

| UNITED STATES DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration NATIONAL MARINE FISHERIES SERVICE Southeast Regional Office 263 13th Avenue South St. Petersburg, Florida 33701-5505 http://sero.nmfs.noaa.gov

> F/SER31:FI SER-2018-19253

Christina Fellas National Oceanic and Atmospheric Administration's Restoration Center Deepwater Horizon Natural Resource Damage Assessment Program 263 13th Avenue South Saint Petersburg, Florida 33701

Dear Ms. Fellas:

This letter responds to your request for consultation with us, the National Marine Fisheries Service (NMFS), pursuant to Section 7 of the Endangered Species Act (ESA) for the following actions located in Alabama.

Project	Applicants	SER Number	Project Name	
1	NMFS Restoration Center (RC) and Alabama Department of Conservation and Natural Resources (ADCNR)	SER-2018-19253	Lower Perdido Islands Restoration Phase I	
2	NMFS RC and ADCNR	SER-2018-19254	Coastal Alabama Sea Turtle Protection: Enhancement & Education	
3	NMFS RC and ADCNR	SER-2018-19256	Alabama Estuarine Bottlenose Dolphin Protection: Enhancement & Education	
4	NMFS RC and U.S. Department of the Interior (DOI)	SER-2018-19257	Colonial Nesting Wading Bird Telemetry Study	
5	NMFS RC and ADCNR	SER-2018-19259	Oyster Hatchery, Claude Peteet Mariculture Center	
6	NMFS RC and ADCNR	SER-2018-19260	Oyster Grow-out Restoration Reef Placement	
7	NMFS RC and ADCNR	SER-2018-19309	Alabama Marine Mammal Stranding Network (ALMMSN) Capacity Enhancement	

Consultation History

This is in response to NMFS RC's letters, dated April 9 and May 7, 2018, requesting consultation on 7 restoration projects in Alabama coastal waters in the Gulf of Mexico. We initiated consultation on the date consultation was requested, and decided to batch these projects



into a single consultation based on the overlapping action areas and the similarity of the projecteffects associated with each proposed project.

Project Number	Latitude/Longitude	Water body
1	30.282336°N, 87.549672°W	Lower Perdido Bay
2	30.316469°N, 87.936897°W	All coastal and estuarine waters in Alabama
3	30.316469°N, 87.936897°W	All coastal and estuarine waters in Alabama
4	30.506962°N, 88.034215°W	Mobile Bay
5	30.282984°N, 87.665562°W	Mobile Bay, Bon Secour Bay, and Mississippi Sound
6	Point aux Pins site: 30.375747°N, -88.312770°W Sullivan Bayou site: 30.368304°N, -88.220170°W Bon Secour Bay site: 30.253341°N, -87.799806°W	Mobile Bay, Bon Secour Bay, and Mississippi Sound
7	30.316469°N, 87.936897°W	All coastal and estuarine waters in Alabama

Project Location

Existing Conditions

Existing site conditions of each project are provided in detail below, followed with each project location shown in Figures 1-7.

 The Lower Perdido Islands Restoration Phase I project area includes 5 islands at the intersections of Bayou Saint John, Terry Cove, Cotton Bayou, and Perdido Pass, all in proximity to Orange Beach, Alabama, within the lower Perdido River and Perdido Bay watershed (Figure 1). The total project area encompasses approximately 420 acres on Robinson Island (11 acres), Bird Island (15 acres), Walker Island (7 acres), Gilchrest Island (2 acres), Boggy Point (7 acres), and the surrounding estuarine and marine environment. The remaining portion of the project area includes open water and a variety of wetland types. There are no mangroves, corals, or existing structures in the project area. However, submerged aquatic vegetation (SAV) exists in portions of the project area. In recent decades, the Perdido Islands have sustained erosion and other ecological injuries resulting from storms, heavy boat traffic, and recreational use of the islands.



Figure 1. Image showing project area (Project 1) that includes several islands at the intersections of Bayou Saint John, Terry Cove, Cotton Bayou, and Perdido Pass, all within lower Perdido Bay (Source: Figure 1 in ADCNR Biological Evaluation for the Lower Perdido Islands Restoration)

2. The Coastal Alabama Sea Turtle Protection: Enhancement & Education project will occur within Alabama state waters or on adjacent beaches along the entire Alabama Gulf coast in Baldwin and Mobile Counties (Figure 2). There are existing piers, boat docks, jetties, and similar structures along the Alabama coast and estuaries. There are no mangroves or corals in the project area; however, SAV exists in portions of the project area.



Figure 2. Map of the project area, which includes all sea turtle nesting beaches (in green) in Alabama. (Source: Figure 1 in ADCNR Biological Evaluation for the Coastal Alabama Sea Turtle Protection: Enhancement & Education)

3. The Alabama Estuarine Bottlenose Dolphin Protection: Enhancement and Education project area includes all coastal and estuarine waters in Alabama (Figure 3). There are existing piers, boat docks, jetties, and similar structures along the Alabama coast and estuaries, all of which could potentially be used by project staff for public outreach regarding interactions with cetaceans and hook and line gear or to reduce cetacean feeding and harassment. There are no mangroves or corals present in the project area; however, SAV exists in portions of the project area.



Figure 3. Project vicinity map for the Alabama Estuarine Bottlenose Dolphin Protection: Enhancement and Education. (ADCNR Biological Evaluation for the Alabama Estuarine Bottlenose Dolphin Protection)

4. The Colonial Nesting Wading Bird Telemetry Study Project sites are located in Mobile and Baldwin Counties, Alabama, and include Mobile Bay, Mississippi Sound, and Perdido Bay. Gaillard Island is located in Mobile Bay and will serve as the main study site for this project (Figure 4). This 1,300-acre island was created by the U.S. Army Corps of Engineers and is currently used for dredge spoil placement. The island is used extensively for nesting by brown pelicans and other wading birds and sea birds, and is considered to be one of the most important bird breeding sites along the northern Gulf of Mexico. There are no mangroves, corals, SAV, or existing structures present in the project area.



Figure 4. Project area for the Colonial Nesting Wading Bird Study. (Source: Figure 1 in DOI Biological Evaluation for Colonial Nesting Wading Bird Telemetry Study)

5. The Oyster Hatchery, Claude Peteet Mariculture Center's project area consists of a portion of the Alabama Marine Resources Division (AMRD) Claude Peteet Mariculture Center (CPMC) (Figure 5), as well as the AMRD office at Dauphin Island, Alabama. The CPMC property is located on the Gulf Intracoastal Waterway. Although project sites are primarily located in the upland areas, waterfront areas on the Gulf Intracoastal Waterway, Dauphin Island Bay and Mobile Bay will be utilized, and the project would require use of marine water from these sources. There is limited SAV and no mangroves or corals present in the project area. Shorelines at the site are armored and consist of seawalls and rip rap, and the adjacent shoreline includes a boat ramp and several docks and jetties.



Figure 5. Project vicinity map for the Oyster Hatchery at Claude Peteet Mariculture Center project; existing reefs shown in yellow. (Source: Figure 1 in ADCNR Biological Evaluation for the Oyster Hatchery, Claude Peteet Mariculture Center)

6. The Oyster Grow-out and Restoration Reef Placement project area is located in open waters of all Alabama coastal waters that include Mobile Bay, Bon Secour Bay, Mississippi Sound, Perdido Bay, and all sub-embayments and connecting waters. All sites within the project area are located away from existing structures, with the exception of existing living shoreline structures, where oysters may be placed after grow-out. Existing living shoreline structures within the action area are located at various locations parallel to the shorelines of Mobile Bay, Bon Secour Bay, Mississippi Sound, and Portersville Bay (Figure 6, below). Seagrasses and other marine vegetation occur within northern Mobile Bay, Grand Bay, Mississippi Sound, and Perdido Bay. Oyster grow-out sites will not be located within SAV habitats. There are no mangroves or corals present in the project area.



Figure 6. Project location of three proposed oyster grow-out areas. (Source: Figure 1 in ADCNR Biological Evaluation for the Oyster Grow-Out and Restoration Reef Placement)

7. The ALMMSN Capacity Enhancement project area may include all coastal and estuarine waters in Alabama (Figure 7). There are numerous existing structures and areas containing SAV along the Alabama coast and estuaries. There are no mangroves or corals present in the project area.



Figure 7. Project vicinity map for the ALMMSN Capacity Enhancement Project. (ADCNR Biological Evaluation for the Alabama Estuarine Bottlenose Dolphin Protection)

Project Description

A detailed description of each project is provided below.

1. ADCNR's Lower Perdido Islands Restoration Phase I project proposes to develop a proactive and unified strategy for protecting the ecological functions of the Perdido Islands complex, while continuing to allow for public recreation. This project will include activities in Federal navigation channels but most project activities will be conducted in Alabama state waters.

The project includes marine debris monitoring and interim habitat enhancement activities. Additionally, baseline monitoring data will be collected during field surveys that are intended to identify areas requiring protection (i.e. sensitive habitats, areas of high erosion, and areas of at-risk SAV).

In-water project activities will include the use of boats within lower Perdido Bay to carry out field surveys. Field surveys include habitat mapping, T&E species surveys, bathymetric/topographic surveys, geotechnical (soil) sampling, cultural resources surveys, recreational use monitoring and user behavioral observations (systematic user counts), and marine debris monitoring.

For marine debris monitoring, the City of Orange Beach Waterways Enhancement Program (OBWEP) staff will mobilize via work vessel daily to systematically patrol area waterways. Trash and debris will be observed by the crew, and either recovered or recorded (depending on recoverability). Operations would be limited to 6-hour work days, 5 days per week for a

total of 600 working hours. A 24-foot flat bottom skiff would be used for the patrols and a 32-foot pontoon work vessel would be used to recover larger debris such as pier sections, piles, and vessel remnants. All debris would be discarded in a permitted landfill. Other interim habitat enhancement activities associated with this project will include the installation of signage on the islands alerting visitors of marine debris monitoring. The project is expected to take approximately 18 months to complete.

- 2. ADCNR's Coastal Alabama Sea Turtle Protection: Enhancement & Education project proposes to minimize or avoid human activities that have adverse effects on sea turtles. Project activities will involve the use of boats on any waters or coastal lands where opportunities exist to promote sea turtle conservation, and will be carried out with the aid of a biologist. The purpose and associated activities are the following:
 - 1) Increase awareness and understanding of the ESA through public education initiatives designed to assist state enforcement efforts,
 - 2) Increase state on-water enforcement presence dedicated to sea turtle conservation,
 - 3) Initiate steps to reduce fisheries-related sea turtle bycatch including fishery surveys, and purchasing and distributing turtle excluder devices to skimmer trawl boats.

This project is proposed to support 4 years of implementation.

- 3. ADCNR's Alabama Estuarine Bottlenose Dolphin Protection: Enhancement and Education project proposes to provide increased resources for state enforcement and education around a variety of bottlenose dolphin protection issues in Alabama. The project proposes to increase on-water state law enforcement in waters along the Alabama coast. There is no specific location associated with this project and most activity will occur within the same locations as do existing agency operations using boats operated by staff employed by NMFS and AMRD, e.g., fishing piers and local marinas. This project is proposed to support 4 years of implementation.
- 4. DOI's Colonial Nesting Wading Bird Telemetry Study project is designed to provide information about wading bird populations that breed along the Alabama Gulf Coast. The study proposes a telemetry tracking study of the movements of up to 4 bird species breeding along the Alabama coast. The project will utilize boats to travel to and from research sites during the capturing and handling of target species, and marking them with satellite tags for tracking. The project area includes the western portion of Grand Bay in Mobile County and nearby beaches, and mud or sand flats. The project is located in areas designated as critical habitat for Gulf sturgeon, Critical Habitat Unit 8, which is addressed below. This project is proposed to support 4 years of implementation, and will potentially involve the USFWS, USGS, ADCNR, ADEM, Dauphin Island Sea Lab, and target universities.
- 5. AMRD is proposing to construct an oyster hatchery at AMRD's CPMC in Gulf Shores and operate the facility within a 4 year project period. The oyster spat produced as a result of this project will be used to encourage oyster recruitment in portions of Mobile Bay, which has experienced reduced oyster production compared to the early 20th century. The project

would also entail acquisition of wild oyster broodstock from local waters and maintaining that broodstock in existing ponds at the CPMC.

Vessels towing side-scan sonar to map portions the floor of Mobile Bay would be used to identify the most suitable locations for deploying spat produced from the new hatchery. These locations will have the following habitat characteristics: firm mud, existing oyster reefs, or other hard bottom substrates suitable to support oysters. This project is proposed as 2 restoration alternatives: (A) with high spat production and the development of a comprehensive oyster restoration plan; and (B) with approximately half as much spat production and no restoration plan. For the purposes of this consultation we will assume that the "high spat production" alternative would be implemented as this alternative would have the higher potential to effect ESA listed species under NMFS' jurisdiction.

Once the suitable locations are found, cultch material and spat from CPMC would be placed on a barge for transport to areas within Mobile Bay and Mississippi Sound. The cultch material will be deployed on firm mud, existing oyster reefs, or other hard bottom substrates that are suitable to support oysters.

6. ADCNR's Oyster Grow-out and Restoration Reef Placement project proposes to create up to three "off-bottom oyster grow-out areas" in the Mississippi Sound and Bon Secour Bay. The project, which will be conducted by the Alabama Cooperative Extension System (ACES) in coordination with its other oyster gardening activities, will grow oysters to at least one year old. These oysters will be placed on priority locations for oyster reef restoration that will include existing yet to be determined artificial nearshore living shoreline structures and intertidal oyster reefs. The three proposed grow-out sites are: (1) Point aux Pins site (2) Bayou Sullivan site, both located in Mississippi Sound/Portersville Bay, and (3) Bon Secour Bay site in Eastern Mobile Bay/Bon Secour Bay (Figure 8).

The 3 sites would provide an evaluation of whether there are geographic variations in oyster survival / growth at a range of salinities. These sites will be developed using off-bottom growing techniques (See Figure 8, below) in which grow-out baskets would be suspended in the middle of the water column, above the sediment to decrease predation by oyster drills. Each of the 3 grow-out sites is approximately 0.25 acres, comprised of oyster baskets supported by piles placed in unvegetated soft bottom habitats. At each grow-out site, 12-20 tapered 12"-diameter piles will be installed by pushing them into the sediment (where necessary, a vibratory hammer will be used) via barge-mounted equipment (Pers. Comm. Christy Fellas to F. Innocenti on Aug 17, 2018). Each pile will support 1 suspended oyster basket. Figure 10 depicts a likely schematic of piles and grow-out structures (baskets) that would be suspended approximately 12" to 18" above the bottom substrates.



Figure 8. Proposed layout of an oyster grow-out site. (Source: Figure 2 in ADCNR Biological Evaluation for Oyster Grow-out Reef Placement)

After growing oysters at the grow-out sites for 1-year, vessels would be used to transport live oysters from the grow-out sites and place them on existing reef sites including both existing living shoreline sites in Mobile Bay and Mississippi Sound and artificial reefs constructed of cultch. If the cultched sites are located in areas open for harvest, these sites would not be subject to harvest for a minimum of 2 years. In addition to growing out the oysters at the grow-out sites, predator control techniques such as adding a copper ring to the support piles and/or suspending the baskets from wire that is never below the surface of the water will be applied to different plots within the grow-out sites to determine which methods are most successful at reducing predation by oyster drills. The different predator reduction techniques

will be monitored over a five year period and the grow-out site infrastructure will be adaptively managed to establish the most successful predator controls on more plots to increase oyster survival.

Periodic maintenance may be necessary following severe weather events or other situations that would disturb the grow-out sites. In the event that the structures were disturbed, they would need to be re-installed following the same installation techniques. Further, the grow-out sites will be adaptively managed over time in order to retrofit the structures with the most effective predator controls.

A project-specific monitoring plan will be developed and will likely include annual survivorship monitoring at the grow-out sites and restoration reef locations. To evaluate the success of the cultch placement, baseline monitoring will be conducted or previous monitoring data obtained prior to oyster deployment at each restoration reef. In addition, oyster larval recruitment surveys will be conducted near the grow-out sites to determine the effectiveness of the sites in providing larval supply to reefs in the vicinity. Monitoring may include the following:

- 1) An evaluation of oyster health at each grow-out-site during pre-spawn, spawning, and post-spawn periods;
- 2) An evaluation of oyster growth at reefs and living shoreline projects near the growout sites;
- 3) The placement of settlement plates near the grow-out areas to assess larval setting.

All of these maintenance and monitoring activities would require the use of small work vessels to access the grow-out sites and restoration reef locations.

The project area contains one grow-out site within water that is designated as critical habitat for Gulf sturgeon (addressed below). Gulf sturgeon Critical Habitat Unit 8 encompasses the western portion of Grand Bay in Mobile County, Alabama.

7. The ALMMSN is operated out of the Dauphin Island Sea Lab on Dauphin Island, Alabama. ALMMSN is part of the NMFS Southeast Region Stranding Network and a Stranding Agreement holder, which authorizes personnel to respond to cetacean strandings and collect samples on behalf of the State of Alabama. The use of small work vessels is proposed to search for and access stranded individuals that cannot be reached from shore. All vessel activity would occur during daylight hours, and would not require the use of artificial lights. For strandings of ESA-listed whales, the response will be coordinated with the NMFS Marine Mammal Health and Stranding Response Program, which holds a permit to cover take associated with response/handling of large whales; therefore, no additional ESA consultation is needed for those species.

Conservation Criteria

The following criteria will be applied throughout all applicable project activities: NMFS's *Sea Turtle and Smalltooth Sawfish Construction Conditions* dated March 23, 2006;¹ and NMFS Southeast Region's "*Vessel Strike Avoidance Measures and Reporting for Mariners*" (revised February 2008).² Construction activities would be limited to daylight hours so construction workers would be more able to see listed species, if present, and avoid interactions with them.

Species	ESA Listing Status	Action Agency Effect Determination	NMFS Effect Determination			
Sea Turtles						
Green (North Atlantic [NA] distinct population segment [DPS])	Т	NLAA	NLAA			
Green (South Atlantic [SA] DPS)	Т	NLAA	NLAA			
Kemp's ridley	E	NLAA	NLAA			
Loggerhead (Northwest Atlantic [NWA] DPS)	Т	NLAA	NLAA			
Hawksbill	E	NLAA	NLAA			
Leatherback	Е	NLAA	NLAA			
Fish						
Gulf sturgeon (Atlantic sturgeon, Gulf subspecies)	Т	NLAA	NLAA			
Critical Habitat						
Loggerhead sea turtle (Unit LOGG-N-33)	NLAA	NLAA				
Gulf sturgeon (Unit 8)	NLAA	NLAA				
E = endangered; T = threatened; NLAA = may affect, not likely to adversely affect; NE = No Effect						

Effects Determinations for Species the Action Agency or NMFS Believes May Be Affected by the Proposed Action

Critical Habitat

Projects 1 and 5 are not located in any designated critical habitats, and there are no potential routes of effect to any designated critical habitat from these two projects.

Loggerhead Critical Habitat

Loggerhead sea turtle critical habitat unit LOGG-N-33 contains nearshore reproductive habitat, defined as the portion of the nearshore waters adjacent to nesting beaches that are used by nesting females to transit between the beach and open water and by hatchlings to egress to the open-water environment. The action area includes nearshore waters designated as critical habitat

¹ NMFS. 2006. Sea Turtle and Smalltooth Sawfish Construction Conditions revised March 23, 2006. National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Southeast Regional Office, Protected Resources Division, Saint Petersburg, Florida.

http://sero.nmfs.noaa.gov/protected_resources/section_7/guidance_docs/documents/sea_turtle_and_smalltooth_sawf ish_construction_conditions_3-23-06.pdf, accessed June 2, 2017.

²http://sero.nmfs.noaa.gov/protected_resources/section_7/guidance_docs/documents/copy_of_vessel_strike_avoidan ce_february_2008.pdf

for loggerhead sea turtles. Projects 2, 3, 4, and 7 include activities that would occur in loggerhead sea turtle critical habitat unit LOGG-N-33. The following primary constituent elements (PCEs) support this habitat, and are present in the action area:

- (1) Nearshore waters with direct proximity to nesting beaches that support critical aggregations of nesting turtles (e.g., highest density nesting beaches) to 1.6 kilometer (1 mile) offshore
- (2) Waters sufficiently free of obstructions or artificial lighting to allow transit through the surf zone and outward toward open water
- (3) Waters with minimal man-made structures that could promote predators (i.e., nearshore predator concentration caused by submerged and emergent offshore structures), disrupt wave patterns necessary for orientation, and/or create excessive longshore currents

Gulf Sturgeon Critical Habitat

Gulf sturgeon critical habitat Unit 8 (Lake Pontchartrain - Mississippi Sound) includes the western portion of Grand Bay in Mobile County. Projects 3, 5, 6, and 7 include activities in this area; however, only projects 5 and 6 include activities that may affect this critical habitat. The following PCEs support this habitat, and are present in the action areas for these projects:

- (1) Abundant prey items, such as detritus, aquatic insects, worms, and/or molluscs, within riverine habitats for larval and juvenile life stages; and abundant prey items, such as amphipods, lancelets, polychaetes, gastropods, ghost shrimp, isopods, molluscs and/or crustaceans, within estuarine and marine habitats and substrates for subadult and adult life stages.
- (2) Water quality, including temperature, salinity, pH, hardness, turbidity, oxygen content, and other chemical characteristics, necessary for normal behavior, growth, and viability of all life stages.
- (3) Sediment quality, including texture and other chemical characteristics, necessary for normal behavior, growth, and viability of all life stages.
- (4) Safe and unobstructed migratory pathways necessary for passage within and between riverine, estuarine, and marine habitats (e.g., an unobstructed river or a dammed river that still allows for passage).

Analysis of Potential Routes of Effects to Species

NMFS has analyzed the routes of effects from the proposed actions to sea turtles and Gulf sturgeon. We have determined the potential routes of effects include physical injury from construction activities, temporary habitat loss due to avoidance or exclusion from the action areas, permanent habitat loss due to loss of SAV and soft-bottom habitat from the proposed inwater structures, vessel interaction, and noise from pile driving, as described below.

Projects 5 and 6 include the risk of direct physical impact to sea turtles and Gulf sturgeon due to the in-water activities requiring the use of heavy construction machinery and/or placement of materials in aquatic habitats. We believe this effect will be discountable due to the species' ability to move away from the project site if disturbed. Mobile species such as sea turtles and Gulf sturgeon are able to avoid this type of slow-moving equipment and placement of material. In addition, the implementation of NMFS's *Sea Turtle and Smalltooth Sawfish Construction Conditions* will require all construction workers to observe in-water activities for the presence of

these species. If a sea turtle or Gulf sturgeon are seen within 100 yards of construction operations, all appropriate precautions shall be implemented to ensure its protection including ceasing operation of heavy machinery or other construction activities. Activities may not resume until the protected species has departed the project area of its own volition.

Projects 5 and 6 include activities that may affect sea turtles and Gulf sturgeon by temporarily impeding their use of project areas for forage or refuge habitat, due to avoidance of construction activities and related noise, and the placement of in-water materials (e.g., scientific survey/sampling equipment, oyster cultch and placement of wooden piles). We believe these effects will be insignificant, given there are ample suitable habitat areas adjacent to the project areas throughout Alabama coastal waters and the Mississippi Sound that these species can utilize if they avoid project work areas. Further, due to the limited duration and frequency of construction activities, sea turtles and Gulf sturgeon will be able to return and use the work areas for foraging and refuge between and following construction activities.

Sea turtles forage on seagrass and algae and may be affected by potential impacts to seagrass and algae resulting from proposed activities from project's 1, 4, 5, and 6, such as placement of oyster cultch or operation of vessels in shallow water. However, effects to sea turtles due to any impacts to aquatic vegetation will be insignificant due to the sparse coverage of vegetation in the project areas and the existence of higher quality foraging habitat around these areas that sea turtles can use during and after project activities. Similarly, these activities may disturb substrates that support Gulf sturgeon macroinvertebrate prey such as brachiopods, mollusks, benthic worms, and crustaceans.³ However, Gulf sturgeon are opportunistic feeders that forage over large areas, and given the open water environment in the areas surrounding these projects, there is extensive suitable alternative habitat available for these mobile species to use for foraging or refuge.

Project 6 includes activities that may affect sea turtles and Gulf sturgeon through the permanent loss of habitat resulting from the placement of piles (12-20 tapered 12"-diameter piles, at each of 3 proposed grow-out sites). However, we believe these effects will be insignificant, given the small area to be affected (less than 50 sq ft spread across the 3 areas) and the fact that the surrounding areas contain extensive similar habitats for these mobile species. Furthermore, the project will avoid impacts to seagrasses, sponges, and other sensitive resources.

All proposed projects include the risk of direct physical injury or death to sea turtles and Gulf sturgeon if struck by vessels conducting project-related activities. We believe this effect is discountable. The risk of these small vessels striking a sea turtle or Gulf sturgeon is extremely low as these species are highly mobile, as well as Gulf sturgeon are demersal and rarely would be at risk from shallow draft vessels. Additionally, boat operators will follow best management practices that will be implemented to avoid or minimize impacts to these species including: NMFS' *Sea Turtle and Smalltooth Sawfish Construction Conditions* and NOAA NMFS Southeast Region's *Vessel Strike Avoidance Measures and Reporting for Mariners*.

³ Mason, W. T., and J. P. Clugston. 1993. Foods of the Gulf sturgeon (*Acipenser oxyrhynchus desotoi*) in the Suwannee River, Florida. Transactions of the American Fisheries Society 122(3):378-385.

Effects to listed species due to noise created by pile driving activities proposed under project 6 could physically injure animals in the affected areas or change animal behavior in the affected areas. Injurious effects can occur in 2 ways. First, immediate adverse effects can occur to listed species if a single noise event exceeds the threshold for direct physical injury. Second, effects can result from prolonged exposure to noise levels that exceed the daily cumulative exposure threshold for the animals, and these can constitute adverse effects if animals are exposed to the noise levels for sufficient periods. Behavioral effects can be adverse if such effects interfere with essential activities such as migrating, feeding, resting, or reproducing. Our evaluation of effects to listed species as a result of noise created by construction activities is based on the analysis prepared in support of the Opinion for SAJ-82.⁴ The noise analysis in this consultation evaluates effects to sea turtles and Gulf sturgeon identified by NMFS as potentially affected in the table above.

Based on our noise calculations, installation of wooden piles by vibratory hammer will not result in any form of injurious noise effects, and any behavioral effects will be insignificant. In the analysis in SAJ-82 (SAJ-82, Appendix B, Table 11 footnote), the noise source level used for this analysis was based on the vibratory installation of a 13-in steel pipe pile as a surrogate for the vibratory installation of the proposed wood piles. This is a very conservative approach since the installation of a 13-in steel pipe pile would be considerably louder than a similarly-sized wood pile. This installation method could result in behavioral effects at radii of up to 16 ft (5 m) for sea turtles and up to 72 ft (22 m) for Gulf sturgeon. Given the mobility of sea turtles and Gulf sturgeon, we expect them to move away from noise disturbances. Because there is abundant similar habitat nearby, we believe this effect will be insignificant. If an individual chooses to remain within the behavioral response zone, it could be exposed to behavioral noise impacts during pile installation. Since installation will occur only during the day, these species will be able to resume normal activities during quiet periods between pile installations and at night. Therefore, installation of wood piles by vibratory hammer will not result in any injurious noise effect, and we anticipate any behavioral effects will be insignificant.

Analysis of Potential Routes of Effect to Loggerhead Sea Turtle Critical Habitat

Projects 2, 3, 4, and 7 would include the operation of small work vessels within the boundary of (LOGG-N-33). While the operation of these vessels within nearshore critical habitat could result in minor, temporary disturbances in wave patterns (PCE 3) and potential introduction of artificial lighting (PCE 2) to the habitat, any effects on these PCEs would be insignificant. The vessels would only operate during daylight hours, so there would be no introduction of artificial lighting to the habitat, and any disruption of wave patterns would be of extremely short duration, and therefore unlikely to disrupt the orientation of nesting females or hatchlings entering the surf. There are no other potential routes of effect to this designated critical habitat.

Analysis of Potential Routes of Effect to Gulf Sturgeon Critical Habitat

Projects 5 and 6 include construction activities within the boundary of Gulf sturgeon critical habitat unit 8.

⁴ NMFS. Biological Opinion on Regional General Permit SAJ-82 (SAJ-2007-01590), Florida Keys, Monroe County, Florida. June 10, 2014.

The abundance of prey items (PCE 1) may be affected by the installation of pile-supported structures that would cover and displace bottom substrates that may contain sturgeon prey species. However, we believe that the effects to this PCE will be insignificant since the area of impact from individual piles is very small and discontinuous (12-20 piles spaced 100 ft apart at 3 different sites, affecting a total of less than 50 sq. ft of substrate). Prey items will still be present in the surrounding sediment allowing Gulf sturgeon to forage in the area after construction. Further, not all of the habitat affected may support prey items or serve as preferred foraging habitat.

PCE 1 may also be affected by cultch material deployment; however, we believe this effect will be insignificant. Cultch material will be deployed on firm mud, existing oyster reefs, or other hard bottom substrates that are required to support oysters. These bottom types are not the preferred habitat for the prey items of Gulf sturgeon, which forage in sandy or soft mud habitats. However, some project locations may contain small areas of appropriate habitat for Gulf sturgeon prey items or placement of materials may occur in small amounts just outside of the intended hard-bottom areas. These small areas may contain appropriate prey items for Gulf sturgeon. Still, we believe that the potential displacement of prey items from these small areas through burial by cultch material is insignificant due to the ample adjacent habitat of Mississippi Sound that supports Gulf sturgeon prey items.

Gulf sturgeon critical habitat water quality (PCE 2) may be affected through increases in turbidity caused by the installation of pile structures, and during cultch material deployment; however, we believe these effects will be insignificant. Cultch material will be placed on firm mud, existing oyster reefs, or other hard bottom substrates. Sediment suspension from cultch material deployment on these bottom types is expected to be minimal. Following construction activities, we expect that suspended particles will settle out quickly and turbidity levels will return to pre-construction conditions. Effects to temperature, salinity, pH, hardness, oxygen content and other water quality parameters are not expected to result from the proposed activities.

Gulf sturgeon critical habitat sediment quality (PCE 3) may be affected by pile placement. We believe that the effects will be insignificant since the area of impact from individual piles is very small and discontinuous (12-20 piles spaced 100 ft apart at 3 different sites, affecting a total of less than 50 sq. ft). The surrounding benthos is expected to maintain the sediment quality characteristics necessary for normal behavior, growth, and viability of all life stages.

Additionally, PCE 3 may be affected by cultch material deployment; however, we believe this effect will be insignificant. The applicants selected sites to avoid negatively impacting areas characterized as suitable habitat for Gulf sturgeon by avoiding deployment in areas with sandy substrates preferred for Gulf sturgeon foraging. The applicants will place cultch material on firm mud, existing oyster reefs, or other hard bottom substrates. These bottom types do not contain the texture and other characteristics preferred by Gulf sturgeon for foraging. However, some project locations may contain small areas of appropriate sediment quality necessary for Gulf sturgeon foraging or placement of materials may occur in small amounts just outside of the intended hard-bottom area where the sediment is of appropriate quality. Still, we believe that the effects to the sediment quality essential feature is insignificant due to the ample adjacent habitat

of Mississippi Sound that contains the sediment quality necessary for normal behavior, growth, and viability of all life stages Gulf sturgeon.

The safe and unobstructed migratory pathways (PCE 4) may be affected by clutch deployment; however, we believe this effect will be discountable. Cultch material will be placed on existing living shorelines, oyster reefs or other open water areas that will not produce any sort of obstruction or constriction of migratory pathways. There will be ample area within and adjacent to these deployment sites for safe and unobstructed passage of Gulf sturgeon.

Conclusion

Because all potential project effects to listed species and critical habitat were found to be discountable, insignificant, or beneficial, we conclude that the proposed action is not likely to adversely affect listed species and critical habitat under NMFS's purview. This concludes your consultation responsibilities under the ESA for species under NMFS's purview. Consultation must be reinitiated if a take occurs or new information reveals effects of the action not previously considered, or if the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat designated that may be affected by the identified action. NMFS's findings on the project's potential effects are based on the project description in this response. Any changes to the proposed action may negate the findings of this consultation and may require reinitiation of consultation with NMFS.

We look forward to further cooperation with you on other projects to ensure the conservation of our threatened and endangered marine species and designated critical habitat. If you have any questions on this consultation, please contact Francesca Innocenti, Consultation Biologist, at (727) 209-5995, or by email at francesca.innocenti@noaa.gov.

Sincerely,

David Bernhart, Assistant Regional Administrator for Protected Resources

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