancement purposes. Permit issuance criteria require that research activities are consistent with the purposes and polices of these federal laws and would not have a significant adverse impact on the species or stock. The proposed permit would allow the applicant to better address recovery plan goals providing information on sea turtle species essential to their conservation and management.

In light of the potential impacts of the Deepwater Horizon oil spill on sea turtle assemblages in the Gulf, assessing damage to sea turtles and other natural resources in the coming months is critical. Under the ESA, three species of sea turtle targeted by the proposed research (green (*Chelonia mydas*), Kemp's ridley (*Lepidochelys kempii*), and hawksbill (*Eretmochelys imbricata*)) are listed as endangered and one (loggerhead (*Caretta caretta*)) is listed as threatened. Each of these species can be found, at various points of the year, within the waters of the Gulf (Eckert et al. 1999). As such, the potential for adverse impacts on these listed sea turtles is present and the need to document and assess those impacts is paramount.

## Research Objectives

Under the ESA, NMFS is responsible for the conservation and recovery of most endangered and threatened marine species. Scientific research is an important means of gathering valuable information about these species and is necessary to conserve them and promote their recovery.

To collect information on sea turtle assemblages in the Gulf, the applicant proposes to conduct scientific research on green, Kemp's ridley, loggerhead, and hawksbill sea turtles in the coastal waters of Texas and Louisiana.

The need for scientific research on sea turtles in oil-affected waters is important as it would provide managers with critical data on the impacts of the Deepwater Horizon oil spill on sea turtle populations of the Gulf along the Texas and Louisiana coasts. The research would examine movement patterns of sea turtles in relation to the areal extent of Deepwater Horizon oil in the environment, blood and tissue sampling for toxicological and chemical analyses, inspect sea turtles for external signs of oil, and compare sea turtle abundance and spatial distribution in oiled and non-oiled sites. This research would also be used to support future NRDA claims. In addition, this research would address other aspects of sea turtle biology in areas comparatively less affected by the Deepwater Horizon oil spill. Other components of this work include examining seasonal abundance, movement, and habitat preferences of sea turtle assemblages in the coastal waters and estuaries of Texas and Louisiana, quantifying infection rates of fibropapillomas and assessing serum concentrations of environmental estrogens.

### Methods

The proposed action is composed of four inter-related projects. The purposes of these projects are to 1) examine green turtle assemblages in sea grass habitats in Texas; 2) determine trends in seasonal abundance and movement of green, Kemp's ridley and loggerhead turtles in Texas and Louisiana estuaries; 3) characterize environmental estrogen uptake in green and Kemp's ridley turtles at a Texas Superfund site; and 4) document impacts of the Deepwater Horizon oil spill on sea turtle assemblages in the western Gulf. The applicant proposes to capture, handle, transport, measure, weigh, flipper, satellite, and passive integrated transponder tag, blood, tissue, fecal and epiphyte sample, and release sea turtles. The number of sea turtles taken for each project would vary by species and life stage; up to 200 turtles would be taken annually for a particular activity (See Take Table in Appendix 1). Details on the proposed methodologies can be found in the scientific research permit application (File No. 15606). The proposed permit is requested for a period of five years.

## 2.0 MANAGEMENT ALTERNATIVES

Section 1502.14 of the Council on Environmental Quality (CEQ) regulations requires agencies to explore and objectively evaluate all reasonable alternatives for an action, including the No Action alternative. The analysis of alternatives shall describe the environment to be affected by the action and the environmental consequences of each of the alternatives. Alternatives shall be presented in comparative form to provide a clear basis for why decision makers selected the preferred alternative.

Two alternatives are being considered in this Environmental Assessment (EA). Descriptions of the environmental consequences associated with each alternative can be found in Section 4.0 along with the physical, biological, economic, social, and administrative environments affected by this action.

**Action: Issue a permit for sea turtle research in areas affected by the Deepwater Horizon oil spill.**

**Alternative 1:** No Action. Deny the permit request to conduct sea turtle research in Gulf waters, including areas affected by the Deepwater Horizon oil spill.

**Preferred Alternative 2:** Issue Permit No. 15606 for sea turtle research in Gulf waters, including areas affected by the Deepwater Horizon oil spill. See Appendix 1 for takes of sea turtles that would be authorized by the permit as described above. Under the proposed action alternative, a permit would be issued for activities as proposed by the applicant, with the permit terms and conditions standard to such permits as issued by NMFS. The proposed permit would be valid for five years from the date of issuance. Alternative 2 is the preferred alternative.

### Comparison of Alternatives

Under **Alternative 1** (no action), the application for scientific research on sea turtles in the areas affected by the Deepwater Horizon oil spill would be denied. This alternative would represent

the loss of a unique research opportunity to obtain ephemeral biological data on sea turtle assemblages in the areas have been impacted by the Deepwater Horizon oil spill. It therefore can only be collected in a short window of time since the spill for NRDA to assess the species' risk of exposure and injury from the spill. Furthermore, the applicant would not be permitted to collect biological data to address research needs on sea turtle assemblages in other regions of the Gulf, such as the coastal waters of Texas. Preferred Alternative 2 would allow NMFS to permit the proposed research on sea turtles in areas impacted by the Deepwater Horizon oil spill, examine movement patterns and habitat usage, and assess levels of environmental estrogens in sea turtles. Collecting information on these topics would fill gaps in understanding on sea turtle ecology, and allow managers to make more effective conservation measures to help recover these species.

## 3.0 AFFECTED ENVIRONMENTS

A brief description of the affected environment is included herein for this EA. More detailed descriptions of the affected environment can be found in the EA (NMFS 2005) and SEA (NMFS 2007) for the applicant's previous permit (File Nos. 1526 and 1526-01). Those descriptions are hereby incorporated by reference, and are briefly summarized below.

### 3.1 Physical Environment

In addition to the areas previously described in past EAs, the proposed research under File No. 15606 would take place in the waters of the Gulf off the coasts of Louisiana (LA) and Texas (TX) (Figure 1). Researchers would obtain turtles incidentally captured during operation of dredge relocation trawlers run by the U.S. Army Corps of Engineers (captured under separate authorization). Turtles received from dredge relocation trawlers would come from the waters of the Gulf from the Mississippi River, LA to Brazos Island Harbor, TX. Directed sampling by entanglement and cast net would occur from the Louisiana and Texas coast estuaries from the Louisiana/Mississippi border to the Texas/Mexico border.

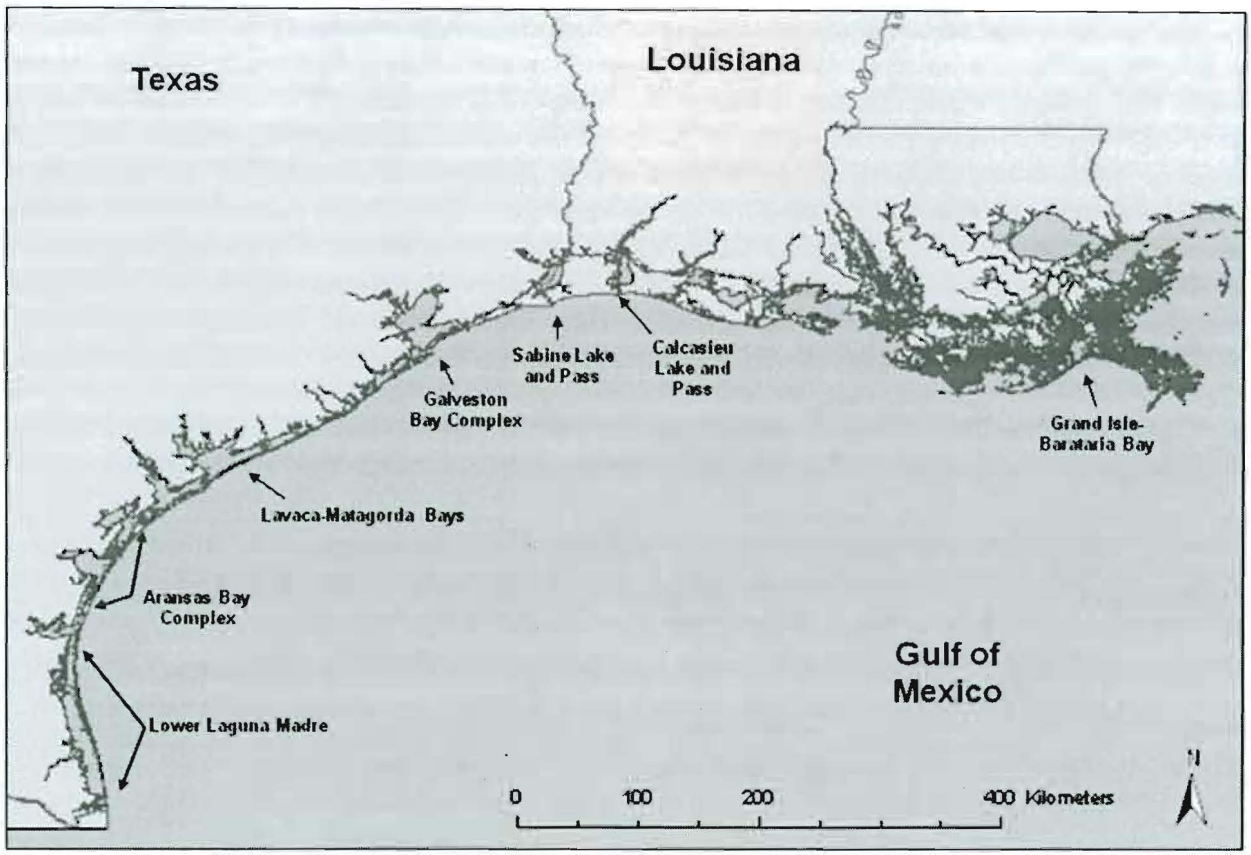

Figure 1: Proposed study areas for File No. 15606; waters of the Gulf, Louisiana and Texas

A portion of the proposed research would take place in Barataria Bay, Louisiana. According to the Nearshore Surface Oil Forecasts trajectory maps produced by NOAA (http://response.restoration.noaa.gov/dwh.php?entry_id=809), oil from the Deepwater Horizon Oil Spill was first projected to enter Barataria Bay and become potentially beached on June 1, 2010 (Figure 2). The area remained in the trajectory maps as subject to oil and potentially beached oil throughout June and July, with progressively lighter observable oil present in the region into early August (http://response.restoration.noaa.gov/dwh.php?entry_id=809). The most recent Shoreline Cleanup Assessment Technique (SCAT) ground observations reported areas of no oil to heavy oiling in the coastal areas of Barataria Bay (Environmental Response Management Application (ERMA) http://www.geoplatform.gov/gulfresponse/) (Figure 3).

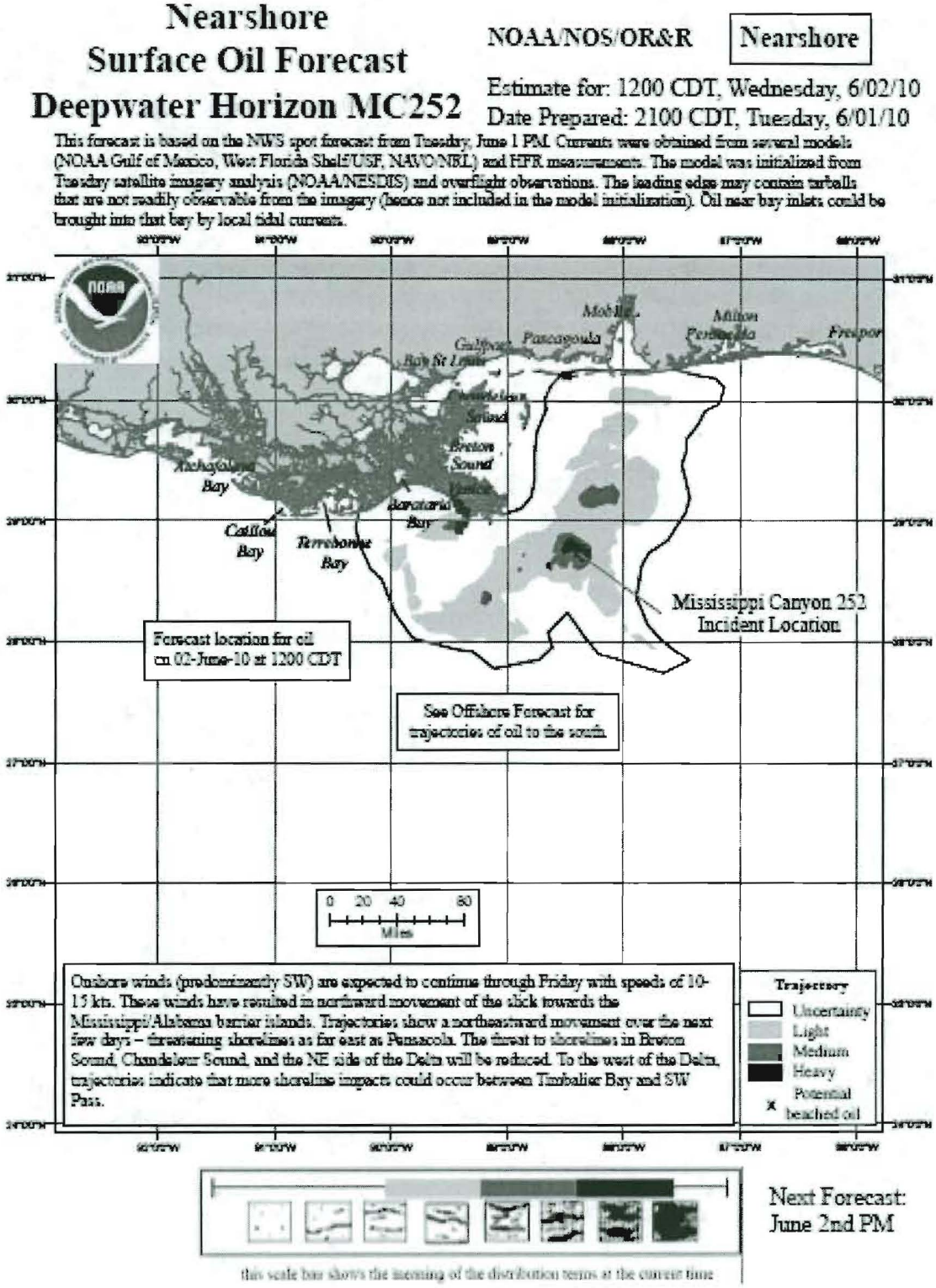


Figure 2: Nearshore Surface Oil Forecasts Trajectory Maps displaying projected oil in the applicant's action area, June 1, 2010.

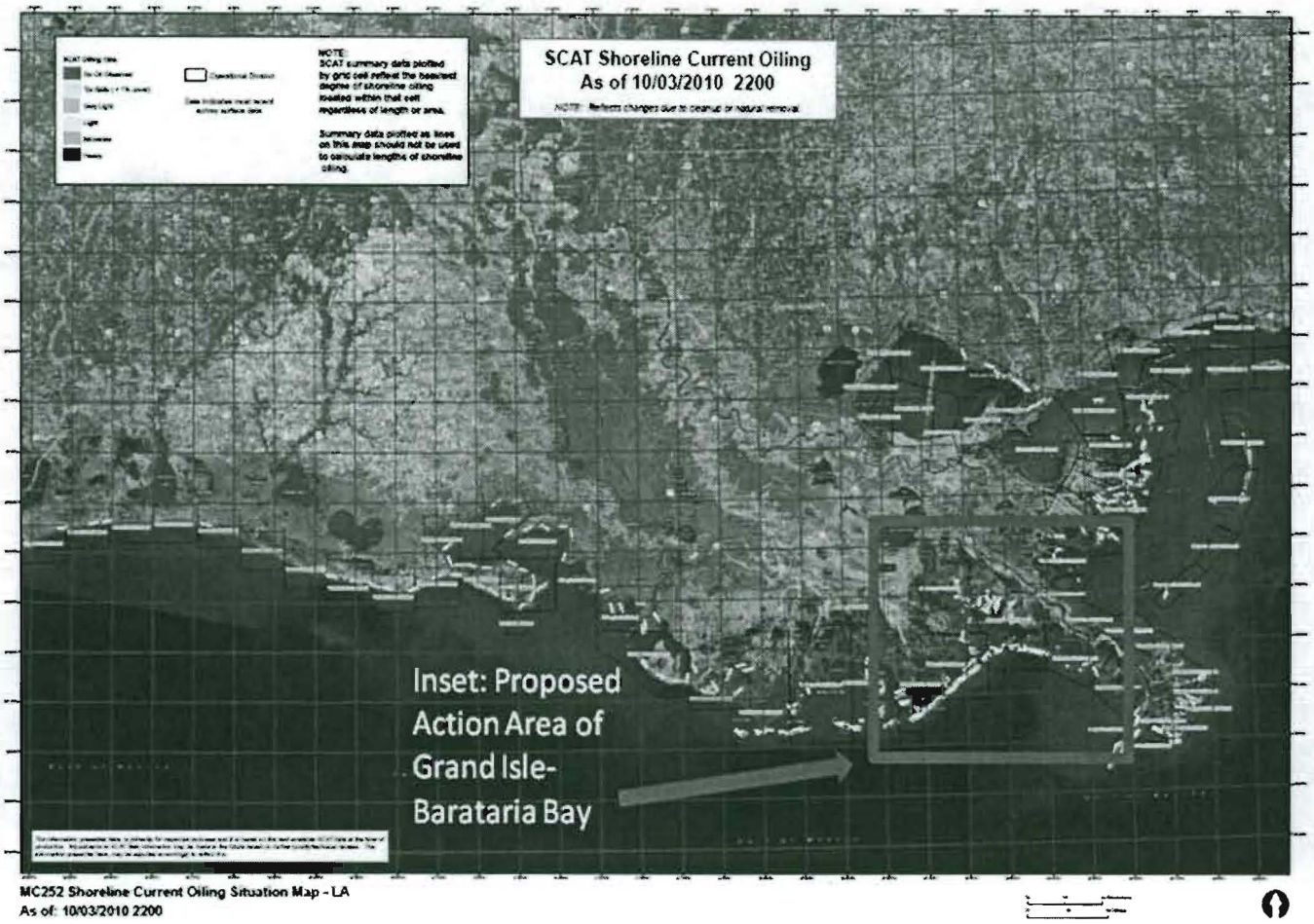


Figure 3: Map of Action Area with Status of Shoreline Oiling (10/03/2010)

### 3.2 Biological Environment

**Target Species**

In addition to the species that are the subject of the permit (target species), a variety of non-target species can be found within the action area, including marine mammals, invertebrates, and fish. Since merely being present within the action area does not necessarily mean a marine organism would be affected by the proposed action, the following discussion focuses not only the distribution and abundance of various species with respect to the timing of the action, but also on whether and by what means the proposed research activities may affect the non-target species.

<u>ESA Target Species Under NMFS Jurisdiction</u>

*ESA Endangered*

| | |
|---|---|
| Green sea turtle | *Chelonia mydas** |
| Kemp's ridley sea turtle | *Lepidochelys kempii* |
| Leatherback sea turtle | *Dermochelys coriacea* |
| Hawksbill sea turtle | *Eretmochelys imbricata* |

*ESA Threatened*
Loggerhead sea turtle *Caretta caretta***

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

*** NMFS is currently considering changing the listing of the loggerhead sea turtle to endangered (75 FR 12598).*

The 2010 Deepwater Horizon oil well blowout has impacted green, Kemp's ridley, loggerhead, and hawksbill sea turtles in the Gulf of Mexico. The event has resulted in the live or dead stranding of tens to hundreds of animals of each species. The overall degree and extent to which the populations and species have been impacted is not known at this time; however, researchers and managers are currently working to assess and quantify impacts. The proposed research would provide valuable insight to the relative potential impacts of the Deepwater Horizon Oil Spill by comparing sea turtle assemblages at oiled and non-oiled sites within the study area. An ESA Biological Opinion (BO) has been prepared for the proposed action analyzing the impacts of the action to the target ESA species (NMFS 2011). Please refer to the BO for a description of the target sea turtle species. The BO concluded that the issuance of the permit would not reduce the likelihood of the survival and recovery of the target sea turtle populations by reducing their numbers, distribution, or reproduction and therefore is not likely to jeopardize the continued existence of these species (NMFS 2011).

**Non-Target Species**

During research, the applicant could encounter non-target species. The EA prepared for the issuance of Dr. Landry's previous scientific research permit (No. 1526) (NMFS 2005) identified and described the non-target species that could be affected by the Proposed Action. The species that could be encountered during the proposed research would not change from those previously described in the 2005 EA. Those analyses and descriptions are hereby incorporated by reference. As noted in that EA, the following species could be encountered during research: marine mammals, Florida manatee, sea grasses, and a minor number of finfish, crabs, and sharks. The permit for File No. 1526 included mitigation measures such as frequent net checks (every 30 minutes) and rapid release of bycatch (NMFS 2005). The status of the species has not changed from how they were described in the 2005 EA. It should be noted that the researcher has no intention of interacting with or capturing non-target species. Mitigation measures of the proposed permit would also limit the potential for impacts to non-target species including marine mammals and seagrasses. The applicant could incidentally catch a small number of fish or sharks each year. However, all bycatch would be released alive and in good condition as required by a condition of the permit. See Section 4.0 for Mitigation Measures. In summary, non-target species may be encountered during research, but would not be likely to be significantly impacted given the conditions set forth in the permit.

### 3.4 Socioeconomic Environment

Descriptions of the human environment in the Gulf can be found at http://sero.nmfs.noaa.gov/sf/socialsci/socialsci.htm. The socioeconomic environment has not changed from that previously described and analyzed in the 2005 EA. Although a variety of human activities may occur in the action area such as commercial fishing, shipping, military activities, recreational uses (such as fishing and boating), and ecotourism, the social and economic effects of the Proposed Action mainly involve the effects on the people involved in the research, as well as the industries that support the research, such as charter vessels and the suppliers of equipment needed to accomplish such research.

## 4.0 Environmental Consequences

This section provides a comparison of the alternatives described in Section 2.0. The direct, indirect, and cumulative effects on the physical and biological environment for each management alternative is described. This section also describes: 1) Any unavoidable adverse effects resulting from the proposed action and 2) any irreversible or irretrievable commitments of resources resulting from implementation of the proposed action.

CEQ regulations (40 CFR 1508.8) define direct effects as those "which are caused by the action and occur at the same time and place." Indirect effects are defined as those "which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable." Cumulative effects are defined as "impacts on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such actions."

### 4.1 Impacts on the Physical Environment

The oil spill event itself has led to short-term impacts on the physical environment of the Gulf and is expected to lead to significant long-term impacts (i.e., essential fish habitat), although the extent and severity of the damage remains unknown at this time. The Proposed Action to permit the applicant to conduct scientific research on sea turtle assemblages in areas affected by the oil spill is not expected to exacerbate the current situation. The No Action Alternative would not have significant adverse effects on the physical environment since the proposed permit would not be issued. Under Preferred Alternative 2, impacts to the physical environment would not differ from those effects previously analyzed in the EAs and SEA for the applicant's prior permitted research in the Gulf (See File Nos. 1526 and 1526-01). Thus, the Proposed Action is not reasonably expected to cause substantial damage to the ocean and coastal habitats and/or EFH, as designated by NMFS under the authority of the Magnuson-Stevens Fishery Conservation and Management Act of 2006. Dr. Landry would use the same gear and vessel in the same manner as previously analyzed and permitted. Further, he would be required to adhere to the same permit conditions as previously permitted that would mitigate the potential for impacts to physical habitat. For the previous EA prepared for Permit No. 1526, NMFS determined that the applicant's netting activities and vessel operation would not cause significant adverse impacts to bottom substrate, provided that the researcher would avoid sea grass beds and follow measures to that effect specified in the permit (NMFS 2005). The BO concluded that the Proposed Action would not likely destroy or adversely modify designated critical habitat (NMFS

2011). Therefore, NMFS does not expect the proposed action to result in significant impacts to the physical environment.

### 4.2 Impacts on the Biological Environment

Although the biological environment may be greatly impacted by the oil spill in the Gulf, NMFS' Proposed Action would not significantly impact the target species. Under Alternative 1, permit would not be issued and no research on sea turtles would occur. Therefore, the biological environment would not be impacted. In addition, the opportunity would be lost to better understand sea turtle biology and ecology and gain vital, ephemeral information on how sea turtles are impacted by the Deepwater Horizon Oil Spill and quantify exposure and injury from the spill for NOAA's NRDA process. Preferred Alternative 2 would permit the applicant to conduct scientific research on sea turtles in waters of the Gulf impacted by the Deepwater Horizon Oil Spill. This alternative is not reasonably expected to jeopardize the sustainability of any target or non-target stocks. Rather, the Proposed Action would benefit the target sea turtle species by providing valuable information on sea turtle biology, ecology, and physiology. Although the proposed action area has expanded, the proposed activities would occur in the same manner as previously described and analyzed in the EAs prepared for this applicant's research in the waters of the Gulf for Permit Nos. 1526 and 1526-01 (NMFS 2005; NMFS 2007), the Proposed Action is not likely to significantly impact sea turtles or any other portion of the biological environment. The BO (NMFS 2011) prepared for this action evaluated the potential impacts of the spill to the target sea turtle species, including the exposure to oil, use of dispersants, and other response activities that could harm sea turtles. The BO concluded that the Proposed Action would not likely jeopardize the continued existence of any of the species. Further, the permit for the Proposed Action will contain mitigation measures to prevent adverse effects to endangered or threatened species and marine mammals; the sampling will follow sea turtle handling protocols established by NMFS Southeast Fisheries Science Center (SEFSC). NMFS also solicited comments from agency marine mammal scientists to ensure the Proposed Action would not adversely affect marine mammals.

The proposed activities would not significantly affect the target or non-target species, biodiversity, ecosystem function, or protected resources differently from those effects analyzed previously.

To reduce the likelihood of serious injury or mortalities during the research, researchers would adhere to standard mitigation conditions in the permit (e.g., frequent net checks, limited set duration). Additionally, researchers would comply with the sea turtle handling regulations found at 50 CFR 223.206. NMFS does not expect entanglement or cast net capture to result in more than short-term effects on most of the individual animals due to the conditions concerning net monitoring, animal handling and follow-up monitoring that would be required by the permit. However, NMFS recognizes that entanglement netting has the potential to result in forced submergence and drowning of sea turtles. This probability is considered low (0.004) based on the applicant's past capture experience and the protocols he would be required to follow. Based on the low probability of mortality, should it occur, the permit would authorize two mortalities over the life of the permit of any of the species authorized for capture.

While the exact effects of the death of two hardshell sea turtles on the target sea turtle populations are not known, given the low number of deaths that would be authorized, this loss is not expected to appreciably reduce the likelihood of survival and recovery of the target species. Even if the sea turtles killed were reproductive females, this loss (which would occur over a limited period) is not anticipated to have a detectable effect on the numbers or reproduction of the affected population.

Preferred Alternative 2 is not expected to have a substantial impact on biodiversity and/or ecosystem function within the affected area. As discussed in the Affected Environment, impacts to non-target species would be minimal and not result in significant impacts. Conditions of the permit would minimize the risk of harm or stress to the target species during capture and subsequent handling, transport, sampling, tagging, and release. These measures would include stringent netting conditions to prevent undue stress to the target species and would minimize the impacts to non-target species. The applicant's proposed activities (capture, handling, measuring, weighing, photographing, transporting, passive integrated transponder (PIT), flipper and satellite tagging, epibiota removal, blood and tissue sampling, and release) would be performed by qualified, trained personnel following standard, established methods commonly used by sea turtle researchers and protocols approved by NOAA's Natural Resources Damage Assessment (NRDA 2010). Furthermore, the effects of the proposed activities on the biological environment have been analyzed under the applicant's previous permit (Nos. 1526 and 1526-01). This permit authorized the handling, measuring, weighing, PIT, flipper and satellite tagging, epiphyte sample, fecal sample, and blood sampling of sea turtle species including Kemp's ridley, loggerhead, green and hawksbill captured by entanglement netting and cast net. The FONSI for this permit found that "issuance of the permit would not likely jeopardize the continued existence of the species and would not likely destroy or adversely modify designated critical habitat" (NMFS 2005a); this finding was supported by the accompanying Biological Opinion for File No. 1526 (NMFS 2005b).

The only activity not previously analyzed for Permit No. 1526-01 that is requested here as part of the Proposed Action is tissue sampling. However, it is not expected that individual turtles would experience more than minimal, short-term stress during tissue sampling. Samples would be collected by trained personnel with experience in biopsy sampling. Other researchers who have examined turtles recaptured two to three weeks after tissue sample collection noted the sample collection site was almost completely healed with no signs of infection (NMFS 2006). Further, NMFS researchers who have performed this technique for at least 10 years have encountered no infections or mortality resulting from this procedure (NMFS 2006). The proposed tissue sampling would be conducted in the same manner as analyzed in the EA for Permit No. 14506, which resulted in a Finding of No Significant Impact (NMFS 2010b). Further, NMFS SEFSC has reported no injuries or mortalities as a result of tissue biopsying (NMFS 2006). Therefore, NMFS does not expect the proposed tissue sampling to result in significant impacts to the target species.

Overall, beyond mortalities that would be authorized, the individual and combined impacts of the non-lethal research activities are not expected to have more than short-term effects on individual sea turtles and any increase in stress levels from the research would dissipate within approximately a day. The short-term stresses to individual animals resulting from the research activities discussed above are expected to be minimal and negligible at the population or species

levels. A limited number of mortalities would be authorized. These takes would kill the individual animal; however NMFS anticipates that the mortalities, even when added to the effects of activities that have, are, or will take place (e.g., as discussed in the threats and baseline section of the attached biological opinion and in this EA) would not have a detectable effect on the numbers or reproduction of the affected populations. The mortalities are authorized over a limited time period with limits on the total level of take. Mortalities would be well documented and reported. In the event that a mortality occurred researchers would contact NMFS within two days and the event would be evaluated.

The permit would contain conditions to mitigate adverse impacts to sea turtles and non-target species from the proposed research activities. Turtles would be worked up as quickly as possible to minimize stress resulting from the research. The Permit Holder 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. Dr. Landry would be required to exercise care when handling animals to minimize any possible injury. During release, turtles would be lowered as close to the water's surface as possible, to prevent potential injuries.

Overall, the Proposed Action would not be expected to have more than minimal effects on endangered and threatened sea turtle populations. Thus the research would not result in a permanent decrease in a sea turtle species' or populations' reproductive success, lead to a long-term reduction in prey availability, the survival of young turtles, or the number of young turtles that annually recruit into the breeding populations of any of the sea turtle species. Given this analysis of impacts to sea turtles, NMFS does not expect the Proposed Action to result in significant impacts to the target sea turtles, their populations or species. Furthermore, as determined in the associated BO, Permit No. 15606 as proposed, would not likely jeopardize the continued existence of the species and would not likely destroy or adversely modify designated critical habitat. In addition, NMFS does not expect the Proposed Action to significantly impact any non-target species or other portions of the human environment.

### 4.3 Impacts on the Socioeconomic Environment

Because the social and economic effects of the Proposed Action mainly involve impacts to the people involved in the research, as well as any industries supporting the research, such as suppliers of equipment needed to accomplish the research, there are no significant social or economic impacts of the Proposed Action interrelated with significant natural or physical environmental effects. Thus, this EA does not include any further analysis of social or economic effects of the Proposed Action.

### 4.4 Cumulative Effect Analysis (CEA)

NEPA defines a cumulative impact as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant

actions taking place over a period of time" (40 CFR 1508.7). Cumulative effects can either be additive or synergistic. A synergistic effect is when the combined effects are greater than the sum of the individual effects.

Historically, one of the major contributors to declines in sea turtle populations was the commercial harvest of eggs and turtles. Today, target sea turtles may be adversely affected by human activities including commercial and recreational fishing (as bycatch via entrapment and entanglement in fishing gear), habitat degradation, and tourism and recreation (via harassment from human approach and presence) within the action area. Of these, 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 entanglement of animals in fishing gear. In addition, the target species benefit from other 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.

Research on sea turtles in the United States is carefully controlled and managed so that it does not operate to the disadvantage of the species. In addition to permits issued by NMFS for the scientific research of sea turtles in the marine environment, similar ESA Section 10 federal permits are issued by the USFWS for the taking of endangered and threatened sea turtles on land for activities and efforts that aid the conservation and recovery of these species.

As a condition of the permit, the Permit Holder would be required to coordinate the timing of his activities with other researchers that may be in the area to minimize cumulative impacts to the target species. Over the last five years, Dr. Landry has been one of two holders of a NMFS scientific research permit (No. 1526-01; Landry's current permit) for work in the proposed, specific action area on the target species. The only other researcher authorized to conduct activities in this area is the NMFS SEFSC under Permit Nos. 1551 and 1570 which authorize research activities on the target species throughout the whole Gulf and the Atlantic Ocean. Given the required coordination and NOAA's efforts to coordinate research as part of NRDA, NMFS does not expect that the Proposed Action would result in cumulative significant impacts to the target sea turtle species. Further, to mitigate the risk of negative cumulative effects to turtles, researchers would be required to scan turtles for existing PIT tags before applying new tags; turtles that have existing PIT and flipper tags would not be re-tagged. 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 the coordination of research permits and other human activities in the area and take steps appropriate to minimize disturbance from multiple activities.

Under the proposed permit, animals in the action area would be disturbed by research for up to five years. Whether this frequency of disturbance, by itself or in combination with disturbance from other permitted research, would result in cumulative adverse effects depends on how long the effects of each disturbance last, whether the animals have sufficient time between disturbance events to resume or compensate for disrupted activities, and whether the effects of repeated disturbance are additive, synergistic or accumulate in some other way. However, as previously discussed, NMFS limits repeated harassment of individual turtles and avoids unnecessary duplication of research efforts by requiring coordination among Permit Holders. All scientific research permits are also conditioned with mitigation measures to ensure that the research impacts target and non-target species as minimally as possible. Further, the effects of many

individual research activities (e.g., a survey, a field trip to capture animals) are short-term, dissipating within hours to days following the research event, impacting individual animals. These proposed research activities are not likely to result in the serious injury, mortality or reduced fecundity of target animals. Given this low degree of adverse impacts and the mechanisms in place to limit repeated disturbance of individual animals, NMFS does not expect the combination of research activities in the action area to significantly impact sea turtles at the population or species level.

The Proposed Action is not related to other actions with individually insignificant but cumulatively significant impacts. In general, this action would provide resource managers with important information on sea turtle assemblages, including how they may be impacted by the Deepwater Horizon oil spill. NMFS' Proposed Action is not anticipated to have significant direct, indirect, or cumulative effects on the biological, physical, and socioeconomic environment. To the extent that future longer-term management actions and restoration decisions are made, NMFS would conduct future environmental reviews and consider the oil spill within the environmental context of the effects of a proposed action and alternatives. The oil spill event itself is expected to lead to cumulatively significant impacts on the physical, biological, and human environment, but the proposed action to permit sea turtle research in areas affected by the oil spill is not expected to exacerbate the situation.

NMFS has concluded that Permit No. 15606, as proposed, would not likely jeopardize the continued existence of the species and would not likely destroy or adversely modify designated critical habitat. Additionally, the activities that would be conducted under the permit are not expected to significantly affect other portions of the environment. NMFS believes issuance of the permit would be consistent with the goals of the ESA and NEPA and should be approved.

## CHAPTER 5 LIST OF PREPARERS AND AGENCIES CONSULTED

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

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Appendix 1: Maximum annual takes of Kemp's ridley, loggerhead, green, and hawksbill sea turtles under Permit 15606.

| Research Project | Species | Lifestage | Number of Animals per Year | Take Action | Collect Method | Procedures |
|---|---|---|---|---|---|---|
| 1 | Green | Adult/ Subadult/ Juvenile | 25 | Capture/Handle /Release | Net, Tangle | Count/survey; Epibiota removal; Instrument, epoxy attachment (e.g., satellite tag, VHF tag); Mark, flipper tag; Mark, PIT tag; Measure; Photograph/Video; Sample, fecal ; Sample, scute scraping; Sample, tissue; Tracking; Transport; Weigh |
| 1 | Green | Adult/ Subadult/ Juvenile | 120 | Capture/Handle /Release | Net, Tangle | Count/survey; Epibiota removal; Mark, flipper tag; Mark, PIT tag; Measure; Photograph/Video; Sample, scute scraping; Sample, tissue; Transport; Weigh |
| 1 | Green | Adult/ Subadult/ Juvenile | 5 | Capture/Handle /Release | Net, Cast | Count/survey; Epibiota removal; Mark, flipper tag; Mark, PIT tag; Measure; Photograph/Video; Sample, tissue; Transport; Weigh |
| 1 | Kemp's ridley | Adult/ Subadult/ Juvenile | 30 | Capture/Handle /Release | Net, Tangle | Count/survey; Epibiota removal; Mark, flipper tag; Mark, PIT tag; Measure; Photograph/Video; Transport; Weigh |
| 1 | Loggerhead | Adult/ Subadult/ Juvenile | 20 | Capture/Handle /Release | Net, Tangle | Count/survey; Epibiota removal; Mark, flipper tag; Mark, PIT tag; Measure; Photograph/Video; Transport; Weigh |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2 | Kemp's ridley | Adult/ Subadult/ Juvenile | 10 | Capture/Handle /Release | Net, Tangle | Count/survey; Epibiota removal; Instrument, epoxy attachment (e.g., satellite tag, VHF tag); Mark, flipper tag; Mark, PIT tag; Measure; Photograph/Video; Sample, scute scraping; Sample, tissue; Tracking; Transport; Weigh |
| 2 | Kemp's ridley | Adult/ Subadult/ Juvenile | 4 | Capture/Handle /Release | Capture under other authority | Count/survey; Epibiota removal; Instrument, epoxy attachment (e.g., satellite tag, VHF tag); Mark, flipper tag; Mark, PIT tag; Measure; Photograph/Video; Sample, fecal ; Sample, scute scraping; Sample, tissue; Tracking; Transport; Weigh |
| 2 | Kemp's ridley | Adult/ Subadult/ Juvenile | 125 | Capture/Handle /Release | Net, Tangle | Count/survey; Epibiota removal; Mark, flipper tag; Mark, PIT tag; Measure; Photograph/Video; Sample, scute scraping; Sample, tissue; Transport; Weigh |
| 2 | Kemp's ridley | Adult/ Subadult/ Juvenile | 10 | Capture/Handle /Release | Capture under other authority | Count/survey; Epibiota removal; Mark, flipper tag; Mark, PIT tag; Measure; Photograph/Video; Sample, scute scraping; Sample, tissue; Transport; Weigh |
| 2 | Loggerhead | Adult/ Subadult/ Juvenile | 10 | Capture/Handle /Release | Net, Tangle | Count/survey; Epibiota removal; Mark, flipper tag; Mark, PIT tag; Measure; Photograph/Video; Sample, scute scraping; Sample, tissue; Transport; Weigh |
| 2 | Loggerhead | Adult/ Subadult/ Juvenile | 40 | Capture/Handle /Release | Capture under other authority | Count/survey; Epibiota removal; Mark, flipper tag; Mark, PIT tag; Measure; Photograph/Video; Sample, scute scraping; Sample, tissue; Transport; Weigh |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2 | Green | Adult/ Subadult/ Juvenile | 15 | Capture/Handle /Release | Net, Tangle | Count/survey; Epibiota removal; Mark, flipper tag; Mark, PIT tag; Measure; Photograph/Video; Sample, scute scraping; Sample, tissue; Transport; Weigh |
| 2 | Green | Adult/ Subadult/ Juvenile | 10 | Capture/Handle /Release | Capture under other authority | Count/survey; Epibiota removal; Mark, flipper tag; Mark, PIT tag; Measure; Photograph/Video; Sample, scute scraping; Sample, tissue; Transport; Weigh |
| 3 | Kemp's ridley | Adult/ Subadult/ Juvenile | 12 | Capture/Handle /Release | Net, Tangle | Count/survey; Epibiota removal; Mark, flipper tag; Mark, PIT tag; Measure; Photograph/Video; Sample, blood; Transport; Weigh |
| 3 | Green | Adult/ Subadult/ Juvenile | 12 | Capture/Handle /Release | Net, Tangle | Count/survey; Epibiota removal; Mark, flipper tag; Mark, PIT tag; Measure; Photograph/Video; Sample, blood; Transport; Weigh |
| 4 | Kemp's ridley | Adult/ Subadult/ Juvenile | 200 | Capture/Handle /Release | Net, Tangle | Count/survey; Epibiota removal; Instrument, epoxy attachment (e.g., satellite tag, VHF tag); Mark, flipper tag; Mark, PIT tag; Measure; Photograph/Video; Sample, blood; Sample, tissue; Tracking; Transport; Weigh |
| 4 | Loggerhead | Adult/ Subadult/ Juvenile | 20 | Capture/Handle /Release | Net, Tangle | Count/survey; Epibiota removal; Instrument, epoxy attachment (e.g., satellite tag, VHF tag); Mark, flipper tag; Mark, PIT tag; Measure; Photograph/Video; Sample, blood; Sample, tissue; Tracking; Transport; Weigh |
| 4 | Loggerhead | Adult/ Subadult/ Juvenile | 20 | Capture/Handle /Release | Net, Tangle | Count/survey; Epibiota removal; Mark, flipper tag; Mark, PIT tag; Measure; Photograph/Video; Sample, blood; Sample, tissue; Transport; Weigh |

| | | | | | | |
|---|---|---|---|---|---|---|
| 4 | Green | Adult/ Subadult/ Juvenile | 20 | Capture/Handle /Release | Net, Tangle | Count/survey; Epibiota removal; Instrument, epoxy attachment (e.g., satellite tag, VHF tag); Mark, flipper tag; Mark, PIT tag; Measure; Photograph/Video; Sample, blood; Sample, tissue; Tracking; Transport; Weigh |
| 4 | Green | Adult/ Subadult/ Juvenile | 20 | Capture/Handle /Release | Net, Tangle | Count/survey; Epibiota removal; Mark, flipper tag; Mark, PIT tag; Measure; Photograph/Video; Sample, blood; Sample, tissue; Transport; Weigh |
| 4 | Hawksbill | Adult/ Subadult/ Juvenile | 10 | Capture/Handle /Release | Net, Tangle | Count/survey; Epibiota removal; Instrument, epoxy attachment (e.g., satellite tag, VHF tag); Mark, flipper tag; Mark, PIT tag; Measure; Photograph/Video; Sample, blood; Sample, tissue; Tracking; Transport; Weigh |
| Any | Hardshell turtle | Adult/ Subadult/ Juvenile | 2* | Capture/Handle /Unintentional Mortality | Other | ***Unintentional mortalities may not exceed 2 hardshell sea turtles of any species authorized for research over the life of the permit, not annually.** |