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

SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT

for

Issuance of a Modification to Scientific Research Permit No. 14726-01 for Research on Protected Sea Turtles

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Lead Agency: U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Office of Protected Resources

Responsible Official: Donna S. Wieting, 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

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Abstract: The National Marine Fisheries Service (NMFS), Office of Protected Resources, proposes to issue a modification to a scientific research permit for takes of sea turtles in the wild, 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). The objectives of Permit No. 14726-01 are to 1) assess areas that serve as developmental habitat for pelagic juvenile and neonate sea turtles; 2) quantify threats to pelagic sea turtles; and 3) study their life-history, genetics, movements, behavior, and diet in Florida waters. The proposed modification would authorize additional research objectives and procedures, increase the number of sea turtles taken annually, and broaden the action area. NMFS prepared an environmental assessment (EA) for issuance of the permit in 2010 and a supplemental EA (SEA) for issuance of a modification to the permit in 2011. This SEA evaluates the potential impacts to the human environment from issuance of the proposed permit modification by supplementing the 2011 SEA's assessment of potential impacts on sea turtles.

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CHAPTER 1 PURPOSE OF AND NEED FOR ACTION

1.1 DESCRIPTION OF ACTION

In response to receipt of a request from Blair Witherington, Ph.D., Disney's Animal Kingdom, Animal Programs Administration, P.O. Box 10,000, Lake Buena Vista, FL 32830, NMFS proposes to issue a modification to his scientific research permit, No. 14726-01, authorizing "takes"[1] of sea turtles in the wild 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).

1.1.1 Purpose and Need

The primary purpose of the permit is to provide an exemption from the take prohibition under the ESA to allow "takes". The need for issuance of the permit modification is related to NMFS's mandates under the ESA. NMFS has a responsibility to implement the ESA to protect, conserve, and recover threatened and endangered species under its jurisdiction. The ESA prohibits takes of threatened and endangered species, with only a few specific exceptions, including for scientific research and enhancement purposes. Permit issuance criteria require that research activities are consistent with the purposes and policies of the ESA and will not have a significant adverse impact on the species or stock. The proposed modification would allow the applicant to better address recovery plan actions and provides information on sea turtles essential to their conservation and management.

1.1.2 Research Objectives

The objectives of the research that would be permitted under the Proposed Action are to:

1) locate and describe areas of the Atlantic Ocean and Gulf of Mexico around Florida that serve as developmental habitat for pelagic-stage sea turtles;

2) quantify threats to pelagic sea turtles; and

3) gather information on their life history, genetics, movements, behavior and diet.

1.2 OTHER EA/EIS THAT INFLUENCE THE SCOPE OF THIS SEA

An EA (NMFS 2010a) was prepared for issuance of the original permit (No. 14726) in 2010 which resulted in a finding of no significant impact (FONSI), determining that issuance of the action and conduct of the associated research would not have measurable impacts on the physical, social, or economic environment but could result in harassment, as defined in the ESA, of sea turtles. The analyses focused on potential impacts to the biological environment, especially sea turtles. NMFS determined that the proposed harassment to sea turtles would not result in significant impacts to any portion of the human environment. In addition, a biological opinion was prepared for the action finding that the action would not jeopardize the continued

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1 The ESA defines "take" as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." The term "harm" is further defined by regulations (50 CFR §222.102) as "an act which actually kills or injures fish or wildlife. Such an act may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns including breeding, spawning, rearing, migrating, feeding, or sheltering."

existence of any threatened or endangered species or result in destruction or adverse modification of any critical habitat (NMFS 2010b).

A SEA (NMFS 2011a) was prepared for issuance of the first modification to the permit (No. 14726 in 2011 also resulting in a FONSI similar to the 2010 FONSI. The modification authorized an increase in activities, action area, sea turtle lifestages (adult and subadult), and annual take numbers temporarily through 2011 as part of the NRDA response for the DWH oil spill. This included a temporary expansion of the action area to the entire Gulf of Mexico. The analyses focused on potential impacts to the biological and physical environment. NMFS determined that the proposed activities would not result in significant impacts to any portion of the human environment. In addition, a biological opinion was prepared for the action finding that the action would not jeopardize the continued existence of any threatened or endangered species or result in destruction or adverse modification of any critical habitat (NMFS 2011b).

The scope of this SEA is limited to the potential impacts to the physical and biological environment, particularly sea turtles, associated with the proposed increase in take numbers, additional research activities, and the expanded study area. The duration of the permit would not change as a result of the proposed modification and therefore is not discussed in this SEA.

1.3 SCOPING SUMMARY

The purpose of scoping is to identify the issues to be addressed and the significant issues related to the proposed action, as well as identify and eliminate from detailed study the issues that are not significant or that have been covered by prior environmental review. An additional purpose of the scoping process is to identify the concerns of the affected public and Federal agencies, states, and Indian tribes. CEQ regulations implementing the National Environmental Policy Act of 1969 (NEPA; 42 U.S.C. 4321 et seq.) do not require that a draft EA be made available for public comment as part of the scoping process. However, a draft SEA was made available for review and comment concurrent with the requisite public comment period for the proposed permit modification request. NMFS published a Federal Register notice of receipt (78 FR 57353) of the request for File No. 14726-02. The modified permit would authorize standard, well known techniques that are routinely authorized in NMFS scientific research permits. Thus, the proposed action is not considered controversial; this determination is supported by the lack of public comment on the action.

CHAPTER 2 ALTERNATIVES INCLUDING THE PROPOSED ACTION

This chapter describes the range of potential actions (alternatives) determined reasonable with respect to achieving the stated objective, as well as alternatives eliminated from detailed study. This chapter also summarizes the expected outputs and any related mitigation of each alternative. Two alternatives are being considered in this SEA. One alternative is the "No Action" alternative where the proposed permit modification would not be issued. The No Action alternative is the baseline for rest of the analyses. The Proposed Action alternative represents the research proposed in the submitted modification request, with standard permit terms and conditions specified by NMFS. Descriptions of the environmental consequences associated with each alternative can be found in Section 4.0 along with the biological environments affected by this action.

2.1 ALTERNATIVE 1 – NO ACTION

Under the No Action alternative the permit modification request would be denied. The current permit, No. 14726-01, would remain valid through its expiration date and research would continue to occur as currently authorized by the permit.

Permit No. 14726-01 authorizes the Permit Holder to 1) locate and describe areas of the Atlantic Ocean and Gulf of Mexico around the coast of Florida that serve as developmental habitat for pelagic-stage loggerhead (*Caretta caretta*), green (*Chelonia mydas*), Kemp's ridley (*Lepidochelys kempii*), hawksbill (*Eretmochelys imbricata*), and leatherback (*Dermochelys coriacea*) sea turtles; 2) quantify threats to pelagic sea turtles; and 3) gather information on their life-history, genetics, movements, behavior, and diet. Researchers are authorized to capture by dip net, flipper and passive integrated transponder tag, measure, weigh, fecal sample, and oral swab sea turtles. A subset of animals may be skin biopsied, lavaged or have a satellite tag attached to the carapace. See Appendix 1 for details on the takes that were temporarily authorized in 2011 with permit modification No. 1 (Table 1), and takes currently permitted (Table 2). The takes in Table 1 expired in 2011 and authorized takes were reverted back to those identified in Table 2 as of 1/1/2012.

2.2 ALTERNATIVE 2 – PROPOSED ACTION (ISSUANCE OF PERMIT MODIFICATION WITH STANDARD CONDITIONS)

Under the Proposed Action alternative, a permit modification would be issued for activities as proposed by the applicant, with the permit terms and conditions standard to such permits as issued by NMFS.

NMFS proposes to modify Permit No. 14726-01 to authorize the changes noted below and as indicated in the proposed take table in Appendix 2. If this alternative is selected, the resulting permit would be designated Permit No. 14726-02.

- Broaden the action area to the entire Gulf of Mexico and re-authorize research on adult and subadult lifestages of sea turtles (as previously authorized for 2011) for the remaining life of the permit.
- Modify the manner in which some animals are satellite tagged to use a 'softer' epoxy attachment method and authorize its use on all species except leatherbacks as noted in Appendix 2.
- Change the species and number of animals that may be biologically sampled and satellite tagged as noted in Appendix 2.
- Add scute and blood sampling to the suite of procedures that can be performed on captured sea turtles as noted in Appendix 2.
- Authorize takes for vessel surveys for counts of leatherback and loggerhead sea turtles.

Genetic and stable isotope analyses from this sampling would help Dr. Witherington determine the trophic history of pelagic neonate and neritic stage loggerhead sea turtles and assign a source

rookery to these turtles. Satellite telemetry with the trophic histories would further describe the sea turtles' home range, habitat use, residency and intersection with fisheries.

Duration

The proposed modification would be valid through the life of the permit, September 15, 2015.

Area

The Proposed Action would expand the action area to authorize research throughout the Gulf as done temporarily for 2011 as part of Modification No. 1 to the permit. Researchers would survey habitat identified by pelagic *Sargassum* at major convergence zones found 180–300 km offshore from ports in Texas, Louisiana, and central Florida associated with Gulf Loop Current features in oceanic waters of the western, central, and eastern Gulf. No work would occur in protected areas, including National Marine Sanctuaries. This expansion would be valid for the remaining life of the permit.

Methods

Research activities on the target sea turtles would occur in the same manner as previously described in the 2010 EA for Permit No. 14726 with the exceptions and additions discussed here. Scute and blood sampling as well as the collection of a second tissue sample from some animals would be new activities for this permit and are described here. The permit currently authorizes collection of a tissue sample from the rear flipper as analyzed in the 2010 EA. In addition to the epoxy-based attachment described in the 2010 EA, researchers also would use a modified 'soft' adhesive attachment method for juvenile sea turtles as described below for the take rows listed in Appendix 2. The permit would continue to contain conditions to mitigate potential impacts, such as requiring the use of aseptic sampling methods, to sea turtles from these activities.

Tissue, blood, and scute sampling

Sampled turtles would be over 10 cm straight carapace-length (SCL). Researchers would use aseptic techniques with a 6-mm biopsy punch to collect a second skin sample from the shoulder and to collect a scute punch from the thickest portion of a first or second costal scute. The scute punch would provide three layers of material. The skin and scute samples would comprise as many as four representative time periods of trophic history from recent experience (skin) to the turtle's post-hatchling period (exterior scute). Blood for stable isotope analysis would come from 7-ml samples (for turtles no smaller than 50 cm SCL) drawn from the turtles' cervical sinus using aseptic techniques.

To assess the trophic record of captured sea turtles, researchers would analyze stable isotope ratios of carbon, nitrogen, and sulfur, found in samples of blood, skin and multiple carapace-scute layers. These different tissues would provide a record of stable isotope ratios ranging from days (in blood serum) to years (in the oldest carapace scute layers). Intervening ratios would allow researchers to determine whether the turtle had experienced major changes in habitat or diet. The collected blood would be spun with a centrifuge for 10 minutes. Serum would be collected by a disposable pipette and kept in liquid nitrogen. In the laboratory, carapace scute samples would be divided between eight layers, which would receive separate analyses of stable isotope ratios.

Soft attachment of satellite transmitters
Researchers would attach miniature Argos satellite transmitters (PTTs) to a subsample of no more than 60 (per year) juvenile sea turtles >15 cm SCL captured within surface-pelagic habitat. The PTTs would be 9.5 g, solar powered tags, attached with "soft" adhesive using the methods of Mansfield et al. (2012). The attachment uses a flexible adhesive to hold the tag fast via an acrylic base coat, followed by a mount with strips of neoprene and aquarium silicone. Attachment duration is expected to be less than 6 months, after which the tag would fall off (Mansfield et al. 2012). Even smaller, more subject-ergonomic and hydrodynamic tags would be used as new developments allow. Dr. Witherington would be working collaboratively with Kate Mansfield (Florida International University) on tag development and best available satellite tracking technology. Any changes to the tag design would make the unit smaller or lighter in weight; thus, NMFS expects that such changes would result in lesser impacts to the target animal, compared to those impacts described in this EA. An annual distribution of telemetered turtles would not surpass those totals described in the Appendix 2 take table, distributed between the three study regions of the western, central, and eastern Gulf of Mexico. The species ratio is similar to the species occurrence in the eastern Gulf of Mexico (Witherington et al. 2012). Raw Argos location estimates would be subjected to plausibility filtering based on speed, angle and geometry using a filtering program created by Douglas Argos Filter Algorithm (Douglas 2006). These data would be used to assess sea turtle movements relative to drift habitat and surface advection identified using satellite imagery.

No other changes to the permit would be authorized. All existing conditions in the permit would remain in effect to minimize potential impacts to sea turtles and non-target species. These conditions were identified in the 2010 EA and are hereby incorporated by reference. These measures minimize stress to captured animals; the chance of spreading disease or causing infection during biological sampling; and drag effects, energetic costs, and risk of entanglement of tag attachments. One condition would be added to the permit for the request to specify the minimum size of animals that may receive transmitter attachments.

CHAPTER 3 AFFECTED ENVIRONMENT

A brief description of the affected environment is included herein for this SEA. More detailed descriptions of the existing affected environment for the current permit can be found in the 2010 EA and 2011 SEA and are hereby incorporated by reference and briefly summarized here.

The 2010 EA described and analyzed waters of the Atlantic Ocean and Gulf around the coast of Florida that were 10 to 1,000 m in depth. These areas would still be permitted under the Proposed Action. In the 2011 SEA, the applicant requested to expand the action area through December 31, 2011 to include Federal waters of the Gulf of Mexico. Research would not occur in state waters other than Florida waters currently permitted. Work would not occur within any National Marine Sanctuaries. The expanded area analyzed in the 2011 SEA for issuance of Permit No. 14726-01 would be authorized again for the remaining life of the permit as part of the proposed modification.

Since the writing of the 2011 SEA, critical habitat has been proposed in the nearshore waters of the action area for loggerhead sea turtles (78 FR 43005). More information about the proposed rule can be found at http://www.nmfs.noaa.gov/pr/species/criticalhabitat_loggerhead.htm. Vessel surveys would not involve more than routine vessel movements at the water surface. The proposed modification would not change the manner in which the vessel or research gear would be used in the water column. As noted in the 2010 EA and 2011 SEA, researchers would not conduct activities that are likely to alter or damage bottom habitat, essential fish habitat or other protected areas. Due to the nature of the changes to the research that would be permitted under the proposed action, NMFS does not expect the physical, social and economic environment to be impacted in a manner not previously analyzed in the 2010 EA or 2011 SEA. Therefore, they are not considered further in this SEA.

Under the Proposed Action, NMFS would modify Permit No. 14726-01 to allow the applicant to perform research as described in Section 2.2. The affected biological environment is limited to the target endangered and threatened sea turtles: green, Kemp's ridley, hawksbill, leatherback and loggerhead sea turtles. The status of these species has not changed since the preparation of the 2011 SEA. A more detailed analysis of the status of these species can be found in the Biological Opinion (BO) prepared for this SEA, which is hereby incorporated by reference. As discussed in the BO, all of the target sea turtle species, except for loggerheads, are endangered under the ESA; the most likely distinct population segment (DPS), the Northwest Atlantic DPS, of loggerhead sea turtles to be found in the action area are considered threatened under the ESA. Major threats to sea turtles include destruction and alteration of nesting and foraging habitats, incidental capture in commercial and recreational fisheries, entanglement in marine debris, and vessel strikes. All of the species are included on Appendix I of the Convention on International Trade in Endangered Species of Wild Fauna and Flora. Non-target species would not be affected by the Proposed Action as researchers would not approach or interact with other species.

CHAPTER 4 ENVIRONMENTAL CONSEQUENCES

This chapter represents the scientific and analytic basis for comparison of the direct, indirect, and cumulative effects of the alternatives. Regulations for implementing the provisions of NEPA require consideration of both the context and intensity of a proposed action (40 CFR Parts 1500-1508).

4.1 EFFECTS OF ALTERNATIVE 1: No Action

The No Action alternative would eliminate any potential risk to the environment from the proposed research activities. The target sea turtles would not be impacted by the proposed additional activities. However, activities currently authorized by Permit No. 14726-01 would continue under the No Action alternative. The following summarizes the potential impacts of those activities analyzed in the 2010 EA:

- Research activities are expected to result in no more than short-lived minimal harassment of individual animals, with no serious injury or mortality expected.

- Transmitters, as well as biofouling of the instrument, attached to the carapace of turtles could increase hydrodynamic drag and affect lift and pitch. However, NMFS does not

expect that the transmitter attachments would significantly impact turtle health, biology, physiology, behavior, habitat use, or their ability to forage.

- Repeated tissue, blood and scute sampling has no effect on growth rates and the sampling would not adversely impact turtle physiology or health.

- Animals would be released within hours of capture and should recover from the procedures within the same day.

- 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.

The scientific community would lose the opportunity to collect valuable data that could aid the understanding of turtle habitat use in the Gulf of Mexico.

4.2 EFFECTS OF ALTERNATIVE 2: Issue permit modification with standard conditions

The activities currently authorized by the permit would continue to occur under Alternative 2. Because this modification focuses on activities that would occur on sea turtles already authorized for capture and on the additional loggerhead and leatherback sea turtles that would be counted during vessel surveys under the Proposed Action, impacts would be limited primarily to the biological environment. The activities proposed in the permit modification request would be unlikely to affect the physical or socioeconomic environment or pose a risk to public health and safety.

Environmental Consequences to the Biological Environment – Sea Turtles

The environmental consequences to the biological environment for currently authorized research activities have not changed from how they were described and analyzed in the 2010 EA and 2011 SEA. Therefore, the following discussion focuses on impacts of the research procedures that have not previously been authorized for the permit and the expansion of the action area.

Effects of Blood and Scute Sampling

Although Permit No. 14726 did not originally authorize blood and scute sampling, these activities were analyzed for impacts as part of the 2010 EA because it was a batched assessment for two research permits. As noted in the summary of impacts in Ch. 4.1, impacts from these activities would be short-lived and would not result in serious injury or mortality of the target animals. Because the proposed manner of sampling is similar or identical to that described in the 2010 EA, the impacts of those activities are not re-analyzed here. Therefore, that analysis is incorporated by reference here.

Effects of Soft Attachment of Transmitters

The proposed modification in transmitter attachments is expected to result in lesser or equal impacts to the effects of transmitter attachment methods described in the 2010 EA. In place of

the epoxy, another non-toxic adhesive would be used to attach the transmitters. As noted in Ch. 2, this method would allow researchers to attach a smaller, lighter weight, more hydrodynamic tag unit that would result in less drag than currently authorized satellite tags. Tags would weigh a fraction (approximately 5-6%) of the original satellite tag units authorized by the permit. The flexible adhesive would allow for better tag retention providing better data and more information than current units. To minimize potential impacts (e.g., energetic costs, drag) turtles ≤15 cm SCL would not be tagged keeping in line with the current permit requirement that transmitters and attachment materials equal no more than 5% of a turtle's body mass. Therefore, the proposed modification in transmitter attachments is not expected to result in significant impacts to tagged sea turtles.

Effects of Geographic Expansion and Take Increase

As discussed in Ch. 2 and Ch. 3, the expanded action area was previously analyzed in the 2011 SEA for the temporary authorization of research throughout the Gulf of Mexico as part of the first modification to the permit, No. 14726-01. The analysis in the 2011 SEA indicated that the temporary expansion was not expected to result in significant impacts to the environment. The expansion of the area for the current modification request is expected to result in an increase in take of loggerhead and leatherback sea turtles as a result of researchers conducting additional vessel surveys for counts in this area, but the expansion is not expected to significantly impact the target species or other portions of the biological environment. The increase in takes and expansion of the area would allow the researcher to conduct activities previously analyzed in the 2010 EA but does not represent a consumptive use of sea turtles.

The issue most relevant to the analysis of the increase in take is the potential for negative impacts on the target species. It is important to recognize that an adverse effect on a single individual or a small group of animals does not translate into an adverse effect on the population or species unless it results in reduced reproduction or survival of the individual(s) that causes an appreciable reduction in the likelihood of survival or recovery for the species. In order for the Proposed Action to have an adverse effect on a species, the exposure of individual animals to the research activities would first have to result in:

- direct mortality,
- serious injury that would lead to mortality, or
- disruption of essential behaviors such as feeding, mating, or nursing, to a degree that the individual's likelihood of successful reproduction or survival was substantially reduced.

That mortality or reduction in the individual's likelihood of successful reproduction or survival would then have to result in a net reduction in the number of individuals of the species. In other words, the loss of the individual or its future offspring would not be offset by the addition, through birth or emigration, of other individuals into the population. That net loss to the species would have to be reasonably expected, directly or indirectly, to appreciably reduce the likelihood of both the survival and recovery of the listed species in the wild to result in a significant impact to the species and thus the human environment. As noted in the analysis of impacts from the 2010 EA, the vessel surveys may cause short-term harassment of the target sea turtles while in their vicinity. Animals are expected to resume their previous behaviors minutes after the encounter ends. Thus impacts of the proposed increase in take resulting from vessel survey counts are limited to impacts that have been previously analyzed in the 2010 EA and 2011 SEA

and are incorporated by reference here. We have reviewed the analyses of the 2010 and 2011 EAs and find them to be accurate and up to date. Therefore, effects of the area expansion and take increases are not expected to significantly impact the target species or other portions of the biological environment.

Although the total number of animals taken, action area, and the suite of activities performed would increase as a result of the Proposed Action, as described in Ch. 2, none of the activities is expected to result in the serious injury, mortality or reduced reproductive success of the target species. Therefore the Proposed Action is not expected to significantly impact individual sea turtles, their populations or species. In addition, the biological opinion prepared for this action determined that the Proposed Action would not jeopardize the continued existence of any threatened or endangered species or result in destruction or adverse modification of any critical habitat (NMFS 2014).

In summary, NMFS does not expect that mortality or serious injury of any species would occur as a result of the Proposed Action. Impacts to individual sea turtles are likely to be minimal and short-lived. Any effects of the proposed research activities are not expected to adversely affect the survival, longevity, or lifetime reproductive success of any age class of species. Therefore, NMFS does not expect that the proposed activities would adversely affect any species at the population or species levels or have significant effects on them.

4.3 SUMMARY OF COMPLIANCE WITH APPLICABLE LAWS, NECESSARY FEDERAL PERMITS, LICENSES, AND ENTITLEMENTS

Compliance with applicable laws and other requirements has not changed from those discussed in the 2010 EA. The proposed research is consistent with the purposes, policies, and applicable requirements of the ESA and NMFS regulations. NMFS issuance of the permit would be consistent with the ESA. That discussion is incorporated by reference here.

4.4 COMPARISON OF ALTERNATIVES

While the No Action alternative would result in a lower level of take and therefore effects on the target sea turtles, the opportunity would be lost to collect information that would contribute to better understanding sea turtles and that would provide information to NMFS needed to implement NMFS management activities. This is important information that would help conserve and manage sea turtles as required by the ESA and NMFS's implementing regulations, in that very little in-water research occurs on sea turtles in the Gulf of Mexico and large data gaps exist regarding how sea turtles use this habitat. Thus the proposed research is essentially needed data that would help fill data gaps and address recovery plan priorities for these ESA species. The Proposed Action would affect the environment, primarily individual sea turtles. However, the effects would be minimal and the preferred alternative would allow the collection of valuable information that could help NMFS' efforts to recovery sea turtles. Neither the No Action nor the Proposed Action is anticipated to have adverse population or stock-level effects on sea turtles or other non-target species.

4.5 MITIGATION MEASURES

The activities authorized under Permit No 14726-01 must follow certain procedures in order to minimize and mitigate effects of the proposed action. These conditions would remain in effect if

the Proposed Action were authorized. Also, one new permit condition specific to the new activities to the permit would be included to minimize potential impacts of those methods as noted in Ch. 2. These include conditions that will minimize the potential for injury and stress during procedures.

4.6 UNAVOIDABLE ADVERSE EFFECTS

The research activities would cause disturbance and stress and injury to captured sea turtles. However, the research is not expected to have more than a minimal, temporary effect on individuals, and no effect on populations. While individual sea turtles may experience short-term stress or discomfort in response to the activities of researchers, the impact to individual animals is not expected to be significant. The minimization measures imposed by permit conditions are intended to reduce, to the maximum extent practical, the potential for adverse effects of the research on all species.

4.7 CUMULATIVE EFFECTS ANALYSIS

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 local agencies and organizations including management, conservation, and recovery efforts, nest monitoring, education and outreach, and stranding response programs.

In addition to the above information on the threats to target sea turtle species, the 2010 Deepwater Horizon oil well blowout has impacted green, leatherback, Kemp's ridley, loggerhead, and hawksbill sea turtles located in the Gulf of Mexico. Based on the number of animals collected during response efforts, the event has resulted in the live or dead stranding of more than 1,100 sea turtles. However, this is likely an underestimate of the number of sea turtles impacted by the spill because 1) it is unlikely that all oiled animals were documented and 2) additional sea turtles were observed within oiled waters but were unable to be captured during the response. 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 through efforts such as the Proposed Action. The biological opinion (NMFS 2014) 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 biological opinion concluded 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.

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 all current permit conditions would remain in the modified permit, the Permit Holder would continue to 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. It should be noted that only two other Permit Holders, the NMFS SEFSC and Dr. Kristen Hart, are currently authorized to conduct sea turtle research in Federal waters of the Gulf. The applicant has been actively collaborating and coordinating research with the SEFSC since 2010. 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. Permitted researchers are also required to notify the appropriate NMFS Regional Office at least two weeks in advance of 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. Further, to mitigate the risk of negative cumulative effects to turtles, researchers would continue to 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.

The proposed permit modification would increase takes and potential impacts to the target sea turtles species. Whether this additional level 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 the proposed research activities (e.g., tissue sample, lavage, etc.) are short-term, most dissipating within a day of the research event, impacting individual animals. These 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. The Deepwater Horizon 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. In general, the Proposed Action would provide resource managers with important information on sea turtle assemblages in the Gulf of Mexico. 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.

LIST OF PREPARERS

This SEA was prepared by Amy Hapeman with the NMFS, Office of Protected Resources in Silver Spring, Maryland. No other agencies were consulted in the preparation of this document.

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APPENDIX 1.

Table 1. Temporary annual takes authorized in Permit No. 14726-01 for 2011 only. These takes have since expired and authorized takes reverted back to those identified in Table 2 as of 1/1/2012.

SEA TURTLE SPECIES	NO. ANIMALS	LIFESTAGE	TAKE ACTION	COLLECT METHOD	PROCEDURES
Loggerhead	500	Juvenile, Neonate	Capture/Handle/ Release	Dip Net	Count/survey; Mark, flipper tag; Mark, PIT tag; Measure; Sample, fecal; Sample, oral swab; Weigh
Loggerhead	100	Adult/Subadult /Juvenile, Neonate	Capture/Handle/ Release	Dip Net	Count/survey; Lavage; Mark, flipper tag; Mark, PIT tag; Measure; Sample, fecal; Sample, oral swab; Sample, tissue; Weigh
Green	500	Juvenile, Neonate	Capture/Handle/ Release	Dip Net	Count/survey; Lavage; Mark, flipper tag; Mark, PIT tag; Measure; Sample, fecal; Sample, oral swab; Sample, tissue; Weigh
Green	50	Juvenile, Neonate	Capture/Handle/ Release	Dip Net	Count/survey; Instrument, epoxy attachment (e.g., satellite tag, VHF tag); Lavage; Mark, flipper tag; Mark, PIT tag; Measure; Sample, fecal; Sample, oral swab; Sample, tissue; Weigh
Hawksbill	100	Juvenile, Neonate	Capture/Handle/ Release	Dip Net	Count/survey; Lavage; Mark, flipper tag; Mark, PIT tag; Measure; Sample, fecal; Sample, oral swab; Sample, tissue; Weigh
Kemp's ridley	500	Juvenile, Neonate	Capture/Handle/ Release	Dip Net	Count/survey; Lavage; Mark, flipper tag; Mark, PIT tag; Measure; Sample, fecal; Sample, oral swab; Weigh
Kemp's ridley	50	Juvenile, Neonate	Capture/Handle/ Release	Dip Net	Count/survey; Instrument, epoxy attachment (e.g., satellite tag, VHF tag); Lavage; Mark, flipper tag; Mark, PIT tag; Measure; Sample, fecal; Sample, oral swab; Weigh
Leatherback	10	Juvenile, Neonate	Capture/Handle/ Release	Dip Net	Count/survey; Lavage; Mark, flipper tag; Mark, PIT tag; Measure; Sample, fecal; Sample, oral swab; Weigh

Table 2. Current annual takes authorized for pelagic juvenile and neonate sea turtles under Permit No. 14726-01. Note, this is the same level of take as originally authorized for the original permit, No. 14726.

SEA TURTLE SPECIES	NO. ANIMALS	TAKE ACTION	COLLECT METHOD	PROCEDURES
Loggerhead	150	Capture/Handle/Release	Dip Net	Count/survey; Mark, flipper tag; Mark, PIT tag; Measure; Sample, oral swab; Weigh
Loggerhead	100	Capture/Handle/Release	Dip Net	Count/survey; Lavage; Mark, flipper tag; Mark, PIT tag; Measure; Sample, oral swab; Sample, tissue; Weigh
Green	100	Capture/Handle/Release	Dip Net	Count/survey; Lavage; Mark, flipper tag; Mark, PIT tag; Measure; Sample, oral swab; Sample, tissue; Weigh
Hawksbill	50	Capture/Handle/Release	Dip Net	Count/survey; Lavage; Mark, flipper tag; Mark, PIT tag; Measure; Sample, oral swab; Sample, tissue; Weigh
Kemp's ridley	45	Capture/Handle/Release	Dip Net	Count/survey; Lavage; Mark, flipper tag; Mark, PIT tag; Measure; Sample, oral swab; Weigh
Kemp's ridley	5	Capture/Handle/Release	Dip Net	Count/survey; Instrument, epoxy attachment (e.g., satellite tag, VHF tag); Lavage; Mark, flipper tag; Mark, PIT tag; Measure; Sample, oral swab; Weigh
Leatherback	10	Capture/Handle/Release	Dip Net	Count/survey; Lavage; Mark, flipper tag; Mark, PIT tag; Measure; Sample, oral swab; Weigh

APPENDIX 2.

Table 1. Proposed annual authorized takes of sea turtles along the Atlantic coast of Florida and throughout the Gulf of Mexico. Changes from the current permit (Table 2 of Appendix 1) are reflected in bold font.

SEA TURTLE SPECIES	NO. ANIMALS	TAKE ACTION	COLLECT METHOD	PROCEDURES	DETAILS
Loggerhead	**140**	Capture/Handle/ Release	Dip Net	Count/survey; **lavage;** Measure; Sample, oral swab; Weigh	Post-hatchlings (4-10 cm SCL)
Loggerhead	**10**	Capture/Handle/ Release	Dip Net	Count/survey; **Instrument, soft attachment of satellite tag; Lavage;** Mark, flipper tag; Mark, PIT tag; Measure; Sample, oral swab; **Sample, tissue, fecal, scute, and blood**; Weigh	Surface-pelagic juvenile (10-45 cm SCL)
Loggerhead	**85**	Capture/Handle/ Release	Dip Net	Count/survey; Lavage; Mark, flipper tag; Mark, PIT tag; Measure; Sample, oral swab; **Sample, tissue, fecal, scute, and blood**; Weigh	Adult/subadult/juvenile rows
Loggerhead	**15**	Capture/Handle/ Release	Dip Net	Count/survey; **Instrument, epoxy attachment, satellite tag**; Lavage; Mark, flipper tag; Mark, PIT tag; Measure; Sample, oral swab; **Sample, tissue, fecal, scute, and blood**; Weigh	Adult/subadult/juvenile rows
Green	**60**	Capture/Handle/ Release	Dip Net	Count/survey; lavage; Measure; Sample, oral swab; Weigh	Post-hatchlings (4-10 cm SCL)
Green	**20**	Capture/Handle/ Release	Dip Net	Count/survey; Lavage; Mark, flipper tag; Mark, PIT tag; Measure; Sample, oral swab; **Sample, tissue, fecal, scute, and blood**; Weigh	Surface-pelagic juvenile (10-45 cm SCL)
Green	**20**	Capture/Handle/ Release	Dip Net	Count/survey; **Instrument, soft attachment of satellite tag;** Lavage; Mark, flipper tag; Mark, PIT tag; Measure; Sample, oral swab; **Sample, tissue, fecal, scute, and blood**; Weigh	Surface-pelagic juvenile (10-45 cm SCL)

SEA TURTLE SPECIES	NO. ANIMALS	TAKE ACTION	COLLECT METHOD	PROCEDURES	DETAILS
Hawksbill	**40**	Capture/Handle/ Release	Dip Net	Count/survey; Lavage; Mark, flipper tag; Mark, PIT tag; Measure; Sample, oral swab; **Sample, tissue, fecal, scute, and blood**; Weigh	Surface-pelagic juvenile (10-45 cm SCL)
Hawksbill	**10**	Capture/Handle/ Release	Dip Net	Count/survey; **Instrument, soft attachment of satellite tag;** Lavage; Mark, flipper tag; Mark, PIT tag; Measure; Sample, oral swab; **Sample, tissue, fecal, scute, and blood**; Weigh	Surface-pelagic juvenile (10-45 cm SCL)
Kemp's ridley	**30**	Capture/Handle/ Release	Dip Net	Count/survey; Lavage; Mark, flipper tag; Mark, PIT tag; Measure; Sample, oral swab; Weigh; **Sample, tissue, fecal, scute, and blood**	Surface-pelagic juvenile (10-45 cm SCL)
Kemp's ridley	**20**	Capture/Handle/ Release	Dip Net	Count/survey; **Instrument, soft attachment of satellite tag;** Lavage; Mark, flipper tag; Mark, PIT tag; Measure; **Sample, tissue, fecal, scute, and blood**; Sample, oral swab; Weigh	Surface-pelagic juvenile (10-45 cm SCL)
Leatherback	10	Capture/Handle/ Release	Dip Net	Count/survey; Lavage; Mark, flipper tag; Mark, PIT tag; Measure; Sample, oral swab; Weigh	Surface-pelagic juvenile (10-45 cm SCL)
Leatherback	**490**	**Harass**	**Vessel survey**	**Count/survey**	**Adult/subadult/juvenile**
Loggerhead	**450**	**Harass**	**Vessel survey**	**Count/survey**	**Adult/subadult/juvenile**