



**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
NATIONAL OCEAN SERVICE  
National Centers for Coastal Ocean Science  
Silver Spring, Maryland 20910

**MEMORANDUM FOR:** The Record

**FROM:** Steven Thur, Ph.D.  
Acting Director

**SUBJECT:** Categorical Exclusion for RESTORE Act Science Program Award #NA17NOS4510091, “Linking Community and Food-Web Approaches to Restoration: An Ecological Assessment of Created and Natural Marshes Influenced by River Diversions”

NOAA Administrative Order (NAO) 216-6A, Environmental Review Procedures, requires all proposed projects be reviewed with respect to environmental consequences on the human environment. This memorandum addresses the determination that the activities described below for Project #2620660, “Linking Community and Food-Web Approaches to Restoration: An Ecological Assessment of Created and Natural Marshes Influenced by River Diversions”, qualifies to be categorically excluded from further National Environmental Policy Act review.

### **Purpose and need**

The RESTORE Act Science program is funding a three-year project to Louisiana State University researchers and sub-awardees to examine how river diversions influence the ecological trajectory, food web structure, and functionality of both natural and created marshes. The investigators have three objectives: 1) To determine species composition, relative abundances, and food web structure in natural marshes along a salinity gradient influenced by a river diversion, 2) To examine species composition, relative abundances, and food web structure across different-aged created marshes that are influenced by a river diversion, and 3) To incorporate field data collected under Objectives 1 & 2 to develop and test an ecosystem model (Ecopath with Ecosim) that will be used to predict the impact of salinity changes and habitat restoration efforts on marsh food web structure, function and resilience. This work will take place in the West Point a la Hache (WPH) area within Barataria Bay, in Plaquemines Parish, Louisiana.

The following activities are proposed to meet the above project objectives:

1. Species abundance and community structure
  - a. Primary producers and nutrient chemistry:
    - i. Clipping of all aboveground vegetation
    - ii. Surface (0.5cm) coring to obtain benthic microalgae and chlorophyll



- concentrations.
- iii. Water sampling from tidal creeks, ponds and channels adjacent to marsh sampling plots to determine pelagic and benthic aquatic primary producer abundances.
    1. Water samples will also analyze pH, temperature, turbidity, and salinity, major ion chemistries and trace metal concentrations
  - iv. Surface cores (0-5cm) to determine soil organic C, total N and total P concentrations and grain size.
- b. Microbiology:
- i. Relative and quantitative abundances for bacterial, archaea, and fungi (referred to as total microbial diversity) will be assessed from marsh platform subhabitat soil cores (up to 0.5 m deep) from 1 m, 5 m, and 10 m from the marsh edge.
- c. Infaunal Benthos
- i. Infaunal benthos will be collected at each site along one transect at 1 m from the edge and 10 m from the edge. Five replicate cores (7.6cm diameter x 10cm depth) taken between plant stems at each distance.
- d. Macroinvertebrates:
- i. The densities of marsh macroinvertebrates (e.g., snails, fiddler crab burrows, and ribbed mussels) will be measured using quadrat sampling. At each of the 1-m and 10-m distances a 0.25-m<sup>2</sup> quadrat will be placed randomly near the core samples. From this quadrat, epibenthic invertebrates will be collected, as will? crabs, bivalves, and gastropods as appropriate.
- e. Aquatic and terrestrial insects:
- i. Quantitative sampling of terrestrial arthropods (insects and spiders) will be done using sweep nets, on plots (5 per site) measured from the edge of the marsh to 50m inland (50m x 2m linear transects) and the researcher will move over a few meters and then sweep back to the edge at each site for a total of 100m<sup>2</sup>.
- f. Fishes:
- i. Marsh fish and nekton composition and abundance (catch per unit effort) will be quantified using fyke nets and wire mesh traps
    1. Fyke nets constructed of 3-mm mesh netting will be placed along the marsh edge while the marsh is flooded. Panels of mesh frame, constructed of PVC will be buried approximately 10-15-cm into the sediment and water and nekton will drain into a cod end, where they will be collected as water recedes off the marsh.
    2. Wire mesh traps (41 cm long, 22 cm wide, with 3-mm mesh), baited with dry dog food will be placed in all marsh subhabitats (edge, creek, ponds, depressions) and the number and identity of fish captured per minute (CPUE) will be recorded.
    3. Off-marsh fish and nekton communities will be quantitatively sampled using replicated tows of a 5 m otter trawl behind a small research vessel traveling ~2.5 knots.

**Action Area:**

The action area for this project will be in the West Point a la Hache (WPH) area within Barataria Bay, in Plaquemines Parish, Louisiana (Figure 1). Sampling is expected to occur within 3 general locations in the Lake Hermitage area as denoted on Figure 1. As part of Objective 1 they will sample three natural marshes along a salinity gradient (i.e., distance from WPH siphon) during single, 1 to 2 week long sampling events at both low (fall 2017) and high (spring 2018) river stages (Figure 1). As part of Objective 2, they will sample three created marshes for species composition and relative abundance in the WPH area during both low (i.e., fall 2018) and high (i.e., spring 2019) river stages. Created marshes (figure 1, blue outline) will be at 3 - 5 years maturity at the time of sampling.

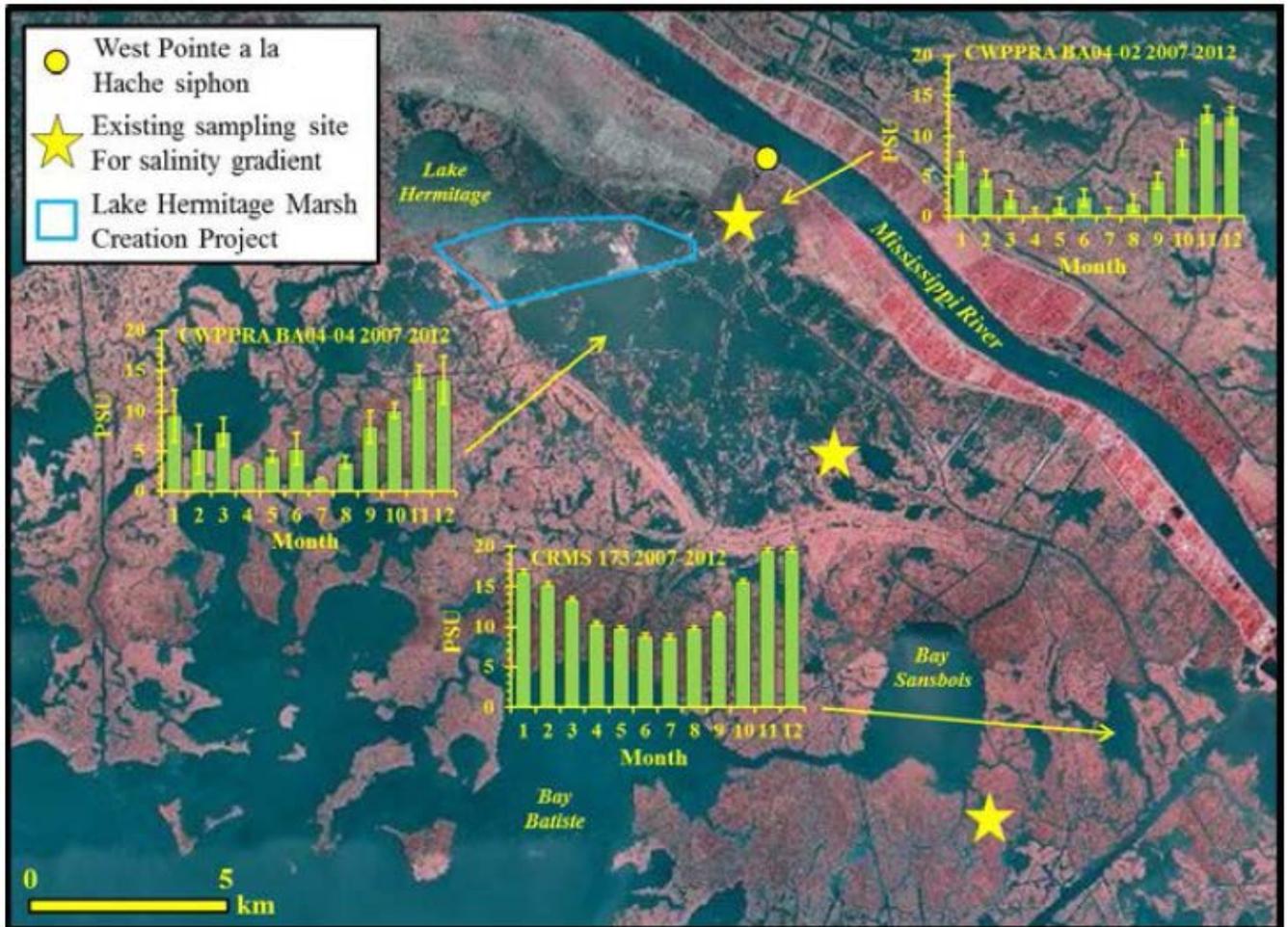


Figure 1. Site map of study area. Map of the West Point a la Hache (WPH) area within Barataria Bay, in Plaquemines Parish, Louisiana noting the location of the siphon, the Lake Hermitage Marsh Creation Project and proposed sampling sites along a salinity gradient extending away from the siphon. Bar graphs highlight seasonal changes in salinity as monitoring stations in close proximity to proposed natural marsh sampling sites. Data from Boshart (2003), LADNR, and [www.lacoast.gov/crms](http://www.lacoast.gov/crms). Created marsh sampling sites are outlined in blue.

**Project Activities:** Only those field-related project activities associated with Objective 1 and 2 are described in detail below. Activities that take place in the office or laboratory have been

excluded from the descriptions below. Sub-habitats refers to marsh edge, creek, ponds, depressions)

1. Species Abundances and Community Structure: The following activities would be carried out at each of the three natural marsh sampling sites during two sampling periods in Fall 2017 and Spring 2018, and at created marsh sampling sites in Fall 2018 and Spring 2019.
  - a. Primary Producers and Nutrient Concentrations: Vegetation on the marsh platform will be quantified along three transects within the sampling region. All aboveground vegetation will be clipped at the base of the plants at the sediment surface and collected from 0.25m x 0.25m quadrats at five locations along each transect (e.g., 1, 10, 20, 30, and 50m from the marsh edge). The vegetation will be sorted by species, and dried in the lab to determine biomass per species within each quadrat. Subsamples of plant tissue will be used to determine organic C and total N content of tissue. Within each quadrat, benthic microalgae abundance will be quantified from duplicate surface (1.5cm diameter to a depth of 0.5cm) cores and the cores will also be analyzed for chlorophyll a concentrations after extraction with 90% acetone. Pelagic and benthic aquatic primary producer abundances will be assessed from duplicate water samples for tidal creeks, ponds, and channel adjacent to each marsh. Chlorophyll a and particulate organic C (POC) concentrations will be determined on both screened (105um) and unscreened water samples. Separate surface soil cores will be collected for determination of soil organic C, total N and total P concentrations and grain size. Soil cores are 6.9cm diameter and will reach a maximum depth of 5cm. Analyses of water chemistry in the field will be done for each subhabitat; pH, temperature, turbidity, and salinity, and water samples will be collected to measure major ion chemistries and trace metal concentrations.
  - b. Microbiology: Total microbial diversity would be assessed from marsh platform sub - habitat soil cores (10 cm diameter, maximum 0.5 m deep) at 1 m, 5 m, and 10 m from the marsh edge and sediment cores from 1m off the marsh edge, and from subhabitat water.
  - c. Infaunal benthos: Infaunal benthos would be collected at each site along one transect at 1-m from the edge and 10-m from the edge. Five replicate cores (4.6cm diameter x 10cm depth) would be taken between plant stems at each distance location.
  - d. Macroinvertebrates: The densities of marsh macroinvertebrates (e.g., snails, fiddler crab burrows, and ribbed mussels) would be measured using quadrat sampling. At each of the 1-m and 10-m distances a 0.25-m<sup>2</sup> quadrat will be placed randomly near the core samples. From this quadrat, epibenthic invertebrates would be collected, as would crabs, bivalves, and gastropods as appropriate. Three (3) representative intertidal macroinvertebrates would be focus. Fiddler crabs (*Uca spp.*), Marsh periwinkles (*Littoraria irrorata*) and Gulf ribbed mussels (*Geukensia granosissima*) as they are all ecologically important species. Within each quadrat, marsh periwinkles and ribbed mussels will be counted, total shell

length (nearest 1mm) will be measured for marsh periwinkles and shell width will be measured for mussels. Fiddler crab burrow density and diameter would serve as a proxy for crab size and abundance.

- e. Aquatic and terrestrial insects: Quantitative sampling of terrestrial arthropods (insects and spiders) would be done using sweep nets, on plots (5 per site) measured from the edge of the marsh to 50m inland (50m x 2m linear transects). The researcher would move over a few meters and then sweep back to the edge at each site for a total of 100m<sup>2</sup>. Emergence traps and aquatic net sampling would also be conducted to capture aquatic insects at the marsh edge and platform. Samples would be immediately frozen in the field and transported back to the laboratory for sorting.
- f. Fishes: Marsh fish and nekton composition and abundance (catch per unit effort) would be quantified using fyke nets and wire mesh traps. Fyke nets constructed of 3-mm mesh netting will be placed along the marsh edge while the marsh is flooded. Panels of mesh frame, constructed of PVC would be buried approximately 10-15-cm into the sediment and water and nekton would drain into a cod end, where they would be collected as water recedes off the marsh. Fyke net openings are 4' x 4' square and each wing is 3.5' x 4.0' (LxW). Fyke nets and wire mesh traps would be used during every sampling (Spring and Fall of each year) at each site.

In addition, up to 30 wire mesh minnow traps and up to 5 wire mesh crab traps would be set at each site per day during field operations that would soak for approximately 24 hours. Fyke nets would be erected at high tide at the marsh edge and, as the tide recedes, fishes and invertebrate nekton inhabiting the marsh would drain into a central collection bag. Therefore, the soak time would be from high to low tide. Bycatch using both traps and nets would be released alive promptly. Sampling would not occur when water temperatures exceed 33°C, the lethal limit for green sturgeon (Kahn et al., 2010). In addition at each sampling event and every site, 5-10 individuals of the following species would be collected: Gulf killifish [*Fundulus grandis*], diamond killifish [*Fundulus xenicus*], and offmarsh juvenile fish (e.g., Atlantic croaker [*Micropogonias undulatus*], red drum [*Sciaenops ocellatus*]) for microchemical analyses and age studies.

- i. Minnow traps are wire mesh traps (41 cm long, 22 cm wide, with 3-mm mesh), baited with dry dog food would be placed in all marsh subhabitats (edge, creek, ponds, depressions) and the number and identity of fish captured per minute (CPUE) would be recorded.
- ii. Crab traps are wire mesh traps sized 60cm x 60cm x 30cm with 3.5cm x 3.5cm openings.
- iii. Otter trawls - Off-marsh fish and nekton communities would be quantitatively sampled using replicated tows of a 5 m otter trawl behind a small research vessel traveling ~2.5 knots. Nekton catch in trawls would be standardized on a catch per minute basis. All captured specimens would be placed in a cooler on ice until identification to the lowest taxonomic

level possible, measured, and subsampled for isotopic content as needed.

2. Anchoring: While no anchoring is anticipated for this research as a result of science activities, anchoring may be required for other reasons, such as avoidance of adverse weather conditions or in the unlikely event of an engine malfunction. If necessary, anchoring will be accomplished using a hydraulic shallow water Power-Pole anchor, While the choice of anchoring location is at the discretion of the boat's crew, vessel operators would select the anchor location based on depth, protection from seas and wind, and bottom type. Preferred bottom types include sticky mud or sand; they would not anchor on rocky or coral reefs.
3. Vessel transit - Boats will launch at Happy Jack boat launch (29.517496, -89.737069) in Port Sulphur (approximately 15 km from the restoration sites) or the Plaquemine Parish boat launch (29.569916, -89.804763) at the diversion site will be used (<5 km from the sites). Boats will be used to reach the site and trawl. The University of Florida vessel is a 25' Carolina Skiff equipped with a 200 hp Yamaha outboard and jack plate. The LUMCON boat is R/V Bluerunner - 20' Hanco center console boat with Yamaha 200 hp engine. Two LSU boats will be used, both are 19' Boston Whaler center console boats with Evenrude 135 hp engines.

### **Effects of the Project, Environmental Statutes & NCCOS Determination of Effects:**

Endangered Species Act (ESA) Section 7 (a)(2) requires that each Federal agency, in consultation with NMFS and/or the U.S. Fish and Wildlife Service (USFWS), ensure that any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat.

#### ESA resources under USFWS jurisdiction:

There are a total of two (2) species of birds, one (1) marine mammal species (details under MMPA section below), four (4) turtle species and one (1) fish species listed under ESA within the Lake Hermitage study area (Table 1) that are under USFWS jurisdiction. These species are listed as either endangered or threatened. None of the listed species has critical habitat overlapping the study area.

The field research activities potentially occur in the range of one ESA listed marine mammal species under the authority of USFWS. That species is the West Indian manatee (*Trichechus manatus*). The West Indian manatee is currently listed as endangered but is proposed to be downlisted to threatened. The manatee has critical habitat designated in Florida waters in the Gulf of Mexico but no sampling activities would be conducted in designated critical habitat; therefore, NCCOS determines that research activities and vessel transit would not adversely affect West Indian manatees or destroy or adversely modify designated critical habitat.

The two species of birds listed are the piping plover and the red knot, both are listed as

threatened. [Critical habitat for piping plover](#) nesting is sandy beaches. There is critical habitat near the sampling location but no activities would be conducted within the area where piping plovers nest. Both the piping plover and the red knot are not known to nest in marshlands where research activities would occur. None of the sampling activities would adversely affect the piping plover. The Red Knot and has a wide habitat within the Western Hemisphere, ranging from the Canadian Arctic to Tierra Del Fuego. The Red Knot is particularly vulnerable to climate change due to its dependence of seasonally productive habitat zones. The research activities undertaken in this project will not significantly alter food availability and thus are unlikely to impact the red knot. There is no red knot critical habitat in the Gulf of Mexico.

There are two listed fish species within the sampling area of this project, the pallid sturgeon and Atlantic sturgeon. The primary concern is capture in fyke nets and otter trawls.

The research activities and vessel transit are not expected to have adverse impacts on the listed fish species. The range of [Atlantic sturgeon](#) and [pallid sturgeon](#) overlaps with the project action area, however no critical habitat is within the proposed project area. Atlantic sturgeon (*Acipenser oxyrinchus*) adults migrate to freshwater or brackish water in the spring to spawn. Spawning occurs over hard bottoms (rubble, gravel, shell) in running water (Boschung and Mayden 2004). Eggs become adhesive upon reaching the bottom and stick to these hard surfaces. The shovelnose and Alabama sturgeons (*Scaphirhynchus platorhynchus* and *S. suttkusi*) also prefer hard bottom with rubble (Dovel 1979). *Scaphirhynchus* spp. females have been observed spawning in open channels of large rivers, where currents are strong (Hoese and Moore 1977, Boshung and Mayden 2004). The pallid sturgeon is found in the Missouri and Mississippi River basins from North Dakota to Louisiana ([78 FR 16526 16527](#)) Spawning appears to occur between March and July, with lower latitude fish spawning earlier than those in the northern portion of the range. Spawning appears to occur over firm substrates, in deeper water, with relatively fast, turbulent flows, and is driven by several environmental stimuli including flow, water temperature, and day length

(<https://ecos.fws.gov/ecp0/profile/speciesProfile?sId=7162#lifeHistory> ,USGS 2007; DeLonay et al. 2009). Newly hatched larvae are predominantly pelagic, drifting in the currents for 11 to 13 days and dispersing several hundred km downstream from spawn and hatch locations (Kynard et al. 2002, 2007; Braaten et al. 2008, 2010, 2012a).Based on their life history, it is unlikely that spawning adults and juvenile sturgeon would be near marshes, along muddy bottoms that do not provide these hard surfaces and preferred currents. Researchers from Louisiana State University, LUMCON, Rutgers University, and University of Florida have been conducting studies in Barataria Bay since 2012 and during this time have never encountered sturgeon in their sampling gear, which includes minnow traps, crab traps, seine nets, fyke nets, gill nets, and otter trawls. All fyke nets will be deployed at the marsh-water interface. Because sturgeon (adult or juvenile) are not known to utilize the marsh platform, there should be no Atlantic or Pallid sturgeon encounters.

In the unlikely event that listed fish species are caught in fyke nets and/or otter trawls every effort would be made to return them live to the water column. Tows would be short in duration to minimize bycatch of fishes which could be easily identified and returned to the water. However, fyke nets would be set for 24 hours, therefore potential mortalities could occur.

Therefore fyke nets would only be used at the marsh edge, where depth at the marsh edge is too shallow to allow sturgeon use of the marsh surface, thereby reducing interactions and preventing their capture using either of these techniques (sturgeon are not known to use the interior of marshes). In the highly unlikely event of capture sturgeon would be released promptly following the best practices (Kahn et al., 2010) and USFWS would be notified. *B*

Given the limited spatial and temporal scope of the sampling and relatively unlikely event of capturing one of these fish species NCCOS determines that project activities may but are not likely to adversely affect these fish species.

There are four (4) species of ESA listed sea turtles potentially found within the project area (Table 1). There is no critical habitat in the project sampling area thus there is no potential to destroy or adversely modify critical habitat. The primary concerns are capture in fyke nets, otter trawls and vessel strikes. As described above the fyke nets would be set at the marsh edge thus a turtle would need to be up in the marsh during high tide in order to be caught in the net as the water level lowers. This scenario is unlikely for the four (4) listed species of sea turtles. To reduce the likelihood of a sea turtle being collected in an otter trawl trawl duration would be short in duration (no more than 2 minutes) and at low speeds. Researchers would maintain a constant lookout to avoid adverse effects to sea turtles. Thus, capture and harm to sea turtles is highly unlikely. In the event a sea turtle is captured it will be immediately released and USFWS will be notified. *Based on this analysis, NCCOS determines that research activities may but are not likely to adversely affect sea turtles.*

Marine Mammal Protection Act (MMPA) - All marine mammals are protected under the MMPA. Sections 101 (a)(5)(A) and (D) allow the incidental take of marine mammals only under special circumstances, where “take is defined as “to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal” (16 U.S.C. §1361-1421h). Harassment includes any annoyance which has the potential to injure a marine mammal or stock (Level A) or disrupt its behavioral patterns (Level B). Similar to the risk of vessel strike for turtles, research activities are not expected to have adverse impacts on any marine mammal species. The primary concern is for a vessel strike during vessel transit between stations or to and from launch sites.

There is one (1) species of threatened and endangered marine mammals whose potential ranges overlap with the action area of the research activities (Table 1). This is the West Indian Manatee (*Trichechus manatus*). The proposed research activities do not overlap with the typical habitat of this species. The primary risk to the manatee would be from vessel strike during transit or entanglement in otter trawl. Protective measures incorporated into this project include maintaining safe distances from marine mammals spotted during the course of research, maintaining safe speeds and minimizing entanglement risks by maintaining a vigilant lookout. (see below). However, as it is unlikely that a manatee would be in the project area thus, NCCOS determines that project activities would not adversely affect the West Indian Manatee.

Table 1. Threatened and Endangered Species located in the study area as defined by Figure 1. This list is a result of the IPAC results from the USFWS webpage.

Status	Species Name	Critical Habitat (in Gulf of Mexico)
<b>Birds</b>		
E	Piping Plover ( <i>Charadrius melodus</i> )	Yes, <a href="#">linked here</a>
T	Red Knot ( <i>Calidris canutus rufa</i> )	N/A
<b>Mammals</b>		
E	West Indian Manatee ( <i>Trichechus manatus</i> )	Yes, linked <a href="#">here</a> . Marine and coastal areas in the southeast of Florida and GOM waters.
<b>Sea Turtles</b>		
E	Hawksbill Turtle ( <i>Eretmochelys imbricata</i> )	No
E	Kemp's Ridley Turtle ( <i>Lepidochelys kempii</i> )	N/A
E	Leatherback Sea Turtle ( <i>Dermochelys coriacea</i> )	No
T	Loggerhead Sea Turtle ( <i>Caretta caretta</i> )	Yes linked <a href="#">here</a> 38 designated marine areas in the southeast (includes GOM)
<b>Fishes</b>		
E	Pallid Sturgeon ( <i>Scaphirhynchus albus</i> )	Yes
T	Atlantic Sturgeon ( <i>Acipenser oxyrinchus</i> )	Yes, <a href="#">linked here</a>

E = Endangered, T = Threatened.

Migratory Birds - Birds are protected by the migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. Any activity that results in the take of migratory birds or eagles is prohibited unless authorized by the USFWS. There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured. There are thirty-six (36) species of migratory birds potentially found in the project area (IPAC results). Researchers would ensure that no birds are breeding, nesting or otherwise impacted by project sampling activities. *Based on the analysis of project activities as stated above, NOAA NCCOS determines that no activities conducted as part of this project would result in the*

ESA resources under NMFS jurisdiction:

There are a total of five (5) marine mammal species (details under MMPA section below), five (5) turtle species, five (5) fish species and seven (7) coral species listed under ESA within NMFS jurisdiction in the Gulf of Mexico region (Table 2). These species are listed as either endangered, threatened, proposed endangered or proposed threatened. None of the listed species has critical habitat overlapping the project action area of the Lake Hermitage study area (Figure 1).

Of the five listed fish species for the Gulf of Mexico two have critical habitat, the Gulf Sturgeon and the Smalltooth Sawfish. The Smalltooth Sawfish critical habitat is located on the southern coast of the Florida panhandle. Gulf Sturgeon has critical habitat throughout the Gulf of Mexico, including the Pearl River watershed, which is adjacent to the study area of Barataria Bay. However, both species critical habitat do not overlap with the project study area. *Therefore, NCCOS determines that no essential elements of their critical habitat would be adversely modified or destroyed by project activities.*

The distribution of Nassau grouper, giant manta and the oceanic whitetip shark are not likely to overlap with the project action area near Lake Hermitage (Figure 1.). *Therefore, NCCOS determines that project activities would not adversely affect these species.* For Gulf sturgeon and smalltooth sawfish) the primary concern is capture in Fyke nets, otter trawls and wire mesh (minnow) traps (larvae, young of year).

The Gulf Sturgeon distribution and range is primarily east of the Mississippi River and planned sampling sites are to the west (<http://www.fisheries.noaa.gov/pr/species/fish/gulf-sturgeon.html>). While less is known about Gulf Sturgeon, Atlantic sturgeon (*Acipenser oxyrinchus*) adults migrate to freshwater or brackish water in the spring to spawn. Spawning occurs over hard bottoms (rubble, gravel, shell) in running water (Boschung and Mayden 2004). Eggs become adhesive upon reaching the bottom and stick to these hard surfaces. The shovelnose and Alabama sturgeons (*Scaphirhynchus platorhynchus* and *S. suttkusi*) also prefer hard bottom with rubble (Dovel 1979). *Scaphirhynchus* spp. females have been observed spawning in open channels of large rivers, where currents are strong (Hoese and Moore 1977, Boshung and Mayden 2004). Based on their life history, it is unlikely that spawning adults and juvenile sturgeon would be near marshes, along muddy bottoms that do not provide these hard surfaces and preferred currents. Researchers from Louisiana State University, LUMCON, Rutgers University, and University of Florida have been conducting studies in Barataria Bay since 2012 and during this time have never encountered sturgeon in their sampling gear, which includes minnow traps, crab traps, seine nets, fyke nets, gill nets, and otter trawls. According to this NMFS [website](#), smalltooth sawfish generally inhabit shallow coastal waters of tropical seas and estuaries, very close to shore over muddy and sandy bottoms. Based on this, there is the potential for smalltooth sawfish to occur in this habitat type to be sampled but they are generally found closer to the peninsula of Florida.

All fyke nets would be deployed at the marsh-water interface. Because sturgeon (adult or juvenile) are not known to utilize the marsh platform, it would be unlikely to have Gulf Sturgeon encounters. In the unlikely event that listed fish species are caught in fyke nets, wire mesh traps and/or otter trawls every effort would be made to return them live to the water column. Tows would be short in duration (2 minutes) to minimize bycatch of fishes which could be easily identified and returned to the water. However, fyke nets would be set for 24 hours, therefore potential mortalities could occur.

Fyke nets would only be used at the marsh edge, where depth at the marsh edge is too shallow to allow sturgeon and smalltooth sawfish use of the marsh surface, thereby reducing interactions and reducing the risk of their capture using either of these techniques (sturgeon are not known to

use the interior of marshes). In the highly unlikely event of capture of sturgeon or smalltooth sawfish the fish would be released promptly following the best practices (Kahn et al., 2010) and NMFS OPR will be notified (POC in Best Management Practices (pg 14).

*Given the limited spatial and temporal scope of the sampling and relatively unlikely event of capturing one of these fish species NCCOS determines that project activities may but are not likely to adversely affect these fish species.*

There are five (5) species of ESA listed sea turtles potentially found within the project area (Table 2). There is no critical habitat in the project sampling area thus there is no potential to destroy or adversely modify critical habitat. The primary concerns are capture in fyke nets, otter trawls and vessel strikes. As described above the fyke nets would be set at the marsh edge thus a turtle would need to be in the marsh during high tide in order to be caught in the net as the water level lowers. This scenario is unlikely for the five (5) listed species of sea turtles. To reduce the likelihood of a sea turtle being collected in an otter trawl trawl duration of the tow would be short (no more than 2 minutes) and at low speeds. Researchers would maintain a constant lookout to avoid adverse effects such as inadvertent capture or a vessel strike to sea turtles. Thus, capture and harm to sea turtles is highly unlikely. In the event a sea turtle is captured it will be immediately released and NMFS will be notified. *Based on this analysis, NCCOS determines that research activities may but are not likely to adversely affect sea turtles.*

Marine Mammal Protection Act (MMPA) - All marine mammals are protected under the MMPA. Sections 101 (a)(5)(A) and (D) allow the incidental take of marine mammals only under special circumstances, where “take is defined as “to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill any marine mammal” (16 U.S.C. §1361-1421h). Harassment includes any annoyance which has the potential to injure a marine mammal or stock (Level A) or disrupt its behavioral patterns (Level B). Similar to the risk of vessel strike for turtles, research activities are not expected to have adverse impacts on any marine mammal species. The primary concern is for a vessel strike during vessel transit between stations or to and from launch sites.

There are five (5) species of threatened and endangered marine mammals whose potential ranges occur in the Gulf of Mexico (Table 2). There is no critical habitat for any of these species located with the project area, thus critical habitat would not be adversely modified or destroyed as a result of project activities. The proposed research activities also do not overlap with the general distribution of these large whales due to the depth of the water being too shallow to accommodate these large whales. During transit a lookout would be maintained to avoid vessel strikes with all marine mammal species, including smaller Cetaceans (not listed by ESA), similar to the BMPs to be employed to avoid adverse affects to turtles (Pg. 14). Other protective measures incorporated into this project include maintaining safe distances from marine mammals spotted during the course of research activities, maintaining safe speeds and minimizing entanglement risks (highly unlikely). *Based on this analysis NCCOS determines that project activities would not adversely affect marine mammals.*

Table 2. List of endangered and threatened species within the Gulf of Mexico region. Species list obtained 3/21/2017 from Colette Cairns NMFS/OPS

Species	ESA Status	Critical Habitat	Recovery Plan
<b>Marine Mammals – Cetaceans</b>			
Blue Whale ( <i>Balaenoptera musculus</i> )	<a href="#">E – 35 FR 18319</a>	-- --	<a href="#">07/1998</a>
Fin Whale ( <i>Balaenoptera physalus</i> )	<a href="#">E – 35 FR 18319</a>	-- --	<a href="#">75 FR 47538</a>
Sei Whale ( <i>Balaenoptera borealis</i> )	<a href="#">E – 35 FR 18319</a>	-- --	<a href="#">76 FR 43985</a>
Sperm Whale ( <i>Physeter macrocephalus</i> )	<a href="#">E – 35 FR 18319</a>	-- --	<a href="#">75 FR 81584</a>
Bryde’s Whale ( <i>Balaenoptera edonii</i> )	<a href="#">PE – 82 FR-88639</a>	-- --	-- --
<b>Marine Reptiles</b>			
Green Turtle, ( <i>Chelonia mydas</i> ) – North Atlantic DPS	<a href="#">T – 81 FR 20057</a>	<a href="#">63 FR 46693</a>	<a href="#">63 FR 28359</a>
Hawksbill Turtle ( <i>Eretmochelys imbricata</i> )	<a href="#">E – 35 FR 8491</a>	<a href="#">63 FR 46693</a>	<a href="#">57 FR 38818</a>
Kemp’s Ridley Turtle ( <i>Lepidochelys kempii</i> )	<a href="#">E – 35 FR 18319</a>	-- --	<a href="#">75 FR 12496</a>
Leatherback Turtle ( <i>Dermochelys coriacea</i> )	<a href="#">E – 35 FR 8491</a>	<a href="#">44 FR 17710 and 77 FR 4170</a>	<a href="#">63 FR 28359</a>
Loggerhead Turtle, ( <i>Caretta caretta</i> ) – Northwest Atlantic Ocean DPS	<a href="#">T – 76 FR 58868</a>	<a href="#">79 FR 39856</a>	<a href="#">63 FR 28359</a> <a href="#">74 FR 2995</a>
<b>Fishes</b>			
Gulf sturgeon ( <i>Acipenser oxyrinchus desotoi</i> )	<a href="#">T – 56 FR 49653</a>	<a href="#">68 FR 13370</a>	<a href="#">Recovery Plan</a>
Smalltooth Sawfish ( <i>Pristis pectinata</i> ) – U.S. portion of range DPS	<a href="#">E – 68 FR 15674</a>	<a href="#">74 FR 45353</a>	<a href="#">74 FR 3566</a>
Nassau grouper ( <i>Epinephelus striatus</i> )	<a href="#">T – 81 FR 42268</a>	-- --	-- --
Giant Manta ( <i>Manta birostris</i> )	<a href="#">PT – 82 FR 3694</a>	-- --	-- --
Oceanic Whitetip Shark ( <i>Carcharinus longimanus</i> )	<a href="#">PT - 81 FR 96304</a>	-- --	-- --
<b>Marine Invertebrates</b>			

Species	ESA Status	Critical Habitat	Recovery Plan
Elkhorn Coral ( <i>Acropora palmata</i> )	<a href="#">T – 71 FR 26852</a>	<a href="#">73 FR 72210</a>	<a href="#">80 FR 12146</a>
Staghorn Coral ( <i>Acropora cervicornis</i> )	<a href="#">T – 71 FR 26852</a>	<a href="#">73 FR 72210</a>	<a href="#">80 FR 12146</a>
Rough Cactus Coral ( <i>Mycetophyllia ferox</i> )	<a href="#">T – 79 FR 54122</a>	-- --	-- --
Pillar Coral ( <i>Dendrogyra cylindrus</i> )	<a href="#">T – 79 FR 54122</a>	-- --	-- --
Mountainous Star Coral ( <i>Orbicella faveolata</i> )	<a href="#">T – 79 FR 54122</a>	-- --	-- --
Boulder Star Coral ( <i>Orbicella franksi</i> )	<a href="#">T – 79 FR 54122</a>	-- --	-- --
Lobed Star Coral ( <i>Orbicella annularis</i> )	<a href="#">T – 79 FR 54122</a>	-- --	-- --

Magnuson-Stevens Fishery Conservation and Management Act (see [this](#)) requires that Federal agencies consult with NMFS on actions that “may adversely affect” Essential Fish Habitat (EFH) (16 U.S.C. §1855(b)(2)).

NCCOS consulted the NOAA OHC, [EFH mapper](#) to determine the potential species or management units within the project action area. Research activities and sampling (described above) would occur in the West Point a la Hache (WPH) area within Barataria Bay, Louisiana. The EFH resources derived from the EFH Mapper are listed below. There were no Habitat Areas of Particular Concern (HAPC) or EFH areas protected from fishing within the project area.

In addition, the EFH Mapper sources indicated that there is no coral EFH within the research activity area. However, both sources indicated the following species groups or taxa potentially have EFH designated within the research activity area (Figure 1) as follows:

A) Species or Management Unit within **Barataria Bay** Research Area:

1. Scalloped Hammerhead Shark
2. Finetooth Shark
3. Bull Shark
4. Spinner Shark
5. Atlantic Sharpnose Shark
6. Red Drum
7. Reef Fish (43 species)
  - a. Balistidae
  - b. Carangidae
  - c. Labridae
  - d. Lutjanidae
  - e. Malacanthidae
  - f. Serranidae

8. Coastal Migratory Pelagics
9. Shrimp
  - a. Brown
  - b. White
  - c. Pink
  - d. Royal Red

The proposed research activities include: fyke nets, wire-mesh traps, otter trawls, coring, and sweep nets for capturing insects. Based on the limited spatial and temporal extent of the sampling at each general location (~15 days per sampling season), NCCOS determines that no adverse effects to EFH are likely. For example the fyke nets (4' x 4' square and each wing is 3.5' x 4.0' (LxW)) and wire mesh traps for minnows (41 cm long, 22 cm wide, with 3-mm mesh) and crabs (60cm x 60cm x 30cm with 3.5cm x3.5cm openings) are small and will cover a limited area of habitat and would not reduce the quantity or quality of essential fish habitat. Similarly otter trawls will occur with a 5m net and be restricted to a 2 minute duration. NCCOS would use BMPs (below) when anchoring as needed to avoid impacting EFH

National Marine Sanctuaries Act (NMSA) - Section 304(d) of the National Marine Sanctuaries Act requires the “action agency” to consult with the Office of National Marine Sanctuaries if the action is “likely to destroy, cause the loss of, or injure a sanctuary resource” (16 U.S.C. §1431 et seq.). However, no activities would be conducted within a National Marine Sanctuary; we will not be requesting a letter of concurrence pursuant to this Act.

National Historic Preservation Act (NHPA) - Section 106 requires Federal agencies to take into account the effects of their actions on historic resources (16 U.S.C. §470 et seq.). After review of the National Historic Registry Database, that is in the National Park Service cultural\_resources data layer

([https://mapservices.nps.gov/arcgis/rest/services/cultural\\_resources/nrhp\\_locations/MapServer](https://mapservices.nps.gov/arcgis/rest/services/cultural_resources/nrhp_locations/MapServer)).

NCCOS found only one known Historic resources within the vicinity of the action area of research activities. It is the Woodland Plantation Building (NRIS\_Refnum 98000702) located in West Point a la Hache LA. However, project activities would conducted within marsh and tidal creek habitats to the west of this location and thus would not adversely affect cultural resources in this area. Therefore, NCCOS will not be requesting a Section 106 consultation.

### **Determination Summary and Extraordinary Circumstances**

Project activities described above would be temporally (less than 12 weeks) and spatially small in scale (small footprint of fyke nets, wire mesh traps and otter trawls). Collecting permits are required for this sampling from Louisiana Department of Wildlife and Fisheries and will be maintained throughout the course of the project fieldwork. Sampling protocols are routine and have occurred hundreds of times in the past. It is not likely that any listed species will be collected because of the habitat being sampled and the small size of fyke nets slow tow speeds of otter trawls used, and if so, they will be returned to the water as soon as it is practicable and NMFS OPR would be immediately notified. No activities will be conducted in areas where children may congregate. These activities are not the subject of controversy based on potential environmental consequences and do not establish a precedent or decision in principle about

future proposals. There are no uncertain environmental impacts or unknown risks as project activities are routine and non-intrusive there will be no impact on geographically or ecologically critical areas (sanctuaries, wetlands, watersheds), National Historic Sites, and no adverse impacts to marine mammals, essential fish habitat (marsh, wetlands, seagrasses, corals, etc.) or threatened and endangered species or their critical habitat. Baratavia Bay is an EPA estuary of national significance, the research activities will not adversely affect the estuary. In addition, activities do not include bird nesting areas, marine mammal nursery or feeding areas. The proposed project activity does not involve air, noise, or water quality impacts; and does not otherwise have a significant impact on the human environment.

No adverse environmental impacts are anticipated from laboratory activities. Laboratory activities will follow all appropriate safety and disposal regulations. Waste chemicals from this project will be disposed of through a licensed hazardous waste Treatment, Storage, and Disposal (TSD) facility, transported by a licensed transportation contractor. The proposed project has no potential to generate, use, store, transport, or dispose of hazardous or toxic substances in a manner that may have a significant effect on the environment. The proposed project does not have a disproportionately high and adverse effect on the health or the environment of minority or low-income communities, compared to the impacts on other communities (EO 12898). The project will not contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area or involve actions that may promote the introduction, growth, or expansion of the range of the species. The applicants have approval for all activities regarding vertebrate animals from their Institutional Animal Care and Use Committee(s) under the Animal Welfare Act and related policies and regulations. Thus, there is no potential to violate Federal, State, or local law or requirements imposed for protection of the environment. There are no highly controversial environmental effects. Thus, there are no extraordinary circumstances present that may require further analysis in an EA or EIS.

### **Special Award Condition**

NCCOS initiated informal EFH and ESA Section 7 consultations with NMFS and an ESA Section 7 consultation with the USFWS. Special award conditions have been placed on the award to ensure work does not begin until the consultations have been completed, protected measures (if any) have been incorporated, and required permits obtained. An addendum to this memorandum will be completed once the consultations are concluded that includes any required protective measures resulting from the consultations. The special award conditions for the consultations will be removed once the addendum is complete.

### **Categorical Exclusion Determination**

The Program Office has determined that the Categorical Exclusion E5 likely covers the project activities described above since these activities would not result in any changes to the human environment. As defined in Section 4 and Appendix E of NAO 216-6A Companion Manual E5, activities involving invasive techniques or methods that are conducted for scientific purposes, when such activities are conducted in accordance with all applicable provisions of the Endangered Species Act, Marine Mammal Protection Act, Migratory Bird Treaty Act, and Magnuson-Stevens Fishery Conservation and Management Act. Such activities will be limited to impacting living resources on a small scale relative to the size of their populations, and limited to

methodologies and locations to ensure that there are no long-term adverse ecosystem impacts. The proposed project falls within the scope of the E5 categorical exclusion. Cumulative effects are negligible. A final determination will be made in an addendum to this memorandum once any consultations described above (see **Special Award Conditions**) are complete.

### **Protective Measures and Best Management Practices Incorporated into the Action**

In the event of unauthorized incidental take of protected species, NCCOS would suspend all activities causing such take and immediately contact NMFS Office of Protected Resources (see contact below). NCCOS would request ESA Section 7 reinitiation in the event of unauthorized take, systematic noncompliance, unanticipated adverse effects, or modification of the action.

NMFS POC - Colette Cairns, [colette.cairns@noaa.gov](mailto:colette.cairns@noaa.gov), 301-427-8414, NMFS OPR ESA-ICD  
USFWS POC - David Horning, [david\\_horning@fws.gov](mailto:david_horning@fws.gov);

BMPs are required to be incorporated within project instructions, cruise plans and NEPA documentation including financial assistance awards and environmental review memoranda. All applicable BMPs must be communicated to the principal investigators, boat operators and field staff in order to explain responsibilities, communication procedures, marine mammal monitoring protocol, and operational procedures.

1. Minimize vessel disturbance and ship strike potential
  - a. Reduced speeds (<3 knots) while transiting through designated critical habitat .
  - b. When transiting through ranges of mysticete cetaceans (large whales) and sea turtles, at least one observer is mandatory. The watch stander or vessel operator is sufficient in most cases.
  - c. Species identification keys (for sea turtles– as applicable) will be available on all vessels
2. Minimize noise
  - a. Reduced speed (see above)
3. Minimize vessel discharges (including aquatic nuisance species)
  - a. Meet all Coast Guard requirements.
  - b. Clean hull regularly to remove aquatic nuisance species.
  - c. Avoid cleaning of hull in critical habitat.
  - d. Avoid cleaners with nonylphenols.
4. Minimize anchor impact to corals, seagrass or other EFH
  - a. Use designated anchorage area when available
  - b. Use mapping data to anchor in mud or sand, to avoid anchoring on corals
  - c. Minimize anchor drag

5. Sea Turtles, Manatees and Dolphins
  - a. Avoid approaching within 50 yards.
  
6. Entanglement Protective Measures
  - a. Use small otter trawls
  - b. Otter trawl duration will not exceed 2 minutes
  
7. Habitat Protection
  - a. Avoid unnecessary contact of gear, towed or lowered, with the sensitive bottom habitat (e.g. submerged aquatic vegetation (SAV) and hard bottom).
  
8. State Collecting Permits
  - a. Scientific Collection Permit from the Louisiana Department of Wildlife and Fisheries (<http://www.wlf.louisiana.gov/permit/scientific-collecting-permit>). These are annual permits (expire on December 31) and will be renewed throughout the project.
  - b. Permission from landowners is required for marsh access. There are currently written access agreements in place with each individual landowner at each site.

## **References**

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